Reconsidering Evidence:
Evidence-based Practice and Maternity Care in Canada

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Abstract

Evidence-based practice (EBP) has been widely adopted as a scientific and objective approach to health care. Enthusiastic acceptance of EBP within maternity care appears to have had unexpected effects on the care of childbearing women. This qualitative study of an interprofessional group of maternity care providers explores EBP from a critical science studies perspective to understand the social inside the science. A literature review and interviews with family physicians, midwives, nurses and obstetricians were analyzed for themes. Initial hopes for EBP were high and often contradictory. Although many had hoped EBP would help limit rising rates of intervention in childbirth, informants noted that interventions, such as induction of labour and caesarean section, have continued to increase. Informants described patterns of uneven application and misapplication of evidence. They described how some evidence is applied quickly while other evidence is resisted. The rapid uptake of the findings of a single trial about breech birth was frequently contrasted with reluctance to implement evidence in favour of auscultation rather than electronic fetal heart monitoring. My findings reveal patterns of over application, for example, when research about post-term pregnancy is used as a rationale for induction of labour earlier than the findings justify. Informants described under interpretation when multiple or ambiguous interpretations are ignored and over interpretation when evidence is generalised to populations beyond its relevance. Informant interviews reveal underlying reasons that evidence is oversimplified and unevenly applied. Care providers are influenced by belief systems, powerful cultural trends to technologic solutions, discomfort with uncertainty, a focus on risk avoidance, and structural issues including payment systems and limited resources. Many informants expressed concern that the adoption of EBP has unexpectedly undermined support for physiologic birth. They described a profound sense of loss, including loss of skills, access to care and choices for women. Informants advocated reconsideration of EBP, calling for a conscious and reflective approach which acknowledges that scientific evidence alone cannot set goals and objectives of care. My findings are evidence of interprofessional interest in open dialogue about interpretations of evidence and revisions of EBP in the care of childbearing women.

Dedication

To Murray Enkin for his courage, humanity and critical intelligence as an advocate and critic of EBP, and for his outstanding support for midwifery

To the many dedicated care providers who have so enthusiastically talked to me about evidence-based practice and caring for women during pregnancy and birth

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Introduction: Looking for the Social Inside Science

The past two decades in health care have been marked by the widespread adoption of a "new" and now dominant approach known as evidence-based practice (EBP). My interest in EBP and in understanding the social and political aspects of its application to the care of childbearing women is rooted in my history as both a practicing midwife and a student of social analysis. The story of EBP in maternity care in Canada is particularly interesting, as obstetrics, once heralded by British epidemiologist Archie Cochrane as the least scientific of all medical specialties, has since been recognized as a leader in the EBP movement[1-5] with Canadian researchers at the forefront. Enthusiasm for EBP has not been restricted to the specialty of obstetrics, but has been widely taken up by the other maternity care provider groups: family practice, midwifery and nursing. Maternity care in the 1980s provided a highly political ground for the evolution of "the new paradigm", as a very lively debate about the medicalization of childbirth was taking place in popular, academic and professional cultures. The care of childbearing women remains an area within health care that is distinguished by social and political movements[6,7,8] and public and academic debates. The inter-relationship between the "childbirth reform" and EBP movements has been largely unexplored and sets the background for my analysis of the impact of EBP in maternity care in Canada.

What is EBP?

Evidence-based practice is commonly defined as a commitment to base health care on the best available scientific evidence. A variety of more specific definitions of EBP have evolved over time. (A list of acronyms is included in Appendix One and Appendix Two contains definitions of EBP.) EBP uses well-defined criteria to evaluate the quality of clinical research, creating a hierarchy of evidence with the most scientific and therefore highest quality being the randomised controlled trial (RCT). In the case of drug trials a double blind RCT is the "gold standard", whereas in clinical research blinding is often not possible as both the care provider and patient the know the nature of the treatment being applied or not applied. In maternity care, both pregnant women[i] and care providers involved in trials, for example, of induction of labour or of

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[i] I have chosen to call the users of maternity care "pregnant women" and "childbearing women" or "women and their families", consistent with the majority of the maternity care literature. I use patients when referencing the medical literature where this is the norm. What to call the childbearing person is the subject

caesarean section for breech babies, are aware of the treatments but patients are randomised to either receive or not receive the treatment. The Canadian Task Force on the Periodic Health Exam developed a system in 1979, revised in 2003[12,13] which was used in the first EBP "how to guide"[14] for grading the level and quality of research evidence and establishing the RCT at the top of the hierarchy.

EBP is described as both epistemological and clinical, as it proposes optimal ways to develop knowledge and asserts that information obtained from high quality scientific research is the foundation for effective clinical practice.[15] EBP is posited as superior to the use of other "non-evidentiary" or "lower" quality forms of knowledge, such as individual clinical experience, physiologic principles, expert opinion and understanding of patient, professional, or social values.[4,5,16,17] The term EBP is an adaptation of "evidence-based medicine" (EBM), first coined by McMaster University's Gordon Guyatt in an article in the *Journal of the American Medical Association* (*JAMA*) in 1992, and evolved from previous labels including the less specific "research-based practice".[18] It is meant to be more inclusive than EBM and is often interchangeable with evidence-based health care. EBP has generated labels specific to particular health professions such as evidence-based midwifery, nursing, physiotherapy etc.; labels for non-clinical practice both inside and outside health such as evidence-based policy and evidence-based management; and labels for professions outside health such as evidence-based social work and teaching. It has also generated terms with more nuanced meaning such as evidence-informed practice, which reflects an acknowledgement of some of the limitations of EBP. I generally use the term EBP as it applies to all of the maternity care professions, including midwifery, nursing and medicine. I also use EBM where relevant, for example in discussions of the EBM debates in the medical literature.

EBP had its beginnings in the emerging fields of epidemiology and population health in the late 1970s and 1980s. Advocates in the early nineties posed EBP as a central paradigm shift for clinical care providers, promising not only a more systematic and scientific approach to clinical practice but also a challenge to practices based on tradition, professional opinion and authority.[16,18] "Good evidence" is argued to be essential to both care providers and the recipients

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of several debates which I would like to acknowledge. These debates are related to gendered language, given the exclusion of transgendered individuals,[9] whether the fetus is a separate patient,[10] and limitations of the term "patient" and alternatives such as "consumer".[11]

of care.[4,5,19] Since that time, the concept that quality scientific evidence is fundamental to health care is universally accepted, even if debate about how to best produce, evaluate and apply evidence remains. Medical,[15] midwifery,[20] and nursing[21] education have enthusiastically espoused EBP, although the resources to support EBP teaching have not been equally available.[22] An article published in the *Journal of Advanced Nursing* in 2002 charted the number of times EBP and its variants were used in the titles of articles or in abstracts published in the professional literature since it was first used in 1992.[23] Over its first decade EBP spawned not only thousands of articles, but many texts, several international journals and research institutions. [15,23] Two decades later the term has become ubiquitous leading authors from McMaster University, which many consider to be the birthplace of EBP, to coin the term "evidence-based everything".[24]

The impact of EBP reaches outside of health care and is increasingly expected in other professions and practices. Linked with not only health care practice but also with education and with institutions that produce or support research, EBP is deeply entwined with research funding decisions and academic career paths. EBP has become not only a dominant world view but also a thriving industry. [25]

Why this Topic?

Although a lively debate in the health care literature explores the impact of EBP and its value and limitations, EBP is often an unquestioned "good" in day to day practice, in texts and in the professional literature. Despite a long history and well established critique of health care practices related to childbirth in the professional, academic and popular literature, when I began my project there were few attempts by scholars to put the development of EBP in maternity care in a social and political context. My interest in this topic was sparked by noting debate and discomfort on the ground among maternity care providers from all disciplines. In my day to day work as a midwife I heard concern about how EBP was dramatically altering practice and questions about how evidence was being applied. In hospital hallways, in birth rooms and in the discussions following presentations at hospital rounds, I began to understand that there was a lot going on underneath the science.

My research, conducted mainly between the years 2002 and 2007, explores the perceptions of midwives, nurses and physicians about the impact of EBP on the care of childbearing women in Canada, and by doing so, explores the space where science meets the complex web of social relations, world views and system politics that characterizes health care.

It appeared to be a fascinating moment in the history of childbirth. The "EBP revolution" [26] was in full swing and yet many advocates and champions of improving the science of health care seemed to have second thoughts and concerns about unexpected effects. As my research indicates, these concerns were often expressed at the edge of official conversations. Care providers were beginning to note a growing dissonance between the way research findings about pregnancy and childbirth were reported and the way that they were applied. Research findings often overtly supported choice of a variety of approaches. However, the production of evidence-based guidelines and policies trying to apply the research frequently resulted in prescriptive approaches and seemed to eliminate choices for pregnant women. Some of the research findings welcomed by those supporting "low intervention" approaches to pregnancy and birth seemed to be interpreted in the opposite direction by their colleagues. In the conversations that informed my preliminary exploration of this topic, I heard from members of all care provider groups that they had concerns about how evidence-based practice was contributing to rising rates of interventions in birth. Others worried that despite EBP's anti-authoritarian aspirations, it had become unacceptable to express dissenting views.

This research hopes to reveal some of the social dynamics behind both the widespread acceptance of EBP and the growing critiques of EBP. In the tradition of critical and feminist science scholarship, my work attempts to identify EBP as a practice that is 'inside' history and politics.

The Context of Maternity Care in Canada

My research takes place within the Canadian health care system which provides universal access to health care for residents and is organized at a provincial level. Maternity care in Canada is challenged by the geographic diversity with extremely densely populated urban areas, decreasing populations in rural areas and very sparsely populated remote communities. Care takes place in both very large and very small hospitals and in the clinics and offices of care providers working in the community. Most Canadian births take place in the hospital however births also occur at home and in small birth centres. Unlike many other countries, most maternity care in Canada is provided by physicians who act as the primary care or "most responsible" provider and nurses who staff the labour floors and monitor and support the women admitted under the care of physicians, with midwives only recently integrated to some provincial health systems.[27]

Over the last thirty years, there has been a move away from small community based

hospitals where births were largely attended by family physicians towards concentrating births in regional high risk centres, regardless of risk status.[28] Closure of small community hospitals means that women outside of urban areas travel long distances for care. In northern and remote communities the norm is to "evacuate" or fly women far from home for weeks or even months in order to access hospital care.[28] Decreasing numbers of family physicians attend women in labour particularly in urban communities. Although midwifery is growing, the majority of births are attended by the obstetricians and nurse team.[27,28] Most normal births in Canada are attended by high risk specialists working in large high risk centres.[28]

This pattern of care is typical of Canada and the US but it is at odds with maternity care in many other settings. Most births in the world are attended by midwives, and obstetricians are involved as consultants when the pregnancy or birth is complicated. Like the US, but in contrast to the majority of countries in the world including those with the best records of safety in childbirth, the shift in the early 20th century towards hospitalized medical care meant that midwifery was not recognized in Canada until the 1990s. Although midwifery was an integral part of both aboriginal and immigrant societies in early Canadian history, midwifery was replaced by medical care by the mid-twentieth century in all but the most isolated parts of Canada. Public demand for alternatives to medicalised childbirth catalyzed a rebirth of the practice of midwifery outside the formal health care system in Canada in the 1970s and 1980s and activist movements calling for recognition and funding of midwifery services.[29] Calls to "change childbirth" and improve the status of midwifery emerged in other countries at the same time, as part of feminist women's health and grassroots childbirth movements.[30]

In Canada, midwifery was established as a self-regulating profession and integrated into the health care system in many provinces during the 1990s. The profession remains unregulated (and therefore alegal or illegal) in three provinces (New Brunswick, Newfoundland and Prince Edward Island) and one territory (Yukon) at the time of writing. Investment in establishing midwifery systems has been minimal in many provinces and the percentage of midwife attended births remains low[27] although demand for midwifery services is high. The emergence of debates about midwifery's status both in Canada and internationally parallel the emergence of EBP, and this timing influences the experiences and perspectives of some of the care providers I interviewed.

Some scholars and many popular writers argue that dichotomous models of care and views of birth separate the professions, particularly medicine and midwifery.[31,32] My work will

both reinforce and challenge this idea, however the history and context of the different care provider groups is important to understanding the ways in which care providers reflect on evidence about different approaches to maternity care, and the different positions care providers hold in the health care system.

EBP and Childbirth

One of the reasons that EPB in maternity care is of particular interest is that lack of scientific evidence for numerous routine obstetric practices formed the basis for many critiques of the medical management of childbirth. Some of the early advocates for better scientific evidence were childbirth activists and feminist women's health scholars.[6-8,33,34] Under the influence of feminist political movements, several decades of grassroots activism on women's health issues and an effective childbirth movement that had made significant gains in childbirth reform, early calls for EBP appear to have assumed that the systematic interpretation of scientific evidence would support a "woman-centered" approach to childbirth that respected rather than pathologized the physiology of birth.[1,35,36] The nature and relationship between childbirth activism and EBP will be described in depth the next chapter. Twenty years later, however, the application of evidence to practice appears to reassert professional and technological dominance in obstetrics. Childbirth movements, despite or perhaps because of many successes, appear to have lost focus, been suppressed or been forgotten.[6,8,37] Caesarean section "on demand" competes with "natural" childbirth to claim the labels of feminism and choice in both the popular and academic press. American sociologist, Barbara Katz Rothman, author of one of the defining texts of the childbirth movement *In Labour: Women and Power in the Birth Place*, worries "we won all of the battles but we lost the war".[37]

Many of the care providers I interviewed note that evidence which promotes intervention and medicalization of birth appears to be quickly taken up. A notable example, which will be discussed throughout my chapters, is a randomised controlled trial which showed a greater risk for vaginal breech birth than for caesarean section.[38] This single RCT changed international obstetric practice almost overnight. In contrast, evidence that challenges intervention in pregnancy and birth has often proved almost impossible to implement, despite significant effort on the part of professional organizations and governments. Electronic fetal monitoring is still the norm in most North American hospitals almost three decades after RCTs which showed that it did not improve long term neonatal outcomes, restricted women's ability to move in labour and

increased rates of pharmacologic pain relief and caesarean section.[39] As discussed by many of the caregivers I interviewed, this dramatic contrast complicates maternity care's claims to EBP.

Advocated as a move towards a more scientific and objective approach to health care, EBP was championed by many who wished to "humanize childbirth".[40] I will argue that the uncritical acceptance of EBP in both medicine and midwifery has the potential to obscure some of the politics of childbirth that childbirth activists and feminist scholars uncovered during previous decades of the childbirth movement. Claims to EBP can work to hide politics under the cloak of science and silence discussion of philosophies, values and the structure of the health care system.

In a broader health care context, EBP can be put forward as the scientific justification for cost reduction, "managed-care" and "risk management" that aims for efficiency and avoidance of litigation. Some worry this use of EBP will diminish access to appropriate care for individual situations and participation of both practitioners and patients in decision-making. This has led to critiques of a "new authoritarianism", at odds with the goals of EBP. Feminist critiques of obstetrics, as well as medicine and science in general, have pointed out the need for not only a "more scientific" science but also for a more reflective science, willing to expose and interrogate the social and political influences on both development of knowledge and on the application of science in health care practice.[34,41-43] The status of EBP as "more scientific" may operate to distance health care practice from the social context in which it operates, placing it above or outside of history and politics, consolidating rather than challenging professional power, reinforcing the drive to "efficiency", and restricting rather than opening up choices for the users of health care. This is particularly problematic in maternity care during the profoundly social and cultural experience of childbirth.

My thesis is that an analysis of EBP in maternity care allows an examination of whether and in what ways these concerns about EBP manifest in an area of health care that welcomed it as a new paradigm. Looking at how EBP functions and noting the directions and operations that emerge as it is applied to the care of pregnant and childbearing women illuminates some of the "hows and whys" that shape its use.

Theoretical framework

My work is set in the context of critical, feminist and postmodern theorizing about the relationships between science, medicine and women's bodies. Several interpretive strategies will

guide my analysis. Inspired by scholars whose work has involved charting the changes over time of a scientific idea or practice[31,34,43-49] I will examine the development of EBP in order to explore the forces which shape it. This approach sees science as both constructing and constructed and looks at how a scientific practice is both theorized and used. I start with the understanding that neither science nor evidence is a neutral tool which produces indisputable "facts" and proceed with the theory that examining what is presented as universal, fixed, factual or natural can be revealing.

The care providers I interviewed and the literature I examine often present science and quantitative methods as objective and completely separate from values, beliefs and politics. Social science and qualitative methods are also often presented as completely separate from medical science. My perspective is that there is no objective science or method. I attempt to look underneath what appears to be unquestionable, authoritative, 'sacred' to examine why and how some interpretations become dominant. Following scholarly practice in critical, feminist and postmodern analysis, I will explore not only the applications but also the misapplications or the unexpected effect of EBM or how "things bite back".[50] Looking for what is left out or unsaid can assist in understanding how dominant paradigms reassert themselves under new labels. I will also examine how those in different social locations use science differently and are affected by science differently. I am interested in the directions of power and how social relations impact on and emerge from the practice of using evidence as the basis of clinical decision-making, including how economic pressures and ideological perspectives influence how EBP works in practice. I examine the social context and politics that produce particular "operations of evidence" in maternity care. This method might be summarized as "politicizing science".

My interviews pointed me towards not only the broadly social uses of EBP, but also the more personal uses of evidence. I am interested in the individual dilemmas and pressures which affect the caregiver as a person in a social context. I explore how clinicians use EBP to deal with uncertainty, responsibility and prioritizing, as social expectations of perfect outcomes and perceived medico-legal pressures in maternity care shape the context in which evidence is applied.

I assume that a "liberatory feminist body politics"[51] is possible but complicated; and that the interests of women, caregivers and researchers in scientific and technologic approaches to birth are diverse and often contradictory. This follows the body of feminist scholarship which shows how, as caregivers, midwives, nurses and physicians both resist and assist women in

making their own meanings out of the science and the experience of pregnancy and birth.[10,52-54] My clinical midwifery practice has also given me first-hand understanding of the ways in which childbearing women both use and resist scientific interpretations of their bodies in their day to day experiences of being pregnant and giving birth.

I frame my work within the feminist literature about women's bodies and reproductive processes. This literature has provided strong evidence of the power and persistence of scientific discourse to define the female body as an object of knowledge equated with nature[43,51,55-58] with science conceptualized as the discovery of nature.[42,43,57,59] These concepts are closely linked with understandings of women as reproductive vehicles [43,45,51,53] and of the maternal body as a machine,[31,32,45,46,60,61,62] or alternately as abnormal, with reproductive physiology seen as pathological and requiring treatment, discipline and management.[31,34,46,61,62] A significant literature on the power of expert discourse within obstetrics[31,34,46,52,61,63] and the subsequent disappearance of women and creation of the fetus as an object of medical interventions[53,54,64-67] informs my discussion of the new paradigm of evidence-based practice.

Inter-disciplinary Research

Like other feminist science studies projects, this research crosses disciplines, and uses approaches and resources from anthropology, cultural studies, gender and women's studies, political science, sociology, and the inter-disciplinary field known as science studies to look at health care from a social science perspective. The inter-disciplinarity of this study acts to bring a qualitative eye to a quantitative field, given that EBP defines itself and its value by the most quantitative of research methods, the randomised controlled trial (RCT).

The project is also interprofessional. I read and interviewed across the boundaries of medicine, midwifery and nursing and attended conferences within each maternity care profession, as well as those that were deliberately interprofessional. Although a call for interprofessional approaches to education, practice and research is currently very popular in health care generally and in maternity care specifically[68-70] the normative culture continues to be "siloed".[71-73]

The inter-disciplinary and interprofessional aspect of the research became one of its most interesting elements. Care providers appeared to crave conversation across the cultural boundaries between the professions and also to think and talk outside the clinical box. Informants expressed enthusiasm and desire for the opportunity to reflect on both the social meaning of the science and the day to day realities of their work. The group of clinicians interviewed clearly had concerns

and opinions about the social and political environments they practice in and the broader cultural implications of their work, yet it seems for many there are few forums to discuss these aspects of health care work.

Research Methodologies

This study used qualitative research methodologies, including key informant interviews and analysis of texts and professional presentations, to conduct a thematic analysis of both "talk" and "writing" about EBP in the two decades after it was introduced. Qualitative research using semi-structured interviews provided the opportunity to ask questions about the "hows" and "whys" of health care practice. (A list of interviewees and transcripts is included as Appendix Three. A list of conferences attended is Appendix Four.) Interviews were conducted using a schedule of interview questions (Appendix Five) and transcribed verbatim. Quotes were edited for readability only. Themes that emerged from the literature, the interviews and conference presentations were the basis for the creation of a thematic coding guide (Appendix Six). Transcripts were coded using NVIVO qualitative data analysis software. Ethics approval was obtained from York University (Appendix Seven).

Talking about Evidence

. I interviewed fifty maternity care providers from across Canada with an identified interest in EBP, with the goal of including approximately equal groups from the main maternity care provider professions: family practice, midwifery, nursing and obstetrics. Two interviews were not able to be transcribed due to poor sound quality and so were not included in my data analysis. My interviews with women's health activist and epidemiologist Abby Lippman and obstetrician and clinical epidemiologist Mark Walker have informed my understanding and analysis, however they have not been formally cited due to the inability to transcribe the tapes. My sampling was purposive, but also snowballed, with key informants letting me know about others who they thought should interview. Some were identified through published literature, relevant conferences or through participation in an online chat group hosted by the Ontario College of Family Physicians called the Maternity Care Discussion Group (MCDG). I attempted to include those who could be identified primarily as advocates or critics of EBP who had published or spoken on the topic or been identified by others. I attempted to include a balance of those identified as front line practitioners or as professional leaders. Some were selected because they were known as EBP researchers (from each profession); others were those who had never done research and

whose focus was on clinical practice. My sample cannot be seen to be representative of the professions, as informants expressed individual views. My awareness of the politics of the professional groups I involved led me to want to balance input from each group both in my data collection and in my reporting of my findings, to ensure each had their fair "hearing". Inevitably my work has focused more on medicine generally, and obstetrics specifically, as much of the EBP research has been generated and debated within medical forums.

I deliberately sought out practitioners who had practiced prior to 1990 to provide a historical perspective reflecting the emergence of EBP and its initial goals. As this tended to lead to older and more experienced practitioners, I deliberately also sought out a newer practitioner in each of the provider groups. I deliberately sought out informants with an involvement in regulation, guideline development and in professional liability or risk management.

A significant proportion of those I interviewed had a history in, and commented on, practice in more than one profession. These were most commonly those who were both nurses and midwives, but also included those who had first been family physicians and were now obstetricians, as well as a family physician who was formerly a pediatric specialist. I included one neonatologist who participated in many of the key studies of obstetric care that are referenced by informants and who is an international EBP leader. I included a childbirth educator and author from the US who has worked extensively in Canada to educate others from all maternity care provider groups and was an early of EBP advocate. I also included a prominent evidence critic from outside maternity care, an internal medicine specialist because his work was referenced by many informants and in the literature as highly influential. I had hoped to include Mary Hannah, a very influential researcher who was the lead author of many of the central RCTs that the care providers I interviewed discuss, however she declined, noting that she was no longer actively involving herself in debates about EBP.

Many of the practitioners I interviewed had significant experience in more than one setting in Canada. My interviewee group reflects practice in at least ten of the thirteen Canadian provinces and territories including rural and remote as well as urban practice settings and practice in ten of the sixteen Canadian Academic Health Science Centres. Many had been educated outside of Canada or had practiced internationally. A few of the care providers I interviewed lived outside Canada at the time I interviewed them but had either worked in Canada or had made a contribution to EBP that made their insights invaluable.

The midwifery and nursing groups were exclusively female. My family practice group

was comprised of equally female and male participants. My obstetric group had a majority of male informants. Given that I deliberately sought experienced practitioners, this mix reflects the demographics of the professions. However, given the dramatic shift in the gender demographics of obstetrics in Canada (the group over 45 is largely male and the group under 45 is largely female),[74] I ensured that my group included the views of a female obstetrician.

I conducted semi-structured interviews which were taped and transcribed. A pilot interview was held with a member of each of my sample groups, i.e. a family physician, a midwife, a nurse, an obstetrician. My interview guide was adapted and revised based on these pilots. I began interviews with general questions about the participant's history with and perspectives on EBP. These were frequently the only questions I asked. Many participants, often despite a disclaimer that they were not sure they had much to say, spontaneously addressed the remaining thematic areas covered by my questions, frequently extending the allotted interview time. The interview guide included prompts relating to key clinical topics or "contested areas of practice", in order to draw out a more in depth understanding of the particularities of applying evidence. These prompts were rarely needed and the same clinical topics were almost uniformly raised by participants. This is not surprising given that the literature and conferences also consistently identified the same topics as key examples.

The interviews were typically conversational and interactive, with participants seeking my views and reactions and often referring to the views of others I had interviewed or planned to interview. This seemed in keeping with a conversation between care providers in a relatively small community and between those with an interest in the topic. Like Anne Oakley in her discussion of feminist approaches to research, I saw this conversational element as not only fair but also inevitable and allowed conversation to happen, as part of an exchange of information and knowledge.[75]

My goal was to foster dialogue and relationships that would extend beyond the timeframe of my research project, based on an approach to research that sees the research process itself can foster social change.[76] Open dialogue on this topic is vital in order to understand what underlies how research is translated into health care practice and how the scientific becomes the social. My interview style borrowed from participatory research methods, working with informants as colleagues to get to the bottom of how different interpretations, applications and misapplications of the same "evidence" occurs, with the fundamental common goal of improving practice.[77] Also in keeping with participatory approaches, I offered all participants the opportunity to review the

quotes which I have included in my text.[78] All participants generously agreed to be identified by name, however on a few occasions informants asked that certain comments not be identified by name.

Having been the subject of research on midwifery and political change in the health care system myself, I am aware of how easy it is for social science researchers to either romanticize or vilify professional groups and to accentuate conflict or division. From the inside, I am acutely aware that there is no universal obstetrics, nursing, midwifery or practice of EBP. Many of the conversations I had were simultaneously clinician to clinician and researcher to informant. My reading of the evidence also occurred at both of these levels. The conversations were sometimes overtly about more than the research; they sometimes involved negotiating relationships between midwifery and the other professions. For example, when I met with David Young, he was the Society of Obstetricians and Gynecologists of Canada (SOGC) President. I had travelled to Halifax not just to interview him but also to be involved in a debate about caesarean section on demand sponsored by the Atlantic Centre of Excellence in Women's Health. Prior to our interview, we had to work out our mutual concerns that the press attending the event might try to polarize the debate and create conflict between medicine and midwifery, which was not yet legally recognized in Nova Scotia. For the young family physician I interviewed in Fredericton, I was the first practicing midwife she had ever met and she asked many questions about midwifery unrelated to my topic.

I also observed, in a general sense, that my questions and the interview process prompted reflection in a group with too little time for reflection, and that this opportunity was both appreciated and valued. In some cases, especially when interviewing practitioners at the end of long and in some cases historic careers, it seemed that the topic and the interview process prompted a retrospective of career contributions and of historic changes in medical or midwifery practice. It was sometimes surprising and moving how passionate and how personal some of these reflections were.

Reading Evidence and Reading about Evidence

Primary and secondary sources on this topic are more than plentiful. My review of the medical literature focused primarily but not exclusively on EBP and maternity care and on critiques of EBP. My review of the social science literature focused on the history and politics of science and women's bodies, in particular on biomedical science, obstetrics and midwifery. To

identify key articles and books, I searched both health care and social science data bases covering between 1985 and 2005 under the terms EBP and EBM combined with the following search terms: maternity care, midwifery, nursing, obstetrics, debates, critics, limits, politics, ethics, patient choice, patient values, normal birth, intervention in childbirth, risk, medico-legal, liability. I continued to identify relevant literature until the time of writing.

I also conducted searches under a number of terms for key clinical topics that emerged in both the literature and in interviews as illustrative of the dynamics of EBP in maternity care: breech birth, postdates/post-term pregnancy, Group B Streptococcus infection (GBS), pre-labour rupture of membranes at term (TPROM or PROM), vaginal birth after caesarean section (VBAC), one to one care in labour/support in labour, electronic fetal monitoring (EFM), intermittent auscultation (IA), caesarean section on demand/maternal request, home birth. I followed up key references in identified articles and benefited from participating in several lively internet lists that regularly shared resources and opinions related to the topic.

Another important method that I used to survey current practice and emerging debates about EBP and to understand the perspectives of care providers about the uses and misuses of EBP was attending professional conferences nationally and internationally. I attended 41 conferences/professional presentations between 2002 and 2007 (Appendix 4). Some informants, e.g. Christilaw, Enkin, Hall, Klein, Kotaska also gave permission to tape conference presentations or shared transcripts of unpublished papers presented or shared slide presentations. By attending conferences I was able to collect publicly available tapes and videos of relevant presentations, conference syllabi and handouts from relevant speakers who were not interviewed individually. I was able to tape and transcribe several conference proceedings but normally made written notes during my attendance.

Working as a Participant Researcher

My research was both facilitated and complicated by my dual "location" as a midwife and a social science researcher. Like all maternity care practitioners, my day to day clinical practice has been profoundly influenced by EBP. As a midwifery teacher, I am concerned with both learning about and teaching students about how to find, critically appraise and translate evidence into clinical practice. This means my research is embedded in a context which regularly reinforces the importance of and strengths of EBP. Although the research was inspired by an

awareness of problems and critique, my analysis of EBP and its application to maternity care is rooted in the context of EBP as an important basis for health care practice.

In distinction to many social science researchers who study health care and the health professions, I did not conduct my research from "outside". I am an insider, not only doing research from within the community but also participating in the field I am studying. This puts me in a position not unlike the "interested researcher" described by Bourgeault and MacDonald[79] where the motivation and approach of the research comes from commitment to the field of study.

The insider researcher is considered so commonplace as to go without note in quantitative research, i.e. the physician or nurse studying health care practice. In fact, participation in research activities is part of the culture of health care. Quantitative methods and findings are generally seen as objective and unrelated to the researcher's status as a physician, nurse or midwife. Declaration of conflict in RCTs, for example, is defined by declaration of competing interests, such as the funding of research activities by pharmaceutical companies. Personal or professional "philosophies" or points of view are not considered significant as the methods themselves are deemed to be objective.

In contrast, qualitative research and researchers can be viewed by clinicians and quantitative researchers as lacking in objectivity. This perception is doubled when associated with midwifery, which is seen within the maternity care community as representing a particular perspective or ideology about birth that promotes normal physiology, woman-centred or relationship-based care and informed choice. Medicine and nursing, both dominant cultures in health care, are often perceived as offering more neutrality.

Being a participant researcher meant that I was not unknown to many of those that I interviewed. Being known within the maternity care community appeared to open many doors, but may have also created preconceptions about "my agenda" in doing this research, making some perhaps more and others less open to my questions. In some cases being a student researcher acted as a passport to another kind of identity that promoted interprofessional dialogue. In most of the provinces where I conducted interviews, I was welcomed by interprofessional colleagues. Only one potential informant declined to be interviewed, citing an extremely busy schedule in the short time frame I was available. In New Brunswick, I did not receive a reply to my requests to the Department of Obstetrics to suggest a physician informant. In this case, the lack of legal status for midwifery in that province may have hindered my ability to make this connection. On two occasions I was invited to interview small groups of midwives (Manitoba

Midwives and Rural Ontario Midwives) that were meeting when I was in the community to interview one of the members, an opportunity that resulted from interest in my work and being known prior to the interview.

It is accepted in the social sciences that it is as important for researchers to be reflective and open about the "location" of the researcher and the ways in which this might influence the research and how it is reported, as it is to attempt to find objective methods. As a midwife, I share with my professional culture a particular interest in the impact of EBP on normal birth as a profoundly important biosocial as well as biomedical event. I start from a position of concern, rather than neutrality, about rising rates of intervention in childbirth. I believe that I share a concern with many from family practice, nursing and obstetrics that although ideal rates of intervention are not known, the continued rise in procedures like caesarean section and induction of labour has the potential to make childbirth not only more clinical and technological and therefore less physiologic and less social, but also less safe. As my findings demonstrate, I am not alone in my concerns about the "fate of normal birth" in a more and more highly technological health care system and society. I share feminist science studies' vision of a better, more reflective science; of more dialogue and less division between the scientific and the social; and of a more socially responsible science.[31,41,42,56,57,80] I also bring a perspective that all knowledge production and application is political and takes place in a political context that needs to be taken into account in health care research and practice.

My work as a midwife is based in a commitment to improving women's lives and the lives of their families. I see my work as part of broader women's health and reproductive rights movements for women's control of their sexual and reproductive lives as a fundamental human right. Reproductive rights politics, in part because of their successes, have fallen out of fashion in many northern hemisphere countries but pregnancy and childbirth are still major health and social issues globally.[81,82] Pregnancy and childbirth are the most common cause of death for women globally with stark inequities in women's sexual and reproductive freedom and access to health services.[82] The impact of EBP is also global, as the international multi-centred RCT crosses the boundaries of what trial researchers call high resource and low resource settings, seeking in large sample sizes and randomization uniform results applied across very different environments.

My status as a caregiver has profoundly influenced how I heard and have interpreted my findings. I cannot help but be deeply sympathetic to other care providers and the practical and personal stresses they face in trying to give the best care they can, often with limited time or

resources. This may mean that I am perhaps not as critical as a social scientist would be. My "insider's" critique is consciously and deliberately sympathetic to health care providers. I also have conflicts of interest in knowing that I have to live and work within the community I am researching long after my research is done. My position makes me sensitive to potential harm to my professional relationships if the tone of my work is seen to be too critical or to my academic reputation if it is not critical enough. This tension has led me to strive to create a respectful critique focused on shared questions and concerns and on positive change. I hope to honestly and respectfully acknowledge differences and conflict; however, I have found that the interprofessional focus of my work has created a structure to express commonalities and understand differences that might otherwise be overlooked.

Chapter Summary

In this introductory chapter I have looked at why EBP in maternity care is an important topic for social analysis and describe the context of maternity care at the time EBP was introduced as the new paradigm. I described my theoretical framework and my dual background as a student of feminist theories of the reproductive body and of women's health care and a practicing midwife immersed in the day to day work of maternity care. The research methodologies used are explained both in terms of how I approached reading the literature about EBP in maternity care and how I conducted the interviews with key informants that provide most of the data for my analysis of the social dynamics of EBP. Chapters Two and Four focus on the literature as key sources whereas Chapters Three and the rest of the dissertation are based largely on key informant interviews and presentations at relevant professional conference sessions.

Chapter Two focuses on the emergence of the new paradigm, particularly in relation to the important role that maternity care played in the genesis of EBP. Important texts, such as *Effective Care in Pregnancy and Childbirth* (*ECPC*),[1] and other initiatives, such as the *Oxford Perinatal Database* (OPDB), are explored to establish a background for the debates that emerge in the literature and the hopes and second thoughts of informants about EBP. I examine the roots of EBP as an anti-authoritarian movement seeking to address variations in medical practice that advocates felt undermined medicine's legitimacy. Initial resistance to the new paradigm is quickly overturned by rapid uptake linked with the impact of the electronic information revolution.

Chapter Three describes the hope and excitement that maternity care providers felt at the

emergence of EBP and the many different and conflicting expectations that they held for the new paradigm. I explore the first impacts of EBP on the care providers I interviewed, which many described vividly as turning points in their practices. Informants across all care provider groups describe their hopes for best practice, certainty and clarity. They also wanted to avoid authoritarian practice, use evidence to enhance women's choices and support change in maternity care. Many informants expected evidence to support their own philosophies, particularly those who found the first waves of EBP in maternity care supporting both low intervention approaches and the critique of medicalised obstetrics. This chapter ends with a look at second thoughts about EBP when the care providers I interviewed began to understand that their initial expectations may have been naïve.

Chapter Four turns away from my interview data and back to the health care literature, exploring the passionate debates that emerged in journals and at conferences, as critiques of EBP and its new orthodoxy emerged. The themes of this chapter inform the concerns about how EBP has been used in maternity care in Canada, which are the focus of the rest of the dissertation. I begin with the central problem and irony of the apparently self-evident claim for EBP. I explore critics' concern about EBP's focus on population-based statistics and its lack of ability to inform care of a specific individual, a problem linked with the growing use of EBP at a health policy level in the areas of resource allocation and managed care. Debates about the difference between outcomes which emerge from the rarified environment of the RCT and the way in which interventions work in the messy and complex conditions of the "real world" of health care are examined. Much critique focuses on problems in the hierarchies of evidence, with worry about the devaluing of other forms of knowledge such as clinical experience, skill and judgment. Critics also raise concerns about the lack of integration of evidence with the values and choices of the patient. Both of these problems raise the spectre of EBP as a new and powerful form of institutionalized authority. I explore the use of religious language in the EBP movement as a window into the new authoritarianism.

Chapter Five focuses on the "hows" of the application of evidence in maternity care in Canada and identifies several dynamics that describe the way care providers use evidence. Evidence is not only actively applied but also very actively not applied or misapplied. Patterns of uneven application are explored using examples from clinical practice that illustrate how some evidence is applied readily and some evidence is very hard to implement in practice. Informants also describe clinical situations in which evidence is over-applied, beyond what the science

justifies. This is linked with variations in the interpretation of evidence. Informants indicate that the same research study and the same recommendations are often interpreted in different directions by different care providers or institutions. All of these dynamics can lead to a pattern of over-simplification which does not reflect the complexity of maternity care as both highly individual and highly social.

The remainder of the dissertation moves from the "hows" to the "whys" of the use of evidence by institutions and care providers. Chapter Six focuses on the tendency to use evidence to legitimate individual and organizational belief systems. Care providers openly share their responses when evidence both affirms and challenges their belief systems, and talk about colleagues who either apply or do not apply evidence which confirms or challenges pre-existing opinions and beliefs. Chapter Seven looks at "birth cultures" and the influence of popular culture and the media. Care providers across all professional groups talk about the ways in which women's choices increasingly appear to "lean towards technology", as if intervention has replaced physiology as the expectation for childbirth. Some challenge this approach and explore the role of professional cultures in constructing popular perceptions of birth. Maternal request for caesarean section without medical indication emerged as an issue that catalyzed informants' concerns about a changing birth culture. Chapter Eight brings together the themes of fear and medico-legal liability as central drivers of the way in which evidence is applied or not applied. This chapter explores the ways in which informants talked about fear of both personal and professional responsibility and the ways in which evidence is perceived to protect against error or potential for error. This leads to a discussion of organizational cultures of risk management and clinical practice guidelines which contribute to greater comfort with intervention or with "doing" rather than trusting in physiologic birth. This results, according to the care providers I interviewed, in "*court-based versus evidence-based practice*".

Chapters Nine and Ten continue to explore the "whys" and unexpected effects related to the dynamics and directions of evidence. Chapter Nine looks at what informants called the "industrialization of birth" and examines workplace structures and pressures which impact on the way evidence is used. Time pressures, the need to manage workload, as well as the desire to accommodate care provider and institutional convenience and preference, lead to a culture of "getting on with things". All of these patterns have resulted in rising rates of intervention in childbirth. Chapter Ten looks at the paradox that as birth has become increasingly safer in high resource countries the health care system is using more and more intervention to address smaller

and smaller risks. This chapter also explores the resulting sense of loss that dominated my interviews, with care providers from all backgrounds expressing a sense of grief about the direction of maternity care. For some, the cascade of interventions and resultant fear of loss of normal birth lead to calls for a revision to how we understand the EBP paradigm and how evidence is applied.

I conclude with an exploration of the interactions between these dynamics and directions and argue that an understanding of the "hows and whys" of the application of evidence is important for both practitioners and policy makers.

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Chapter Two: The New Paradigm

> Thomas Kuhn has described scientific paradigms as ways of looking at the world which define both the problems which can legitimately be addressed and the range of admissible evidence which may bear on their solution. When defects in an existing paradigm accumulate to the extent that the paradigm is no longer tenable, the paradigm is challenged and replaced by a new way of looking at the world. Medical practice is changing, and the change which involves using the medical literature more effectively in guiding medical practice is profound enough that it can appropriately be called a paradigm shift. . . .The foundations of the paradigm shift lie in developments in clinical research over the last 30 years.
>
> Centre for Health Evidence 2004 [1]

Introduction

This chapter explores the roots of evidence-based practice in maternity care and the early development of this new paradigm. It focuses on the links between childbirth movements and the evidence movement which have been largely unexplored. However, the need for medicine to respond to widespread critiques of the medicalization of childbirth in the 1970s and 80s played a catalytic role in the development of EBP.

Through the literature and through key informant interviews, I describe what early advocates saw as the defining features, rationale and promise of the new paradigm. EBP advocates first condemned obstetrics for its lack of scientific basis for practice and then valorized it as a quick adopter of EBP. An examination of key texts, including *Effective Care in Pregnancy and Childbirth*,[2] help in understanding the leadership role played by obstetrics in the EBP movement and the influence of the childbirth reform movements. This chapter explores how the new paradigm was defined against what was painted as an out of date approach to practice, most often defined as "opinion-based practice", and the reaction of the medical community to this characterization. The new paradigm was seen as anti-authoritarian, democratic and as an antidote to wide variations in practice, claims which are explored here in relations to their roots in maternity care and then reflected on throughout the following chapters, to see if the actual application of EBP achieved the new paradigm's goals. I look at the importance of the timing of the emergence of EBP, which aimed to categorize, disseminate and apply findings from the health care literature, just as the electronic information revolution was taking off. The coincident development of EBP and the internet is explained as key to the success of the new paradigm. Early development and then rapid uptake of EBP as an organizing principle and method of health

care is not without its critics. In this chapter I describe early resistance to the extent of the claims for what EBP can accomplish and just how "new" the new paradigm really is through an analysis of the literature and input from informants.

The Inter-twined Histories of Evidence-Based Practice and Maternity Care

Women's movements to "change childbirth" have a long and well documented history. In the early twentieth century North American and European childbirth reform movements and women's rights activists advocated for twilight sleep, a drug that promised to relieve the suffering of childbirth. It did not eliminate pain, but created amnesia and was later condemned as inhumane.[3] Nevertheless, this campaign for pain relief during labour helped move birth into the hospital setting. Childbirth came to be defined as a medical procedure to be supervised by physicians assisted by nurses, rather than attended by midwives at home. In the US and Canada midwives were geographically dispersed and separated by different languages and cultures and were successfully discredited through campaigns organized by medical associations as uneducated and unsafe. In Britain and in Europe with a longer history of education and regulation, midwives retained their role as the main care providers for childbearing women and worked within established systems of education and regulation. They increasingly functioned within a medical model in the hospital and under the authority of physicians.[4] By the late 1950s in the US and Canada, resistance to medicalization of birth coalesced around an article in *Ladies Home Journal* titled Cruelty in the Maternity Ward[5] which drew attention to inhumane approaches and called for "natural childbirth". Rather than seeking to escape the pain of childbirth, women increasing asked to be "awake and aware" and a movement for conscious childbirth was spurred on by the popular uptake of the works of physicians such as British obstetrician Grantly Dick Read who wrote *Childbirth Without Fear*[6] in 1933 and French obstetrician Ferdinand Lamaze who in the mid 1950s advocated a method of psychoprophlaxis for birth which would lead to "painless childbirth" without drugs.[7]

Birth technologies continued to proliferate simultaneous with childbirth movements growing in popularity and branching into several directions. By the 1970s, childbirth reform included women across diverse backgrounds, from traditionalists to women's health activists in the second wave women's movement.[8] Some sought to promote more humanized care in hospital and called for a set of practices often called "family-centred maternity care": childbirth education; the inclusion of "husbands" and then later inclusion of families, bonding of mother and baby and

promotion of breastfeeding. Other childbirth activists challenged existing institutions with movements for home birth and the reinstatement of midwives as autonomous care providers. These groups asserted that only a more radical change of birth setting and care provider could challenge medical control of childbirth, empower women to make choices and avoid unnecessary intervention.[8-10]

One of the Canadian leaders in family-centred maternity care was McMaster University Health Sciences Centre in Hamilton, Ontario. McMaster's history as an innovative medical school, willing to experiment with new approaches to clinical care and student admission and teaching, positioned it to be one of the birth places of the new paradigm. An enthusiastic and influential group of physicians, epidemiologists and teachers at McMaster formed the Evidence-Based Medicine Working Group (EBMWG) in 1992. Members included internal medicine specialists Gordon Guyatt, David Sackett and obstetrician Murray Enkin, all of whom were destined to become influential leaders of EBM internationally.[11,12]

Enkin had been a family doctor in Saskatchewan where he attended births, including those of his own children, in an environment he describes as "low tech". He also explains that from his earliest days as a medical student he had a great respect for women during childbirth and for the process of natural birth. When the EBMWG formed, he already had a long history in working to "humanize childbirth" and had been frustrated by a lack of interest in family-centred approaches by other physicians and institutions. Over the next decades, Enkin would emerge as an important champion of many reforms to maternity care including the legal recognition and acceptance of midwifery in Canada and for a fuller role for midwives in all jurisdictions.

EBM as defined by the EBMWG represents consolidation of a set of practices that evolved over the previous decade, bringing insights from epidemiology and from the use of randomised controlled trials (RCTs) in testing drugs. Prior to naming the new paradigm, an increasing number of physicians had called for an approach that was initially called "practice based on scientific research" or "research-based practice". Enkin describes the evolution of the terminology and its rhetorical power:

> *. . . we didn't think of it in terms of evidence-based. We used a much more cumbersome, probably much more honest term which had its basis around randomised trials. Evidence-based is a beautiful jargon catch phrase. It replaced what used to be the phrase which was 'scientifically proven', as in "scientifically proven to make your teeth 94 percent whiter". Both evidence-based and scientifically proven were ubiquitous terms of approbation. If you wanted to believe something it had to be scientific and it gradually morphed into evidence-based. I certainly took advantage of it for a while.*

Enkin 8:33

Arne Ohlsson, a Swedish-trained neonatologist who worked at Mount Sinai Hospital in Toronto when I interviewed him, has been an international leader in EBP in neonatology:

> *Well, I think that the term was coined by Gord Guyatt at McMaster and it started not that long ago. I think it's less than ten years ago. I was trained at McMaster in clinical epidemiology in the DME [Design Methodology and Evaluation] program, and . . . even if they hadn't coined the term at that time, I think the idea of evidence-based practice and not just evidence-based medicine was there already. And the idea was to find the evidence and then apply it in a timely fashion to the patient that was seeking help for a certain condition. And then later on the term was coined.*
>
> Ohlsson 42:12

Cochrane's Wooden Spoon

British physician and epidemiologist Archie Cochrane is widely credited[2,13-15] with being one of the most influential founders of what we now understand to be EBP. Cochrane's inspiration grew out of his experiences during the Spanish Civil War and in World War II as a prisoner of war when he was forced to provide medical care in situations where there was sometimes a lack of treatments and technologies and at other times experimental leading edge approaches were attempted. He worried that the application of treatments and technologies may have actually worsened outcomes in many cases. He retained a respect for what he called the "recuperative powers of the human body" and a concern about the widespread use of untested tests and treatments when he returned to postwar medical practice. He became a strong advocate for social medicine and the development of the British National Health Service in the postwar period. His interest in social justice and research came together in a study of tuberculosis in coal miners in Cardiff, Wales. The study, called Rhondda Fach Study, consolidated his concerns about the need for better science to guide clinicians. His leadership in the international epidemiology community influenced policy makers in several countries to resist strong pressure from health technology companies to implement widespread and untested screening programs.[16]

His 1972 book *Effectiveness and Efficiency: Random Reflections on Health Services* is seen as groundbreaking. Cochrane asserted that, despite public trust many of the claims of medicine were unfounded: "It is surely a great criticism of our profession that we have not organized a critical summary, by specialty or sub-specialty, adapted periodically, of all relevant randomised controlled trials."[17] In 1979, he singled out obstetrics as the specialty "least likely to implement randomised trials and to practice medicine based on evidence from trials".[13] With a

gesture referenced by many of the care providers I interviewed, he awarded obstetrics an "anti-award" he called "The Wooden Spoon" to mark its poor standing. Cochrane's concern for the "long and blemished history" [18] of obstetrics in adopting untested procedures, echoed the complaints of the childbirth reform movement.

Many advocates of EBP, including Cochrane,[2] identify an RCT conducted by Sir Austin Bradford Hill as a turning point in the history of medicine. *The Lancet's* "Keywords in the History of Medicine" definition of EBP notes:

> The MRC's trial of streptomycin in tuberculosis, published in 1948, is regarded as the first published randomised controlled trial (RCT) and was promoted as a model of trial design by the MRC, establishing the RCT as the gold standard for evidence of therapeutic effect.[19]

Interestingly, the maternity care literature and the care providers I interviewed frequently refer to a much earlier published trial on the "shave-prep", the practice of preparing women for birth by removing pubic hair by shaving and giving an enema,[20] as an illustration of the need for the EBP movement. In Enkin's view, the long neglect of the evidence that this "preparation" did more harm than good illustrates the fact that research alone was not enough to change practice. As an advocate for childbirth reform he was well aware of resistance to change in his field. He reflects on how he came to believe that the EBP movement was the "*loudspeaker*" that was needed to promote change.

> *So clinical trials go a long ways back, but it took a while for medicine to catch on. Obstetrics didn't get into controlled trials until the twentieth century. In 1922, Johnston and Siddall conducted a trial of perineal shaving. It showed no benefit from the uncomfortable procedure on rates of puerperal infection. Perineal shaving continued for another 60 years. The 1950s and 60s produced a few more obstetric trials, many of them showing that the tried and true rituals were either harmful or ineffective. They challenged conventional wisdom, but they had little or no effect on practice. They were weak, small voices. I hadn't heard them. Very few people heard them. Then Iain Chalmers and this little book came along. I was lucky enough to recognize that this* [EBP] *may be the loud speaker, the rhetoric that we needed. I was hooked.*
>
> Enkin 11:39

British obstetrician Iain Chalmers, working in Cardiff with Cochrane as a Medical Research Council (MRC) scholar, was profoundly affected by what is now referred to as "Cochrane's challenge" to obstetrics.[13] He began to collect perinatal trials and promote epidemiologic approaches in obstetrics. Shortly after, he met Canadian obstetrician Murray Enkin. Enkin's story of meeting Chalmers at a "*think tank*" of "*48 of the most brilliant thinkers*

and childbirth advocates in the English speaking world" (Enkin 11:320) conveys some of the excitement of the time and sets the roots of EBM firmly in the childbirth reform movement. Enkin has related the story of the first encounters of childbirth activists with emerging EBP founders at several conferences and forums over the past decade. The Maternity Centre in New York, an association founded in 1918 to reduce maternal and infant mortality through improving midwifery education,[21] had evolved into a centre for childbirth education and the movement for childbirth reform in the 1970s. They hosted the think tank of progressive physicians and childbirth activists described by Enkin. He explains the impact of the "*hot off the press book*" lent to him by Chalmers which had not yet reached North America.

> *I started to tell you about an amazing stroke of luck, my chance meeting in 1977 or 78, at a Maternity Centre retreat in New York, with Iain Chalmers, an intense young man with a big vision, head of the newly formed National Perinatal Epidemiology Unit in Oxford. And about a book Iain had brought with him, called "Benefits and Hazards of the New Obstetrics." That book became my epiphany. I stayed up all night reading it. It questioned the unquestionable, challenged the unchallengeable . It resonated with my innate iconoclasm. It spoke a new language. Clinical science. Not the guys in white coats playing with their test tubes. Not just the feel goody stuff. Clinical science. The controlled clinical trial. The rhetoric we needed. It spoke clearly, it spoke loudly. I listened. Others would listen.*
>
> Enkin 10:323

Enkin's appreciation of the rhetorical power of science and the potential of the RCT to effect change more than the "*feel goody*" demands for a more humane approach conveys an understanding of the need for an organized and accessible body of scientific evidence to support demands for change coming from outside of medicine. His remembered his excitement when discovering scientific research which confirmed many of the claims of the childbirth movement. This view was also widely shared by my other informants:

> *I could hardly believe what I was reading because here was solid evidence, facts, supporting all the things that I . . . and so many other people intuitively felt. Iain introduced me to the concept of the randomised trial, a concept that could take the guess work out of obstetrics, could tell us which interventions were more likely to do good than harm. It was very exciting. It was once again too good to be true.*
>
> Enkin 9:41

It is easy to see the influence of *The Benefits and Hazards of the New Obstetrics*[15] on the later work of Chalmers, Enkin and their colleagues. It is clear that the book's genesis lay in the need for the obstetrics profession to respond to the childbirth reform movement, which is described in the book as "militant". The title itself conveyed a challenge to the authority of the

profession and to the claims of obstetrics to a scientific basis for emerging practices. The text is a partial compilation of the proceedings of a conference held in 1975 in Britain. Although the book is referred to as one of the first steps towards EBP in maternity care, its eclectic contents combining basic science, medical science and social science perspectives reflect a broad basis for the discussion of the care of childbearing women. It is interesting to note that the book was co-edited by reproductive physiologist Tim Chard, and includes a chapter on physiology of initiation of labour. Rising rates of induction of labour and the use of forceps were key controversies of the time and Chard's contribution signals the respect for more "ways of knowing" than experimental science. This is significant because as the EBP movement unfolds, and as is described in coming chapters, the focus becomes narrower and defines clinical medical science as distinct from other ways of understanding.

The book includes a chapter by prominent social science researcher and childbirth activist Ann Oakley on cross-cultural practices with quotes by anthropologist Sheila Kitzinger, arguably the world's most influential childbirth reform advocate. Psychologist E.M.D. Riley on "What Do Women Want? The Question of Choice in the Conduct of Labour" raises the importance and challenge of providing care which is flexible, recognizes difference and respects choice. It is noteworthy that the only review of the book in the medical literature discusses most chapters in detail, but these chapters are dismissed with the comment that they are written "by non-medical women".[22]

As reflected in this text, the new paradigm had mixed beginnings. The book documents and calls for the need to address a concern that continues to haunt the EBM movement. Wide variation in the use of obstetric technologies, internationally, within countries and even between hospitals in the same cities is posed as evidence of a lack of a scientific approach to health care. The solution posed is evaluation of care, using the RCT. However, *The Benefits and Hazards of the New Obstetrics* also demonstrates a commitment to a variety of knowledges and the importance of recognizing social context. The book is clearly based in a critical perspective of the overuse of technologies, in fact throughout the text there seems to be an underlying expectation that EBP will support what later comes to be called "low tech, high touch"[23] approaches to care. This expectation was shared by care providers on the ground, as illustrated in the next chapter.

After exposure to this book and his encounter with Chalmers at the think tank, Enkin was a convert. At a forum on EBP at Ryerson University in Toronto in November 2003 he stated:

Without even finding out whether he [Chalmers] *would pay any attention to me or not, the*

> *first thing I did was phone* [and tell] *Eleanor* [his wife] *that I had to go to Oxford for a year. I knew what she'd say. Then I went to Iain and said "Would you take me to come and work in your unit for a year?" He said "I'll think about it." That was good enough for me. I went back to the chief of our department at McMaster and said "Iain Chalmers, director of National Perinatal Epidemiology Unit will take me for a year if you'll give me a sabbatical." Well it all happened.*
>
> Enkin 9:113

Enkin traveled to Oxford and the now famous team of Chalmers, Enkin and Dutch obstetrician Marc Keirse devoted themselves to finding and promoting clinical science in the care of women and babies during childbirth. Obstetrics soon lost its place at the bottom of Cochrane's list of "scientific" medical specialties, as described by Enkin.

> *Now Iain had an incredibly ambitious idea although he had no real idea how to go about it. He wanted to collect all the randomised trials that had been done in perinatal medicine and put them all together to try to find the real answers, so he had them all collected. Now Eleanor says he had them in a shoe box. He denies that. He says it was a file box. I don't know. But they were completely disorganized. Anyway Eleanor who fortunately had some librarian training, started to put them into order and then we built up a scheme for classifying them so we could find them, and then actually we got to the point . . . we were able to do a book classifying all the trials we had been able to find up to that time. We had done a systematic search of some 60 odd journals that we thought would be likely to have trials. We had people searching literature and languages other than English. Of course we used the rudimentary electronic means that were available. And we collected I think some 3,000 trials and published them into a book* [Effectiveness and Satisfaction in Antenatal Care]. *Remember this was before the days of the personal computer. So it was I think a fascinating thing to bring all that together. But that's when the work really started. In 1986 when I was able to get another sabbatical, we went back to work and we began to commission systematic reviews of the trials, actually bringing them together. We identified reviewers throughout the world who we felt had content expertise and methodologic expertise to tell what studies were valid and which weren't. We gave them explicit guidelines for how to evaluate trials and how to abstract the results so that they could be put together and eventually in 1989 we first published the reviews in electronic form . . . the Oxford Database Of Perinatal Trials and later the Cochrane Library.*
>
> Enkin 9:114

Effective Care in Pregnancy and Childbirth

The Oxford Database of Perinatal Trials (ODPT) also engendered a book soon to be called a "bible" of evidence-based practice, *Effective Care in Pregnancy and Childbirth.*[2] It is a large and heavy two volume boxed set, over 1500 pages and widely and affectionately called *"ECPC"*. It was published together with the first edition of the ODPT on compact disc (CD). Archie Cochrane wrote the forward to *ECPC*, in which he defends his choice of obstetrics as the original recipient of the wooden spoon, but follows by noting the dramatic change:

> . . . and a great deal has happened since. There has been a marked increase in the use of randomised trials in the world of obstetrics. Moreover, the systematic review of the randomised trials that is presented in this book is a new achievement. It represents a real milestone in the history of randomised trials and in the evaluation of care, and I hope it will be widely copied by other medical specialties. I now have no hesitation whatsoever in withdrawing the slur of the wooden spoon from obstetrics, and I feel honoured by being associated, even in an indirect way, with such an important publication.[2]

ECPC is a comprehensive summary of the state of both the science and the social science about childbirth in the mid 1980s. As one of the exemplary texts of the EBP movement, often cited as a model for the compilation and evaluation of scientific research, its inclusion of social science and other qualitative research is significant. It is an impressive model of international, interprofessional and interdisciplinary collaboration. Its primary authors come from diverse fields including anthropology, economics, family practice, midwifery, obstetrics, neonatology, nursing, physiotherapy and sociology.

The Guide to Effective Care in Pregnancy and Childbirth (*GECPC*)[14] is a paperback synopsis of the larger volumes. Enkin explains its origin:

> *Ali Macfarlane, the statistician for our group, made an astute observation. She said "Your opus magnum is not only two volumes, it [is] too full of jargon for pregnant women to understand, too costly for them to buy, and too heavy for them to even lift." This became the stimulus for our paperback "Guide to Effective Care in Pregnancy and Childbirth", which has gone through three editions, and has been translated into Italian, German, Japanese, Czech, Russian and Portuguese.*
>
> Enkin 9:49

As one of the most important mechanisms that established the new paradigm in maternity care (and as a template, in all of health care), the role of *ECPC* and *GECPC* cannot be underestimated. In his influential article "On the Need for Evidence-Based Medicine", which appears in various forms in numerous publications in the mid-nineties, David Sackett refers to *ECPC* as a key example of the fundamental shift required by EBP:

> For example, of 226 manoeuvres that are carried out in obstetrics and childbirth, Chalmers et al. have documented sound evidence from randomized trials in almost a half (about 20% having been shown to be beneficial and almost 30% found to be of either doubtful value or harmful)"[25-27]

Through the work of Chalmers, Enkin and Keirse and their growing international network of perinatal researchers, obstetrics had become the flagship of EBP. David Naylor noted that *ECPC* had "shaken obstetrics worldwide" largely because of the many routine approaches to care that it threw into question.[28] Many of the caregivers I interviewed recalled when they bought the book,

and the strong influence it had. Informants like Toronto family physician Anne Biringer referenced *ECPC* as a very important step in their own adoption of EBP:

> . . . *in terms of* [evidence] *actually guiding practice, I was well into practice by the time I sort of felt that coming. . . I guess the publication of ECPC probably for me was the sort of big surge. ECPC was a big event in my life* . . .
>
> Biringer 1:18

In a review in the British midwifery journal *Midwifery Information and Research Service (MIDIRS)*, editor Jilly Rosser writes:

> . . .the book is an invaluable tool. Midwives can be confident that reading, and heeding, the contents will help to offer care that is effective, rather than ineffective or harmful. No midwife studying, questioning policies or offering advice to women could ask for a better source of reference.[29]

As the first chapter of the first edition of the *GECPC*[14] and the preface to *ECPC*[2] make explicit, the goal of scientific evaluation of health care is to determine the "most effective means to achieve" the objectives of care. The authors specifically point out that scientific evaluation cannot set these objectives. They attempt to establish the ways in which scientific research can and cannot assist health care providers, users and policy makers. *ECPC* is very clear that how individuals or communities determine the objectives of care is outside the realm of medical science, and, although the term was not yet coined, by implication outside the project of EBP. The authors also acknowledge that the diversity of views held about appropriate objectives contributes to "widely differing recommendations" to achieve good care and "disparate indicators" used to measure effectiveness. They acknowledge that factors like culture, resource allocation, payment structures within health care and the medico-legal environment affect variations in the patterns of health care. They are careful to explain that scientific evidence is unlikely to have an impact when these factors or differing objectives are the cause of variations in practice. The stated goal of *ECPC* is more limited: to address the "collective uncertainty that exists . . . about the effectiveness and safety of many of the elements of care given during pregnancy and childbirth"[2]

Like the *Benefits and Hazards of the New Obstetrics*, the structure and content of *ECPC* acknowledges the intertwining and interdependence of the non-scientific objective setting and the scientific project of evaluating treatments and interventions. This recognition of the important relationship between the scientific and the social is remarkable to reconsider decades later. The infrastructure that produces and disseminates evidence has grown exponentially, with little

development of social mechanisms to discuss the goals and priorities for either research or health care. The failure of both the EBP movement and the childbirth movement to acknowledge and take on the social debate needed to apply evidence may be fundamental to understanding some of the limitations and unexpected results of both movements. And yet at the time both *ECPC* and the guide to it were written, many protagonists shared roles in both movements and, as some of the care providers I interviewed reveal, it seemed that EBP and humanizing childbirth would proceed hand in hand.

Both *ECPC* and G*ECPC* conclude with a set of summary lists, which many informants referred to as a powerful tool. These lists provide a synopsis of the findings of the book organized into tables:

1) beneficial forms of care
2) forms of care that are likely to be beneficial
3) forms of care with a trade-off between beneficial and adverse effects
4) forms of care of unknown effectiveness
5) forms of care that are unlikely to be beneficial
6) forms of care that are likely to be ineffective or harmful[24]

For many in the childbirth movement, these lists appeared as a concise and almost unbelievable statement of support for the reforms to routine care they had been advocating for years. Practices such as continuous support in labour, offering the choice of midwifery care and out of hospital birth were listed as beneficial whereas enemas, episiotomy and separation of mother and baby were listed as harmful. The power of this compilation of evidence was noted by many informants. *MIDIRS* editor Rosser called them "too good to be true!"[29] The lists represented a scientific justification of decades of childbirth reform work. Activist recommendations which had been relegated to the margins of the system were suddenly in the centre of scientific evaluation. Penny Simkin is a Seattle physiotherapist who is an internationally respected author and leader in childbirth education. She recalls being recruited by the OPEU to be part of the interdisciplinary team which formed to systematically evaluate the evidence in the early 1990s. She sums up the sentiments of many informants, who expressed that it seemed that suddenly "*we had science on our side*" (Simkin 50:437).

The following statement appears in all editions of G*ECPC*, in the introductions to the summary tables:

> First. . . the only justification for practices that restrict a woman's autonomy, her freedom of choice and her access to her baby, would be clear evidence that these restrictive practices do more good than harm; and second, that any interference with the

> natural process of pregnancy and childbirth should also be shown to do more good than harm. We believe that the onus of proof rests on those who advocate any intervention that interferes with either of these principles.[14,24]

Contrary to many of the routine practices of that time, these powerful criteria establish three of the most fundamental principles of the childbirth movement as standards: women's autonomy and choice, the importance of the mother-baby dyad and physiologic pregnancy and childbirth. Choice and normal birth are the default, rather than technology. The *ECPC* discussion of these standards and of the need to differentiate between objectives and evidence foreshadows some of the troubling debates that have persisted over the past three decades of childbirth care: "[Objectives] may range from enjoyment of the experience of childbirth to shaving another fraction of a percentage point off the perinatal mortality rate, regardless of the costs".[14] This sentiment is expanded in the third edition:

> Some may give priority to each woman's personal experience of childbirth, even if this might mean some sacrifice in terms of safety. Others may aim to minimize perinatal morbidity and mortality no matter how much this may increase the mother's risk or discomfort. Still others, primarily concerned about the rising costs of care and the limited resources available, consider efficiency and cost savings to be the most important objectives. All of these goals are important but they involve trade-offs.[24]

Despite the overt acknowledgement of the need to clarify objectives, discussion of the process through which this could happen is put aside as outside of science's purview. Although the authors state in the first edition that objectives of care "will always remain a matter of individual judgement", it is not clear if this is the clinician's or patient's judgment or both, and appears to contradict the need for a broader professional and public discussion which an earlier statement seems to call for. "[Objectives] depend on what individuals *or communities* think is most important" [my italics].[14] By the 3rd edition they state, "What we most want to achieve depends on what we think is important. Different communities, groups and individuals may have different opinions about this".[24] *ECPC* and G*ECPC*, intentionally or not, leave a challenge to those involved in maternity care as important as Cochrane's award of the wooden spoon which remains to date unresolved. Given the momentum and successes of the childbirth movement in the 1980s, it may have seemed that better science would contribute to, rather than silence the discussions of objectives of care. It was not unreasonable in 1989 for the authors to have assumed that forums for the discussions of the objectives of care would evolve and thrive alongside the evaluative science.

G*ECPC* both begins and ends by giving readers other work to do to determine best practice. What is clear from re-considering these texts post the EBP "revolution" is that the founders of EBP in maternity care put evidence from randomised controlled trials into a framework that placed importance on context, values and judgment. Despite the strength of this stance, through its focus on scientific evaluation and on the tools to evaluate "best evidence", *ECPC* and the broader EBP movement may have acted to distract the maternity care community from essential conversations about objectives and values. As the following chapters show, its contribution to fostering input and dialogue between science and social science and between professionals and the public seems to have been all but forgotten in the scramble to find objective "best practice". More than two decades after these texts were published attention of care providers is largely focused on measuring and understanding effectiveness rather than on dialogue and debate about what the goals are. At least in maternity care, EBP originators seemed to intend clinical science to serve objectives that would need to be determined outside the arena of the RCT and the hierarchy of evidence. The proliferation of scientific evidence and the broad claims of many of its advocates, however, may have reduced the space for this conversation to take place.

The Old and New Paradigms

All of these developments in maternity care take place alongside parallel steps towards EBP in other fields of medicine. By 1992, when EBM is named and described in the *Journal of the American Medical Association* (JAMA), it is defined in opposition to a set of characteristics presented as the old paradigm. Particularly in early work advocating EBP, the old and the new are often presented as distinctly different and dichotomous, a feature which softens over the decade that follows. In 1992 the EBM Working Group wrote:

> A new paradigm for medical practice is emerging. Evidence-based medicine de-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision-making, and stresses the examination of evidence from clinical research.[11]

The common catch phrase for the old paradigm is "expert-opinion based practice" or even more simply, "opinion-based practice".[25-27] Others refer to authority-based or tradition-based practice[11,30] or practice based on past practice, previous teaching, precedent, or habit[25-27] and even faith-based practice.[31] In the view of EBM advocates (a perspective often reinforced by my informant interviews) past medical practice was based on an authoritarian and hierarchical

structure, which EBP hoped to challenge. Critiques of the old paradigm's authoritarian structure echo feminist critiques of the patriarchal structure of medicine. In the old paradigm, more junior physicians, nurses and midwives were expected to follow the senior staff physician's approaches, which were often based in turn on what had been taught by the senior physicians of the past. These experts set institutional policies, which often long outlasted the individual experts, creating traditions and norms often expressed in health care as "this is how we do it here". In UK hospitals, the senior physician is still called "the master", in North America more commonly "the chief" or "head" physician:

> *Now, in the hospital the chief's word was absolutely law. He was always sure. He wasn't always right, but he was always sure. And we all had to follow his example that went through the chief resident, to the resident, the senior intern, to the junior interns and woe betide anybody that defied the chain of command. It was a benign dictatorship.*
>
> Enkin 9:140

David Gass is a Halifax family physician now working on health policy in the Nova Scotia government. Like Enkin, he identifies the tradition of the expert leader:

> *Well when I trained in medical school, probably the evidence used was the opinion of the expert . . . Gradually the culture in which I worked became "Do we know? What's the evidence for that? How well do we know that?" And that would have echoed in my own professional development, the sense* [that] *there were a number of things we'd been doing that now as people researched them actually were not such good ideas, some of the things that are left that we're still basically doing cause that's the way we always did them.*
>
> Gass 16:169

Thomas Baskett is an obstetrician originally trained in Ireland who worked as both a family physician and an obstetrician in the Canadian Arctic, Manitoba and Nova Scotia. His comment was delivered with an ironic smile:

> *I came in from the era or the remains, if you like, of the era where we did what we were told by the seniors. And it was, in my experience when a senior said that, as a junior you basically accepted that unless it was clearly wrong. And I feel a little cheated, in fact, because now that I've got to the stage where I could do that, where I could be the master, people will stop me and say 'Hard luck Baskett. Where's the evidence? Your experience doesn't count for anything.' So anyway, I grew up with that and tended to work by that. .*
>
> Baskett 1:18

Mark Tonelli is a University of Washington critical care specialist and professor of medical history and ethics who in the 1990s became one of the leading EBM critics. According to Tonelli, the new paradigm "explicitly attempts to supplant expert opinion which is viewed as an

antiquated and unreliable form of medical authority".[32] He describes EBP's levels of evidence as a hierarchy of knowledge in which clinical expertise "plummets from top of the list to the bottom . . . superseded even by methodologically flawed clinical research".[32] Knowledge gained from experience and practice is devalued and the expert clinician is theoretically demoted as a resource for other clinicians. The evidence hierarchy makes it clear that expert opinion should only be used in the absence of clinical research. Tonelli asserts that EBP's claim to a new paradigm relies on this challenge to expert opinion as the traditional authority base of medicine, stating that without this claim EBP "runs the risk of being merely a buzz word".[32]

Anti-authoritarian Roots

Based on this characterization of the old paradigm, EBP has been labelled an anti-authoritarian movement, able to free health care practice from the dominance of the expert physician leader and bring more authority and autonomy to the individual physician. The claim to greater democracy extends not only to junior physicians but also to medical students who are expected to evaluate the science for themselves.[33] In the new paradigm teachers no longer dictate what to do and how to do it. In fact students are encouraged to question their experienced teachers with what becomes a ubiquitous question "What's the evidence?"[33,34] EBP is both rooted in and reinforced by a growing trend in medical schools to adopt "problem-based learning" (PBL). PBL emerged in the 1960s, from the medical school at McMaster University in Hamilton, Ontario, championed by some of the early EBP leaders.[11] Although PBL developed earlier, it was not widely adopted until the 1990s and the EBP era. Both approaches claim an anti-authoritarian foundation. In PBL, students learn how to solve health care problems in small groups led by non-expert tutors, by going to the research literature and developing problem solving and critical thinking skills rather than reliance on the authorities. Both PBL and EBP signal a move in the discourse away from the pedagogical tradition of apprenticeship style learning of skills from the masters of the "art" of medicine towards learning research skills and mastering the science.[11] The literature celebrates both PBL and EBP's potential to "level the intellectual playing field".[30,34]

As excitement and understanding about EBP's potential grows, its advocates link this levelling effect of EBP to patient's rights and other health care consumer movements which gained strength in the 1980s, demanding information, choice and participation in decision-making and making an impact on health care culture. EBP is characterized by some as a kind of Protestant movement[35] removing the hierarchy between the science and the practitioner and

allowing individual physicians and patients to read and interpret the science themselves. Although the suggestion that physicians and patients could have a more direct relationship with the evidence does work to challenge authority, this approach is later is transformed and complicated beyond any of the initial EBP advocates wildest dreams by the information technology revolution.

Given that the movements to change childbirth were among the most powerful of the patient/consumer movements in health care, it is not surprising that some of the most articulate arguments for how EBP could transform the hierarchical relationships of the health care system come from this literature. In their concluding call for "better understanding and provision" of obstetrical procedures and practices, Chard and Richards see a new physician-patient relationship as an intrinsic part of this change, based on greater communication and participation. They conclude the collection with this sentence: "The management of pregnancy and labour should be a working partnership between the mother and her attendants."[15]

The foundational texts of EBM fail to note the potential to change interprofessional relationships in the medical hierarchy. Although junior physicians, medical students and patients are welcomed to look at the evidence for themselves and challenge the experts, interestingly this enthusiasm for democratic exchange of views is not extended outside of the medical profession.[36,37] Leaders in midwifery[38-44] and nursing[45-51] began to advocate for the uses of EBP by their own professions.

Variations in Practice

EBP advocates argue that widespread variation in medical practice acts to undermine the legitimacy of medicine and its scientific basis.[11,34] Obstetrics often serves as an example of unexplained variation in practice, even in the literature aimed at other professions.[25-27] Chard and Richards summarize this point of view:

> . . . immense international and inter-regional variations in variations in obstetric practice . . . suggest that practice is not always rational or necessarily in the best interests of the mother and her baby [15]

Reference to "variations in practice' is almost a euphemism for lack of rationale for interventions, but also for overuse of interventions. There is a tension in the early EBM literature both inside and outside obstetrics about acknowledging that without good research we cannot be clear about whether there is an ideal rate of intervention which benefits rather than harms. Authors move between equipoise and critique of overuse of intervention, with a need for more

and better evidence as the outcome of both positions.[2] Many of the early calls for better science to guide care refer to the admonition to do no harm:

> No one means to cause injury or undue distress to another individual seeking help or advice, yet many patients die or suffer serious morbidity from iatrogenic causes such as un-indicated or unnecessary testing.[52]

Chalmers and Richards use variations in the use of forceps in England and Wales and the US as evidence of the arbitrary nature of practice, charging "variability in medical fashion rather than defined need".[15] They acknowledge that structural issues such as physician-based care (versus midwifery care) and payment schemes may impact on issues such as rates of instrumental delivery. However they point to an underlying dichotomy between interventionist and conservative care providers as the most significant cause, as "definitions of need, as perceived by individual obstetrics practitioners, vary considerably." Research evidence is seen to be a "cure" for variations in practice. Although current practice is seen to be "not always rational", a rational solution offering more knowledge is posed as the solution.

Variations in rates of intervention seemed to follow a pattern which runs counter to need, with British data showing lower rates of intervention in lower social classes. In their conclusion, Chard and Richards use the concept of the inverse care law[53] to describe the pattern of health system use where those with "the least need of a service" are "nevertheless the principle user".[15]

Susanne Houd is a midwife who has worked in Canada and Denmark and cites variations in practice as her inspiration for her early involvement in EBP both at the practice and policy level:

> *. . . in '77 or '78 I started to ask questions . . . I'd been working in different places and different cities, and I did not understand the differences . . . Something that was allowed in one place was not allowed in another place. I'm from a time when fathers were not allowed to be in the birth room in one place but* [were allowed] *in another place, where children could come in one place and not in another place, where everybody got an enema in one place but not in another place. Why? And then I started to look at the literature and understood that there [was] a way to support my questions somehow. . . I felt for instance this business about giving women an enema when she was in strong labour and placing her on a cold toilet alone, I thought it was so inhuman. So when I was reading in the literature that in 1928 or something there has been randomised controlled trials, I had a weapon. I felt I had a weapon that I could use in an argument and change things to the benefit of the woman.*
>
> Houd 22:184

Houd created a publication for pregnant women and parents showing the variation in rates of interventions between Danish hospitals as a tool for them to advocate for themselves. It

had the explicit goal of assisting parents to seek low intervention style of care:

> *I made all my birth guides for the parents, for them to get a means of argument so they could get the birth they wanted . . . using as little interventions as possible . . . They came with the book and said "Why do you have one percent of this and they have 20? Why do you have 50 percent episiotomies and the next door neighbour only have 10? What is the right amount? The research says this. Why are you not changing?" I was using it as a means of changing things and make people think. The science part of it was important.*
>
> Houd 22:184

The Information Revolution

Although the origins of the EBP revolution predate the information revolution, the rapid growth of computer technologies and electronic and internet access to the medical literature both consolidated the need for a systematic approach to processing the overwhelming volume of research findings increasingly available to the practitioner, and provided the mechanisms to address the problem of too much access to information. The success of the EBP paradigm shift is inextricably linked with the information technology revolution.[11,54,55] Enkin describes the laborious task of compiling trials prior to the widespread use of computers through the story of the first steps in the development of the Oxford Perinatal Epidemiology Unit (OPEU):

> *Turning the concept into reality was not as simple as we had envisaged. First we had to find the trials. No easy task. A search with Medline - which of course was not computerized yet - only picked up half the randomised trials that we uncovered with a hand search of selected journals, so we had to hand search back issues of all journals that might contain reports of randomised trials. We could not assume that all properly controlled trials were published in English, so we had to enlist an army of searchers in other countries, in other languages. Then we had to get the articles translated. Also not easy.*
>
> *We tried to get all of the trials, because leaving any out would bias the results of our meta-analysis. We worried that some trials, particularly those with negative results, might not have been published, and this too would distort our conclusions. In an effort to locate unpublished trials, Iain wrote to some 50,000 obstetric and pediatric researchers around the world, asking if they had carried out any trials that had not been published. We also went to enormous lengths trying to identify conference proceedings, PhD theses, and other so-called grey literature. We could never get them all, but we certainly tried.*
>
> *Then we had to read the reports of all the trials. We found that some studies that called themselves randomised trials clearly were not. In others, the method of allocation to the groups compared was not clear, and we had to write to the authors for clarification. Sometimes we still couldn't be sure, so we erred on the side of over inclusion, rather than miss possibly valuable data. Next, we had to classify the trials we identified by the population served, the details of the intervention, and the effects or outcomes that they looked for. I began to think that some authors intentionally obfuscated their findings. When some outcomes seemed to have been omitted from the published report, we wrote*

to authors, asking us if they could provide us with the data. Some did, some didn't. Then we extracted the results of the trials and statistically combined the results of trials of similar interventions, in similar populations, hoping to end up with statistically significant estimates of the effects of each intervention which could then be used to rationally guide practice.

Finally, we had to disseminate the results of our efforts. We started out with a monograph on antenatal care [Effectiveness and Satisfaction with Antenatal Care] as the first volume of what was to be a series of short monographs on the various stages of pregnancy and childbirth . . . But I clearly remember the draft after draft of each chapter, painfully typed in those pre word processor days.

Around this time computers became available, a new technology that made our complicated job more feasible. We settled for a regularly updated electronic database, The Oxford Database of Perinatal Trials, ODPT to its friends. This in turn became the basis for our enormous, multi author, two volume, encyclopedic 'Effective Care in Pregnancy and Childbirth' which was quickly dubbed ECPC - Acronyms. I hate them, but can't escape them.

Enkin 11:348

Lack of ability to cope with the sheer volume of information that health care providers grapple with is put forward by some as an explanation for wide variations in practice and lack of uptake of important research findings. The reality in the mid nineties was described by Grimes as "scientific reports scattered throughout 200,000 biomedical journals" leading to the problem that "daily practice of medicine lags far behind what we know"[30] with most of this lag stemming from lack of systematic and convenient access. Sackett gives examples from his field stating that internists would have to read 19 articles per day to keep up, with about 1 hour per week available for reading.[56]

Volume is not the only consideration. As illustrated by the challenges of putting together the Oxford Database, practitioners face wide variety in the quality of the research available. EBM offers not only a systematic organization of the information but also the tools of "critical appraisal of the research literature" to support busy care providers. The User's Guide produced by the Evidence-based Medicine Working Group, the guidebook of the new paradigm, presents EBP as time efficient for medical students (1/2 hour including trip to library to access computer) and cost effective as accessing the evidence is more likely to lead to effective care than following the expert clinician. Sackett outlines three levels of EBM practitioners: those who have the skills and take the time to critically appraise individual research papers, those who will rely on systematic reviews and those who will *accept and submit to* EBM guidelines (my italics).[25-27] The

authoritarian implications of this increasingly hierarchical approach to operationalizing EBP are addressed in future chapters. Tonelli notes that it is impossible to argue with the benefits of EBM from the perspective of time and the need for quality information: "all of us seem to benefit".[57]

Not so New?

Some make the case that the new paradigm is not so new[58-60] and not a paradigm shift given that the histories of healing and research into effective treatments have always been closely linked. They argue that medical practitioners, particularly the experts charged with opinion-based practice, have always valued, evaluated and integrated research into practice. Those who resist the claim that EBM is a new paradigm note that medical historians have documented reliance on scientific evidence and attempts to standardize care for at least two centuries.[58] Grimes notes EBP's roots are half a century old, with RCTs used for a century.[30] In this view EBP and access to electronic and computer technology allows an evolution in to a more systematic approach, but is in step with a long tradition rather than a revolution. Some critics, like Shahar, question the need for the label:

> "would they [doctors] gain anything from substituting a three-word descriptor ('evidence-based medicine') for what they have been doing for a living for a one word descriptor ('medicine').[59]

Spodich calls the use of the term "terminologic lapse or terminologic arrogance".[61]

Maternal fetal medicine (MFM) specialist Matthew Sermer works at Mount Sinai hospital in Toronto and studied epidemiology at McMaster during the early days of the EBM movement. His comments convey a sense of a long history behind EBP:

> *I just thought of it* [EBM] *as another step . . . there are questions that need to be answered. And you need to design trials to make sure that the answers you get are scientifically valid. I think of it as a natural progression of medicine. Even though the term evidence-based medicine to me seems like a new sexy term as it's currently applied and people freely use it, I think the implication is that we never practised that way before. And my sense is that we always practised based on knowledge that we had or thought we had. And medicine and research has been evolving through many years and once you have time you should read William Osler. And that was about the turn of the previous century. And the lack of evidence was just astounding and he created certain scientific rigours in medicine around the turn of the century. And you will see that the medicine over the decades has progressed remarkably. Some of the changes that have taken place within the first 50 years and subsequent 50 years are just absolutely unbelievable. Unbelievable. And so to me I see all this as a kind of gradual progression of medicine, inevitable progression of medicine. And amazing work was done in the 1930s, 1940s, and I guess 1950s but our science of medicine and research has improved. And so since it has improved then we are more likely to engage in that type of science. And so they*

> *didn't have clinical epidemiology the way we know it now in 1950 so it would have been difficult to practice such medicine or practice such research. So to me it's all kind of an evolution of medicine that has taken bounds and leaps over the decades, even since I've been in medicine.*
>
> Sermer 49:31

In response to the charge that the new paradigm ignored history, EBM advocates acknowledge that physicians have always "sought to base decisions and actions on the best possible evidence"[25-27] seemingly aware that some may take offence. In some cases, the claim that EBP is not so new appears to be part of a profession saving face in relation to what is perceived to be an insult: that past practice was arbitrary and without scientific basis. EBP advocates, particularly in maternity care, argue that although some health care practitioners may have tried to base practice on the best available research, the widespread persistence of practices despite evidence seemed to reveal that a dramatic shift, rather than a gentle evolution was needed. From this perspective the rhetoric of the new paradigm is part of what is necessary to challenge the status quo and expert power.

In her article "Evidence-based practice: Been There Doing That!" Carol Deets claims that "nurse researchers have been advocating research-based nursing interventions for years". The tone of the article may reflect some of the interprofessional tensions in the health care hierarchy:

> "What is noteworthy, however, is the reality that the profession [nursing] has been striving for this type of care long before other professions considered it an imperative. Being ahead of the curve . . . is a unique and gratifying position"[60]

In response to the flurry of debate in the literature about EBM's claim to being a new paradigm, EBM User Guide authors try to address the underlying discomfort of those who are offended. They outline the difference is in EBM's use of a routine systematic process for consulting the literature:

> Most readers will recognise that the ideas underlying evidence-based medicine are not new. Clinicians identify the questions raised in caring for their patients and consult the literature at least occasionally, if not routinely. The difference with using an explicit, evidence-based medicine framework is twofold: it can make consulting and evaluating the literature a relatively simple, routine procedure, and it can make this process workable for clinical teams, as well as for individual clinicians.[1]

In an editorial for the journal *Medical Ethics* British psychiatrist Tony Hope notes that the tendency to claim EBP as old news reflects its impact:

> One can tell that a movement is important when its detractors heatedly maintain that it is nothing new. 'Evidence-based medicine?' one chemist said to me, 'What other kind of

> medicine could there possibly be?' and a consultant physician said gruffly: 'We have always practised evidence-based medicine'.[5]

Sweeping Scope

EBP advocates are inspired, enthusiastic and ambitious. Claims found in the initial advocacy literature in the early and mid nineties are often sweeping, promising dramatic change and significant remedies for some of the challenges facing health care. The initial articles predict that the paradigm shift will not only impact the practice of medicine, but will be felt in many other areas of health care. Several respected authors claim that the EBP movement is of the same scope and importance as the Human Genome Project.[13,28]

Critics call the claims for EBM arrogant, grandiose and overreaching, and seem to be resistant to what appears to be "an EBP bandwagon".[63] The extent of the reaction to EBM seems to testify to just how exciting and infuriating the project was, and to the many nerves its remedies touched. The passionate debates that erupt across the many sub-specialties of medicine and other areas of health care are the subject of Chapter Four.

The claims of EBM within clinical medicine are all encompassing, establishing EBM as "the clinical bases for diagnosis, prognosis, decision analyses and therapeutics". Authors appear self conscious of the need to temper a push back.[25-27] Starting with the article in *JAMA* widely accepted to be the first use of the term, "Evidence-Based Medicine: A New Approach to Teaching the Practice of Medicine" advocates put forward the new paradigm's superiority but work to acknowledge that many aspects of former approaches will remain important. Clinical experience and understanding of pathophysiology are acknowledged as still necessary but no longer sufficient.[11]

The *JAMA* title focuses on education. Sackett calls EBM a life-long self-directed learning approach. He argues that practicing the strategies and learning the skills of EBM, will protect physicians and patients from poor practice based on tradition, expert opinion and the "self-serving interests of commercial sources" such as drug and medical equipment companies. EBM is proposed as a protection for physicians against the influence of drug company promotion as the most frequent form of continuing medical education.[25-27]

One of the first arguments for benefit beyond better clinical care is that EBM will support better time management in a system challenged by "reductions in junior doctors hours".[25,64] It is an interesting and often unexplained assumption that EBM will support more "efficient", less time-intensive care. EBM it seems will assist clinicians to drop time and resource intensive tests

and manoeuvres. This assumption is rooted in the conviction that many untested or discredited procedures will be abandoned in the light of better evidence and that this will "save time" in a stressed system.

EBP enters health care in the midst of a policy environment where anxiety about escalating health care cost is a dominant theme in the discourse. Advocates extended EBM's importance as tool to the economics of medicine, encompassing what Sackett describes as "a fundamental shift in . . . economic analyses" arguing that EBM is critical for deciding on resource allocation "appropriate purchasing and provision", an argument that evolves into the field that emerges as evidence-based policy.[65] Linked with the argument about time management, the hope that EBP will support greater use of effective treatments and phasing out of those that were ineffective or harmful,[15] leads advocates to promote EBP's role in stabilizing and even reducing health care costs, the results of which would be more equitable and rational distribution of resources.

EBM also claims to create a "common language" which will assist in an environment which increasingly involves teamwork. In this way EBM will assist in communication between care providers on the team. Notably in the early articles there is no mention of who the team players might be (presumably non-physician providers such as nurses or midwives). EBM is seen to be invaluable to teamwork as it provides "rules of evidence by which one can agree on who will do what and to whom".[25-27]

Not surprisingly, given its close links to innovative medical education and PBL, EBM promises to improve medical education, and much of the research to support its use comes from this arena:

> Evidence-based medicine can be taught to, and practised by, clinicians at all levels of seniority and can be used to close the gulf between good clinical research and clinical practice. In addition it can help to promote self directed learning and teamwork and produce faster and better doctors.[62]

Initial Resistance, Rapid Uptake

Enkin tells the story of the first reactions to *ECPC*, which illustrates the wider response to EBP. Response to the books was dramatic but at first, mixed. He describes a meeting sponsored by the Milbank Foundation [66] at which the reception was enthusiastic, and an award from the British Medical Association[14] but a reluctance to translate the knowledge into practice:

> *Our work had a dramatic impact on the academic community. Reviews were hyperbolic: "must reading; the most authoritative obstetric text of the 20th century; the most*

important work in obstetrics since Smellie's 18th century treatise on midwifery; the new "obstetrical bible" . . . How laudatory can you get? It was almost embarrassing. There was only one dissenting review, by Dennis Hawkins, Professor of Obstetrics at the University of London, who deliciously wrote "The price of £225 should protect aspiring registrars from acquiring too many confused ideas from its pages". Maybe he was close to the mark. It would be hard to pick up any issue of any obstetrical journal in those years without finding a reference to ECPC. The British Medical Association awarded the paperback version the prize for the best general medical book of the year. In 1991 the Milbank Foundation convened a special meeting in Washington, to consider the impact of the work on the future of obstetrical care in the United States. Members of congress attended, as well as heads of important government committees and obstetrical organizations like ACOG, and the proceedings were published in prestigious journals. To our surprise, despite the heady praise and the accolades our work was receiving, despite widespread dissemination of the evidence that we had so carefully collected, one could only describe its influence on practice as "Gornisht fun gornisht; Niente. Nothing. Diddley squat". We couldn't understand it. The evidence about the effects of obstetric practices was clear: which practices were effective; which were not; which were still not determined, was known, was available. Why wouldn't people listen? We didn't know the reason, but others did.

Jonathan Lomas, knew the reason; He said "there are all sorts of things go into decisions about policy. Evidence is not one of them". Luella Klein, the president of ACOG, knew the reason. At the special Milbank meeting, while the academics were all raving about ECPC, she told the assembled meeting in no uncertain terms. "A $450.00 book, written in another country" she said, "is unlikely to have an effect on [US] *physician behaviour. "But then," she went on "neither is anything else". How right she was. How wrong she turned out to be.*

Enkin 9:50

Despite resistance, by 2001, within a decade of the first introduction of the term, Tonelli reports 5000 citations in MEDLINE using the term EBM, noting that EBP's "popularity is undeniable".[67] Enkin explains:

The change seemed to come almost overnight. In a short dozen years or less, the paradigm shifted. Statistical evidence began to replace expert authority. It is a fascinating exercise to speculate about why, how, suddenly, evidence-based obstetrics switched from being "a $450.00 book, written in another country" to become the new mantra, the new authority. We'll probably never know the whole answer. Paradigms rarely change so quickly. For one thing, the time was right - perhaps the most important factor in the acceptance of any innovation. Science was in, and could provide the truth about everything from cosmology to consumer goods, from turbojets to toothpaste (scientifically proven to make your teeth 97.3% whiter). Maybe people just felt the need for a new, more convincing authority, something that they could rely on to tell them what to do. A substitute for fallible clinical judgment that had so often been found wanting. Whatever the reasons, remarkably rapidly, over a period of years rather than centuries or even decades, the paradigm had shifted. We were on a roll. ODPT changed its name and morphed into the Cochrane Library. It grew and expanded its scope beyond

obstetrics into all health care disciplines, and from our little unit in Oxford to centres in 21 countries around the world. The new paradigm was Evidence-based Medicine.
Enkin 11:18

What comes next is an explosion of articles, guides and courses on how to do EBM and how to teach EBM. EBM's uptake impacts on the way in which articles use and report research findings and spawns new journals, databases and institutions. Virtually all medical curriculums now integrate EBM in some form, often and increasingly as free standing courses.[57] Health care education programs of all kinds claim to integrate EBP into the curriculum, although there may be variance in the resources available to support it.[68] The EBP movement shifted problem-based learning from what was seen for at least a decade as an interesting but obscure innovation at a Canadian university to an international norm. Critical appraisal of research courses that were rare in the early 90s, are now widespread. Goodman notes that by 1999 EBM is a small industry.[69] Commenting on the convergence of interests that begin to claim EBM by 2001, including those concerned with resource allocation and defining the legal standard of care, Timmermans and Angell call EBM a "veritable cottage industry" which is international in scope.[34]

Suddenly "the in phrase for much of the health-related literature is evidence-based something; evidence-based decisions, evidence-based medicine, evidence-based disease management, evidence-based public health, and even an evidence-based profession".[60] In the enthusiastic uptake, those who opposed are seen as retrogressive, resistant to change[70,71] or perhaps not so capable.[32] Advocacy for the new paradigm spreads to other professions, with enthusiastic uptake from midwifery [38,41-43,72-76] and nursing [50,51,77,78] By 2004 Mykhalovskiy and Weir observe that the EBM movement has "taken the health care world by storm and is arguably the most important contemporary initiative committed to reshaping biomedical reason and practice."[12]

Conclusion

The roots of the new paradigm in maternity care set the stage for the hopes and aspirations of the care providers I interviewed which are explored in the next chapter. The move to challenge opinion-based and authoritarian practice and wide variations in practice fit well with the activist aspirations of the childbirth reform movements. Early steps towards an evidence-base practice approach integrated knowledge from a broad inter-disciplinary and interprofessional base. The early advocates of EBP in maternity care established physiologic birth and women's autonomy as standards against which interventions were to be measured. These early principles

are important to understanding concerns which emerge over the next two decades about the limitations and unexpected effects of EBP. The clear articulation by the early advocates of EBP within maternity care that there are policy questions about the objectives of care that cannot be answered by clinical science called for both individualized care and a social discussion about what is important in the care of childbearing women, babies and families.

Advocates for EBP outside of maternity care made sweeping claims for the new paradigm and despite initial resistance the information technology revolution fueled rapid uptake. The passionate debates which followed are explored in Chapter Four. The combination of high hopes for EBP in maternity care flowing from its idealistic roots in childbirth reform and the heated debates about its limitations set the stage for my final chapters.

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Chapter Three: The Promise of EBP for Maternity Care

Introduction

In talking with midwives, nurses and physicians across the country there was a remarkable congruence when they described their first exposure to the concepts of EBP. Although there was variation in the ways they discovered EBP, most described the experience of the beginnings of the "evidence movement" with marked excitement and enthusiasm. There were also those who were more cautious or who were early dissenters and critics in each care provider group. As with some of Murray Enkin's reflections in the previous chapter, informant's retrospective descriptions of their expectations for EBP were repeatedly tempered with irony. Looking back over a decade or more, informants often seemed amused or almost embarrassed by their former hopes and enthusiasms. Understanding the level of excitement the new paradigm generated on the ground helps to explain its rapid adoption and dominance. The high, and potentially conflicting, expectations that those working in maternity care had for EBP provide insight into how it is applied and misapplied. What emerges is a sense of how the new paradigm moves from idea to implementation, from challenge to the status quo to clinical practice guidelines, and from guidelines into practice.

In this chapter, informants describe their early excitement about EBM as a very positive time in their careers. They conveyed a sense of being caught up in a moment in history, in an opportunity to learn and make positive changes in their personal practice or practice environment and, in some cases, in maternity care more broadly. Most recall their discovery of EBP as an important turning point. Some informants made direct links between the early years of EBP and work they had been doing to change the conditions of childbirth. They were excited by evidence which confirmed beliefs and practices that were not always supported in mainstream practice, but which they had espoused as part of "family-centred maternity care". Themes of hope that EBP will provide clarity about best practice were common, often expressed as a desire for truth and certainty. This desire for more clarity was articulated simultaneously with hopes for a more egalitarian and flexible approach to knowledge and practice which would offer women and care providers choice and greater autonomy.

The language used by informants in describing their hopes for EBP often borders on hyperbole and reflects a surprisingly emotional response to a concept which on the surface

appears completely rational: using scientific research findings to guide health care practice. Their language is also marked by the use of religious terminology to describe both the promise and the limitations of the EBP, a finding that reflects the power of the movement and its complex impact. The emotional language reveals that reactions to the new paradigm are complex and highly social. The second edition of the *GECPC* has a promotional quote on its back cover from the *Midwifery Information and Research Service* (*MIDIRS*) calling it "the midwives' bible".[1] I have often called *ECPC* or *GECPC* "bibles" myself in my role as a clinical care provider and a teacher. Many informants, especially from family practice, midwifery and nursing spoke of its importance in similar terms.

Hope and Excitement for the New Paradigm

Tiffany Haidon worked for a decade as a labour and delivery nurse in both Toronto and in Texas prior to becoming a midwife. She first encountered EBP in her midwifery education. Her initial reaction mirrors the level of enthusiasm of most informants: "*I was so thrilled*". She describes the context for front line nurses working shifts on the labour floor. EBP seemed to her to be an intervention which disrupted the norm of following routines passed from generation to generation without question:

> *I was thrilled* [to learn about EBP] *because I felt so much of my nursing practice and my nursing education was mostly just routine. Routines passed down from one health care provider to another. So I was so thrilled because I felt like often . . . the routine care and procedures that I did really had no backing and were done just because this was how I was taught because the person who taught me was taught that way . . . and so a lot of times as a nurse working in the hospital you just did things often without knowing why you did them.*
>
> Haidon 19:24

Haidon also describes her excitement at learning to ask questions about her own practice. This self reflective aspect of EBP had a strong appeal among informants. For many, EBP not only gave them permission to ask questions of others, but also pushed them to ask questions of themselves:

> *What about everything that I do that I just take for granted that we do for a good reason and not really looking into why do I do them? What are the benefits? What are the risks? And really what's the reason behind it? What does the research show? So, I think that came in later years of nursing practice and made me question a lot of things as to why I did them.*
>
> Haidon 19:28

Andrew Kotaska is an obstetrician who currently works in Yellowknife, NWT, but who

was an obstetrical resident at the University of British Columbia when I interviewed him. His previous work as a family physician providing maternity care in remote communities in BC inspired him to become an obstetric specialist. He describes himself as part of the first generation of medical students for whom EBP was integrated into the curriculum, learning to use the concepts of critical appraisal and the methodologies of RCTs as part of his fundamental training. His description of the atmosphere around EBP during his medical school experience as "intoxicating" indicates the strength of the appeal of EBP within medicine. Like others reflecting on the first glow of EBP, Kotaska's comments allude to future problems and limitations of EBP:

> *There was so much excitement about the power of it, it really hadn't become a doctrine yet. It was the new kid on the block and it was intoxicating and so we all kind of jumped on and were very enthusiastic about it. And certainly initially it got applied to questions that were relatively easy, if you like, to answer. Does raloxifene increase your bone mass? Is atenolol better than thiazide for hypertension? . . . pretty clear questions that it actually was quite useful to answer.*
>
> Kotaska 31:124

Céline Lemay is a nurse who became a "lay" midwife and practised prior to the recognition of midwifery in Quebec. She has worked since then at the Maison de Naissance de Pointe Claire, at the Université du Québec à Trois-Rivières and in Nunavik, the Inuit region of Quebec. Lemay is also a childbirth scholar and her PhD dissertation focuses on cultural perspectives on pregnancy and birth as a "normal life event". Again her language shows the strength of enthusiasm that maternity care providers felt. Her comments point to the potential of EBP to empower those who felt disadvantaged in bringing forward their critiques of routine maternity care practice. At the time *ECPC* was released, midwives were working on the fringe of the Canadian health care system, as unregulated health care providers. Lemay describes both initial enthusiasm and an emerging hesitation:

> *When I became aware of ECPC, I said "Wow!" And when I first read not the big one [ECPC] but the smallest one* [GECPC], *I got so excited. So excited.* [Thinking,] *"Wow! Finally." Thinking, with the help of science and looking at things* [to assess effectiveness] *we can say "This is not useful. No proof of that." "Oh this is good", and "This one, we don't really know". Who wants to question that? . . . It was good. And finally with the benediction, the blessing, of science I was able to criticize some obstetrical practices. But after that, by the end of the '90s there was this thing about guidelines, this movement with not just practitioners but with the health care system about money and efficiency and all that.*
>
> Lemay 33:24

Karen Kaufman is a midwife and a nurse who was recruited to work in the McMaster School of Nursing in the 1980s, positioning her in a leadership role in nursing in one of the

institutions leading the new paradigm. She felt privileged to be able to be invited into the process as it unfolded. When I interviewed her she was the Director of the Midwifery Education Program at McMaster:

> *Well part of it was this sense that you were really learning something new and that it was au courante stuff and it was. It was like learning a new language and a whole new set of intellectual skills. [I felt I was] being let in the door of a world that I didn't know very much about. So it was, from that point of view, fascinating.*
>
> Kaufman 26:113

Discovering EBP

Role Models and Research Exposure

A highly influential figure in the development of first problem-based learning (PBL) and then EBP, David Sackett is mentioned by many of my physician informants. Although I was aware of Sackett as one of the most frequently published and cited advocates of EBP, I was surprised by how many informants had been exposed to him. Chosen from institutions all across the country for their interest in or critique of EBP, many had encountered him as medical students, in a graduate epidemiology program or as staff physicians or nurses at McMaster. I did not directly ask about mentors but many informants noted that they had been directly influenced by Sackett. He was clearly an inspiration and a role model to many. It is interesting to note that although Sackett's writing is sometimes described in the literature as evangelical and dogmatic, many of his former students note his ability to challenge and question.

Philip Hall was an obstetrician and maternal-fetal medicine (MFM) specialist at St. Boniface hospital in Winnipeg when I interviewed him. He has passed away since the time of our interview. He was an outspoken critic of some of the effects of EBP on maternity care in Canada. He explains Sackett's influence:

> *I was an undergraduate at Mac* [McMaster] *amidst the . . . second graduating class. Several people that were there then, that I still have great respect for. Dave Sackett. Murray Enkin. Dave Sackett was a masterful man at challenging thought and how you look at stuff, and so I remember being exposed to some of the ideas before the label.*
>
> Hall 20:205

Pat Mohide is an obstetrician, MFM specialist and an *ECPC* chapter author and Cochrane reviewer. At the time of my interview he was head of the Department of Obstetrics and Gynaecology at McMaster University. He talked self-critically about a period in his career when the development and uptake of obstetrical technology was expanding rapidly. He reflected on the realization that he was actively "preaching" the regionalization of care and the establishment of

referral networks to ensure access to high risk care, with very little understanding of the risks and benefits of some of the technologies he was promoting:

> *Ultrasound was starting, fetal monitoring was new, infusion pumps were new. We were out in the community preaching our wares, telling everybody about high risk pregnancies and in large part it was based on very, very, very limited evidence and some of the outcomes were unexpected like the sky rocketing section rates and some of the trials, early trials were ambiguous about, you know, for instance whether tocolytic drugs worked or not and we eventually got involved in the Canadian Preterm Labour Trial and showed that in large part it's not very effective. . . it was disillusionment and then the flip side of that was total rapture with Dave Sackett and his very seductive way of just getting people involved in the idea* [of EBM].
>
> Mohide 41:14

One of the attractions of the evidence movement was that it offered a way forward for those within obstetrics who acknowledged that technologic approaches were not all producing the outcomes that were hoped for. EBP provided a rational and seemingly scientific mechanism to address public critique about the "medicalization of birth". EBP allows obstetrics to begin to take leadership and even ownership of a way to evaluate outcomes using a method consistent with medical science and at some distance from the politics of the childbirth movements. When asked to elaborate on how Sackett inspired "total rapture" with the idea of EBP Mohide says:

> *He has a marvelous theatrical style, almost Shakespearean style. He is a great actor. Could put on a great show. He asks very challenging questions at times. He almost never agrees with you, like Murray* [Enkin] . . . *He has charisma. He walks into a room and he hasn't said a word yet and he has a presence. And there are very few people who can do that.*
>
> Mohide 54:23

Kaufman, Mohide's colleague at McMaster, also notes Sackett's influence on the atmosphere at the university:

> *One of the noteworthy departments in McMaster at that time was the clinical epidemiology and biostatistics department. And that was under the leadership of Dave Sackett. And so you didn't have to be* [at McMaster] *very long . . . before it was just sort of permeating the air and there was a lot of publicity attached to some of that because they became acknowledged quite early on as establishing a leadership role in promoting clinical trials and what clinical trials had to offer, what it was about evidence that was supposed to help shape practice, to answer practice questions, to give evidence about best treatment.*
>
> Kaufman 26:16

Many who had been influenced by Sackett note the irony contained in recognizing the power of an individual leader in a movement that claimed to eschew expert opinion. Larry

Reynolds, a family physician who was Head of the Department of Family Practice at the University of Manitoba when I interviewed him, explains:

> *Dave Sackett was my thesis supervisor a long time ago at McMaster. It's interesting, kind of the paradoxical, that in a movement that at the beginning was meant to be sort of radical and revolutionary has become a culture where the one who determines what evidence counts has become a new authority figure.*
>
> Reynolds 44:19

Like Reynolds, Mohide's description of Sackett's approach to PBL reveals some of the contradictions of leadership in an anti-authoritarian system:

> *Well I remember him as an educator and I co-tutored with him in DME* [the Design, Methodology and Evaluation Master's program] *at one time. And he was probably the worst tutor I've ever seen in terms of the McMaster dictum of the time of non-directive tutoring. Cause he'd be non-directive for about the first two to three minutes and then he would jump up with whatever idea that was being discussed, go to the blackboard and then the rest would really be a lecture but absolutely nobody would argue and everybody was totally enthralled by the experience. Whatever it was, it wasn't a* [PBL] *tutorial.*
>
> Mohide 41:22

Research points to the importance of opinion leaders and role models in the successful application of research findings and EBP guidelines.[2] One of the rural midwives working in the Grey Bruce region of Ontario recalled an event to promote EBP in the midwifery community. Murray Enkin had been an outspoken defender of midwifery prior to its legal recognition. This midwife expressed her feeling that given the role Enkin had played, midwives should listen to his advocacy of EBP:

> *I just sort of thought, if Murray Enkin is willing to take us seriously and give us the benefit of his information and his background, then I think we should pay attention to the things that he's espousing as well.*
>
> Rural Ontario Midwives 46:279

Bobbi Soderstrom is an Ottawa midwife who practiced prior to regulation. She is also educated as a nurse. Soderstrom is widely recognized as a Canadian expert in medico-legal issues in midwifery and maternity care. She commented:

> *One of the things that really made me comfortable with the whole notion of* [EBP] *was knowing somebody like Murray because* [he was] *a person that I knew who was a champion of* [midwifery and family-centred care] . . . *And on top of that he had the gumption to be able to say "No, we were wrong", when you looked at something like diabetes or episiotomy. I think some of us did admire the fact that* [through EBP] *we might be in a position where people would acknowledge when they may have been wrong . . . that was kind of exciting.*
>
> Soderstrom 51:34

Several midwives mentioned British midwife, researcher and author Caroline Flint as an inspirational leader. Canadian nurses Kris Robinson from Winnipeg and Sarah Payne from BC were educated as midwives in Britain. They both described how Flint actively role modeled the use of evidence in supporting midwifery approaches to care. Marjorie Tew was a statistician who critiqued claims to the greater safety of hospital birth.[3] Robinson explained:

> *At that time in the 80s technology was a very important part of obstetrical care and as midwives* [in the UK] *we were sort of participants in that but at the same time learning about normal births too. There was an emerging role for research and science, either good or bad. It was always both sides of the question. It was the 'real' midwives, (I belonged to a radical midwives association and used to go up to London and listen to Caroline Flint who was challenging even midwifery then) saying "you know, look at the evidence." People like Marjorie Tew were starting to write about* [the evidence for] *home births. I feel very fortunate that I was able to sort of touch base in different places with that whole notion "where is the evidence? Where is the research?" And challenging the traditional medicalised model in a number of different ways.*
>
> Robinson 45:31

Many others mentioned the importance of individuals as role models in both learning about and applying evidence-based practice; in fact many of informants encouraged me to go and talk to their mentors.

Some physicians linked their first exposure to EBM, not to a specific individual role model, but to exposure to or involvement in research activities. John Kingdom is an Toronto MFM sub-specialist who trained in Ireland and England. During his training he was exposed to an RCT of electronic fetal monitoring (EFM). EFM, which had been widely adopted prior to being scientifically evaluated, uses a transducer attached by belts on the laboring woman's belly to a monitor which records the fetal heart rate and contractions. The trial compared EFM versus intermittent auscultation (IA) by a midwife with a fetal stethoscope or hand held electronic device. Kingdom tied his interest in EBM to this trial:

> *The randomised electronic fetal monitoring trial is a classic from Dublin from about 1985 and that was conducted while I was a medical student in Dublin actually. That's how I got my interest* [in EBM].
>
> Kingdom 28: 248

Kingdom calls the RCT "classic" because it is regarded as a cautionary tale of the EBP movement, as it acts as a warning that technology can be widely adopted in the belief that it will improve outcomes, when the science will show otherwise. The findings of the EFM trial showed that EFM conveyed no significant benefit for routine use with healthy women. The widespread

and ongoing use of EFM can be seen to do harm as it was shown to raise the caesarean section rate without improving outcomes for mothers or babies.

Michael Klein is a family physician, now Professor Emeritus at UBC, who did a ground-breaking RCT on episiotomy when he worked at McGill University in Montreal. Episiotomy is the incision of the perineal skin at the time of birth, once used routinely to widen the vaginal opening and believed to protect the muscles of the pelvic floor. His desire to do research led him to the OPEU and the EBP leaders, Enkin and Chalmers:

> *The first formal connection to evidence-based medicine was through my own episiotomy study . . . I was skeptical about the evidence there was around the routine use of episiotomy both because I was trained by midwives and because it just didn't make any sense to me. And I was influenced by the National Perinatal Epidemiology Unit. I took a sabbatical in 1980 and 1981 in Oxford with Iain Chalmers and through them I met Murray of course.*
>
> Klein 29:254

Personal Experiences of Care that was not Evidence-Based

Several of the midwives I spoke with referenced their own pregnancies as the beginning of their history with EBP, long before the term was in use, usually before they became midwives. They talked about their very personal sense that many routine procedures were not necessary and about their search to find support for their desire to avoid routine procedures in the medical literature. They described their struggle to use the available research to be able to make choices themselves, to try and expand the limited options presented to them by the maternity care system of the time. This process brought a growing realization, and often what some described as shock, that childbirth practices of the time were often not based on scientific research. Their personal experiences, both of the lack of research and of the gap between the research that existed and practice, inspired their ongoing involvement in maternity care and exposed them to broader social activism to change childbirth. They also saw these realizations about lack of evidence or the failure to use evidence as important influences in their decisions to become midwives in a country where midwifery was not recognized. The lack of a midwifery system in Canada despite widespread acceptance in most other parts of the world was itself not supported by scientific evidence. These stories are consistent with research on the revival of midwifery in Canada and the linked history of midwifery and childbirth activism.[4]

Jane Kilthei is a midwife who practiced in Ontario for 15 years prior to the regulation of midwifery. Following legal recognition of the profession she became Registrar of the College of Midwives of Ontario. She was Registrar of the College of Midwives of BC when I interviewed

her. She explained:

> My *son was born in 1980 and that was my beginning of being aware of how non evidence-based maternity care was, as I tried to get some pretty simple things for myself and my birth.* [I wanted] *to have people around me that I knew and to have information about what might happen in various circumstances . . . to make some choices about what would happen based on some information. . . I was told by my obstetrician "You women today think too much and ask too many questions." So I started going to the library and trying to figure out what I wanted and ended up having a home birth . . . And so it was sort a surprise to me that obstetrics and maternity care was still based on things that people thought were true from 1921, things about forceps and episiotomy and shaving women that were still routine in some centres when I was having a baby in 1980. It just seemed so outrageous.*
>
> Kilthei 27:9

Isabelle Brabant is a midwife in Montreal and author of the popular consumer guide to birth *Une Naissance Heureuse*.[5] She practiced for many years prior to the recognition of midwifery in Quebec in Montreal and Nunavik. She now works at Maison Bleue, an interprofessional community health centre for newcomers to Canada and teaches in the midwifery program at the Université du Québec à Trois-Rivière. Brabant described her sense that many routine procedures were unnecessary:

> *So in my first pregnancy,* [I was] *reading about things like episiotomy and reading about midwives and home births and questioning things, I could tell that things were happening* [in routine care] *that probably were not supposed to. And I would say that even with the second pregnancy I had read things that showed that episiotomies didn't have to be systematic.*
>
> Brabant 3:24

International or Northern Comparisons

Inspiration for evidence-based practice for some providers flowed from the experience of practice outside of Canada or in diverse regions of Canada, particularly the remote north. They observed varied approaches to birth in their different practice settings which lead them to appreciate the need for a broader base for practice than institutional routines or expert opinion. Many also linked the desire for evidence with the desire for change, hoping to incorporate aspects of practice they found elsewhere that they thought improved care and would benefit Canadian women and babies.

Kris Robinson trained as a nurse in Saskatoon. Like Haidon, she described the model of nursing care she learned as very routine based. She then worked and learned with midwives on the west Hudson Bay coast in the former Northwest Territories (NWT). At this time the NWT and several other remote regions such as northern Newfoundland and Labrador were the only

places in Canada where midwifery practice was still legal. She described the care that she witnessed as "*a totally different model of care*" and "*inspiring*".(45:19) Robinson later worked in San Francisco and then in Cambridge, England, where she received her midwifery education. In all of these settings she saw less routine intervention than in southern Canada. Robinson described the opportunity to see care provided differently as critical to her understanding of the need for evidence and of her growing desire to use evidence to promote change in Canada:

> *The experience of being exposed to midwifery . . . really made me challenge* [what I had been taught] *in a tertiary care environment. . . Then working in a forward thinking, challenging childbirth environment in California where they were* [using] *the research . . . in a highly organized and politicized way, again, that was a real eye opener for me. And then eventually I went to England and learned midwifery in a formal way and again was exposed to different ways of doing things.*
>
> Robinson 45:22

Haidon, in contrast found care in the US in the 1990s less evidence-based than in Canada:

> *Having been in Laredo, Texas* [working as a nurse] *where you see so many things happen to women that are not evidence-based, I can't imagine wanting to go back to that. You just see routine after routine thing. It was routine everything. Episiotomy, routine vacuum, epidural, shave, and enemas still. Walk in, get shaved, enema, labour with pit*[ocin], *and epidural, you labour in one room and then get moved to the delivery room. Of course I wasn't really around when it was routine episiotomies here but even since then* [I have seen] *many routine procedures in obstetrics that we now look at and go, you know, "That's crazy. I can't believe we ever did that."*
>
> Haidon 19:88

Hopes for "Best Practice", Certainty and Clarity

Bill Fraser is a Montreal obstetrician and MFM subspecialist who has been involved in many RCTs in obstetrics. His profound discomfort with the gaps in knowledge that existed prior to the EBP movement is a sentiment which informants shared:

> *Well I think that at the time there was so much sort of darkness in a sense, a lack of understanding, there was very little evidence about the effectiveness of interventions . . . I think I saw it as being essential to have good information about the effectiveness of interventions and I still* [do].
>
> Fraser 15:180

It goes without saying that maternity care providers perceive themselves as seeking to provide the best care to pregnant women. The hope to have the best information to inform practice and to find some certainty in a highly contentious field motivated many care providers to champion evidence-based practice. Their search for clarity fits with an overall trend in health care, and more broadly, to attempt to use evidence to define "best practice" and to identify

"benchmarks" against which practice and policy can be evaluated.[6] The excitement expressed by informants about EBM's potential to provide clarity about best practice was both professional and personal. The attraction of "knowing with certainty" what care leads to the safest outcomes reflects personal and political stresses on those working in maternity care. Biringer describes this as "*a cushion*":

> *. . . I was very excited about it. I felt that it would be a comfort, that it would be a sort of a cushion . . . There would be truth, that we would know the truth. That we wouldn't be subject to opinions, beliefs, last case scenario, worst case scenario, making decisions that were emotional, that this would be the holy grail, this would be the truth. And that we could practice knowing what the truth was. Somewhat naïve I suppose . . .*
>
> Biringer 2:22

Unrealistic social expectations for perfect birth outcomes can lead to high stress levels and burnout for practitioners and to problems with recruitment and retention in obstetrics. Obstetrics in Canada has the second highest rate of litigation, second only to anaesthesia. Liability concerns are cited as one of the most common reasons for leaving maternity care despite evidence that rates of professional litigation remain low in Canada as compared to the US. Liability concerns affect family physicians and midwives as well.[7-9] Soderstrom's involvement in professional liability issues has meant that much of her work focuses on helping maternity care providers avoid errors. In Soderstrom's view EBM seemed to be a powerful tool for "managing risk" both to increase patient safety and reduce claims against care providers:

> *Here we can finally discover what the truth is. What's the science that we need to know to keep from making mistakes?*
>
> Soderstrom 51:50

Jan Christilaw is an obstetrician and gynecologist at UBC and former president of the SOGC. Like Biringer, Christilaw articulates the vision of EPB as providing a comforting certainty. She reflects back on not only the allure of eliminating hesitation and guesswork, but also looks back on how unsophisticated that hope now seems:

> *So in other words the guessing would go from medicine. We would know what we were doing. We would always be able to offer patients the safest thing. And therefore practice would just gradually improve because the more we knew, the safer we would be, and we'd be able to move forward. And in light of that, that you would have to base your practice on that. And clinical guidelines would come along and they would tell you the right thing to do and you would welcome them because you would not . . . be worried about the fact that they were going to drive your practice. You would welcome them because you would be able to tell your patients without any hesitation what the right answer was. So given two possible outcomes, you would always be able to know which*

> *one was better. And that eventually you'd be doing so many trials it would become so mainstream to medicine, our file of unanswered questions would go down as our file of answered questions went up.*
>
> Christilaw 4: 136

Thomas Baskett argues that some of the argument for EBP comes out of the clinical interventions adopted into obstetrics which "*we got wrong for the very best reasons*". He uses the EFM versus IA trial as an example of the problems of adopting new approaches or technologies before they have been evaluated through an RCT, even when they seem to make sense at the time:

> *We embraced* [fetal heart rate] *monitoring with great hope that this was going to eliminate cerebral palsy. It now seems an incredibly naïve thought, but at that time it was a reasonable thought. In retrospect when we now look back, we were over-enthusiastic. That was one of the first things that we have shown where evidence-based medicine, if you like, surprised us.* [It was] *something that appeared logical and appeared that it might do a lot of good for those rare tragedies, intrapartum tragedies, and it really didn't make a huge difference.*
>
> Baskett 1:21

Avoiding Arbitrary and Authoritarian Practice

Avoiding "opinion-based" practice is presented as a central goal of EBP, and my interviews confirm the desire that existed among practitioners on the ground to move away from a system based on expert opinion. Many described situations from their educational or practice experiences where they had found interactions with authoritarian clinicians to be inappropriate. Kaufman describes EBP to be, in part:

> *. . . a reaction against the kind of opinion makers who just developed their own personal habits and then imposed them as the reason for why something should or shouldn't be done. And that's good enough. I mean that's legit. It's a good rationale. Because there were a lot of bad practices and obstetrics is full of the EFM story and the episiotomy and forceps stuff none of which was ever evaluated but was always just some leaders' view of how it should be done.*
>
> Kaufman 26:225

Haidon spoke of her experience as a labour floor nurse and articulates the vulnerability of nurses in an expert-opinion based approach to care. She comments on how evidence-based practice offers hope for a shared approach across professions and greater certainty about how physicians will expect the nurse to provide care.

> *Why I really love evidence-based practice* [is] *because the disadvantage of not using* [it] *is the inconsistency of care amongst care providers and I think that that puts so much stress on the people who are working under or taking orders from those care providers. And you had to try and remember what Dr. A wants and then what Dr. B would want and*

obviously not get those orders mixed up. . . it made it a challenging job for nurses to work when there were so many different opinions.

Haidon 13:33

In speaking about his own training in the1950s, Enkin observes:

We knew that everything we did was right. How did we know? The chief told us. It was very comforting. We had these rigid protocols to follow. It was very easy to learn without having to think. So I passed my specialist examinations without any difficulty and without any thinking. There wasn't a lot of agreement [between physicians] *about the best method. The decision of course was based on the standing orders of the attending physician rather than in any way individualized for the needs or desires of the individual woman.*

Enkin 9: 29

Owen Hughes is a family physician in Ottawa. He is a founding member of two of the EBP initiatives of the Society of Obstetricians and Gynecologists of Canada (SOGC), Advances in Labour and Risk Management (ALARM) [10]and Managing Obstetrical Risk Efficiently ($MORE^{OB}$).[11] The need to challenge arbitrary rules in medicine informed his early hopes for EBP:

I've had a healthy disrespect for the hierarchy of medicine . . . I never bought that . . . I remember having a run in with one of the old timers . . . I said 'Well there's not much evidence to do a monitor strip on arrival.' And he said 'No, but that's what we do here.' And I resolved from that day on that I would not accept that as an answer. It's just not right. It has to be based on some sort of evidence.

Hughes 24: 34

Perle Feldman is a family doctor who worked in Montreal at Jewish General Hospital when I interviewed her. Perle is known for her promotion of low intervention approaches to birth and as a passionate advocate for breastfeeding. Her comments express hope for a less authoritarian approach and name the gender hierarchy that existed in medicine as EBP began to challenge authority. Like many others her vision of EBP as a "*double-edged sword*" foreshadows critique:

Evidence-based practice has been and is right now a double-edged sword. I think at the beginning when it first started in the '80s it was just such a breath of fresh air because before that it was all the white haired, blue suited, red tied men, you know, blowing hard and saying 'Well I'm the professor and that's why I'm right'.

Feldman 14:22

Underlying the push back against the hierarchy is a desire for more egalitarian relationships, as expressed by Christilaw and Kaufman:

> *You know, what some people say in the literature is that, you know, caregivers would no longer be authoritarian.* [With EBM] *they're not doing it because it's their opinion. They're doing it because they have the knowledge of what's best. And I think in many ways it has changed the balance in terms of physicians having their place in the community. So in other words, if the evidence is the authority, what's the role of physicians and how are they positioned and does that decrease the authority of physicians? And hopefully it does.*
>
> Christilaw 4:124

> *I think it's not good enough anymore or it's become not good enough to just be told by the head of a department to do it a certain way. I suppose it's democratic or egalitarian, its information to be put in the hands of everyone as opposed to you can only attain this ability to influence others if you wait long enough to be the master.*
>
> Kaufman 26:235

The care providers I interviewed hoped that EBP would be a tool to address the troubling variations in practice that they saw in their institutions and communities. Many spoke passionately about their hopes that EBP would assist them in improving care both as individual practitioners and in the institutions they worked in:

> *The story that I usually tell is that I was a family medicine resident. I was kind of aghast by the variation in practice that I saw and there didn't seem to be a great deal of evidence, particularly in maternity care. Some people would do stem to stern types of episiotomy as a kind of a prophylactic procedure and others would really try to avoid episiotomy and there was a great deal of vehement kind of feeling about what should and shouldn't be done. It was more smoke than fire I guess. And so that was what stimulated me to develop an interest in evidence-based practice.*
>
> Fraser 15:22

Hopes for Making Change and Enhancing Choice

Similarly to the EBP founders, some informants linked their history of involvement in childbirth reform movements and their hopes for EBP. In this context it is not surprising that they saw EBP as a tool for changing the conditions of childbirth. For many it was perceived as a much needed and powerful tool in the face of resistance to popular and professional calls for reform. The change involved in the desire to "humanize childbirth" combined lowering rates of intervention, a more social approach to birth, less authoritarian relationships between women and care providers and a greater range of choices for childbearing women and families. Murray Enkin talked about his early days working on family-centred maternity care at McMaster and the fact that making change in the broader system was not as easy as he and his local colleagues had thought. Encountering barriers to spreading the success of family-centred care made Enkin understand that a more powerful tool was needed to make widespread change. He describes how

he began to have high hopes for EBP as a more effective "*loud speaker*":

> *We found that a woman didn't have to be rushed down the hall to a separate delivery room, but could give birth in her own bed, in her own labour room. She could have a supportive companion or companions of her choice with her, and even her older children if she wished. We were perfectly happy, and perhaps a bit smug, with our family-centred practice in Hamilton. Our patients were happy too, and the medical students all thought "Hey, this is the way to go". We were on a roll. We had demonstrated the success of family-centred obstetrical care. We had set an example for all to follow. Surprise, surprise. No one followed. Outside of our tight little circle, women continued to be shaved and enemaed, starved and IVed, and left to labour without supportive companions. Even in our own city, women were still rushed down the hall to the delivery room, put up in stirrups, and handcuffed to the delivery table. . . The practices considered to be archaic continued unabated. We could challenge, but not change, the entrenched routines. The facts (as we saw them) didn't speak for themselves. Or, at least, they didn't speak loudly enough. No one listened. We couldn't get their attention. We didn't have the rhetoric. We needed a loud speaker.*
>
> Enkin 10:30

Susanne Houd's comments express not only the hope to use evidence as a more effective tool for change, but also reflects the pattern of midwives inspired by their own birth experiences to take up an interest in the evidence behind routine practices:

> *I felt that in order to get any power or influence, it wasn't enough for me to come and say "It feels wrong" and "When I had my baby I was sitting on a cold toilet for three hours. It was hell." So what. Nobody was listening. It wasn't authoritative. But when I found research about the uselessness of enema, I had the argument. I could speak the language of the people that are deciding the rules.*
>
> Houd 22:87

For my midwife informants, and those from other professions who commented on midwifery, the hope to use scientific evidence to support change is deeply intertwined with a defence of midwifery practice. After several decades of increasing medicalization of birth and loss of autonomy for midwives as a profession internationally, the movement to reclaim or defend an autonomous and respected role for midwives was bolstered by the emergence of EBP and its link to childbirth reform.[12,13] One of the goals of initiatives to change childbirth in many countries has been to strengthen midwifery and claim or reclaim the role of midwives as "guardians of normal childbirth".[12] In *ECPC,* one of the forms of care "that should be abandoned" for lack of evidence is physician attendance at all births. Kerstin Martin is a midwife who worked for many years in Montreal both pre and post regulation. When I interviewed her, she was practicing outside of regulation in Nova Scotia and working towards the integration of

midwifery into the health care system there. She describes a view shared by many midwives:

> *. . . most of us were looking at it as something that could really support midwifery practice, midwifery principles, a midwifery approach because most of the evidence seemed to be very much in line with things we were already doing, we already believed in, and so forth. And it seemed to be a support for that.*
>
> Martin 20:22

When I interviewed Lee Saxell, she was the Head Midwife at BC Women and Children's Hospital in Vancouver. She also practiced midwifery in BC prior to midwifery regulation. Her sense that "*we were home free*" conveys the importance of the emergence of EBP to those who wanted to promote not only midwifery care but physiologic birth:

> *Well I would say that I really got introduced to evidence-based practice in 1989 or 1990, when I bought Effective Care in Pregnancy and Childbirth when it was still in textbook form. And that was really my first introduction to evidence-based practice, and I was really excited by it. And I thought this is it. This is what's next. And it* [almost] *totally supported midwifery practice. Outside of really only one thing that I can think of which was the active management of third stage, everything else was right on course for what I thought. And I thought that that was it, that this would support midwifery practice. And I think I paid four or five hundred dollars for those textbooks. It was a lot of money, and I read them all the way through, and I was a believer. I loved evidence-based practice. I thought it was the best thing that could have happened. I thought we were home free.*
>
> Saxell 29:18

Although the response to *ECPC* from the international midwifery community was highly enthusiastic, for midwives in Canada in the 1980s and 1990s the context was more dramatic. Canada was distinguished as "the only industrialized country with no legal provisions for midwifery".[4] In most countries midwives looked to EBP to defend their role and their approach to birth. In Canada midwives were trying to make an argument to re-establish the profession, after it had been eliminated in all but the most northern and isolated communities. The move to EBP emerges as midwives are involved in extensive political work to gain a place in the health care system. The idea that EBP was a kind of lifeline for midwifery was common in my interviews with midwives who had worked prior to regulation of the profession. Payne worked at UBC when nurses with midwifery credentials were hired in a midwifery demonstration project. She conveys the importance of EBP to the pre-regulation midwife:

> *I guess my history with* [EBP] *began as a midwife in attempting to change practice in the birthing environment in this country, and evidence was our only tool to use as we were under a lot of scrutiny, especially working within the hospital before we were legal.*
>
> Payne 26:10

Expectation of Support for Normal Birth

Anne Biringer contextualizes her hopes that EBP would support normal birth by explaining that she "*never, ever*" saw a physiologic birth without intervention, in either medical school or in her residency. Like other physicians of her generation, she learned to use routine episiotomy and forceps and described how she experienced the feelings of power that using those tools can give a caregiver. But doubts about why intervention would be needed in the majority of births troubled her. She was profoundly influenced when, after being out in practice for a few years, she attended a birth with a "*kind nurse who was also a British midwife*" who coached her through a normal birth. She realized that she wanted to support more humane approaches to birth in her own practice and EPB seemed to promise support for move away from unnecessary intervention.

> *I was hoping that the evidence would all support* [physiologic and family-centred approaches] *because initially it did. I was really hoping that things would change, because the evidence was really striking down, bit by bit, the ways of practice that we had grown up with, like routine episiotomy. And those that often had seemed pretty silly. I mean I loved how ECPC had, you know, their lists of things that should be abandoned. I thought it was fantastic . . . there were just many, many, many* [routine practices that should be abandoned] . *Like continuous EFM. Routine ARM* (artificial rupture of membranes) . . . *It really felt like the evidence would help us to change practice and to change practice in ways that would get us more towards normal birth and away from intervention.*
>
> Biringer 2:31

As both author and educator, Penny Simkin has been an advocate for both normal birth and midwifery care. She explains her hope that EBP would affirm the value of respecting a physiologic approach to birth.

> *We did think that the evidence would show that a simpler approach to birth was going to be a better one and a safer one.*
>
> Simkin 33: 437

Soderstrom and Brabant looked to EBP to give credibility to ideas about normal birth and to those challenging the status quo:

> *We can prove to those nay-sayers that what we're doing is correct. You know, I think I looked to it for being a way to legitimize beliefs that I and other midwives and our clients had about birth as a normal process to legitimize those beliefs. That's probably the main thing I hoped for.*
>
> Soderstrom 34:50

Brabant's comments speak to the history of childbirth reformers using the evidence to support

normal birth even before the EBP movement was named as such:

> *And very early, early '80s I would say in my career as a midwife, I was reading studies that demonstrated things and actually I would say that almost all of them demonstrated exactly what we instinctively believed in* . . . [about the] *method of pushing, not limiting the second stage of labour, I mean all of that went along exactly what we thought. And it was appalling to see that the process was so different. Actually the word evidence-based was not there yet.*
>
> Brabant 3:24

Sue Harris, a BC family physician, was Head of the Department of Family Practice when I interviewed her. She has since passed away. Like many others, she expected that implementing EBP was part of a broader project to support physiologic childbirth and greater control and choice for women:

> *I would have promoted evidence-based practice, normal birth, choice in childbirth, and control all in one breath without thinking twice that they might be carved into pieces and choice and control would be about caesareans and evidence would be about intervention and normal birth would be out there somewhere.*
>
> Harris 21:76

Initial Concerns and Emerging Second Thoughts

Two informants, an obstetrician and a midwife who identified themselves as "EBP skeptics" from the start, initially reacted not with hope but with concern to the claims and growing power of the new paradigm. They felt worried that the level of enthusiasm for EBP would contribute to a lack of critical perspective. James Goodwin is a Canadian obstetrician who did his specialty training at Harvard working at the Boston Lying In Hospital and Brigham and Women's Hospital, then worked in Edmonton, St John's, Toronto, Oxford, the Middle East and Yarmouth Nova Scotia prior to retiring in 1999. Goodwin has written about the history of medicine. He describes how his perspective on the limitations of EBP grew out of a discomfort with some of the language and trappings of the new movement. He describes his sense that EBP had an authoritarian tone despite the claims to democracy:

> *My first thought was that it seemed to be a little . . . controlled by the Cochrane people and it seemed to me that for young people who were training it seemed a bit cultish frankly. It seemed to be an odd trend to sort of a fraternity* . . . [with] *buzzwords and double-speak . . . you sort of weren't in unless you were talking odds ratios and clinical trials. And that's fine as long as it's not overdone.*
>
> Goodwin 11: 28

Goodwin's concerns about EBP also focused on its seeming dismissal of some of what he considered to be important foundations of medicine: physiology and clinical skill, experience and

judgment. His comments point to an interesting irony. Obstetricians trained in Goodwin's era were taught to use many interventive procedures routinely, a practice that led to much critique. They represent, however the last generation with extensive experience at certain hands-on skills such as breech birth and the use of forceps, honed in an era of when caesarean rates were relatively low. Goodwin talked with a great deal of respect about his involvement with some of the early researchers in fetal physiology and learning the hands-on skills of breech birth from some of the "masters" of the art of obstetrics. His initial wariness about EBP is connected to his deep respect for the skills of individual practitioners and the importance of mentoring in medical education. He also worried that emphasis on "statistics" as a basis for practice de-emphasizes further a neglected area in medical education: effective communication.

The other informant who identified herself as an EBP critic from the outset was Linda Knox. She was President of the Midwives Association of British Columbia when I interviewed her. She learned and practiced midwifery beginning in the early 1980s before midwifery was recognized in Canada. Her concerns on encountering EBP echo Goodwin's focus on clinical skills:

> *Well I have to start by saying that I've always been, different from probably the other people you're talking to in that I've always felt really suspicious about it* [EBP]. *I mean there's always been that sort of place for me of, you know, 'so okay the research says', but it doesn't always make sense and it never has really made sense.*
>
> Knox 30:3

> *I kept feeling like everybody was so busy looking at the evidence that they were stopping using common sense and clinical skills. And I was coming from a place of feeling really grounded and centred in my common sense and clinical skills. And I couldn't help it. My gut kept telling that if this research was such hot damn stuff, then it should really jive beautifully with my gut instincts and my clinical experience.*
>
> Knox 30:56

Although she also emphasized the necessity to know the research and try to integrate it into practice, she worried that the focus on research and information could undermine the confidence of both practitioners and pregnant women in the normal processes of pregnancy and birth. Knox talked about how she left practice for five years between 1993 and 1998, the time when EBP became the new paradigm for most maternity care provides in BC. She noted that when she returned to practice much of the focus of care was on acquiring and conveying information and statistics rather than on conveying confidence to women about the normal birth process. Like Goodwin, she worried that this focus on information sharing interfered with effective

communication between women and care providers and undermined women's belief in normal birth.

The majority of informants, however, talked about how worries and ambivalence about EBP came with a growing understanding that achieving the ends they hoped for would not be as simple as it had first seemed. Most reflected backs on their hopes for EBP using words such as "naïve" and "should have known". Both Christilaw and Kilthei referred to their growing realizations that EBP would not provide simple truths or quick or straightforward routes to change as they had envisioned:

> *But of course what's happened is that yes, we've done some trials but the file of unanswered questions gets bigger and bigger . . .*
>
> Christilaw 4: 136

> *I think that many of us sort of naively thought that if we could just get enough information and give it to women and help them have the strength to present it, help them understand the terminology so that they could actually understand what the literature said that then they would be able to ask for what they wanted, get what they needed, and I think that was a naïve and simplistic view.*
>
> Kilthei 17:25

Sharon Dore is a clinical nurse specialist in obstetrics and nurse educator at McMaster who has been involved in the evidence movement there from its beginnings. She reflected on her involvement in trying to spread the EBP approach with the nursing staff on the labour floor:

> *Certainly I had hopes. Naively. My goodness if you present the evidence, people would obviously do the right thing. Wrong! And certainly presenting it to bedside caregivers who do not have a background in research, and at that time most nurses were diploma nurses, you know they said, '"Tell me what to do", or "I know how to do this, don't interrupt me - I'm doing it fine". Or physicians at that time who said "Well I just want to do my patients and get out of here".*
>
> Dore 7: 30

Helen McDonald, an Australian educated nurse and midwife, has worked in both roles at McMaster and St Joseph's Hospitals in Hamilton, where she was the Head Midwife when I interviewed her. McDonald also teaches in the Midwifery Education Program at McMaster.

> *What was maybe naïve* [was that] *we didn't understand the strength of the reaction* [to EBP]. *We just didn't understand. Lots and lots of people didn't understand that just because you went and said "Ah, but this is the right way", that it wouldn't* [necessarily] *happen that way.*
>
> McDonald 22:46

Concerns about EBP as a powerful source of authority began to trouble some informants who observed EBP functioning to discourage debate and questioning. For many, concern about how and why evidence was being applied or not applied began to be more important than finding "the right answer" to a clinical question. An increasing number of clinical trials in the area of maternity care began to be interpreted as supporting increased use of interventions in childbirth. Advocates who had hoped that evidence would support the humanization of birth and legitimize physiologic rather than medical approaches began to feel very discouraged about their hopes for the new paradigm.

Conclusion

The hopes and expectations for EBP developed during the early and enthusiastic uptake of the new paradigm in maternity care are a foundation for how evidence is applied and misapplied in the decades that follow. Understanding that maternity care provider's motivations for the adoption of EBP came from multiple and sometimes contradictory directions, helps to explain some of the patterns that emerge in the next chapters. At times, hopes for truth and clarity were expressed in the same sentence as wanting to challenge authority. The desire to involve women in decision-making and provide more opportunity for choice was often conflated with supporting a less interventive approach to childbirth. Many informants from across all professions were looking for evidence to support change and childbirth reform. Their growing discomfort with the directions that interpretation and application of evidence were taking is linked with the many of the themes of the next chapter. Chapter Four explores the heated debates about EBP which erupted in the professional literature as it became the dominant paradigm. The chapters that follow will return to my informant's understandings of how and why the application of EBP has diverged from the promise of the new paradigm.

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Chapter Four: Passion and Fervor: The EBP Debates

Introduction

A fervent and voluminous debate about EBP unfolded in the medical literature in the decade after Guyatt coined the term and the EBM Working Group defined the new paradigm.[1] The passion and extent of the debate is both striking and puzzling, considering the rationale for the application of scientific research findings in medical practice would seem to be non-controversial. The claims of EBP, which Feinstein and Horwitz claim have "acquired a kind of sanctity"[2] evoke heated response and counter response in journal articles and letters to the editor. In 1995, Hope notes "EBP has its evangelists and its enemies" in the *Journal of Medical Ethics.*[3]

Despite, or perhaps because of, EBP's roots in maternity care, critiques initially emerge outside of the obstetrical and midwifery literature. These critiques mirror concerns that later surface in maternity care. This chapter explores themes that emerge in the medical literature in the decade after the new paradigm was named. These themes provide a context for the observations of informants about how and why evidence is applied in maternity care, which follow in the next chapters. The themes explored in this chapter include: epistemological problems, such as the self-evident nature of the claims for EBP, using quantitative evidence and population-based statistics in the care of individuals and in the management of the health care system, and the distinction between scientific trials and real world applications. I address problems in the hierarchy of evidence and critics' concerns about the devaluing and lack of integration of other forms of knowledge, such as clinical experience, skill and judgment. This chapter concludes with an exploration of the debates within the health care literature about a "new authoritarianism" which resonates with the worries expressed by informants in the previous chapter.

The titles which began to appear in the health care literature of the late 90s give a sense of the combative tone and reveal some of the themes of these debates:

- Evidence-based medicine in its place[4]
- The dark side of evidence-based medicine.[5]
- When research is just not enough[6]
- Evidence-based medicine: little hope for a critical debate[7]
- Evidence-based medicine is not magic[8]
- In defense of expert opinion[9]
- Evidence-based practice: a retrograde step? [10]

- Myth of evidence-based practice.[11]
- Who will challenge evidence-based medicine?[12]
- Seeing what you want to see in randomised-controlled trials: versions and perversions of UKPDS data.[13]
- EBM: Unmasking the ugly truth.[14]
- Evidence-based practice: panacea or over promise?[15]
- The view of evidence-based medicine from the trenches: liberating or authoritarian?[16]
- Evidence-based? Caveat emptor![17]

At times the debate appears to descend into accusation and name calling, or at least hyperbole, aimed at scoring rhetorical advantage. Using "science" as a trump card, advocates present those who question EBM as clinging to an inferior and antiquated medicine that is less than rational and scientific.[18,19] Critics counter in turn that EBM is both unscientific and antiscientific.[1,20,21] In 1995, the editor of the prestigious medical journal *The Lancet*, Richard Horton, notes that the movement's methods "have sometimes lacked finesse and balance and risked antagonism"[4] By 2001, Horton calls for a re-think of the use of RCTs as "deceitful, disputable, unbelievable, unhelpful and shameful".[22] Those who defend EBM call critics concerns misunderstandings and misperceptions[1,19,23,24] using a tone others find patronizing and condescending.[9,20,25] Resisters are characterized as threatened, slow to embrace change, reluctant to relinquish power or without the skill or time to devote to EBM.[1,19,20,26] EBM advocates in turn are described as having "a penchant for denigrating and belittling" those who express doubts about the new paradigm.[27]

The EBM debates have also fostered a number of satires or spoofs.[28-30] Spoof articles are a long tradition in journals such as the *British Medical Journal* (BMJ) and the *Medical Journal of Australia* (MJA).[30] These articles poke fun at the seriousness and authority (some would say pomposity) of the EBM advocates and critics alike, and at the motivations and sweeping claims of benefit and danger from both sides. They appear to lighten up the intensity of the debate and may be intended to relieve some of the animosity. However, like most humor, they have some serious points to make as well.

An article by Smith and Pell in the *BMJ* in 2003 is titled "Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials".[28] This plea for common sense and critical thinking in the application of the hierarchy of evidence and the hegemony of the RCT also reveals the power of scientific language and the "methods" of EBM to make even the absurd sound necessary and credible. Other spoof articles, such as "The Polymeal: a more natural, safer, and probably tastier (than the Polypill) strategy to

reduce cardiovascular disease by 75%" [29] and "Evidence-based physicians' dressing: a crossover trial",[31] were responded to seriously, not only in the media but also in other medical journals.[30] These responses reinforced the authors' purpose in exposing the discursive power of the form of EBM, which can convey credibility even with nonsensical content.

The article "EBM: Unmasking the ugly truth" is authored by a group called "Clinicians for the restoration of autonomous practice (CRAP) writing group". It parodies both sides of the debate, portraying EBM as a complex and controlling religion and painting its critics as wanting to maintain control as individualistic profit-driven physicians.[14] Taken as a whole, EBM spoof articles attempt to encourage critique and dialogue, making space to ask questions about the dominant role EBP increasingly claims within health care.

You Can't Be Against Evidence

As Glatstein states, "one cannot be "against" evidence-based medicine".[32] This sentiment conveys several problems that trouble EBM by pointing out that the new paradigm appears to be both self-evident and indisputable. Advocates and critics alike note that although EBP's central assertion is against practice based on self-evident fact, EBM itself is presented as a self–evident good.[26,32] In 1998, Tonelli noted: "The literature of EBM often presupposes the validity of the epistemologic framework and tends to focus on the incorporation of evidence into clinical practice."[33]

Because it is "intuitively attractive"[12] EBM's critics warn of being "mesmerized by fool's gold".[35] The idea that medical practice "must be open to question rather than being taken as self-evident",[36] was a powerful motivator for the EBP movement. Yet critics find a fatal flaw in EBM's lack of self-doubt and its arrogance.[2,4, 12,26,32-35]
Many also see insult to the "experts" whose opinions EBP hopes to replace with science.[2,9] Shahar links the reactive tone of the EMB debate to the unexamined assumptions of the new paradigm, noting that the new paradigm is put forward with an "emotive component which serves to seek approval a priori".[7]

That there is little quality evidence for the effectiveness of evidence-based practice is an oft repeated play on words used by critics who point to the paradox that EBP is itself an intervention without evidence of benefit.[2,26,37,38] In his interview and in his writing, Tonelli[33,34] notes proponents such as Guyatt and Sackett[19] unapologetically acknowledge and defend this lack of rigour in the justification for the new paradigm. Strangely, this mimics the very approach to

clinical practice which EBM hopes to overturn: the introduction and uptake of practices into the clinical setting without adequate research to support the assumption that the intervention will have a beneficial outcome. This irony is not lost on critics. Goodman states that "there is no evidence (and unlikely ever to be) that EBM provides better medical care."[12] Concern about the evidence for evidence-based practice is also expressed by other professions that begin to feel the impact as EBM transforms itself into EBP.[11,38-43]

Critics use perspectives from the philosophy of medicine to point out that although EBM advocates empiricism and argues against reasoning based on theory, EBM itself is not empirical but rather is a theory justified through reasoning.[1] Cohen et al conclude that "There is little defense for a movement that does not adhere to its own principles"[26] especially given the extent of resources required to support EBM.

As noted in the previous chapter, EBM has had a transformative impact on medical education.[37] The health care education literature reflects similar concerns about unsubstantiated assumptions about EBM's benefits. Writing about family practice education in an article titled "What evidence supports teaching evidence-based medicine?", Dobbie, Schneider and Anderson point out that the enthusiastic incorporation of EBM into medical education may not accomplish the desired goals of influencing long term practice and improving outcomes for patients:

> After rigorous evaluation of the outcomes of EBM teaching programs, we may discover that the emperor truly has no clothes. If so, we must face facts and be prepared to abandon the teaching of EBM. We must not wait for a child in the crowd to point out our foolishness.[37]

Reference to the children's fairy tale that teaches about the dangers of accepting authority and following the crowd, despite one's own observations to the contrary, is repeated in EBM critiques.[7,43,45] This literary allusion points to a major concern of critics: that the desire to bask in the glow of EBM's authority may lead many to participate in EBM without fully understanding its strengths and weaknesses.

In a systematic review titled "What is the evidence that postgraduate teaching in evidence-based medicine changes anything?" Coomarasamy and Kahn point out that EBM teaching has been relatively easy to implement in the classroom.[46] Although the research shows improvements in knowledge, EBM is much harder to integrate in the clinical setting. It may have little impact on beliefs, attitudes and therefore, ultimately, little impact on practice. This distinction is not always clear in the EBM advocacy literature. The research supporting success in

teaching the skills of EBM is presented as evidence for the effectiveness of EBM in improving clinical care outcomes.[23,26]

The case for EBM is often framed in such a way that it seems impossible not to approve of what EBP purports to deliver: "more and better quality knowledge".[47] This framing leads critics to go to great lengths to point out that they are *not against* EBP or at the very least are not against informing practice with the best scientific evidence available.[12] An almost mandatory use of this kind of qualifier includes many informants and, in fact, it is my position in this dissertation. Critiques often focus on how to apply EBM rather than if the construct is valid. This rush to reassure that, as critics, we are not "against evidence" both reinforces the status of EBP as self-evident and distracts advocates and critics alike from discussion of whether EBM improves clinical outcomes.

Concern about the way in which EBM silences productive debate is linked with critiques of EBM as a self-evident good. Some accuse EBM advocates of not engaging with critics in meaningful ways.[2,7,26,48] An approach that puts EBP above the need for justification and debate means that arguments in favour of its use remain at a superficial level of discussion. Shahar argues that EBM advocates ". . . will begin a serious rebuttal when they show us – the blind who refuse to see the light of 'evidence-based medicine' - what they have to sell, above and beyond a seductive slogan".[7] Goodman critiques one of the basic primers of EBM, *Evidence-based medicine: how to practice and teach it* by Sackett et al., for its presumption that EBM means better care. He alsos notes the guide does not acknowledge or cite critics. For Goodman, EBM advocates and the journals that support them are portrayed as insular and self-referencing,[12,21] with critical perspectives avoided or restricted to correspondence columns "where their opinions can be safely ignored".[12,21]

In the landmark *JAMA* article[19]and in the user's guide[49] by Guyatt et al which compiled a series of EBM articles that followed, there is a whole section on "misunderstandings" of EBM, which is seemingly in response to but not citing or crediting the critiques. Framing the critics' concerns solely as misunderstandings puts the responsibility on the critics to correct their views rather than on the new paradigm. Advocates do not seem to acknowledge the importance or influence of the debate or that the "misunderstandings" may reflect concerns that need to be addressed. The unstated assumption is that EBM has always foreseen and taken into account the problems raised by critics.

Naylor is one of the few early EBM advocates who openly discusses "attacks" on EBM.

Although he acknowledges in his 1995 article "Grey zones of clinical practice: some limits to evidence-based medicine" that "a backlash is not surprising in view of the inflated expectations of outcomes-oriented and evidence-based medicine and the fears of some clinicians that these concepts threaten the art of patient care", the implication is again that the problem is outside of EBM itself.[51]

Numbers versus Individuals

One of the common concerns expressed in the EBP debates is that by its very nature EBP, like clinical epidemiology, is focused on health benefits to a population. While this population-based information is of value, critics point out that it has limits when a health care practitioner is dealing with a specific clinical situation. For Charlton:

> The basic error of EBM is quite simple. It is that epidemiological data do not provide the information necessary to treat individual patients. The error is intractable and intrinsic to the methodological nature of epidemiology, and no amount of statistical juggery-pokery with huge data sets can make any difference. [25]

The inherent problem is that the guidance EBP gives clinicians leads to "treating the average not the individual patient".[12,32] Goodman expresses his concerns about the limitations of population-based information through an analogy to a fashion house. In his metaphor for EBM, the fashion house used research "with large numbers and small confidence limits" to determine that the average dress size was size 16 and restricted production of clothing to that size.[12]

In opposition to hopes that the new paradigm will create improved and more open relationships between care providers and recipients of health care, critics fear that EBM may "subvert the integrity of clinical reasoning and doctor patient communication"[50] and "destroy the doctor-patient relationship".[52] They worry about lack of concern for the patient inherent in the assumption that what is good for the population is good for the individual.[3,53] In this view, EBM guidelines may limit, rather than inform, patient choice through "bringing the weight of numbers down on decisions".[26] For Tonelli:

> Under the current understanding of EBM, the individuality of patients tends to be devalued, the focus of clinical practice is subtly shifted away from the care of individuals toward the care of populations.[32]

Tonelli argues that, although the advocates of EBM paint a picture of a "clear pathway from the patient to the evidence and back to the patient",[32] EBM how to guides are not clear about the distinction between benefits to individuals and benefits to populations and the health system.

He asserts that although these are not mutually exclusive, they are distinct goals that may come into conflict and need to be acknowledged as such. Tonelli, like Charlton and Goodman, sees this as a flaw in the heart of the EBM project as "tightly adhering to [EBM] practice guidelines promises better average outcomes over the course of time. What it does not promise is the best decision in a particular situation"[33] The strengths and weaknesses of the RCT derive from the fact that it produces recommendations for the average patient "who does not exist"[9] which becomes problematic when "the primary goal of clinical medicine, the benefit of the individual patient, is not directly addressed by the techniques of clinical research".[9] The variations and individual nuances that the RCT's randomised design eliminates may represent the most important factors in the care of an individual. For the critics, RCTs can provide information about probabilities but not specific cases or decisions.

Critics acknowledge that wide and seemingly unjustified variations in health care practice across countries, regions, institutions and practitioners may indicate over or under use of treatments. However, they also ask if some variations in practice are important and may reflect adaptation of care to a particular individual or population. Critics challenge the basic assumption behind EBM that variation in practice is always a problem that needs to be fixed. Concern that EBM will lead to the uncritical application of uniform, standardized practice is frequent enough in the EBP debates that David Sackett offers to join those fearing "top down cookbooks . . . at the barricades".[54]

EBM and Managed Care

EBM and health reform initiatives such as "managed care", share a focus on outcomes across populations. Critic's concerns about top down approaches and the loss of physician autonomy and patient choice are not limited to decision-making about care of the individual. Uptake of EBM in the emerging "evidence-based policy"[55] field has sparked worry about potential for inappropriate restrictions in resources. Goodman's analogy about the fashion house reflects concerns about "one size fits all" industrialized systems of care which may suit payers, insurers and risk managers at the expense of quality care for patients.

EBM offers potential cost savings through more efficient use of expensive treatments and hospitalization. It also offers "a vehicle for increased control of doctors" who "have proved highly resistant to managerial and political intervention".[55] Health planners and funders seek to achieve best outcomes over a broad population for the least cost. Tension between those

concerned with overall resource allocation and the clinician concerned with how best to treat their individual patient were unleashed by EBM's potential to act as the science behind health reform and provide guidance for health policy makers and system managers.[50] Discomfort with a managerial approach to medicine is expressed in articles and correspondence filled with doubts about EBM as the panacea to resolve this tension.[3,35,56-60]

Hope raises the ethical problem that without an "evidentiary knowledge" base for all alternatives approaches that could be offered to a patient, the use of EBM to inform policy decisions about resource allocation may be based on knowledge of treatments for which there "happens to be" evidence.[3] Which treatments have RCTs demonstrating efficacy and which do not is at best arbitrary and may be driven by vested interests, such as industry funding for research and by the politics behind which research is published. Many authors echo Hope's concern about "the enormous wealth in the pharmaceutical industry"[3] and the pressure that can be exerted on those who produce, publicize and implement research.[50,61,62] Others worry that insurers or purchasers, whether public or private, will use EBM for their own interests and position the clinician as the one with the interests of the patient at heart. EBM advocates and critics of the time agree that many health care practices do not have an evidence base, and that very few have a strong evidence base.[17,23,24,41,49,54,63] Steinberg and Luce cites sources that vary in their estimates of health care practices that do not have a strong evidence base from 50-96 percent.[17] This unevenness in the available evidence limits the rational use of EBM to guide policy. Despite the lack of evidence on which to base policy, critics fear EBM will have an undue influence on governments[55,57] through "an alliance of managers and their statistical technocrats empowered to define best practice".[20] Sackett attempts to appease those worried about the use of EBM for resource allocation that EBM "identifies the win-win strategies that both serve our patient's goals and free-up resources".[58] Kerridge sees that a lack of evidence may translate to a lack of value and that policy makers are charged with "seeking simplistic solutions to inherently complex problem. The danger is that through evidence-based medicine we will supply them".[64]

Advocates, such as Sackett,[58] respond that EBM can contribute to the social good by making it clear where cheaper treatments, or even no treatment, achieve the same or better outcomes. Sackett argues that physicians need EBM to assist them in clinical decisions when traditional norms in practice lead to, or patients themselves push for, therapies that are not warranted and when "resources may do more good elsewhere". Reassurance is offered to those who are concerned about limits on legitimate patient and physician choices with the argument

that EBM will give support to "invest resources in options that are most effective, even when they raise costs."[54] Nevertheless, EBM is quickly taken up by health care policy makers beleaguered by debates about rising health care costs, accountability, waiting lists, rationing and private versus public payment for health care.[55,65,66] Klein asserts that EBM offers politicians "less pain, less responsibility for taking difficult decisions and a legitimate way of curbing what are often seen as the idiosyncratic and extravagant practices of doctors".[66] EBP offers policy makers a hopeful vehicle for improving the quality of care of a system that is complex and difficult to manage and often exposes policy makers and politicians to tough criticism.

The Trial versus the "Real" World

An RCT measures "efficacy", that is whether or not the experimental treatment (sometimes but not always a new treatment) is shown to work better than the control treatment (often standard care and/or no treatment) during a research project under what are often called "trial" or "experimental" conditions. This is different than "effectiveness" the term which is used for what happens when a treatment is used in "the real world". As stated by Goodwin, "For some conditions there is no doubt that what happens in RCTs is not what happens in the real world". [67] Effectiveness is evaluated using observational studies, sometimes called audit or "outcomes research", and can be done on a small (one hospital) or larger scale (using, for example, the data base of an entire country to look at all outcomes over time).[68]

The problem of the "real world" troubles EBM's critics.[69] One of the reasons population-based information may not be relevant to the individual is that the populations studied, the environment of care and the practitioners involved may not reflect real world conditions. The population examined in an RCT is, by definition, a select group which meets study criteria. Those who volunteer to be involved in an RCT are not only willing to participate in research, but willing to be randomised, a characteristic which may mean they are not representative of the general population or of those who actively choose a health care approach. The population selected for an RCT may be healthier or less healthy, the environment more controlled and the practitioners more or less motivated or skilled than is the case when research findings are applied outside of the context of a research study. Guidelines or protocols may be used differently inside trial conditions as compared to how they are used outside of the trial.[68,69]

Although advocates assert that study designs based on randomization of a large sample size eliminate these concerns, counter arguments flourish. Critics worry that the RCT creates a

simple world in which one question can be asked and answered, whereas in day to day practice the world is much more complex. The real world involves many factors that affect health care decisions but are outside of the realm of quantitative research. Kleinert worries that "the modern trend to search for precise answers in the form of numbers and probabilities can have only a limited role in human sciences and medicine".[70] In a letter to *The Lancet,* Frankel and Smith warn of the danger of being "sucked into the elegant slipstream of evidence-based medicine" and miss the fact that it is "economic and social conditions rather than inadequate application of the results of randomised controlled trials"[59] which are profoundly affecting health. Goodman's article "Who will challenge evidence-based medicine?" warns politicians against confusing EBM with the whole of the practice of medicine (and one would assume health care) and predicts the failure of EBM "because it cannot take account of societal and moral decisions".[12]

Problems in the Hierarchy of Evidence

A defining feature of the new paradigm is the use of well-defined criteria to evaluate the quality of clinical research. EBM relies heavily on both systematic reviews of the cumulative evidence on a particular topic, as well as on clinical practice guidelines that both summarize the evidence and make recommendations to clinicians. Central to this process of "critical appraisal" of the evidence by reviewers and guideline developers is the use of a hierarchy which ranks levels of evidence. This hierarchy is used to justify inclusion and to indicate the quality of the evidence and the strength of the recommendation. A plethora of how to guides, texts and websites, teach and support this process of appraisal. Guyatt and Sackett led the development of separate guides to EBM, each with accompanying websites which are frequently updated.[71-74]

The first hierarchy of evidence cited in the literature predates the naming of the new paradigm having been put forward by the Canadian Task Force on the Periodic Health Examination (CTPHE) in 1979[75] and then revised in 2003.[76] David Sackett was a member of the CTPHE and co-author of the influential article that included the first evidence hierarchy. The hierarchy enabled a practice which has now become standard within the text of a review or guideline. The level of evidence is identified as each finding is cited and as each recommendation is stated. This practice allows readers to be aware of whether a finding or recommendation is based for example on a systematic review of RCTs, a single RCT, a cohort study or an expert opinion. Inherent in the structure of the EBM review or guideline is an expectation of critical appraisal by the user, as the levels of evidence for the claims within the review or guideline may

vary.

As the evidence-based movement grew, a "bewildering variety of systems to rate the quality of the evidence"[77] have been developed, a testimony to the complexity of the task and signaling the uncertain grounds of the science behind the paradigm. Most hierarchies initially put RCTs at the top of the hierarchy without qualification. As the evidence movement grew exponentially, meta-analysis and the systematic reviews became the gold standard for the top of the hierarchy. A single RCT is ranked higher than a cohort study which ranks higher than a descriptive study. Some systems initially included physiologic studies and clinical experience at the bottom of the evidence pyramid, however as ranking systems increasingly focus on experimental research design, they are not mentioned in later revisions. Most systems exclude expert opinion, case reports and anecdotal evidence or list them at the lowest level.[75-78] Qualitative research is not mentioned, presumably because it is not considered to be part of clinical science.

Critique of the levels of evidence comes both from those inside the EBM movement and from its challengers. The concept of meta-analysis, a technique of statistically combining the results from numerous studies, is first heralded as having the potential to increase precision in describing treatment effects, particularly when findings of individual studies conflict, are inconclusive or are too small to be predictive. Both camps in the evidence debates raise technical concerns about the increasing reliance on meta- analysis without "quality-control" of how this tool is used. Like the hierarchy itself, the "gold standard" at the top of the hierarchy is "not infallible".[79] Combining data across studies with variable quality or extrapolating effects without comparable populations does not necessarily increase the overall quality and may distort, rather than increase, the accuracy of findings.[80] Assessment of the quality of studies included in systematic reviews or meta-analysis is posed as essential, however the methods used to measure variability between studies and study quality are seen as problematic because they are essentially qualitative.[81] Hidden at the core of a movement to base medicine on quantitative science is qualitative assessment.

These concerns have led EBM leaders to a focus on creating an ever better grading system. In 2004, a group calling themselves the GRADE Working Group (with significant overlap with members of the original EBM Working Group) conducted an expert review of six grading systems out of 27 potential options. The working group concludes that "All of the currently used approaches to grading levels of evidence and the strength of recommendations

have important shortcomings" and introduces a new approach.[76] Comparing the complex system from GRADE to the initial approach used by the CTFHE is telling. The GRADE group acknowledges the seminal impact of the CTFHE approach, but calls it too simple and finds it is based on too many assumptions about quality within its categories.

To understand and apply the increasing level of detail in the new grading systems now requires an expertise far beyond that taught in health professional education programs, despite the early claims and research that showed EBM was "easy to teach".[46] An international cadre of EBM experts has developed, supported by innumerable institutions and resources. The size and complexity of what some call "the evidence industry"[22] raises doubt about whether EBM can fulfil its original goal of democratizing medical decision-making.

Critics examining the competing models for assessing evidence raise concerns about "who judges" and the subjectivity inherent in the judgment used during assessment and ranking of evidence.[11] Multiple systems of increasing complexity make arguments for efficacy and vie for acceptance as the appropriate models to use. This competition brings into question the process of deciding about what counts and what does not count as evidence.

For some commentators like Thacker, the problem lies not with the need for a better and more objective system to rank evidence. He acknowledges that as in all knowledge creation and application, no matter how "scientific" the research design, bias in interpretation remains an issue for investigators, reviewers and guideline writers:

> A serious concern about quantitative literature reviews is that the reported objectivity may be more appearance than substance; no approach to synthesizing information can eliminate investigator bias entirely. Both critics and advocates of meta-analysis recognize that an unwarranted sense of scientific validity, rather than a more accurate understanding, may result from quantification.[81]

Some critics dispute the validity of the underlying concept of the evidence hierarchy. Tonelli argues that the system of the hierarchy of evidence is "neither evidence-based nor scientific in any way" and takes "a philosophic stance that is untenable". He asserts that EBM advocates make a fundamental mistake in trying to compare and rank the different classes of evidence, which are for him different kinds of knowledge rather than lesser forms of evidence: "Hierarchies that lump and grade evidence are based on an assumption that each class of "evidence" is sufficiently similar to the others to allow for a universal judgment" about their relative merits.[34]

Valuing Other Forms of Knowledge

The purpose of the hierarchy of evidence is to assist clinicians to identify and use "best evidence" as the basis of clinical decisions. Inherent to EBM is the assumption that "higher" grades of evidence are given more weight than lesser forms of evidence or other knowledge. For Tonelli, "The hierarchy implies that empirical evidence, especially when of high quality, should be viewed as so compelling as to obviate the need to consider clinical experience or physiologic understanding in a clinical decision."[44]

Although much of the EBM advocacy literature asserts that high quality evidence from clinical research is the best ground for decision-making no matter what the circumstances, the original *JAMA* article by the EBM Working Group carefully acknowledges the ongoing importance of the traditional knowledge and skills of the physician. Despite efforts to reassure critics during the first decade of EBM, the problem of how to value and integrate other forms of knowledge in clinical practice remains a key to much of the resistance to EBM. The devaluing of other "knowledges" is seen as a fundamental limitation and for some the root cause of its "failure".[5,20,43,48,82]

Critics resist the categorization of clinical experience, skills and judgment, expert opinion, (patho)-physiological reasoning and the values and preferences of patients as "lesser" forms of evidence. They argue that these "other" forms of evidence are perhaps best understood as distinct and equally valuable forms of knowledge rather than evidence: "One can call them all evidence but that does not allow them to be graded on a scale from best to worse"[34] Many letters to the editor, articles and commentaries note that, in the day to day world of health care practice, actions in contradiction to empirical evidence are necessary and justified by physiologic reasoning, clinical experience or patient preferences. This critique suggests a decision-making process which is guided by a process of reasoning and dialogue rather than by a hierarchy. In this understanding, best practice considers each form of knowledge for its strengths and weakness and is used and applied differently in different situations. To take into account the need to balance and integrate appropriate forms of knowledge, critics assert that clinicians need a methodology that incorporates clinical evidence but that is much broader than EBM.[22,44,82-84,85]

Clinical Experience, Skill and Judgment

Although some find EBM's attack on past practice as arbitrary and opinion-based unfair and needlessly inflammatory,[7,20,22] leading to a "stigmatizing" of expert opinion, others agree that

the critique of authoritarian practice put forward by EBM was warranted.[9] However, accepting that medicine should not be based on tradition or status in a professional hierarchy does not equal agreement with EBM's demotion of clinical experience and expert opinion. In this view, the skills and judgment which are developed over time in clinical practice are equally important sources of knowledge. Although challenging authoritarianism is justified, the devaluing of expertise is seen as both harmful and unrealistic.[2,5,9,34] For some, "the art" of medicine is threatened in the pursuit of solely scientific answers to clinical dilemmas.[5,48,86-89]

EBM appears to make the mistake of confounding authoritarian practice and expertise, as well as making EBM and expertise dichotomous. In his interview, Mark Tonelli noted:

> *They* [EBM proponents] *defined the experts as being people who had opinions based on clinical experience. Whereas we all know that clinical experts, even back before anybody invented evidence-based medicine, had clinical experience but also knew the literature better than anybody else.*
>
> Tonelli 52:122

The EBM hierarchy's devaluation of clinical experience as a source of knowledge generated an overwhelming response in the literature. Many point out that the skills of examination, history taking, diagnosis, decision-making and communication are essential to care and cannot be learned through RCTs. The push back is against the implication inherent in the EBM characterization of expertise as insufficient, against the idea that findings of RCTs ideally should be considered superior to, rather than as a part of, clinical reasoning. The EBM critics reverse the argument, asserting that EBM alone, i.e. that clinical research alone, is insufficient to improve clinical practice. They worry that EBM may lead to "cookbook" medicine a term often used to critique evidence-based guidelines and protocols applied without skill and compassion. Critics call for a much fuller understanding of the complexity of the largely unexplored areas of clinical expertise and reasoning.[5,33,34, 44,82,84]

Tonelli argues that the EBM founders have erred in defining expert opinion as a type of evidence that ranks at the bottom of the "evidentiary ladder", "below even methodologically flawed clinical research".[9] He resists the pejorative nature of EBM's use of the term "expert opinion" as synonymous with practice that is authoritarian, arbitrary and clinician-centred. For Tonelli, expert opinion is a complex type of knowledge which should be valued as part of clinical decision-making. Tonelli's respect for clinical expertise is palpable both in his writing and his interview and is at odds with its dismissal in the EBM literature. He views expert opinion as vital at all levels of clinical practice, including in the development and use of EBM, an irony which he

points out is inherent to EBM but not acknowledged. Experts generate research questions, conduct research and help guide novices in understanding how to apply evidence, which requires combining knowledges, dealing with grey zones where evidence is not clear, and translating from population-based research to the individual situation.[9,32,51]

The importance of expert knowledge was explored by Timmermans and Angell in a study of neonatology residents working in a setting where both students and teachers were expected to use an EBM approach. They describe how residents use EBM in day to day practice, illustrating how the residents actively integrate both evidence and expertise acquired from teachers but also their own clinical experience to make what they consider the best decisions. The findings of this study show "that pure 'experience' and 'evidence' do not really exist" but rather "constitute complementary resources".[89] Pope finds a similar "contingency" in operation in her work with surgeons. She concludes that the surgeons in her study resist EBM because they perceive it has limited relevance to the particular procedure or patient that they are dealing with, which they see demands expertise and judgment to understand.[88] Cox makes the compelling argument that ideally evidence and experience are not either/or but both/and.[90] Horwitz concurs stating that "most of us would prefer the expertise that comes from experience guided by evidence, rather than by guidelines and evidence alone."[5]

Values and Choice

Like the problem of clinician skill and expertise, the question of patient values and choices presents a fundamental problem with using "best evidence" as the basis for clinical care. Within EBM's initial and enthusiastic promotion of its model is the apparent assumption that the patient receiving the care will agree with the care recommended by the evidence. One of the democratic hopes of some of the EBM advocates is that, with clearer scientific recommendations for treatment, the patient could be an agent of change by expecting decisions to be based on evidence or by bringing evidence to the physician.[24]

In EBM guides, the relevance of patient values is often presented very narrowly, as for example, in a situation when there is a choice between different evidence-based treatment options or in pseudo quantitative decision analysis models. There is little in the EBM literature that addresses communication skills to aid discussion of values, beyond Guyatt et al's original call for more behavioural science research to provide evidence about effective communication techniques.[19] Critics worry about the apparent lack of acknowledgement by EBM that patient

values and preferences may conflict with care in keeping with the best evidence. They point to the potential for EBM to both reinforce impersonal and mechanistic approaches to care and diminish movements within health care hoping to improve the practice of taking into account the values and choices of the recipient of care. The literature critical of EBM is filled with obvious examples of how clinically, ethically and legally, patient choice trumps all of the best evidence. EBM leaders responded quickly to reiterate the EBM Working Group's list of "misunderstandings" of EBM and increasingly acknowledge patient values and preferences as fundamental. Critics remain worried that, despite calls for integration, the impact of EBM may be to restrict choice and undermine "patient-centred care", as its "unspoken conviction . . . is that impersonal knowledge of the probability of an event is the principal precondition for effective clinical medicine."[5]

Tonelli sees values and preferences as "different in kind" from what he calls "epistemological knowledge", including evidence, experience and physiologic reasoning. He positions discussion of patient values as "one of the topics" of clinical decision-making.[44] Reminiscent of the distinction *ECPC* makes about the difference between the most effective treatment and the objectives of care, he states that only patient values and goals can determine if the probable effect of treatments recommended is a meaningful goal. Both Tonelli and Gupta[91] point out that there is little understanding of how practitioner or institutional values may influence EBM decision-making. Discussion of societal values in the EBM literature is rare and as Gupta notes tends only to appear when resource allocation is under discussion. Some EBM leaders worked to invite more public participation, for example when the Cochrane Collaboration trained members of the public in its critical appraisal workshops.[92,93] However, EBM critics worry that the new paradigm appears to consolidate the power of physicians, with questions defined by physicians and recommendations made by physicians with patient values and choices entering the decision-making flow chart at too late and too superficial a level.[3,33,53,91,94,95,96] The patient is "reconstituted" as the "site of evidence".[50] The worry shared by clinicians and those working the field of medical ethics is that EBM will offer "value-free solutions through research data".[91]

Integrating Other Forms of Knowledge

The volume and strength of reaction against the devaluing of other forms of knowledge within the EBM paradigm is striking. It is particularly interesting to note the passion of the response in light of how overtly EBM's originators tried to address concerns in this area in their

first works promoting EBM. In the *JAMA* article widely accepted as the first full description of the new paradigm, the EBM Working Group anticipates much of the critique about other ways of knowing and addresses the importance of other knowledges. The authors walk a fine line, stressing the need to de-emphasize and replace many traditional forms of knowledge in one paragraph while in the next, stating that they are important and necessary, but not sufficient without quality clinical research.[19]

Given the heated response which marks the literature of the following decade, this approach was obviously not successful in reassuring critics. It seems obvious that many of these debates about other forms of knowledge had occurred on conference floors and around tables at professional associations before they appeared on paper, presumably stemming from debates about the use of clinical epidemiology before it was fully named as EBM and a new paradigm. The approach used in the *JAMA* article appears to be an attempt to pre-empt critics by proactively addressing "misunderstandings" of EBM. One of the main misunderstandings the EBM Working Group attempts to correct is that EBM implies that it can always replace other kinds of skill and knowledge. On the surface, it is hard to understand the extent of concern as most critics of EBM would not appear to disagree with this statement.

Looking more deeply, it is obvious that critics are infuriated by the technique of addressing critiques as "misunderstandings" rather than discussing EBM's limitations, as it appears to characterize those who have reservations about EBM as lacking in understanding rather than having a genuine concern. The EBM Working Group reassures readers that clinical skills such as physical exam and history taking, and a thorough understanding of physiology are still essential aspects of practice, but the message is mixed. Despite wanting to replace practice that is based on expert opinion and authority and eliminate learning by "mere mimicry"[19], they acknowledge that aspects of clinical medicine that can never be learned from studies can be learned from experts.

For critics, the seeming contradictions and lack of clarity is a fundamental flaw.[2,5,20,25,33,96,97] They find EBM Working Group's reassurances about integrating other knowledge lacking in humility about the problems and limits of EBM, without overt acknowledgement and respect for the critical debate about EBM. Limitations of the non-evidentiary forms of knowledge are elucidated, but not the limits of EBM. Other knowledge is seen as important by the EBM Working Group in part because "at present" there is insufficient clinical evidence to guide all decisions. "Evidence-based medicine offers little help in the many

grey zones of practice where the evidence about risk-benefit ratios of competing clinical options is incomplete or contradictory"[51] However, the implication remains that this is a less than satisfactory situation that is hopefully temporary.

Those who have issues with the new paradigm's approach to other forms of knowledge are seen as not fully understanding EBM as a framework to encompass all types of knowledge. They are painted as resisters to its clearly superior approach to medicine. At first, the potential contradictions between replacing, de-emphasizing, ranking and integrating different forms of knowledge are left unresolved and unacknowledged. By the mid-nineties, several articles by EBM proponents begin to more directly address these critiques. More open about the limits of the new paradigm, advocates again attempt to reassure readers that integration with other knowledge is essential to EBM.[51,54] In "Evidence-based medicine: what it is and what it is not", Sackett et al. write:

> Good doctors use both individual clinical expertise and the best available external evidence, and neither alone is enough. Without clinical expertise practice risks becoming tyrannized by evidence, for even external evidence may be inapplicable and inappropriate for an individual patient. [54]

Tonelli notes that, despite this "semantic switch"[44] from de-emphasis to integration of other knowledges, the superiority of experimental evidence continues to be promoted. He argues EBM has to maintain the preferential place for experimental evidence to distinguish itself from previous or alternate approaches. Otherwise it becomes a meaningless label, a charge which many initial resisters made [9,10]and which continues to date.[82] In successive editions of the core EBM how to guides[71-74,98] the necessity for integration of evidence with judgment and patient values becomes more out front, with the 2003 iteration of the *EBM Workbook* having a photo of David Sackett on its introductory page with the following definition of EBP as its caption "EBM is the integration of the best research evidence with clinical expertise and patient values and preferences."[74]

This move to claim a more encompassing approach as part of EBM continues to marginalize and offend critics rather than appease them. In "Evidence-based medicine: what it is and what it is not" Sackett characterizes the critics of EBM as accusing the movement of "being old hat to being a dangerous innovation, perpetrated by the arrogant to serve cost cutters and suppress clinical freedom" and proposes that the discussion should be refined:

> Evidence-based practice is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients . . . integrating individual clinical expertise with the best available external clinical evidence from

> systematic research . . . and compassionate use of individual patient's predicaments, rights and preferences in making clinical decisions about patient care.[54]

Calls for integration of other knowledge with the EBM paradigm however sincere and enthusiastic, lack depth and clarity about how integration of different types of knowledge can work.[44,91] In contrast to the immense amount of attention by EBM advocates to the creation of elaborate systems to develop, disseminate and appraise clinical evidence, the ways in which clinicians can learn and apply the skills of balancing clinical judgment, patient values and evidence seem largely undescribed. Evidence from RCTs continues to be idealized at the top of the hierarchy. EBM proponents seem to believe that simply stating that various forms of knowledge will be integrated addresses the concerns of critics. For Tonelli,

> The most recent attempt to resolve this problem involves the co-opting of kinds of medical knowledge previously viewed as non-evidentiary in nature under the umbrella of 'evidence'.[44]

Problems caused by the seeming primacy of clinical research knowledge are left unexplored. Although acknowledged, other knowledges continue to be devalued within the paradigm. Tonelli notes that, despite the fact that some aspects of traditional medical knowledge have been "recently rehabilitated".[9] EBM proponents have avoided recommending integration of intuition (what he calls "clinical hunches") and expert opinion, both related to interpretive skills of expert clinicians.

A critique that begins to be articulated is inherent in the way in which EBM seems to seek simple answers to complex problems. EBM, in this view, tends to ignore context and conflicts that arise between what Tonelli calls different "warrants for action".[44] Examples of potential conflicts which the clinician has to address include values versus evidence, clinician versus patient values, or population evidence versus the particular circumstances of the individual. Kernick suggests that resources should be directed at understanding the "complex decision-making process" and integrating "other disciplines such as sociology, psychology, communication and decision theory.[35] Tonelli describes "reasoning by analogy" which, although not scientific, is "no less rigourous" than EBM.[33] Many call for a much fuller understanding of how clinical reasoning works.[35,44,52,64, 82,86,91,99]

Naylor's important article "Grey zones of clinical practice: some limits to evidence-based medicine" goes beyond the position of many other EBP advocates to address critics concerns. He asserts that EBM:

> . . . will affirm rather than obviate the need for the art of medicine. Clinical reasoning, with its reliance on experience, analogy and extrapolation, must be applied to traverse the many grey zones of practice. Eliciting and respecting patients' preferences is especially important when there is reasonable doubt about the best course of action. There will also be a place for the art of communicating in ways that help patients live with what we don't know or what they think we know and won't tell them. And even good evidence can lead to bad practice if applied in an unthinking or unfeeling way . . . The craft of caring for patients can flourish not merely in the grey zones where scientific evidence is incomplete or conflicting but also in the recognition that what is black and white in the abstract may rapidly become grey in practice, as clinicians seek to meet their individual patients needs.[51]

Tonelli recognizes the traditional distinction in moral philosophy between statements of fact and value and that value statements never flow directly from statements of fact: "no amount of empiric data can ever tell us what we ought to do in any particular situation, as conclusions regarding what ought to be done are value-based."[33]

A New Authoritarianism

The critical reaction to EBM's devaluing of other forms of knowledge in medicine is linked to issues of authority. EBM overtly claims to challenge the traditional authority of the clinician expert, asserting that years in practice and unsystematic clinical observations are not sufficient for decision-making. Instead all clinicians must learn to read and apply the findings of clinical research. In attempting to replace the traditional clinician expert, the EBM movement at first focused on the role of the individual clinician in appraising and interpreting the evidence, a move which they laud as leveling the playing field. However, as EBM begins to assume a kind of moral and medico-legal authority, and individual assessment of the literature morphs into EBM clinical practice guidelines, journals and centres, critics point to a new authoritarianism. "There is nothing new in this slogan (except a new type of medical authoritarianism)."[7] Goodman calls EBM "another customary practice following its own political agenda and generating its own interests" and points out that EBM seeks to avoid "the presumed dogmatic opinion of the expert" but asks if "has this dogma been replaced by dogma from a different source?", [12] a source which Kernick identifies as "iconoclasts in ivory towers."[35] Sackett's model of EBM practitioners working at different levels, and the language that he uses, fuels this concern. In his vision, practitioners will either have the skills and take the time to critically appraise individual research papers, rely on systematic reviews or "*accept and submit to* EBM guidelines" (my italics).[23,24] It is *submission* to the EBM guideline that leads some to question "if EBM has resulted in trading

one form of authority for the other, replacing the clinical expert with the EBM guideline?"[37]

One of EBM's inherent contradictions is that rapid growth, fueled by access to information via the internet revolution, has meant that a hierarchy of EBM experts has emerged to manage EBM. The need to produce, evaluate and disseminate evidence creates a new brand of expert opinion-based medicine under what some would see as the false label of science in the guise of systematic reviews and guidelines. EBM is an anti-authoritarian movement seeking authoritative knowledge. In Timmermans and Angell's study of neonatology residents,[89] the students prepare treatment approaches for review by their physician supervisors, much as Sackett predicted. They either actively use "prepackaged" guidelines or do a more thorough review and critical appraisal of evidence. They also learn "the attending's best practice": The authors conclude that, despite the fact that both teachers and students label this approach as EBM, the power differential between medical student and teacher is largely intact, with students simultaneously both appreciating and resisting both evidence and expert option. Timmermans and Angell assert that this dynamic has always been part of the learning process in clinical practice. They assert that there is a conceptual difficulty in the claims of EBM as "experience and evidence continue to be viewed as distinct and even opposite entities."[89]

Despite the apparent necessity of EBM experts and their role in creating the framework of systematic reviews and clinical practice guidelines that allow EBM to function, expert opinion is not overtly acknowledged or "rehabilitated" as EBM evolves.[9,44] It seems the ideal is that individual physicians use their clinical judgment in deciding how to apply evidence and what other knowledge needs to be integrated. However, EBM advocates continue to see reliance on expert opinion as an "*unfortunate feature of modern medical practice that can be corrected with development of more and better clinical research*". (Tonelli 48:99) The irony that judgment is used at the core of the process of translating clinical research into practice is discussed only by the critics. This may be because acknowledgment of the ongoing importance of expert opinion would undermine the foundations of EBM as a new paradigm.

Tonelli defends expert opinion as "just as valuable as the integration of individual clinical experience" and as a "rich source of experiential knowledge", calling for a recognition that expert opinion is the "best" form of evidence when based on clinical experience and integrated with individual clinical judgment. He states, "Expert opinion must not be devalued as unnecessary in a developed EBM, but seen as integral to the multifaceted medical knowledge that forms a better basis for patient care than the findings of even the most rigorous clinical

research."[9]

Institutionalized Authority

A 1995 editorial in *The Lancet*, "Evidence-based medicine, in its place"[4] marks the launch of the new journal *Evidence-Based Medicine* and takes the EBM movement to task, characterizing the new periodical's mission as arrogant and its proponents as elitist. *The Lancet* editor Richard Horton worries that EBM has "grown from a subversive whisper to a strident insistence that it is improper to practice medicine of any other kind."[4] He qualifies that *The Lancet* "applauds practice based on the best available evidence . . . but we deplore attempts to foist evidence-based medicine on the profession as a discipline in itself".[4] It appears that EBM proponents ruffled many feathers, but not as early advocates may have first thought, the feathers of those who were clinging to authority or outdated practice. Many very thoughtful practitioners and scholars were equally as ruffled. *The Lancet's* tongue lashing concludes by referring back to the man who inspired EBM, noting that Cochrane "a fierce individualist ever at war with people who thought they knew best, would hardly welcome the elitism of much evidence-based medicine . . . Advocates of EBM can now afford to lower their profile. . ."[4]

According to Horton a "new breed of medical researcher has been designated as the producer of the "best" form of medical knowledge" based on training in biostatistics, epidemiology, study design and interpretation. He notes a clear need to combine this expertise with that of expert clinicians and warns against a dichotomy between clinical and research expertise. Horton encourages the clinician researcher "who cultivates and values the knowledge gained from their own clinical experiences" and the knowledge of their expert colleagues.[4]

EBP as Religion and Truth

One of the most striking findings in the EBM literature, as well as in my interviews, is the use of religious language. Religious terminology is used to describe the movement and its adherents and its opponents, conveying a sense of tension about authority and the growing institutional and ideological power of the new paradigm.[50,91] Similar to the use of religious terms by the care providers I interviewed, EBM texts are referred to in the literature as bibles and sacred texts. The movement moves from seeing itself as heretical to being accused of becoming a new orthodoxy[4] and a dogmatic theology.[100] Proponents are evangelists,[3] protestants [101] and gurus who proselytize with conviction[5] and expect the message to be "hallowed".[4] In contrast opponents are heretics and blasphemers who may be examined by inquisitors[80] for challenging the sanctity of

EBM.[2] An entire issue of *BMJ* published in Oct 30, 2004 was devoted to EBM and had a cover which appeared to have witches (or perhaps angels) dressed in white and stirring a cauldron inside a chapel.

Closely linked with this sense of EBM's religiosity is its promise of truth. EBM seeks to provide universal and generalizable facts derived from clinical research about the best approach to treatment. As explored in the previous chapter my interviews indicate clinicians hope for a "correct" way to provide care and for clarity about best practice, despite the reality that research often produces contradictory findings or equivocal answers. Di Fabio asserts that the EBM movement has been promoted as a way to find truth:

> The rhetoric surrounding the political movement to achieve an evidence-based practice would have you believe that the literature contains truths that are necessary for you to make the "right" clinical decisions. The evidence however
>
> > will not guide you to the truth . . . we ultimately must make inferences . . . when we attempt to apply research to the patient sitting in front of us.[11]

Although clinicians may look to EBM for truths, evidence tends to reveal probabilities rather than certainties and gives information about maximizing or minimizing chances rather than ensuring outcomes. Nonetheless the promise of factual information on which to construct a prescriptive clinical protocol is intensified with meta-analysis which is "purported to provide "the whole truth":[9]

> EBM presumes that there is a right course of action in particular cases: the one "supported by the evidence" . . . only when the body of evidence is viewed as insufficient does EBM allow for significant variability in practice, given the perceived unreliability of other kinds of medical knowledge . . . Excellent and copious clinical research can become compelling enough to guide care in a large number of cases, but the doctor must always remain open to the possibility that the patient at hand represents an exception. And EBM must not only allow but also encourage doctors to consider all potentially relevant kinds of knowledge in each case. To do less is to risk creating a dogmatic kind of medical authority, one based on the evidence.[43]

Tonelli notes that medicine seems to have overlooked the philosophy of science, and I would add other branches of the humanities and social sciences, which has "effectively undermined" this myth of science as objective and value free. He calls for EBM to recognize the contextual nature of scientific knowledge and acknowledge it cannot "provide a font of infallible facts to be freely and uncritically employed by practicing physicians."[9] no matter how much high quality evidence is collected.

Critics argue for the need to respect the fact that the EBM debates are ideological rather

than scientific and are both philosophical and political.[12] And yet EBM's apparently scientific basis seems to have the power to silence debate about alternative approaches, conflicts and underlying politics."The intellectual elegance of the undoubted case for evidence-based medicine may have the adverse effect of eclipsing other forms of evidence" with the EBM physician "unencumbered by ideas of social justice and equity"[59] and armed with "an apparently value-free tool"[3] with which to make decisions not only about the individual patient but also about health policy.

Conclusions

What EBM wants from health care practitioners is at first seemingly simple and to most a given, that health care practice be based on the best science available. As the movement evolves, the demand becomes more inclusive: so that practice is ideally based not only on the best science but also on the skills and judgment of the practitioner guided by the values of the patient. Inside EBM, however, are complex and contradictory ideas and demands that struggle for ascendance and clarity within a paradigm that presents itself as linear and objective. At one level the EBM movement asks for the non-authoritarian and scientific use of research evidence by a medical profession willing to challenge its own traditions, values and authority. On another, it asks for adherence to findings from research that may not be relevant to an individual or social context, either through adherence to clinical practice guidelines or through health policies and resource allocation informed by evidence. Old forms of authority are seemingly challenged and eroded by new forms and tools of authority that emerge, growing out of the powerful combination of EBM's methods of statistical analysis and the information technology revolution. EBM, however, does not appear to have addressed the problem of medical authority justified by an uncertain science.

Debates about EBM continue, with entire journals, such as the *Journal of Evaluation in Clinical Practice* specializing in EBM critique. The debates reached a peaked of intensity within medicine in the late 90s and early 2000s. Debates and questions about EBM in maternity care were most intense in the following decade. A number of factors including strong loyalty to EBP leaders, high hopes and early adoption of EBP within maternity care may have delayed debate about EBP and its impact on the care of childbearing women. EBP was enthusiastically established as the normative approach by professional bodies involved in maternity care and its first impact was to provide support for childbirth reforms. However, debate did emerge with similar intensity and passion.[47,67] The EBM debates discussed in this chapter provide the broader

context within which I conducted my interviews and analyzed my findings. The experiences of maternity care practitioners reveal much about how the hopes and concerns of both EBM advocates and critics manifest in practice. Maternity care is a fertile ground to explore the application and misapplication of EBP.

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Chapter Five: Dynamics of Evidence: Applying, Not Applying and Misapplying EBP

Introduction

The five remaining chapters explore Canadian maternity care providers' observations about the dynamics of the new paradigm within their practices, the institutions where they work and their professions. This chapter is focused on what informants conveyed about how they use evidence and how they see that evidence is applied, not applied or misapplied. The chapters that follow explore perceptions about why evidence is interpreted and applied in the particular ways that they observe and some of the unexpected effects and uses of EBP. Informants used recurring clinical examples, such as intermittent auscultation (IA) versus electronic fetal monitoring (EFM); breech birth; post-term pregnancy; vaginal birth after caesarean section (VBAC); and screening for Group B Streptococcus (GBS), often centering on several influential RCTs and journal articles or clinical practice guidelines (CPGs). They also focused on how the findings of research are translated into resources produced to assist practitioners to apply evidence in their day to day work. The terms "evidence-based product" and "evidence-based tool" are used as a generic terms to describe the kinds of literature reviews, practice guidelines, hospital policies and professional courses that are meant to inform practitioners and guide practice.

In this chapter a picture emerges of health care practice as highly dependent on teams or groups and on institutional rather than individual approaches. Providers from all of the professional groups describe feeling limited in their ability to apply evidence in the way in which they, as individuals, understand it. Practitioners feel constrained by the norms of the institutions where they work or by the other professions they rely on who seem to have different understandings of the evidence. This sense of limitation was expressed by informants across all professions; by those who could be described as being in leadership positions as well as those who were front line practitioners; by those who set guidelines and "give orders"; and by those who follow guidelines and take orders from others.

Several patterns or dynamics in the use of evidence emerged in my conversations with care providers. One of the most common dynamics of EBP is the *uneven application* of evidence, when some evidence is very easily applied while other evidence is met with profound resistance to implementation. *Over application* happens when the findings from research are applied in

excess. Despite being clearly understood, the findings are applied beyond what the science justifies. A number of dynamics occur in relation to *interpretation*, including *invisible interpretation,* when the process of interpretation itself is not recognized. *Over interpretation* happens when the existing science is interpreted beyond the findings of the research and *under interpretation* when multiple interpretations are possible but not acknowledged. *Over simplification* describes the phenomenon of using the findings of RCTs meant to answer one simple question to make recommendations for care during complex processes such as pregnancy and childbirth. The process of using population-based findings and misapplying them to individuals in a different context or different population is *over generalization*. Over simplified evidence can also applied in an unbalanced way, without taking into account the context of care, the values and objectives of the woman and her family or without integrating the clinical judgments of the care provider about the specific or particular circumstances of care.

Uneven Application

Most informants expressed both frustration and bewilderment about the uneven application of evidence, explaining that it is difficult to implement certain evidence-based changes in practice while other evidence is applied much more readily. This frustration was increased by their perception that this uneven application of evidence seemed to occur despite overt commitments from colleagues, professional organizations and institutions to the general principles of EBP. Historical examples include the very slow uptake of the evidence in favour of eliminating shaving and enemas as preparation for birth; or the decades long gap between research showing benefits for the use of antenatal corticosteroids to promote neonatal lung maturity when labour occurs preterm followed by the overuse of this treatment. The most common examples of the uneven application of evidence, repeatedly raised by almost all informants, came from current practice. Many contrasted the rapid uptake of the findings of the 2000 Term Breech Trial (TBT)[1] with the ongoing resistance to discontinuing the routine use of EFM:

> *They stopped doing breeches, you know, half way through the trial . . . And yet here we are 25 years later and we still haven't figured out that we shouldn't be monitoring all these women.*
>
> Harris 21:194

> *Why do we all cave in on breech but we haven't jumped on the bandwagon with intermittent auscultation?*
>
> Rural Ontario Midwives 46:687

This contrast was seen by informants as central to understanding barriers to and limitations of EBP. These specific examples are used to illustrate many of the hows of this chapter and whys of the remaining chapters and will be explored from many different perspectives.

Electronic Fetal Monitoring

EFM was first introduced in the 1960s and was firmly entrenched in obstetric practice by the 1980s in North America and Europe. EFM, also known as continuous monitoring or cardiotocography (CTG), uses monitors strapped to a woman's belly or an electrode attached to the fetal scalp. It creates a paper or computer recording of the baby's heart rate in relation to the uterine contractions and allows assessment of patterns, such as decelerations, which might indicate fetal compromise. Being attached to the machine prevents women from being mobile and limits options for working with the pain of labour, such as the use of water and ambulation. The hope of those who enthusiastically embraced this technology was that it would allow identification of hypoxia during labour, so that care providers could intervene to deliver the baby before brain damage occurred, and thereby reducing rates of cerebral palsy.[2]

A Cochrane Library review[3] from 2004, updated in 2008, compares continuous EFM with intermittent auscultation of the fetal heart rate (IA) using a fetal stethoscope. It found 12 trials involving over 37,000 women. The first small trial was conducted in Denver in 1976 and showed higher caesarean section rates without an improvement in outcome. Most of the evidence in the review comes from "one large, well-conducted trial of almost 13,000 women" known as the Dublin trial, conducted in 1985, which confirmed the findings of the Denver trail. The overall results of the review are consistent with the Dublin and Denver trials. The review shows no differences between the groups in neonatal outcomes for either low or high risk pregnancies, with the exception of neonatal seizures which were reduced with EFM. Although the *Cochrane Review* did not report on a sub-group analysis for induced labours, *ECPC* states that a sub-group analysis of the Dublin trial showed that the reduction in neonatal seizures was limited to labours that were induced or augmented with oxytocin or that were prolonged. Long term follow-up showed no difference between the groups in the incidence of neurologic problems, although cerebral palsy was the only outcome measured.[4-6]

Philip Hall reflected on the intent of one of the "inventors" of EFM:

Eddie Hon said, to paraphrase him, "Above all else, let this device that we're working on

> *not be used on normal pregnant women. The research has been done on women with problems." And of course it was embraced instantly. The core purpose of this whole fantasy was that it would reduce the CP rate . . . There's no connection. It's a failed technique. It's fairly well demonstrated that the only thing it changes is the odds of caesarean section. It doesn't* [change neonatal] *outcomes. The cerebral palsy rate if anything is up. Hasn't changed in a half century. . . we have forgotten the fetal auscultation technique but we've got all these bloody machines, machines that goes ping, if you've seen that Monty Python movie.*
>
> Hall 20:557

Hall was not the only informant to reference the 1983 Monty Python movie the "Meaning of Life", a reference to a scene set in a room full of beeping machines and gowned and masked health care personnel which has since become a pop culture classic. In it the hospital staff is so busy reading monitors and adjusting dials that they are discomfited when they find a woman in labour in the room and don't know what to do with her. This popular culture insight into the dangers of focus on the machine is reflected in a comment in the *Cochrane Review* about a potential downside of continuous monitoring: "It also means that some resources tend to be focused on the needs of the CTG rather than the woman in labour."[3]

The evidence to support IA has been consistent. Many trials since the 1970s show no clear benefit from EFM, but rather a clear risk of significant increase in caesarean section and instrumental vaginal births (forceps and vacuum birth) in women whose labours were continuously monitored. The problem with EFM appears to be that the strips tend to be interpreted to indicate risk to the fetus which leads practitioners to recommend interventions which do not improve outcomes for the baby. The *Cochrane reviewers* note that caesarean section and instrumental birth are "known to carry the risks associated with a surgical procedure although the specific adverse outcomes have not been assessed in the included studies." [3]

Since the mid eighties, recommendations from national and international maternity care bodies based on this evidence about fetal monitoring in labour have been repeated in EBP products. In Canada, SOGC guidelines in 2002 and 2007[7]and fetal assessment[8] and "risk management" courses such as Advances in Labour and Risk Management (ALARM) [9]and Managing Obstetric Risk Efficiently ($MORE^{OB}$)[10] recommend IA for low risk women in spontaneous labour.

> Intermittent auscultation following an established protocol of surveillance and response is the recommended method of fetal surveillance; compared with electronic fetal monitoring, it has lower intervention rates without evidence of compromising neonatal outcome.[7]

Despite the continued endorsement of this seemingly simple low cost approach where bedside midwives and nurses listen to the fetal heart beat with a handheld device, most informants reported significant resistance to IA and widespread use of EFM:

> *Okay, well this* [EFM versus IA] *is one of the most frustrating. It's been one of my personal frustrations working in this hospital because I've been fighting this one since I came and that was almost 20 years ago.*
>
> Biringer 2:122

> *Well a good example is continuous fetal monitoring in my view. That's been a monumental task that we still haven't succeeded in getting people to stop doing continuous fetal monitoring on all patients.*
>
> Seaward 48:41

Anne Houstoun is a Halifax family physician who works in a community health centre and at the tertiary care hospital in the Department of Family Medicine. She explains:

> *Well the biggest* [example] *I can think of is electronic fetal monitoring, you know, there's lots of evidence that it shouldn't be used, that it's detrimental in normal healthy women and yet it continues to be used all the time. . . I don't understand why the obstetricians aren't more concerned about it, why they think it is okay to continuously monitor everybody. I mean it doesn't make sense to me.*
>
> Houstoun 23:44

Owen Hughes was involved in the creation of some of the SOGC's evidence-based products, through the ALARM and MORE^{OB} courses and the clinical guidelines committee. He is one of the authors of the most recent SOGC clinical practice guidelines on fetal health surveillance.[7] His comments reflect his concern that even with readily accessible tools to support EBP and with the credibility of his involvement in national and interprofessional EBP initiatives, he has not been able to change practice in the institution where he works:

> *It's frustrating. I'm just a little annoyed at times, you know, that people won't sit down and take account of the evidence. And I was hoping that my involvement with the SOGC and being one of the authors of the fetal surveillance guidelines was going to give me more currency here, but it hasn't . . . If you realize that intermittent auscultation is proving to be as useful as, even better than electronic monitoring, why are we so reluctant to do it?*
>
> Hughes 24:110

The Term Breech Trial

The Term Breech Trial (TBT) was an international multi-centred RCT which compared planned caesarean section versus planned vaginal birth for breech birth.[1] The lead investigator

was obstetrician Mary Hannah from Women's College Hospital and the University of Toronto Department of Obstetrics and Gynaecology. The TBT was conducted in 26 countries with a large team of international co-investigators and published in the prestigious British journal *The Lancet* in 2000. The trial was dramatically halted halfway through the planned recruitment, due to preliminary findings of a higher risk of perinatal mortality and morbidity with vaginal birth. Informants describe the implementation of the findings of this trial as virtually instantaneous and almost universal:

> *I mean my biggest frustration with the whole thing is, okay, so the breech study comes out. Within a week you can't get a breech birth, a vaginal breech birth anywhere in North America practically. Like boom.*
>
> Knox 30:100

> *And to me* [the TBT] *was an example of how it can go awry. Like the whole world can change in one day and not offer a woman a vaginal birth.*
>
> Krysanauskas 32:42

> *All that's known is that recruitment has been stopped. And my colleague has already concluded what the trial is saying before it's even published. It didn't come out for months after that, and this guy had stopped delivering vaginal breeches. Obviously it was a convenience for him to stop worrying about it. And he hasn't done one since to my knowledge.*
>
> Hall 20:345

Informants pointed to the fact that changing practice based on the preliminary results of one trial is not in keeping with the principles of evidence-based practice. Andrew Kotaska wrote "One randomised controlled trial has dictated a new standard of care for vaginal breech deliveries worldwide.[11] Several informants worried that the trial results were accepted so quickly that there was no time for the kind of review and debate which is necessary to determine if and how RCT findings should be applied. They observed that rapid uptake acted to pre-empt critique and delay appropriate analysis, putting those with concerns in the position of heretics rather than as contributing to a scholarly debate. The result was a change which saw obstetricians no longer willing to offer the choice of vaginal breech birth, a change which most see as irreversible in North America. Kotaska has written and spoken extensively on the problems of the TBT and believes that the "condemnation of vaginal breech delivery by one randomised controlled trial and its sweeping effect on clinical practice" is an example of a failure to understand the limits of RCTs.[11]

Jan Christilaw and several others noted that although Norwegian centres participated in the term breech trial, they did not accept the findings. She referenced the separate analysis the Norwegian investigators did of their trial findings and a study of the national Norwegian perinatal data base[12,13] which convinced them that vaginal breech birth was safe in their setting:

> *They looked at their own data from their arm in the term breech trial. They looked at the population data. They found that for their particular population, the risk of vaginal breech delivery was very low and that they had no significant complications and they didn't have an increased mortality in their population. Now of course it's difficult to take a randomised controlled trial and compare it to a population base where it's not randomised. Because the idea of a randomised controlled trial, of course, is to get the bias and the confounders out of the mix. And that's why they do randomised controlled trials. But a randomised controlled trial for something like this might be much more accurate if you enrolled 100 percent eligible people and of course we know the term breech trial was so much less than that. And I think when they looked at their data they were not convinced they would actually decrease the risk for women in Norway. They thought they would have a net increase because of the possible complications of caesarean section. So it is complicated.*
>
> Christilaw 4:100

A long term follow-up of the TBT was published in 2004 which showed no difference in the number of deaths and serious long term morbidity between the two groups by two years of age.[14] A Norwegian study of intelligence found no difference in breech children at 18 years regardless of mode of birth.[15] Informants expressed concern and frustration at the lack of discussion of these follow-up results in the literature and in their institutions. They noted the negligible impact of the long term TBT results on practice, despite findings which could be considered equally dramatic and controversial as the original study:

> *Overwhelming evidence came out of the breech trial and we changed practice. And yet now that people have critiqued that study and there were so many flaws, we should really be looking at if we should be doing c-sections for all breech babies. Probably not. Have we changed our care based on that? No. There are strong opinions.*
>
> Haidon 9:140

> *A grand statement is made based on one trial, and the other outcomes have not been considered, like the long term outcomes for babies, the long term reproductive outcomes for the women. And so it turns out to be very short-sighted evidence. So it's very limited evidence around one issue without looking at all the ramifications, the ripples for applying that evidence.*
>
> Biringer 1:86

Philip Hall identified a dynamic operating in the maternity care community both in Canada and internationally which allows evidence to be applied in an uneven way. At the MIRU

conference in 2003 Hall stated: "*If you don't like it you can ignore it.*" Isabelle Brabant also noted this dynamic in her discussion of resistance to the evidence against the routine use of episiotomy. Although many informants called the reduction in the use of routine episiotomy one of the successes of evidence-based practice, Brabant described how this practice persists with some obstetricians in her community still preferring routine episiotomy. She noted that this is despite the fact that a Canadian RCT of episiotomy was based in Montreal where she practices; "*It's like some kind of blindness, you know, you just blank what you don't want.*" (3:99)

Over Application

The finding that over application of even the best screening programs or treatments can cause harm is one of the central concerns of the founders of the evidence movement. The introduction of the *Benefits and Hazards of the New Obstetrics* explains how this seeming paradox occurs: "The concern felt by many professional and lay people has been that prophylaxis may be applied to an extent which far outstrips any possible benefit, so that ultimately through the law of diminishing returns, complications of the prophylaxis become worse than the original problem."[16] The problem is that when screening tests or treatments that are effective when used in populations at high risk for a disease are put into widespread use with those who are not at risk, the benefit is less as many more people have to be screened to find the individual with an illness. The harm is also greater as the risk of false positive results goes up. This occurs when those identified with the disease do not actually have it and harm can result when people are treated unnecessarily and suffer resulting complications. Informants noted the irony that the move to EBP in maternity care seems to have resulted in a pattern of using more and more interventions to deal with smaller and smaller risks, without a full understanding of all of the effects, a trend which will be discussed more fully in Chapter Ten.

Post-term Pregnancy

The Canadian Multi-centre Post-term Pregnancy Trial,[17] commonly referred to as the Post-term Trial, was also led by principle investigator Mary Hannah. Post-term pregnancy is normally defined as greater than 42 weeks gestation and is considered either a variation of normal or a risk factor associated with an increase in perinatal mortality and morbidity. When, and how, to induce labour to reduce fetal and neonatal risk has been an area of controversy in obstetrics for decades. Conducted between 1985 and 1990 at 22 Canadian hospitals, the Post-term Trial

compared a policy of induction of labour at 41 weeks gestational age or later with waiting for spontaneous labour (called expectant management). The expectant management approach used fetal monitoring with EFM and ultrasound to assess fetal well being and decide if induction was indicated. The trial found a lower rate of caesarean section in the group of women that were induced and very similar rates of perinatal and neonatal mortality and morbidity. In the discussion of their findings, they note that the higher caesarean section rates in the expectant management group may be explained by use of what was then a new pharmacologic approach (prostaglandin gel) to ripen the cervix only in the induction arm. This was an intention to treat trial, which organizes results by the planned rather the actual treatment. This meant that women in the expectant arm who needed induction are counted in the expectant management results. This group did not receive prostaglandin gel if they were induced. Prostaglandin gel has since been found to increase the chances of vaginal birth in induced labours and its use has become routine. Intention to treat is considered a very strong design but critics point to the need to understand results by actual treatment as well. The authors conclude that a policy of induction of labour after 41 weeks of pregnancy reduces the caesarean section rate and may reduce perinatal mortality. Their conclusion is based not on the findings of their trial, but on the trial in combination with the 1991 *Cochrane Review*.[18]

The care providers I interviewed were almost uniform in expressing their concern about the impact of the post-dates trial and subsequent systematic reviews and guidelines which were based on it. Some disputed the findings; some noted the findings do not justify the conclusions. However, even those who did not dispute the findings or the author's conclusions saw the publication of the trial as a catalyst for rising rates of both induction and caesarean section:

> *The post-term study almost single-handedly, and you shouldn't quote me on this because it will offend people . . . indirectly has led to a huge rise in the caesarean section rate in this country.*
>
> Anonymous

The way in which over application works is illustrated by Baskett's comparison of the application of the Post-term Trial, with the harm you might cause by using "*too much fertilizer*":

> *Now when the post-term study was done I think they said by seven days past term, you should be looking at inducing labour and over the next 48 hours or so you assess and if necessary, make the cervix more favourable with prostaglandin and then move on so that by ten days post-dates induction would be under way. So what people did was they applied a rigidity, seven days, got to be delivered by seven days. And then well it's a bit*

> *like fertilizer on the lawn, you know, if a little is good, a lot is better. So seven days, five days is even better than seven. And really by term and two or three days past, you should be starting to put them on the induction list so they'd be done by day four or five after. So you're massively increasing the number of women you induce. And if half of those are primiparous which they are, you've doubled their section rate.*
>
> Baskett 1:245

The Post-term Trial and the subsequent *Cochrane Review*s on the topic are all very careful to recommend a policy of "offering" induction of labour after 41 weeks, without specifying an optimal time more precisely than that.[19] The observation made by Baskett that the post-term evidence has led to women being induced at or even earlier than 41weeks was called "*a creeping change in practice*" by Pat Mohide (41:113) and the phenomenon was reiterated over and over by informants. The concern here is not that the trial findings or the subsequent reviews and guidelines were misunderstood by practitioners, but that the evidence is misapplied: "*mangled through imprecision*" (Windrim 54:116) and "*expounded beyond its truth*" (Christilaw 4:208). Most informants worried the Post-term Trial findings have been used as permission to induce women increasingly earlier in gestation and without consideration of the whole clinical picture.

Rory Windrim is a maternal fetal medicine specialist at Mount Sinai Hospital in Toronto. He has been a co-investigator on several of Mary Hannah's trials and believes that the research does not support the ways in which the evidence is applied by individuals or hospital policies. He explains:

> *I think that that's because again Mary's study has been mangled through imprecision enough that people now will bail out at exactly 41 weeks irrespective of the readiness of the cervix. If you read the study carefully, it suggests that if you go past 41 weeks you just increase surveillance . . . nobody seems to wait any more.*
>
> Windrim 54:116

Christilaw's comments point to how the evidence is not only misapplied but also how the misapplication can become standard practice:

> *. . . a kernel of evidence becomes the mantra. It is expounded beyond its truth. It's like, you know, it becomes dogma. And that is so fascinating how that happens. And it happens in many, many different parts of medicine, not just obstetrics. The post date trial definitely, it's definitely done that.*
>
> Christilaw 4:208

Sue Harris described work that she did as Head of Family Practice at UBC Women and

Children's Hospital to try and mitigate the overuse of induction that seemed to flow from the Post-term Trial. Her Department established a policy, described in the *Canadian Medical Association Journal* (CMAJ),[20] which did not allow post-term induction bookings until a woman was at least ten days overdue. Harris notes:

> *I have some other concerns, even when you do take the best studies and design policy* [based on evidence] *for example around induction. We worked hard to set some criteria that were reasonable and not completely restrictive, we said 41+3, and then the next problem was actually, I mean it's mystifying to me, was people cheating. We found out that actually one third of them were not even 41 weeks by the best criteria for dating. What we had to do was put in place a peer review process.*
>
> Harris 21: 83

Harris is not my only informant who mentioned implementing systems to try to control the tendency to induce to early. Dore also mentioned that one of the hospitals in her area implemented a restrictive policy to try to stem the rising rates of induction. Seaward describes the impact on the health care system of the overuse of induction:

> *Unfortunately I think the post-dates evidence or literature is an example of where we've taken evidence and misapplied it in that we're now overly eager to induce women possibly not when they're in fact truly post-dates and I think that has resulted in an increase in required intervention. Well again it's the fear of the remote untoward outcome in a woman who has gone over due. The problem is that most practitioners are forgetting what constitutes post-dates. Post-dates, its 42 weeks or at earliest 41 and 3 days. Until you're 41 and 3 days, you're not actually post- dates. People are calling pregnancies post-dates when they're 40 plus. And then one gets into a tricky situation where interventions occur. Well it's swamped out resources. We're doing unnecessary inductions which are very labour intensive in terms of monitoring and the potential for caesarean or other operative interventions.*
>
> Seaward 19:91

Lori Wahoski was the Manager of Patient Care for the birth unit called "Women's Family Birthplace" at University of Manitoba Health Sciences Centre when I interviewed her and had been involved in an audit comparing rates of induction before and after the Post-term Trial. Her hopes that EBP would end the use of induction for non-medical reasons were disappointed. Her distinction between "offer" and "must induce" is important:

> *When I read the post-dates trial I see that both the option of induction and of waiting are reasonable to offer women. But what I see around me is that most have interpreted the trial to mean not just offer induction as the SOGC says, but that you must induce. As a nurse manager, I thought the evidence would help us control "social" induction, but it seems to have made it worse.*
>
> Wahoski 53:103

Vaginal Birth after Caesarean Section

One of the other ongoing controversies in obstetrics has been the issue of vaginal birth after caesarean section (VBAC). The dictum "once a caesarean always a caesarean" was originally put forward by Columbia University obstetric professor Edwin Cragin in 1916, at a time when the caesarean section rate was 2 percent and the procedure held significant risks. In this era, the caesarean incision was made vertically into the uterine muscle and the risk of uterine rupture and danger to mother and baby in a subsequent pregnancy or labour was high. Cragin urged his colleagues to avoid caesarean and its risks whenever possible. [21] The introduction of a lower segment incision technique in the 1930s made uterine rupture less likely and "a trial of labour" for women with previous caesarean section became common in the UK and Europe. The caesarean section rate remained under 5 percent until the 1970s when it began a rapid rise so that by the mid 1980s the rate was over 20 percent in the US and Canada. In North America, the continued practice of repeat caesarean section in the context of a steadily rising caesarean section rate has lead to ongoing public and professional concern and many campaigns to understand and lower the trend. By 2010 the caesarean section rate was over 32 percent in the US.[22] The latest official data for Canada shows a rate of 26.8 percent in 2006. [23]

In the 1990s, childbirth movement advocacy for what became known as vaginal birth after caesarean section (VBAC)[24] and pressure from within the medical profession to address concerns about increasing caesarean section rates lead to national "consensus conferences" both in Canada and in the US in the mid eighties. Canadian recommendations established VBAC as the standard of care, with prominent opinion leaders such as Murray Enkin promoting adoption of the consensus guidelines.[25] The US National Institutes of Health Consensus promoted VBAC as a safe choice about which women should be informed. [26] VBAC rates rose in the mid nineties and caesarean section rates began to decline. This trend changed very rapidly, after the 2001 publication in the *New England Journal of Medicine* (*NEJM*) of an audit of Washington State birth certificate data. Many informants likened the sudden transformation in VBAC practice to the change in breech management following the TBT.

The paper by US nurse-midwife Mona Lydon-Rochelle detailed rates of uterine rupture and factors which were associated with rupture.[27] The author of the *NEJM* editorial commentary on the paper, Michael Greene, was director of maternal fetal medicine at Massachusetts General. Greene gave "an unequivocal recommendation for repeat caesarean section".[28] Most informants linked the quick decline in VBAC to a misuse of the Lydon-Rochelle data, which did not add new

information about overall risks of VBAC and was not a study of high enough quality to justify the degree of impact it had. Most were surprised the study was published in the prestigious *NEJM* and saw it as a vehicle for Greene's commentary. Klein makes the distinction between the findings in Lydon-Rochelle's study, which he asserts could have helped improve outcomes for VBAC and the over application of the findings:

> *The VBAC story is the same. You know. Lydon-Rochelle shows that the rupture rate is 0.5 percent. Well we've always known the rupture rate was 0.5 percent. What's new? Absolutely nothing. She finds out that there's a subset where it shows that oxytocin but especially prostaglandin causes more uterine ruptures. So that's good information. So don't use prostaglandins. But then don't say that VBAC is dangerous. Say VBAC with prostaglandins is dangerous.*
>
> Klein 12:98

Klein's comments speak to the way in which research findings can be over applied when used in a sweeping rather than specific way, in this case having an impact on the care of all women who have had a previous caesarean. The care providers I interviewed almost uniformly agreed that overall policies towards VBAC should not have changed. For Penny Simkin: "*The evidence hasn't changed but attitude towards it has.*" (Simkin 50:371) Many noted that this evidence should instead lead to a more cautious approach to practices such as induction and augmentation and the increasing use of drugs such as prostaglandin gel and misoprostol. Many informants noted the irony that evidence which could have been used to critique the injudicious use of interventions such as drugs which intensify uterine contractions in the presence of a uterine scar was used to justify the intervention of repeat caesarean. They describe a pattern where problems caused by technology are fixed with more technology through a process of over applying evidence about a very specific group (those attempting VBAC who are induced with specific drugs) to all women attempting VBAC.

Ohlsson says evidence "spills over" when giving another example of over application: the overuse of antenatal corticosteroids. Although the uptake of the use of these drugs was slow, once they were finally accepted into practice they were quickly over applied despite evidence only showing benefit for a single course. It became widespread practice[29-31] for obstetricians to give multiple courses of the drug to pregnant women, reminiscent of Baskett's "*if a little is good a lot is better*".(Baskett 1:245) This practice continued until a trial which Ohlsson co-authored was mounted and which eventually showed risk to the fetus and newborn of repeated use.[31] He explains:

The guidelines say not to give multiple courses of corticosteroids. But for a while they did give multiple courses. And that's how you have your evidence for one specific intervention, at a certain dosage, then spills over into using more.

Ohlsson 18:449

Interpretation

Listening to informant's comments about the uneven and over application of evidence makes apparent that differences in interpretation are important to how the recommendations that flow from individual studies or systematic reviews of the literature are applied. Maternity care providers reflected on a number of dynamics in relation to interpretation. They pointed to how the labels "EBP" and "science" can play into an assumption of evidence as "fact", making the process of interpretation invisible and therefore difficult to challenge. Many were troubled by what they saw as over interpretation, when the existing science is interpreted beyond what the quality of the studies or the findings of the research justifies. They also pointed to a common pattern of under interpretation when multiple interpretations are possible but not acknowledged.

Problems related to interpretation happen at several levels. Some informants raised problems about how authors interpret their own data or how systematic reviewers use meta-analysis. Many focused on how professional associations or hospitals interpret data from trials or reviews in the process of creating clinical practice guidelines or hospital protocols. Some worried about how individual colleagues interpreted the data when using it to guide day to day practice.

Several informants (Goodwin, Hall, Klein, Kotaska and Menticoglou) had written, or were in the process of writing, about problems within the design and the data of some of the key trials, and referenced their written work in their interviews. Goodwin wrote a provocative opinion piece published in *the Journal of Obstetrics and Gynaecology of Canada* in 2001.[33] He uses Tonelli's concept of "philosophical limits" of RCTs[32] to take the evidence movement to task as a form of "alchemy" and to raise specific concerns about the TBT. His concern is that RCTs are not well suited to evaluation of a procedure based on skill and judgment. Goodwin appears to be the first author to point to what seem to be anomalies in several of the fetal and neonatal deaths attributed to vaginal birth: two were "pre-enrollment" and two died at home after being discharged well. Goodwin points out that it is unlikely that any of these deaths were linked with mode of delivery, thus undermining the findings of the trial: "The chief conclusion of the Term Breech Trial cannot be considered proven".[33]

With fellow maternal fetal medicine specialist Savas Menticoglou, Hall had published "Routine induction of labour at 41 weeks: nonsensus consensus" in 2002. [34] They question the

intention to treat analysis (when the results are reported based on the treatment the woman was assigned to rather than the care she actually received) as the sole analytic framework. In the Post-term Trial over one third of each group received care that was the opposite of the randomly assigned treatment. Menticoglou and Hall suggest that interpretation should have included not only the results by intention to treat analysis but also the results analyzed by whether the woman was actually induced or if she labored spontaneously.

Hall described in his interview that he and Menticoglou were also in the process of collaborating on a critique of the TBT. Hall was trained to assess the quality of research by David Sackett at McMaster University and fits in with Sackett's first category of users of EBP. He notes that in doing critical appraisal of the research, "*the devil is in the details*".(20:120) He insists that care providers accepting the results of RCTs or meta-analyses should be aware that trial findings accepted prior to a reasonable period of critique and analysis may be flawed and require careful reading.

Many of Hall's insights about the post-term trial and TBT have appeared in articles published by others after his death, such as Menticoglou and Kotaska who question the interpretation of the results of both trials. Like the Post-term Trial, intention to treat analysis is used in the TBT. Hall is troubled by the way in which this method tests the impact of a policy but may not provide information about the actual clinical question. So although the TBT was meant to study healthy singleton breeches, babies with life threatening anomalies (anencephaly), that had suffered intra-uterine death prior to labour, were twins, or were not attended by a skilled practitioner were all, according to Hall, included in the vaginal breech group. Hall, like Goodwin, argues that this has skewed results that should have led to a different interpretation:

> *The perinatal mortality in the developed settings is actually amazingly low, right? And look line by line at these deaths and look at each one. You're going to find in the list* [an] *anencephalic* [baby]. *Well do you know what? Most anencephalic babies die no matter how you deliver them. That was one of the deaths. How about the twin that was dead before labour started. The other twin, by the way, is fine. Delivered vaginally. And in that trial is a Canadian birth that's completely incompetently handled. Well you know what? If you don't know what the hell you're doing and you deliver a vaginal breech, you may cause some harm.*
>
> Hall 20:319

At the time of my interview, Klein and Kotaska were working on a critique of the recent evidence about epidural anesthesia. They disagree with findings which are reported as showing no increase in caesarean section in two subsequent *Cochrane Reviews*.[35,36] The evidence, as cited

in the Cochrane reviews, shows that there is an increase in prolonged labour, use of oxytocin, forceps and vacuum and perineal trauma. Klein and Kotaska did not feel the meta-analysis reflected their day to day clinical experience of rising rates of epidural and caesarean section going hand in hand. Klein's detailed look at the studies used points to potentially important confounders not discussed in the *Cochrane Review*. He explains that several studies took place in units where the caesarean rate was very low. The largest study from Parkland Hospital in Dallas had an institutional rate of caesarean section at a low 12 percent and the rates in both arms of the trial in this setting were at a remarkable at 5 percent. Klein argues that the findings are not applicable to most North American settings where the caesarean rate is much higher. Klein, like Hall, emphasizes the importance of an in depth understanding of how trials are designed and analyzed:

> *This study is sound from a mechanical point of view but is it sound in terms of representing clinical reality, external validity in places where epidural is used differently? And the answer is no . . . what's the worst about this is that people stop reading the individual studies. They look at the summary Cochrane Review. If I'm looking at a manuscript where the only reference is the Cochrane study, I say go back and read the literature. Understand every study that makes up the Cochrane collaboration and understand each and every one of them in terms of whether it's relevant for you. And because the Cochrane is not capable of doing that. If it were a drug trial, I suppose it would be just fine, but not a management trial. And not a trial about real life on the ground.*
>
> Klein 29:56

Term Pre-labour Rupture of Membranes

The most common example given of problems in the interpretation of evidence by professional associations and hospitals relates to another of Mary Hannah's RCTs. In this case the concern was not about study design or author interpretation of the data, but about the interpretation that appeared in subsequent evidence products. The Term Pre-labour Rupture of Membranes Trial (commonly called the Term PROM Trial) was conducted between 1992 and 1995 and published in the *NEJM* in 1996. The RCT studied pre-labour rupture of membranes (PROM) after 37 weeks gestation to look at whether early induction or waiting for spontaneous labour would benefit mothers and babies.[37] The research examines some of the common assumptions about care of women with TPROM which did not have a strong evidence-base. The trial explored whether waiting for labour after PROM increases rates of infection of either mother or baby and whether induced labour might contribute to a higher caesarean rate. Two types of induction were studied. Women were randomised to three groups: immediate induction with

intravenous oxytocin; immediate induction with vaginal prostaglandin gel; or waiting until up to 4 days from rupture of membranes. In the later group, if labour had not commenced within four days women were randomised to an induction with either oxytocin or prostaglandin. The findings of this trial, later reinforced by systematic reviews,[38,39] were that there were no significant difference in outcomes for babies or in caesarean rates. Rates of maternal infection were lowest in the induction with oxytocin group but were low in all groups and considered readily treatable. The authors conclude that all approaches are reasonable and should be offered to women.

Linda McCabe is a nurse educator in labour and delivery at the Ottawa Hospital. She described how the first response to the evidence from the Term PROM Trial on the part of the obstetric staff at her unit was that the trial supported early induction and there was no need for discussion about how to interpret or apply the evidence. This did not sit well with the nursing staff, who felt there were other ways to look at how to apply the trial findings and wanted to offer women the option of waiting for labour to start:

> *You're familiar with the PROM at term trial? We'd just had no luck in getting that evidence to come in here. The physicians decided when they read the evidence that they would support a practice of early induction for term PROM. And that was the evidence. But the nursing staff felt that that's not using the evidence as they saw it. And so it was really nursing that pushed the envelope. We got a little group together and found a physician who was willing to support that effort on behalf of the other obstetricians and we implemented* [a policy of expectant management for] *term PROM. So we only got 24 hours but at least in 24 hours, a high percent of women hopefully will go into spontaneous labour. And that was very successful and really had good outcomes. Now recently we've been inviting our sister campus to take that approach. And it's just how you read the evidence.*
>
> McCabe 23: 148

McCabe explains that although the initiative was successful in avoiding routine induction immediately after PROM, her medical colleagues were not willing to fully apply the Term PROM results. They agreed to 24 hours of expectant management, when the results indicated that waiting up to four days is a safe practice.

Sue Harris also raised similar concerns about the way in which interpretation of the Term PROM Trial evidence was made invisible by a hospital norm of immediate induction, despite the overt acknowledgement by the trial authors of the evidence supporting multiple approaches. For Harris, this singular interpretation is worrisome because it leads to a failure to offer the available options to women. She explains:

> *...another example would be the pre-labour rupture of membranes trial. So the*

> *conclusions were, in fact that the outcomes were the same. But we don't actually say* [to women] *"You know there are a couple of ways of thinking about this", and you know, "We can talk about it and we can consider and you can actually make a real choice based on what you think is necessary." In the environment,* [where I work] *everybody is looking at you like you're a crazy person if you leave a person over 24 hours. It was twisted to mean, well you better do something.*
>
> Harris 21:27

Denial of choice, as well as disapproval of those practitioners who offer choices, are unexpected effects of EBP that will be explored in depth in subsequent chapters. Other clinical examples also reveal problems of interpretation. Like Harris, Ann Biringer used the word "*twisted*" to describe the way in which evidence is used to defend approaches to practice which may not be justifiable. She linked the pattern of over application of the post-term trial to problems of interpretation:

> *The "evidence" gets twisted. . . So suddenly the post-dates trial becomes induce everyone at 41 weeks. I don't know how they got there. Because I look at the evidence and I don't get there. That's not how I would interpret that. But people use it to justify early induction and that to me is very dangerous because then they hold up the holy grail of evidence, but in fact it's not the truth . . . although the evidence may be quite sound . . . how it gets applied is actually individualized and sort of eeked and squeaked and you read it the way you want to read it.*
>
> Biringer 2:102

Group B Streptococcus

Arne Ohlsson uses the example of efforts to prevent Group B streptococcus (GBS) infection in newborns to raise concerns about the process of interpretation of evidence. GBS is a normal vaginal flora that colonizes about 15 to 30 percent of pregnant women and causes illness or death in a small percent of neonates (0.1 percent).[9] The North American adoption of routine screening and prophylactic treatment of GBS is according to Ohlsson, a problematic example of flawed interpretation operating at the level of meta-analysis. The Centre for Disease Control (CDC)[40] and SOGC had both adopted clinical practice guidelines that recommend that all pregnant women who are screened positive for GBS be treated with intravenous antibiotics in labour. Ohlsson is co-author of a systematic review of the literature for the Canadian Task Force on Preventive Health Care (CTFPHC) [41] and the Cochrane Library which both put forward a different interpretation.[42]

In the CTFPHC review Ohlsson and Shah advocated a "screening plus risk factor" approach that would treat far fewer women and still prevent the majority of GBS deaths[41]. This approach screens all women and treats only those who have the bacteria plus an additional risk

factor that increases the risk of neonatal infection, most commonly prematurity, prolonged PROM or fever in labour. The *Cochrane Review* notes that the evidence does not support universal screening and treatment, highlighting problems in the quality of the current evidence. [42] Despite being one of the authors of the Term PROM Trial which studied neonatal infection, and recognized as a leader in EBP internationally, Ohlsson describes how his work with the CTPHC and the Cochrane has not had an impact on either the CDC or SOGC guidelines or even in his own hospital. His critique of the way in which the guidelines use the evidence points to a pattern of over interpretation. Ohlsson argues that routine treatment of all positive women is not justified by the evidence and may represent overuse of antibiotics, with potential harms to both women and babies. His arguments rest on his assessment of the poor quality of evidence in favour of universal screening and treatment of GBS, which may not reduce the number of babies who die of infection. Ohlsson uses the importance of the epidemiologic concept of "number needed to treat" (NNT). He talked about why his work has not been accepted in the US and Canada:

> *Well, I think there is always an element of bias. And in the initial statement from CDC, they didn't quote us. So I wrote to them and said at least you should quote us, and draw attention to the poor quality in these studies. There were duplicate publications and there were problems with the randomization and so on in many of the studies too. And the study that looked at if you had one baby before with GBS infection then you were at much higher risk of having another, that's just anecdotal evidence from Sweden actually, and that is being quoted all the time as well. But each and every study had a problem. And they* [the CDC] *then put in one line that "others" disagreed because of the quality of the studies and referred to us at least, but that's all. And that's gone* [in the current version], *you know. . . But I think the key is that people need to actually critically appraise the literature, and I think we did that for the* [Canadian] *Task Force* [on Preventive Health Care]. *And then we come back to this question: "what is an important difference?" We know that Group B strep infections are rare. There's only perhaps less than one per thousand. You don't appreciate, actually, the impact of how many mothers you need to treat.*
>
> Ohlsson 27:53

Many informants were aware of the CTFPHC guidelines which were published in the *CMAJ.* They noted the almost universal adoption of universal screening and treatment for GBS, despite Ohlsson and Shah's critique. Most acknowledged that they conformed to the CDC and SOGC guidelines themselves, despite having reservations. Anne Houstoun noted that it was "*bizarre*" that "*no one seems to be paying attention*" to an approach which attempts to apply the EBP standard of critical appraisal of evidence to a very widespread intervention. She described how the evidence about both pre-labour rupture of membranes (PROM) and GBS is applied in

her practice setting without acknowledgment that it has been interpreted in a singular manner:

> *The study comes up with you can do either/or. It's safe to watch and wait. Well now they get induced within 24 hours and they get their antibiotics even if they're over 12 hours... the worst aspect of what that evidence was giving us has been grabbed on so that we now induce plus antibiotics earlier than the study ever suggested.*
>
> Houstoun 23: 340

The midwives I interviewed were an exception to this pattern, as many reported that for GBS they applied their philosophy of informed choice and offered both universal screening and treatment (as per the SOGC and CDC) and the screening plus risk factor approach outlined by the CTFPHC. A few noted that they carried Ohlsson's work with them to explain and justify to other care providers an approach that is often perceived as working outside standards, despite being based on evidence and national guidelines.

Under Interpretation

Matthew Sermer and Eileen Hutton both point to the failure of the maternity care community to acknowledge the multiple interpretations that flow from many of the important research trials of the decades since the introduction of EBP:

> *On the face of it Mary Hannah actually didn't say go and induce everybody at 41 weeks. And so that's been perhaps in the small print, it's not really in the small print,* [but] *people will miss that when they read it and the way it is presented in the media. Patients will say, "If I actually allow the pregnancy to go further, my chances of caesarean section will increase and the reason that it will increase is because the baby is more likely to run into difficulty."*
>
> Sermer 49: 65

> *After the post-term trial and the recommendations from that the fact* [is] *that now pretty much at 41 weeks, you're induced . . . the options for women to not be induced are really diminished. And we know for women who want to have a vaginal breech birth, that option is greatly diminished. You know, like all of those kinds of things where the evidence gives us information which we think should be a good thing. We believe that information should be good in order to help practitioners and to help women make choices. But what happens is the system takes that information and puts policy in place that, in fact, restricts*
> *choices. And that's a real concern of mine, how, it's not so much what the evidence says but how it is used...*
>
> Hutton 25:146

Several informants described very hostile reactions to attempts to raise questions of interpretation of the findings of the Term Breech Trial, both in public settings and in one on one discussion with colleagues. Lee Saxell described the reaction to a debate at Grand Rounds at her

hospital:

> *I presented the trial itself. And then my colleague, a family physician did the rebuttal to it. And he did such a good job. He really did a great job. And there was a sense of outrage that we would do that* [debate the trial findings], *beyond outrage. It was like "You can't do that." Just like "It's not possible to do it." We pointed out all the flaws in the study. And the reaction was "But you can't do that." Like as if it was some sort of sacrilege. Like it was religion, you know. It was fascinating to watch.*
>
> Saxell 47:286

Some informants noted similarly strong reactions when Andrew Kotaska, then an obstetrical resident, presented his critique of the term breech trial at several conferences. His widely cited critique has subsequently been published in the *British Medical Journal*[11] and he is co-author of an SOGC guideline that supports vaginal birth in carefully selected cases.[43] However when he first questioned the results of the TBT, the reaction from some of the obstetricians was, as Saxell describes, outside of the norm of reasoned debate about best practice. One obstetrician at a conference I attended said that she was offended that another physician would put pressure on her to accede to a woman who wanted to choose vaginal birth. Another felt that the critique was an affront to "gold standard evidence" and to the researchers as if both should be above thoughtful critique.

This reluctance to acknowledge multiple reasonable approaches leads to a pattern of under interpretation or narrowing of the evidence. Many informants reported lack of systemic supports for either practitioners or women to choose outside the singular interpretation that becomes dominant at the institution or in the profession. However, informants also gave examples of exceptions to this pattern where different interpretations were acknowledged. Pat Mohide described a situation in which he sat on an SOGC guideline committee reviewing the evidence and making recommendations about screening for gestational diabetes. The resulting guideline lays out three options: not screening; screening based on risk factors; or screening all pregnant women. All were considered to be reasonable based on the current state of the evidence. He describes how he had to struggle with significant resistance on the part of one of the lead authors to have the guidelines acknowledge multiple interpretations of the evidence and therefore multiple approaches to clinical practice:

> *It was actually me that got the statement modified because I threatened to resign from the advisory group if they didn't qualify it and allow non screening as an option because it wasn't in there for the first two or three drafts. And I kept on voicing my objections* [saying] *this is not based on evidence and you need to say that and you need to continue*

to offer the other choice which you don't offer in the previous [draft].

Mohide 41:118

Owen Hughes described a similar experience while working on the group that authored the chapter in MORE [OB10] on PROM. He describes how, despite the fact that the Term PROM Trial and the *Cochrane Review* emphasized that choice of induction or expectant management are reasonable and should be offered, the committee debated the issue and settled on recommending induction.

Within this pattern of under interpretation is the persistent tendency towards singular rather than plural understandings of the evidence. It is striking that this pattern is often in contrast to the way in which the evidence is presented in the conclusions of the original research articles or other tools for EBP, such as systematic reviews or CPGs. The turn towards singular understandings can happen at several levels. Many informants find a more nuanced presentation of the evidence by researchers than by guideline writers, or when comparing a systematic review to a hospital policy. The evidence tends to get framed, at one step or another, as "one right way". Informants gave many examples of reading the research to support offering choices with different risks and benefits, but reported patterns of practice in their institutions which worked to limit choice.

The Term PROM Trial is the clearest example of researchers presenting findings as open to multiple interpretations. The authors overtly recommend that women be offered "information and choice about how their care should be managed given that the methods studied" are "all reasonable options for women and their babies . . . since they result in similar rates of neonatal infection and caesarean section."[37] And yet informants report a very different interpretation by their institutions and colleagues, with induction as the widely used approach.

Although the original post-term trial does not make practice recommendations, in a follow-up article titled "Post-term Pregnancy: Putting the Merits of a Policy of Induction of Labour into Perspective", Hannah concludes: "Women should be informed of the benefits and risks associated with the policies of induction of labour and expectant management and their preferences regarding these policies should be respected."[44] As the principle author of the 1997 SOGC guideline, Hannah acknowledges expectant management as an option which some women may prefer despite the "slightly lower risks" associated with induction. It is interesting to note that the SOGC's Maternal Fetal Medicine Committee that reviews and co-authors SOGC guidelines goes further and appears to warn against the dangers of over application. They note

that induction prior to 41 weeks may increase interventions especially for women having first babies for whom induction doubles the risk of caesarean. Again, although the researchers and guideline writers seem to support choice, the impact on hospital labour floors appears to be the opposite.

Some informants saw this pattern of difference between the research, evidence tools and practice in the less ambivalent conclusion of the TBT. Although the researchers write: "A policy of planned vaginal birth is no longer to be encouraged for singleton fetuses in the breech presentation",[1] the recommendation for caesarean section was, according to Hutton as one of the co-investigators, never intended to lead to a denial of care to informed women requesting vaginal breech birth. From this perspective the impact seems to have been very different than the researchers' intent. After the sudden change in practice they saw following the publication of the trial, many informants report that women seeking a vaginal breech birth are unable to find a skilled and willing care provider, a phenomenon echoed in the literature[45-49] and in the emergence of breech birth consumer advocacy groups.[50] The issue of lack of access to care as an unexpected effect of EBP will be explored in Chapter Ten.

During the time period that I conducted my interviews, although some EBP critique had begun to appear in the maternity care literature, with the publication of articles like James Goodwin's "The Tyranny of Evidence-based Practice"[33] in the *JOGC*, much of the critique bubbled under the surface of the maternity care community. Despite recognition that researchers often acknowledged multiple interpretations, I noted passionate and unsolicited reactions during my interviews towards the researchers whose work was seen to have profoundly changed practice. Canadian obstetrician and researcher Mary Hannah was a key player in the evidence movement in maternity care. Because she assumed such a leadership role in several key trials of the last two decades: the Term PROM Trial, the Post-term Pregnancy Trial and the Term Breech Trial, many of the care providers I interviewed commented on her role. Reactions ranged from what could be described as worshipful to extremely negative. Some expressed anger, blame or regret about involvement in participating in some of the clinical trials. From others, especially from those who had been mentored by Mary Hannah or worked as a co-investigator, I noted a kind of protectiveness. Aware that Hannah herself was becoming an object of blame within the community, some made comments which appeared to be aimed at defending her from personal criticism for the way in which others applied her research. Many pointed out that although it seemed her work in each case appeared to prompt significant movement towards higher rates of

intervention, this was not an issue of how the research was done or reported but how others applied it. Others described Hannah as naive about the implications of her work and suggested that researchers need to consider the ways in which their findings are likely to be taken up in practice. Several raised concerns about Hannah's "defensive" reaction to critique, with the observation that she often appeared to believe that the questions she asked and facts she presented were neutral.

Invisible Interpretation

The way in which evidence appears to create neutral facts is linked to the invisibility and singularity of interpretation, which work to hide the ways in which all conclusions about evidence are contextual and value laden. One example that several informants raised is that the term breech trial is interpreted to prove the "fact" that vaginal breech birth is physiologically dangerous. For many in the obstetric community this appears to have become an indisputable biological fact. An alternative interpretation, discussed in the text of the original article, is that care provider skills at vaginal breech birth could be improved. The latter interpretation is supported by Kotaska's critique of the TBT and evidence which emerged from Europe showing better outcomes in countries with historically higher rates of breech birth and more experience with selection of the appropriate candidates for vaginal birth.[13,51,52,52,53] The view that labour after a previous caesarean or that pregnancy going post-term are dangerous is based on the same pattern of interpretation made invisible by the use of evidence to create science-based fact. Murray Enkin commented on this process of creating facts through the use of numbers, statistics and the legitimation of science:

> *It's creating facts. It's a reification of something. If you can quantitate it, it's real. If you can't quantitate it, it's not real. . . It's not what the evidence is but how people interpret it.*
>
> Enkin 5:746

During a 2003 debate on post-term pregnancy at the annual conference of the University of Toronto Maternal and Infant Research Unit, initially headed by Mary Hannah, Phillip Hall challenged *Cochrane reviewe*r Patricia Crowley. He asked whether the very small and potentially insignificant differences shown in the Cochrane meta-analysis between induction and expectant management should lead practitioners to advise routine induction at 41 weeks. Hall role played two very different ways of presenting the evidence to women, both arguably in keeping with the

research findings. Crowley acknowledged in her response that evidence is always framed, whether by reviewers or individual providers. "I have to agree that we are all spin doctors and that we do put our own spin on the information that we give to women".[54]

Over Simplification

The avoidance of multiple interpretations is also linked to a problem informants identified as oversimplification of the evidence, which works to avoid context, complexity and difference. Most expressed the view that it is understandable that in complex health care systems managers and practitioners look for "one right way", often through a protocol or a guideline, to approach problems consistently and to attempt to reduce the human error that the need to use judgment is seen to bring into the decision-making process.[55] Many explained that in some clear cut cases (the most common example being applying the results from drug trials) an unambiguous finding can be applied in a simple protocol. Some noted that even in drug trials complexity can emerge to trouble the findings of RCTs. In the case of Vioxx, which focused on gastrointestinal effects and missed serious cardiac risks, the resulting scandal cast a light on the links between researchers, drug companies and academic journals.[56]

The care providers I interviewed worried that care during pregnancy and childbirth is very different than drug treatment and that RCT research may not be an ideal methodology for childbirth. RCTs are designed to answer a singular, isolated question, whereas pregnancy and birth are complex bio-social processes. In addition, the circumstances in which RCT evidence is applied are full of complexity that trial findings may not be able to address, raising questions of generalisability. Methods which seek "one right way" may not work for childbirth.

Enkin draws a distinction between simple, complicated and complex problems. He explained during his plenary address at the University of British Columbia 2005 conference "Maternity Care in the 21st Century" that maternity care has each kind of problem, with each type of problem requiring different solutions. Simple problems can be handled with "*recipes*", like using antibiotics for infections or blood transfusions for severe postpartum hemorrhage. He states: "*They usually work and work well*". (Enkin 8:88) Complicated problems, like visualizing the fetus in utero or providing pain relief in labour without sedation of the mother, require expertise and technologies. These technologies may have side effects, but for the most part "fixes" can be found with enough resources and expertise. Complex problems do not respond in the same way. Enkin uses an example he attributes to University of Toronto philosopher Sholom

Glouberman to illustrate the problem of complexity. He also refers to the Heisenberg Uncertainty Principle used in the physical sciences to explain that the processes of measurement and observation involved in research may alter findings:

> *Complex problems are, however, entirely different. We can never be sure what is going to happen. The example that Sholom Glouberman gives of a complex problem is raising a child. Formulae, recipes, have a very limited application. Expertise in parenting is a help, but is neither necessary nor sufficient to assure success. Nor do we know how to define success. Every child is unique and a successful outcome for one may be a failure for another. Every child is subject to unforeseen influences that are not under your control. Minuscule factors can have far reaching consequences. A chance meeting with a friend, or with a bully. A teacher who fosters your child's talents, or who blunts her curiosity. No matter how good you are as a parent, you can never be certain about how your child will turn out. Indeterminate. Like Heisenberg's electron.*
>
> Enkin 8:90

Like the critics in the EBM debates, some of the care providers I interviewed linked the over simplifying effect of EBM products to "cookbook medicine" which reduces practice to rote actions and does not support practitioners to think critically or take context into account. Kotaska worries that while striving for EBP, institutions and individuals become rigid and fail to respond to individual situations using their skill and judgment. In his experience, those using EBP in this inflexible manner often forget that even within the EBP framework, evidence and guidelines are only parts of clinical decision-making. Kotaska captures not only the problematic nature of guidelines but also their appeal. He explains how they are used to try and moderate the variation in practice that inspired the EBP movement:

> *The problem is the guidelines have become law. And the number of times I hear when I'm talking about going outside of guidelines, the number of times I hear experienced clinicians say "Oh we can't do that. Until the SOGC or ACOG endorses that, we can't do that. That's against the law." Even though every proponent on paper of evidence-based medicine says "This is only one component for consideration in the equation of deciding what course of action is right in any clinical scenario." . . . By having clinical practice guidelines you're hoping to prevent mavericks, prevent people who are way outside of the bounds, and bring people into what we know works, right? But at the same time you are sometimes enforcing mediocrity.*
>
> Kotaska 31:446

Over Generalization

The care providers I interviewed gave many examples of over simplification where research findings are generalised to populations that it does not apply to. Like Goodwin, Kotaska

developed his critique of the TBT using the concepts developed by Mark Tonelli as the "philosophical limits" of EBM:

> The philosophical limits of evidence-based medicine include failing to appreciate and cultivate the complex nature of sound clinical judgment, failing to appreciate the relevance of poorly quantifiable clinical phenomena that are obscured by randomization, and devaluing the intangible differences between individuals, thus potentially devaluing them (patients and care providers). The condemnation of vaginal breech delivery by one randomized controlled trial and its sweeping effect on clinical practice show how each of these philosophical limits can be exceeded.[11]

Kotaska uses the breech trial as a case study of the "inappropriate use of randomised trials to evaluate complex phenomenon". His concerns focus on a lack of screening for appropriate candidates for vaginal breech birth; lack of appropriate standards of skill of the practitioners who participated; the homogenization of both the population and interventions studied; and the simplification of risk. He explains the problem of over generalization:

> A major limit of evidence-based medicine is the difficulty in applying the results of randomised trials to individual patients. For example, most would agree that a multiparous woman in advanced labour at 38 weeks with a 3000 g fetus in a frank breech presentation with flexed head and no nuchal cord represents a low risk sub-group of all breech presentations. By studying a heterogeneous group of women, the term breech trial lacks the external validity needed to guide us with the management of such women. Yet experienced obstetricians will now press for an emergency caesarean, not trusting their clinical judgment to discern low risk situations, because all women with a breech presentation have been assigned a similar risk status by a randomised controlled trial. [11]

At the time of our interview Colleen Crosbie was a midwife and nurse with over two decades of experience working in the remote north, in the Inuit region of Quebec called Nunavik. The Inuulitsivik Health Centre in Nunavik is remarkable for having returned birth to the region after decades of evacuation of all women to southern hospitals for birth. The midwifery service of Inuulitsivik has achieved excellent perinatal outcomes with 86 percent of women staying in Nunavik for birth with care within the language and culture of the region by locally trained Inuit midwives.[57,58] Crosbie talked about how inappropriate it is to impose standards of care developed in southern and urban centres to the population she works with. Her example provides credence to Kotaska's description of how the TBT is misinterpreted and misapplied:

> *. . . the breech study was done not on Inuit people and yet it's applied to them . . . Dystocia is very uncommon . . . this study about breech doesn't apply. It's increased the caesarean section rate and caesarean is very risky for the Inuit population because of the remote location and number of pregnancies . . . whenever we consult a doctor about a*

breech the recommendation is for caesarean section, whereas we've never had trouble having a woman pushing out her breech babies.

Crosbie 6:26

Crosbie worked in the north both prior to and after the Term Breech Trial and noted a dramatic change in obstetric consultant's attitudes after the trial results were published. Previous to the trial, women from the region who went south because their babies were breech were often considered by physicians and midwives to be excellent candidates for vaginal birth, as they often had already had several normal vaginal births. Crosbie explained that there were always some "surprise" breeches born in the community because they were either undiagnosed prior to labour or came too early and too quickly for transport. Occasionally women with a baby in breech position refused to go south. This meant that it was not unusual for breech babies to be born in the north under the care of the local midwives. Prior to the TBT most physicians accepted that in this population, vaginal breech birth in the community was part of the maternity service, despite lack of access to caesarean section. Crosbie noted that women from the Nunavik communities had high success rates with vaginal breech births without untoward complications, both in the south and the north.

This approach to breech birth, which reflected an understanding of the specific population and the challenges of remote maternity care, changed after the TBT. Crosbie related stories of women who were told that it was too dangerous to have their breech babies vaginally having caesareans and therefore returning to the north with "a scarred uterus". Having had one caesarean, the women would now have to go south for their future births, meaning separation from their families for weeks and giving birth far from home for every subsequent pregnancy. Crosbie explained that many women do not understand this consequence at the time of the decision for caesarean. For Crosbie, this kind of decision-making seems to leave out the bigger picture of the woman's long term reproductive health. She refers to the "ripple effects" that do not seem to have been considered or discussed with the women. The policy of caesarean for all breeches does not take into account the geographic and cultural context of those living in remote communities. The policy did not require that caregivers consider the individual woman's medical history, life and social context. Crosbie noted the increased risk for a woman living in a remote community with a scared uterus, a risk which is increased if she has many pregnancies. She worried that higher rates of placental problems after caesareans could impact maternal and fetal health and noted that they increase with every subsequent pregnancy and repeated caesarean.

Crosbie spoke of one case which shocked her Inuit colleagues, when a breech baby was coming quickly in the remote health centre. This led to phone consultation with a southern physician who insisted the woman be given drugs to try to stop contractions, hoping to allow transport hundreds of miles by plane in order to have a caesarean section. The baby was born safely before the plane had even landed, but the local midwives questioned the rationality and safety of the plan insisted upon by the consulting physician. Crosbie noted that the level of fear about breech birth expressed by most southern care providers since the TBT seems out of perspective with the actual risks. The idea that suddenly after a research paper has been published there is only one way for a breech to be born, rather than a set of risks and benefits to be weighed, seemed to Crosbie to interfere with the consultant's ability to understand the context and make judgments related to the specific circumstances. Crosbie relates that for some in the community, like the Inuit midwives, this lack of contextualizing undermines confidence in southern health care:

> *Now* [breech presentation] *is an indication to transfer south for delivery where they go into the high risk obstetrical care down south with no midwifery care, and the outcome is usually a c-section. Even if they've had two or three babies and a five minute second stage for a nine pound baby and that kind of thing. And it's just heart breaking . . . You know,* [once she has had a caesarean] *then in her future pregnancies, she is required to go south to have her babies. So once she's had one caesarean it means that she's going to be out of her community for every birth . . . And we have had a few women with their breech babies also stay north with informed choice. But most often if they talk to an obstetrician the options are presented in a manner that frightens them about their delivery. And they agree to go south.*
>
> Crosbie 6:42

Owen Hughes raises similar themes in his discussion of the tendency to treat every woman the same way regardless of their obstetric history, worrying that the trend to caesarean section for all breech births and for twins, neglects to consider the specific circumstances of the individual. He argues for an approach that takes the particular woman into account:

> *Well I really think we should revisit the term breech trial. A lot of us believe that. And you know, also be careful. The population* [studied] *that's not our population. The population* [who request breech births] *is these multiparous women who have had a number of births and they're ready to have another one vaginally. And it's like twins. You've got two vertexes there. Why go epidurals and planned section and all this stuff when it likely is they're going to pop out.*
>
> Hughes 10:262

Anne Houstoun echoes these themes. She expresses the idea that the experience and skill of the care provider is critical and cannot be generalised by looking at trial findings conducted with many practitioners who would have had limited experience of breech birth:

> *Well again I think the same travesty has happened with breech as with post-dates, that everybody gets lumped in together. And when you talk about breech deliveries, one is not the same as the other. So a term 12 pound primip breech is a totally different story from a multip with a 7 ½ pounder . . . That's apples and oranges. So when everybody gets lumped in together, and I haven't done the analysis but I've spoken to other people who have looked at those studies in more sub-groups and it looks like there's a . . . group whereby it would be reasonable. And it kind of goes back to the old things that we did. You need somebody with some experience. You need a frank breech that's neither too big nor too small. If you use those criteria, there are many women who would still be eligible and I think that's a crime that they've now actually removed that.*
>
> Houstoun 9:352

Baskett expresses similar concerns about induction for post-term pregnancy in women having their first babies. He advocates an approach which would take parity into account when planning how and when to induce in a way that is more nuanced than the trial calls for:

> *We know absolutely that if you induce a primigravid woman, you double her chances of caesarean section. Absolutely. We found this here in the '80s. We still find it. So multips are different. Multips, doesn't matter. There's no increase. But I always say to the troops, I say if you approach a primigravid woman with induction on your mind, you've just doubled her caesarean section rate straight off the bat.*
>
> Baskett 1:245

Menticoglou also links the way in which he has seen post-term evidence applied as an overly simplistic "cookbook" to all women. He expresses concern that some providers do not weigh the risk of induction for women who have had previous caesareans, as they are reluctant to wait for spontaneous labour past 41 weeks. He worries that care providers lack understanding of the differences in the populations studied and how the information from research from more than one study interacts:

> *. . . they extrapolate from a study and include people who weren't originally included. I mean for example the post-dates* [trial], *they specifically excluded people with a previous caesarean section. Well we've had the scenario here where we've had obstetricians decide to induce women with a previous caesarean section, no other complicating things except that she's had a caesarean, and now she's hit seven or eight days overdue. And we know that the moment you induce somebody with a previous section, you approximately double their risk of rupture compared to letting them go into labour on their own. And when you ask them why they're doing that* [they say] *"Well the Mary Hannah trial said we're supposed to induce everybody at 41 weeks." Well specifically she excluded people with previous caesareans.*

Menticoglou 16:44

The body of Mark Tonelli's work on EBM has focused on the fact that although it is one piece of the decision-making process, it is the beginning rather than the end of a process. Optimal clinical medicine for Tonelli must involve the practitioner in exercising judgment and the recipient of care in deciding what is important by weighing risks and benefits. For Tonelli, the temptation to see EBP as a way to simplify practice and to dismiss "*other kinds of knowledge*" is dangerous:

> *But the problem with the idea of the simplicity of evidence-based medicine, that evidence trumps all the rest of it so we don't have to worry about all the rest of those things if we have some compelling evidence out there is unrealistic and does not lead to the practice of optimal clinical medicine. Again, it's falling back on that idea "Well this will make it a lot simpler". It doesn't. And if anything, all the evidence that we have now to deal with only makes these things more complicated. And it doesn't allow you to dismiss all of the other kinds of knowledge that may be important to a particular clinical decision.*
>
> Tonelli 52: 266

Some informants talked about not wanting care to be limited to being informed by quantitative evidence only. Céline Lemay's use of the concept of "*having the right to ask for complexity*" expresses a kind of resistance to the narrowness which she sees in a simplistic application of EBP, as well as a sense of confidence in what Tonelli's "*other knowledges*" can bring to care:

> *The problem is that it's not just the empirical thing we need, it's too poor. For me it's too poor. It's not enough. Because the reality is much richer. So I want to have, I have the right to ask for the complexity and the richness of that. I am so privileged to work closely with women as a midwife and so it's not limited to using strict and singular and linear ways.*
>
> Lemay 33:160

Kithei's concept of wrestling with how to apply science while still respecting "*who women are*" and "*what is important to them*" expresses what many of informants from all care provider groups explained that they strive to do and how they ideally want to work. She also expresses the dissatisfaction that many had with the simple answers provided by RCTs in the "*messy*" context of maternity care:

> *To take something as, what's the word I'm looking for, as reductionist as the randomised controlled trial, and try and apply it to something as messy as having a baby and growing a family within a culture is, a polite way to say it is its imperfect. I mean it's almost impossible, but that's what we* [as midwives have] *chosen to wrestle with and to*

say well we can't throw out women and who they are personally and what's important to them, and we can't throw out science and yet we can't easily marry the two.

Kilthei 27:21

Informants worried that a simplistic application of EBP gives permission to avoid the need to discuss more than the risks and benefits of decisions, to avoid discussing alternative approaches and the woman's values and preferences. Guidelines create a short cut sanctioned by science. Enkin readily acknowledges that he once believed the answers for maternity care providers would come from RCTs. He is now fascinated by the mismatch of the hierarchy of evidence and the complexity of childbirth. He sees an urgent need for those producing and applying evidence to understand the implications:

We have lots of complex problems in maternity care. In fact, most of our remaining problems are complex. Is gestational diabetes a disease? How can we address the problem of premature labour? How can we deal with the medico-legal concerns that so strongly impact on our practice? How can we evaluate interventions when the outcome depends on the skills of the individual practitioner, or on contextual factors? We are doomed to failure if we persist in treating problems like these in a linear, reductionist manner, as if they are simple rather than complicated problems. We must learn to recognize them for what they are, and approach them accordingly.

Enkin 8:91

Conclusion

Patterns of uneven and over application of evidence appear, to many informants, to be at odds with the goals of EBP to reduce variation in practice and overuse of interventions. They report a tendency to interpret evidence as singular and factual. The process of interpretation of evidence is often invisible. Overly simplistic interpretations of evidence can lead to application to women in situations where they may not apply. Many informants raise concerns that these patterns in the "hows" of applying evidence in maternity care may restrict access to care and choice about approaches to care. These are unexpected outcomes that informants believe are not intended by the researchers or guideline writers. Exploring the dynamics of how informants use evidence raised many potential reasons that help explain why these patterns happen. The next chapter will explore how care providers seem to use evidence to support their beliefs and pre-existing practices. Other directions in the application of evidence will follow, with subsequent chapters exploring a lean towards technology; fears about risk and responsibility and pressures of the increasingly industrialized health care system workplace.

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Chapter Six: Directions of Evidence: Belief and Legitimation

Introduction

The previous chapter explored the dynamics of how evidence is applied, misapplied and not applied. The remaining chapters explore the directions of evidence and the factors that help explain why the application of evidence takes these shapes and follows these patterns. The maternity care providers I interviewed did not hesitate to offer insights and observations about the underlying forces that shape the ways that EBP has influenced their practices and their practice environments. Murray Enkin explains why he has come to see that it is important to go beyond "*what can be counted*":

> *I was wrong I think in my feeling that intuition, knowing inside I was right would provide the answers. It certainly didn't. I was wrong when I pursued the path of looking for quantitative evidence to provide the answers. It didn't. Where I am now is looking to qualitative research to no longer just ask what happens but why is it happening. Not what people say, but why do they say it? Why do they feel that way? It's a whole field of research which is beyond me because all my training has been quantitative. But the students I'm working with now are some miles ahead of me in trying to get inside, know what people are thinking and why rather than just what can be counted.*
>
> Enkin 9:83

Informants appeared to share Enkin's interest in "trying to get inside" the nuances which inform the application of evidence. They spoke compellingly about the "whys" of what they saw as unintended and unexpected uses and effects of the new paradigm, which sometimes ran counter to the principles of EBP. However, as if to demonstrate the hegemony of EBP, most qualified their comments in some way, noting that they were only offering individual opinions and "had no evidence".

The focus of this chapter is on the impact of belief systems and the desire for legitimation of belief systems and pre-existing approaches to practice. It explores the themes of using evidence to promote and resist change, to challenge power and consolidate power. It explores how a seemingly neutral scientific approach is used politically by participants in the health care system. As in the debates in Chapter Four, EBP in maternity care, once seen as a challenge to authority and hierarchy, is viewed by some informants as a new and powerful authority.

When asked why some evidence is quickly and easily applied and other evidence is difficult to implement in maternity care, all informants concurred that evidence is much more likely to be taken up when it reinforces or legitimizes caregiver attitudes and beliefs or

institutional culture. Although EBP by its very definition seeks to avoid practice based on care provider opinions, preferences or values, the ongoing importance of these factors to the application and misapplication of evidence was universally acknowledged by the care providers I interviewed. They were more likely to use the terms belief, value or predisposition than opinion to describe an underlying influence, implying a less rational and perhaps less conscious process. They were more likely to describe the influence of opinion when describing the influence of experts on the creation of evidence-based practice tools, such as clinical practice guidelines (CPGs) or when experts determine institutional policy.

Caregivers from all groups were clear that the influence of attitudes and philosophies about birth and women's bodies, about technologies and interventions in childbirth and about the physiology of birth operates at both the individual and the systems level. Feminist and critical examinations of medicalised childbirth in the academic and popular literature have documented differing world views labeled as the medical and midwifery models[1] or technocratic versus humanistic or holistic views of birth.[2] Many informants noted that the potential importance of beliefs or world views and the factors and systems that inform these views, often remain unacknowledged among care providers in the era of EBP.

The application of evidence for legitimation can support individual or institutional agendas, whether in the direction of the status quo or of change. Evidence is used to justify both restricting and offering choice. Informants shared experiences of the ways in which expert opinion and institutional and professional power structures remain important forces in determining practice and in establishing institutional norms. Enkin makes the point that although he thought that the EBP movement would overturn opinion and personal belief as determinants in clinical decision-making he has come to understand that acceptance of evidence remains dependent on belief. He argues that pre-existing opinions and predispositions are critical to its uptake. An understanding of this "truism" is, for Enkin, essential to understanding the application of evidence in day to day practice:

> *Evidence is only evidence if it's believed, and it's only going to be believed if it fits in with preconceptions. Those are a couple of I think truisms.*
>
> Enkin 8:297

Informants conveyed the view that there are both passive and active processes that help explain why evidence is applied differentially. Fitting in with preconceptions works to either create a fertile or inhospitable ground for evidence. Karyn Kaufman adds the concept of looking

for legitimacy, which will be expanded throughout this chapter:

> *Clearly it has to do with some kind of readiness to be pushed in a certain direction or to take it on board because it reinforces something you already really would like to have happen or you want some legitimacy for making that action.*
>
> Kaufman 26: 198

Believing and Not Believing Evidence

Many informants made comments that illustrate how gratifying it can be for caregivers to find that science supports their pre-existing beliefs and practices. Descriptions of personal responses to the experience of finding that evidence supported their opinions and approaches to practice tended to be expressed in emotional as well as in clinical terminology, speaking to the level of investment clinical care providers often have in their ways of working. Thomas Baskett comments on research about the third stage of labour (delivery of the placenta). Several RCTs showed that the routine use of oxytocic drugs, called "active management of third stage", reduces blood loss. Baskett is pleased to see that this evidence confirms his beliefs:

> *The other area where I think we have had success with evidence-based medicine in labour management is the third stage of labour, and to my great happiness that actually supported my biases which was that active management using an oxytocic was of benefit. And in a sense, if you looked at all the aspects of evidence-based medicine and the management of women in labour, that's the one that comes through as black and white. You know, repeated trials have all shown benefit and really no harm, and it's very cheap. To me, that's ... it's one of the great deals that exists actually.*
>
> Baskett 1:59

Perle Feldman and Helen McDonald refer to "*early*" research that supported the physiologic approaches to labour and birth that they believed in:

> *And the studies that were done early on were just very important and did tend to confirm what I thought. The women-centred approach to obstetrics was something I believed in very strongly from my many years as a women's health activist which I was before I became a doctor, from the age of 17. So it was really exciting.*
>
> Feldman 14:22

Using self-deprecating humour, McDonald frankly exposes the underlying assumption that many early enthusiasts point to, that the "truths" revealed in EBP would support their perspectives on best practice:

> *I did some undergraduate stuff at McMaster and one of the courses I took was critical appraisal of research literature. And that was the first time that I'd actually seen* [the concept of EBP] *laid out systematically. Blew my mind away. Absolutely. I thought it was wonderful. I never thought it would answer all the questions, but I did think it was*

wonderful. And I think the reason I thought it was wonderful was that I thought it would be a really good tool to use to make people practice the way I wanted people to practice.
McDonald 38:38

Maternity care providers from all disciplines described how they found themselves and others engaged in an active search for evidence to reinforce how they already do things and what they see as ideal practice. Philip Hall compares the tendency to apply evidence to suit pre-existing practices to the way that "*water flows down the deepest channel . . . which happens to be the channel that is what [we] already believe*". (Hall 20:293) Hall asserts that we read evidence to answer the question:

So what can I find in there that tells me I'm doing the right thing? We don't like to be told that our practice may not be good. Most people involved in clinical care are good people. . . . but there is an astonishing spectrum of attitudes and willingness . . . and it becomes sort of easy to say okay, from now on all breeches I'm just going to be delivering by caesarean section. I'm not going to worry about it anymore. So and so said I should do that.
Hall 20:291

He raises concerns that the use of evidence to reinforce existing practice can interfere with the necessary critical analysis of evidence which should follow publication of research findings. He fears that healthy debate can "*stop short*" when the "*label*" of the gold standard RCT or meta-analysis is available to reinforce pre-existing beliefs.

For sure they probably didn't read the article, let alone look at its detail. The article itself may not have had sufficient stuff in it to validate the recommendations at the end, whether it's the breech trial or another one. They don't look at that. They just say is there an RCT and even better, is there a meta-analysis to support me? I don't even know how to do one, but is there one? I know if there's a meta-analysis it must be a good thing and therefore I should do that.
Hall 20:292

Hall emphasized that the health care decision-making process is a psychological phenomenon that is more complex than a mechanical process of applying evidence. He worries that EBP presents an apparently simple solution that fails to take into account research on how decision-making happens. In his interview he referenced concepts from decision psychology[3-6] in order to explain why beliefs and other human factors influence how evidence is applied. Hall, like Sermer in Chapter One, refers to William Osler, a Canadian physician from the late 1800s, to illustrate that this perspective is not new. Osler also saw that medical decision is more than the

rational application of evidence and is often prone to error:

> *William Osler said something like "The human mind is constantly misled by the rut of one or two experiences." The human mind is predisposed to accept without challenge information supporting pre-established beliefs and it's predisposed to not read or think about information that's right in the face of that. We've made some colossal errors over time and we still do, just because of that.*
>
> Hall 20:197

Several informants specifically addressed the dilemmas presented to care providers when they are challenged by the fact that evidence is not concurrent with their beliefs. Many felt it was important to challenge themselves when the evidence contradicts personal beliefs but were not always convinced that practice should change when evidence does not "fit". Kaufman explains her worry about using evidence "*when it suits our purposes*":

> *What I struggle with is that we seem to pull out evidence when it suits our purposes. And we tend to just not question it when it doesn't seem to be bothering us, like electronic fetal monitoring. So I don't understand why for example the Department of Obstetrics, the obstetricians, aren't more concerned about it, why they think its okay to continuously monitor everybody. I mean it doesn't make sense to me and that's the group that needs to help make that culture shift if it's going to happen.*
>
> Kaufman 26:72

Enkin's description of the evaluation of evidence as "soul searching" describes a process that is much less clear cut than many advocates hoped for:

> *If the evidence supports what you intuitively know is right, that's great. And that's what I found happened most of the time. But when the evidence contradicts what you know is right, then you've got to do some real soul searching. I don't think you can assume that you're right despite what the evidence says, but you also can't assume that the evidence is right . . .*
>
> Enkin 9:59

Obstetrician David Young was president of the Society of Obstetricians and Gynecologists of Canada (SOGC) at the time I interviewed him. He asked for some time to consider his response when asked to talk about why many care providers are not willing to follow the SOGC guideline which recommends intermittent auscultation (IA) rather than electronic fetal monitoring (EFM). He spoke frankly about his personal reluctance to accept the evidence about the lack of usefulness of routine EFM and the guidelines recommending IA. His reluctance is admittedly ironic given the fact that he was not only president of the SOGC but also one of the authors of the guideline. He acknowledged that he personally believes that we do not yet have enough quality research to clearly show the benefits of EFM. He stated that he is "*anxiously*

awaiting the further information and further evidence" and is convinced that EFM will prove to be superior. As an explanation for why the evidence currently supports IA, he talked about how difficult it is to teach health care practitioners to use EFM well. He conveyed that he himself has a sense of confidence about using and interpreting EFM but that others may be misled by the "*noise*" and "*limitations*":

> *Despite the evidence and despite the fact that I'm an evidence-based person, I believe that fetal heart rate continuous monitoring is good. I believe that our problem is we haven't learned how to use it properly. We try to transfer that information to people* [but] *they don't get it. They can't separate the noise from the real. And* [practitioners] *don't realize the limitations. I believe if you put me with a fetal heart rate monitor and a patient and I will do better than me with intermittent auscultation.*
>
> Young 55:186

He thought that perhaps this underlying faith in the benefits of the more technologic approach, despite the apparent current best evidence, has influenced many of his obstetric colleagues to persist in using EFM routinely for all women.

Some informants explained that after their own personal soul searching, they adopted evidence that challenged their beliefs. This was a distinct and different process than when they described adopting evidence-based guidelines they did not agree with because of pressure to comply with institutional or professional norms or because of medico-legal concerns. It tended to be physicians who described a complete change in beliefs and practice, such as avoiding routine episiotomy, because of new evidence. It tended to be midwives who told me they "took on evidence" that went against their philosophies because they felt that evidence should override their beliefs. Several midwives gave the example of accepting that the routine use of oxytocic drugs to deliver the placenta would decrease postpartum hemorrhage, although this seemed to be counter to their general belief in the superiority of physiologic approaches for healthy women. The attitude expressed was that if they were going to use evidence to support their world views, they also have to accept evidence that does not. Interestingly, this pattern in how midwives describe that they apply evidence appears to contradict one of the findings of research conducted by Michael Klein on Canadian caregivers' attitudes and beliefs. He found that midwives knew about the evidence in favour of routine screening and treatment of all women for Group B Streptococcus and the routine use of oxytocic drugs to deliver the placenta, but did not routinely use these approaches. Klein states: "Midwives were the most likely to be aware of the research but the least likely to apply it".[7]

This finding is explained by exploring different understandings of what applying evidence means. For my midwife informants, accepting the evidence did not lead to routine care but to informing and recommending or offering the treatments. They then actively supported women's choices, a process which resulted in a lower uptake than in Klein's physician cohort. Consistent with this understanding, Klein reports that midwives tend to see EBP applied as "a triad with the evidence, women's preferences and clinical judgment" all coming into play. Physicians were more likely to decide to either apply or not apply evidence as a routine and less likely than midwives to decide to offer choice, resulting in a higher uptake of treatments.[7]

All of the care provider groups gave examples of where they sought policy solutions when they disagreed with the interpretation of the evidence in their institutions, seeking a change in guidelines or protocols at either the hospital or professional level. Some in each group responded to evidence they did not agree with by deconstructing and critiquing the research, digging into the data looking for confounders and errors and looking to other jurisdictions for other findings or even pursuing further research themselves. Andrew Kotaska's reaction to the TBT was to travel to Germany, one of the "dissenting" countries which rejected the findings of the trial based on their own national data, to learn about their successful techniques for vaginal breech birth. After the publication of the trial's long term findings, Kotaska worked with allies within Canadian obstetrics to create a new SOGC guideline recognizing that vaginal breech birth is a safe option in defined situations.[8]

Eileen Hutton described the inspiration for her PhD research, an RCT of external cephalic version (ECV), as an example of responding to a meta-analysis that did not sit comfortably with her clinical experience. Although it was generally accepted in the medical community that the question of the best timing for ECV had been answered, Hutton wanted to ask a more nuanced and specific question than the previous RCTs. This stemmed from her training as a midwife when she learned from an expert clinician that it was best practice to turn breech babies before term, when they are smaller and the procedure is easier. However meta-analysis of the RCT evidence showed that a percentage of babies will turn naturally if you wait until term, which avoids the risks of the procedure and of triggering preterm labour.[9,10] Although Hutton considers herself a strong proponent of evidence-based practice and talked about the importance of care providers challenging their own beliefs when evidence does not confirm them, she felt the ECV evidence was not good enough. She wanted to know if there were times when an earlier attempt at version would benefit mother or baby, and as a PhD student she was in the position to address this

question. She conducted two RCTs that ultimately showed evidence of a higher success rate for early ECV with first babies and those with extended legs (frank breech), with no increase in preterm labour.[11,12]

Enkin spoke about his concerns when some of the "softer", more social innovations in maternity care that he championed did not show benefit when tested through RCTs:

> *It took me a long time, far too long, to seriously question the evidence that we were so busily accumulating. Most trials were convincing to me, particularly the many that confirmed what I already "knew" about the lack of benefit from common maternity care rituals, or the ones that showed particular interventions or treatments to be better than the alternatives tested. I had had niggling doubts, however, right from the beginning, when sometimes trials failed to confirm, or even tried to overturn my tacit knowledge. Several randomised trials, for example, showed no benefits from providing food supplements to malnourished pregnant women. Hey. Were we to conclude that hungry women should not be fed? Prenatal classes, so obviously useful to pregnant women anxious for information and help, failed to show the expected benefits. Our McMaster trial of the Leboyer approach to gentle birth that seemed, and still seems, so sensible to me failed to demonstrate any effects on baby development. Massive trials of social support for marginalized women failed to show any effect on rates of prematurity or low birth weight. Something had to be wrong. What was going on? Should we believe the randomised trials, or our common sense? The paradigm that we had so staunchly supported, so vociferously promulgated, says to believe the trials. Look at the evidence. Look at the facts. But what should we believe when we know that answers the trials gave us are wrong?*
>
> Enkin 8:65

Wahoski notes that when care providers or policy makers pick and choose only the evidence that they agree with that it is often less quantitative aspects that are neglected. However, unlike Enkin, she is referring to practices that have firm evidentiary support, but are seen as "softer" and are often ignored such as one to one care in labour or skin to skin contact between mother and baby. This can happen when more social elements of care are based on quantitative data, as well as when the evidence is qualitative. The effect for Wahoski is that the application of evidence is fragmented rather than holistic:

> *You know, we're all talking about evidence-based practice. You can't just pick the things that you want . . . you have to put the whole picture together. You can't just say, I like this one and pick this one, and ignore the rest of the stuff. And I find that happens, you know. I want to do this. What about all that other stuff that should go in there, and either soften the picture or extend the picture. You know, especially some who are more into science also take the hardcore data stuff when some more of the qualitative stuff tends to be ignored.*
>
> Wahoski 53: 235

Processes of selective interpretation based on personal beliefs and system wide struggles over interpretation when evidence does not easily "fit" can help explain the persistence of variations in practice that EBP was meant to address. Kris Robinson's use of the word "*paradigm*" points to the importance of not only individual beliefs, but also broader world views about birth, to explain why evidence is "*turned around*" to fit:

> *I mean why is it that you've got such a variation in intervention rates between one practicing obstetrician and another and between one nurse and another? I mean you're exposed to the same information. It's how people choose to selectively turn it around and apply it to their own paradigm, their own belief system. They actually believe that electronic fetal monitoring is better . . . I believe that's better so I'm going to interpret it like this and I think I have a reasonable grounds here to interpret it in that way, and choosing not to look at all the outcomes and all the other ramifications of that.*
>
> Robinson 45:194

Tonelli and Kaufman speak to the "*flexibility*" of EBP as it is actually practiced, rather than as its proponents propose, as practitioners with very different approaches find evidence to support them. For Tonelli:

> *I mean that's one of the great things about evidence-based medicine. You can say you practice it because there's so much evidence out there that whatever you decide, that you want to cling to, you cite, or whichever one you think is most compelling to you. You can justify a wide range of practice.*
>
> Tonelli 52:238

Kaufman sees values as a lens through which evidence is "*censored*":

> *Clearly there is more than one way to look at* [evidence] *because a discipline or different individuals will censor it based on what they believe. And beliefs are brewed in the values. And so when* [evidence] *reinforces those beliefs and values, you will be an early adopter. And if it serves your professional interest.*
>
> Kaufman 26:250

Her word choice implies that aspects of the evidence may be modified or not included in an interpretation, echoing Wahoski's concern "*about all the other stuff that should go in there*" and Robinson's "*choosing not to look at all of the outcomes.*" The closer the evidence comes to reinforcing beliefs and values, the quicker and more fully it is taken up. How evidence is censored is guided by the values of a discipline or by professional interests.

Beyond Individual Beliefs

Many informants, like Kaufman, pointed beyond individual beliefs to professional world views, structural systems factors and particular social and historical moments which prime individuals, professions and the health care system for uptake of certain evidence. Enkin

illustrates this concept of readiness for evidence by referring to research published by pediatricians Klaus and Kennel in the early 1970s. This research helped to end the routine separation of mother and baby after birth[13,14] and bring in an era where "bonding" between parents and the newborn baby became the norm. He points out that the research methodology was not strong by current standards; however it was published in prestigious publications including *Pediatrics* and the *New England Journal of Medicine* (*NEJM*). This place in prominent journals both reflected a cultural moment of openness to change towards a less clinical and more humane approach to birth and helped propel a revolution in the care of newborns. Enkin explains:

> *How come Klaus and Kennel's paper was so influential and made such a major change in obstetrical thinking? It legitimized something that people already wanted to do.*
>
> Enkin 8:57

Fraser describes the context for the Term Breech Trial in similar terms. He notes that although RCTs work best to answer an important and apparently unresolved question in clinical practice, the TBT findings were congruent with an already widespread belief in the medical community of many countries. Many informants made the same point, explaining the rapid adoption of this evidence by the fact that the obstetrical community was already strongly biased in the direction of caesarean section, particularly in North America. Fraser's language and his sense of the inevitable death of vaginal breech birth was shared by most informants:

> *I think that there were a lot of factors that influenced the uptake of that information. One of them obviously is the medico-legal environment. But you know, in many regions a large number of obstetricians had made the decision that caesarean section was the best option for breech. The trial was the nail in the coffin really.*
>
> Fraser 15:46

Mohide places the breech trial into a context of increasing social and professional acceptance of caesarean birth for a growing number of indications. All obstetricians have confidence in the skills involved in surgical birth given that rates are close to thirty percent. Increasingly fewer have little hands-on experience with vaginal breech birth as breech presentation occurs in about three percent of cases, most of which are now born by caesarean. In this context, vaginal breech birth is often perceived as a stressful and risky experience for the obstetrician, leading many caregivers to have personal preferences for caesarean. Mohide comments that with the TBT, "*Mary Hannah let everybody off the hook*". (Mohide 41:218) In his view, the trial excused obstetricians from the responsibilities of selecting appropriate candidates for vaginal birth, of educating women about the risks and benefits of both modes of birth, and of

offering women the choice of how their babies will be born. It also excused institutions from finding ways to maintain the skills and systems needed to support safe vaginal birth for breech babies. Mohide explains:

> *They didn't have to live through that negative experience* [of the stress of a vaginal breech birth]. *So I think the world was ready for the results, not that I necessarily believe the results, but the time was right. And I think it's like that book called "The Tipping Point."*
>
> Mohide 41: 219

Mohide explained that he finds resonance in an example he borrows from Malcolm Gladwell's *The Tipping Point*[15] in relation to the impact of the TBT. Mohide describes Paul Revere's role in catalyzing the American Revolution. Another rider going in another direction had no impact on recruiting villagers to the cause. Mohide explained that the difference lay in the context, in some of the "*preliminary things that have to have occurred before the tipping point, that point at which you can push something over the edge".*(Mohide 41:219) He likens this concept of a tipping point to the TBT:

> *I think there were a whole series of things that were happening in the world all tipping people in that direction and then the trial came out and just made it easy to make the move, to do it.*
>
> Mohide 41:219

It is telling that Payne's observation about obstetricians' reaction to the TBT describes concern about risk to the obstetricians prior to concern about the risk to the baby:

> *My guess is that the term breech trial, even before that trial there were less and less people who were able to feel confident in delivering a term breech. All the older obstetricians are dying out and retiring and so I think there was a lack of confidence. And I think it was taken up almost like a relief, an excuse to say "oh we don't have to put ourselves and the babies at this kind of risk". That's my own opinion, you know, but I think it was almost like "Oh thank god".*
>
> Payne 43:80

Kaufman referenced the work of Jonathan Lomas and the Canadian Health Services Research Foundation (CHSRF)[16] on the application of evidence to health policy often called "knowledge translation". She found Lomas' approach that makes values and interests overt aspects of EBP helpful in explaining the importance of values to why evidence is applied differentially:

> *Group*[s] *like CHSRF spend a lot of time trying to figure out how you get the decision makers to adopt the findings from research. The translation and the application of the findings to the policy world is something they're worked really hard on because they find that policy makers by and large are pretty resistant to evidence. And I taught health*

policy in the graduate program with Jonathan Lomas and he has this whole take on this. He puts the research stuff in the knowledge domain, as unemotional, which may or may not be true, but then the value sector is a separate sort of sector and then you [also] *have the interests. So for him it's the knowledge, value and interests. If those all line up then you have an easy sell and an easy adoption.*

Kaufman 26:201

I think that if the knowledge contradicts the values, then it's not going to be easily picked up. Or you will sometimes see policies adopted or interest groups allied because their values and interests all of a sudden coincide even though the knowledge may not even be particularly persuasive. So you get coalitions around a certain thing for a while until it all starts to fall apart because it's maybe more interest driven than values driven. If the values are there, it will take root and stay.

Kaufman 26:206

Hall and Klein discussed how they unexpectedly discovered the importance of institutional and professional cultures to attitudes and beliefs while being involved in research focused on clinical findings. Hall referred to a research study for which he was a co-investigator, conducted in the 1990s in Ottawa, examining predictors and indications for caesarean section. The study found that institutional culture or belief systems were powerful predictors of the rate of caesarean section, more than the population served or level of care provided.[17] He elaborates:

We were wondering what kind of things steer whether a caesarean section is done. And one of the most powerful things predicting operative delivery was that in the mind of the provider of care, the label dystocia or its equivalent had arisen. Now here's where it got interesting. There were four hospitals involved. Two of them had relatively high caesarean rates and two of them had relatively low caesarean rates. Two of them were community hospitals and two of them were level three [tertiary care] *hospitals. The highest and the lowest were the two tertiary units. So you had two tertiary units dealing with basically the same clientele. One of them had the high c-section rate, the other the lowest. And so one of the conclusions out of that was that one of the strongest predictors . . . was the culture of the institution itself. If you went to a certain hospital, that in its own right partly determined how your baby was going to be delivered.*

Hall 20: 157

Klein reflects on an RCT of routine episiotomy[18] for which he was the principle investigator in the early 1990s:

I started to look inside [the data] *because there were certain things that became immediately apparent to me. And that is there were physicians in the trial, one wonders why they joined, who had almost 100 percent episiotomy rate. And since they were supposed to have a 50 percent episiotomy rate roughly, it was clear that they considered episiotomy to be the way to avoid trauma because that's the way the trial was structured. I sent a letter to all the 43 practising physicians who participated in the trial before they had the results of the trial, and I asked them a whole series of questions about episiotomy*

but also about many other issues. And we analyzed this and you could divide the physicians basically in episiotophiles and episiotophobes or some other kind of terminology you could use and when you did that, it wasn't just episiotomy. The episiotomy was a window through which you could look at a whole philosophy. So when we analyzed our trial, we published it in the Canadian Medical Association Journal and it shows that there are whole belief systems operating here and I found that this was much more interesting than the trial.

Klein 29:30

These insights led Klein to organize a provincial study, followed by a Canadian Institute for Health Research (CIHR) funded national study, to examine attitudes and beliefs among different maternity care provider groups in Canada. He had completed the provincial study[19] and was working towards the Canadian study when I interviewed him. His work showed differing attitudes and beliefs along a continuum, with obstetricians generally more likely to support more technological approaches to birth and midwives more likely to support less technologic approaches, with family physicians and nurses usually falling between. He noted differences as well as overlap between all groups, with some obstetricians "thinking like midwives and some midwives thinking like doctors".[20]

Klein's findings are not surprising. There was widespread agreement among those I interviewed, ranging from those in the leadership of the evidence movement to front line care providers across professions, that the application of evidence is influenced by beliefs, attitudes and world views, both at the individual and systems levels. The importance of Klein's research lies in raising the issue in the literature. According to the care providers I interviewed, there is little discussion in day to day clinical practice of how beliefs and attitudes affect the application of evidence. They also noted lack of discussion about how to manage when there is conflict in the philosophies and belief systems that seem to determine how evidence is used. Interviewees noted that the oft heard claim "*it's the evidence*" can silence debate and get in the way of discussions of underlying attitudes and world views.

Kerstin Martin worries not only about avoiding discussion of beliefs, but also the way in which EBP works to ahistoricize current best practice. She finds the unspoken contradiction between the goals and the reality of EBP "*extraordinary*":

We talk about the evidence as though it's objective truth, as though what I believe now is really true. [We think that] *evidence-based practice offers even more support for what I actually subjectively believe. It's extraordinary.*

Martin 36:574

Hall compares the experience of questioning the results of an RCT with the outrage that was

provoked by when Copernicus or Galileo questioned the belief that the earth is flat. He conveys a sense of the backlash that he and other informants have experienced when they have questioned the products of EBP:

> *Well to me we're doing exactly the same thing now when we accept that somebody did an RCT and they publish it and they say this is what it means, and so you should be* [silent] *... It shuts down. It closes the discussion. The information is all in. We shouldn't be even thinking about this anymore.*
>
> Hall 20: 197

An unexpected effect of the success of EBP appears to be that although health care systems have invested in a huge infrastructure to produce, evaluate and bring evidence to the bedside, there is little support for understanding the impact of the lens through which evidence is interpreted. This is ironic as the importance of differing attitudes and beliefs about birth was a dominant topic of debate just prior to the rise of the evidence movement, brought to professional and public attention by childbirth and women's movements. As described in Chapter Two, this debate about differing world views about birth was linked with the early roots of EBP and helped to catalyze its growth.

Robinson spoke about the problems the EBP paradigm presents to those making arguments for maternity care policy based on values. She used the example of supporting women in labour and providing one to one care, asserting that *"there may be some things that are just values that we choose . . . . it's the right thing and the best thing not to leave women alone in labour"*. She questioned why there would need to be an RCT to prove this, "*and yet we had to have a huge multi-centre trial*" to prove safety and cost effectiveness when "*It's just a good thing to do*". (45:80) Her comments refer to a Canadian trial of nurses providing one to one care in labour[21] and multiple systematic reviews.[22] Resistance to basing policy and care decisions on values rather than on scientific evidence alone becomes more difficult to confront if the EBP paradigm has silenced a debate about values.

Perceptions of EBP as "objective" appear to delegitimize the discussion of values and objectives of care that the *ECPC* authors were so careful to point out were essential to guide science yet could not come from science. Care providers, hospital administrators and policy makers create mission or value statements, but for the most part these are isolated processes which do not appear to take account of or responsibility for the interaction of values and belief systems on how the application of evidence works. One informant spoke about "*science as the trump card, the final arbiter*" (Kaufman 26:130), which seems to make discussions about

caregiver and patient philosophies and values and professional and institutional cultures irrelevant.

Using Evidence for an Agenda

Although individual or institutional belief systems are seen to be very powerful and often potentially unconscious frames for evidence, informants also talked about explicit uses of evidence for specific agendas, either to make or resist change or to reinforce status quo approaches to care. Informants both critique and champion the use of RCT findings for an agenda they support without any sense of contradiction. Some informants such as Klein and Enkin express a healthy skepticism about the ways EBP is used and underlying motivations and power structures:

> *I mean we have to make a distinction between evidence-based medicine and the misuse of evidence-based medicine. . . So there's evidence, and there's evidence. So in this debate you find of course that people are using evidence. They choose which evidence to use. That's discouraging.*
>
> Klein 29:764

> *Our ruling elite, our political leaders, our scientific leaders justify themselves in the name of reason, but all too often they forget that their power and methodology is based on specialized knowledge and manipulation of rational structures rather than really on reason.*
>
> Enkin 8:53

Klein expresses disappointment that evidence is "used" to support personal or professional agendas. Penny Simkin calls the deliberate use of evidence to justify ever increasing rates of obstetrical intervention the "*the prostitution of the term*".(Simkin 50:759) Reynolds and Hall both use the term "*decision-based evidence making*" to rename the process to reflect this reality. Reynolds describes this concept:

> *I'm more convinced that the evidence we seek is often meant to support pre-suppositions that we're really looking at not evidence-based decision-making, but decision-based evidence making. We're looking for evidence that supports decisions that we've already made.*
>
> Reynolds 44:47

Evidence for Change

Many talked enthusiastically about personal experiences using evidence to support what they perceived as a positive agenda for change and to accomplish what has been labeled as "quality improvement" within their institutions or personal practices. Informants of all backgrounds described how during the first decade that followed the publication of *ECPC*, EBP

had fulfilled many of their hopes and expectations of evidence as a powerful tool for change. Simkin expresses what many of the care providers I interviewed felt about the initial impact of EBP for change towards a more physiologic and more social approach to childbirth:

> *Well, you know, I used to say science is on our side.*
>
> Simkin 50:441

Linda McCabe's explicit interpretation of the Pre-labour Rupture of Membranes Trial to support normal birth rather than induction was described in the previous chapter. She explains her approach as an example of using evidence for change. She spoke about the active and overt use of evidence to support normalcy in her hospitals labour and delivery unit, noting that a different belief system would potentially influence the application of the same evidence in a different direction. McCabe's comments illustrate how evidence can be framed in the context of a set of values:

> *We believe in expectant management and not having early oxytocin. However, if we had the other perception that pregnancy, yes it's normal for all women, but it's fraught with complications and you just never know when something is going to happen and we have to be on our toes at all times, then that I think slants how we view the evidence, how we view what we're doing.*
>
> McCabe 37:172

McCabe and Biringer talked about the second stage of labour as an aspect of care where they have seen evidence used to encourage lower rates of intervention and both felt the impact had been positive. In the past, the second stage or "pushing" phase of labour was often considered inherently dangerous and intervention with forceps or vacuum extraction to shorten labour was common. An RCT, led by Bill Fraser demonstrated that waiting for "passive" or physiologic descent of the fetal head improved outcomes and decreased interventions, especially for women having first babies or using epidural pain relief. With this approach, caregivers wait until the woman feels a physiologic urge to push before they expect descent and also accept longer second stages as normal.[23] The research challenged the traditional nursing and medical practice of vigorous pushing, strict time limits and routine instrumental birth if time limits were exceeded. Biringer describes this "*positive change*":

> *I'm thinking of the whole concept of active versus passive second stage. And incorporation of that into practice. Which I see as a very positive change. You can* [now] *accept much longer second stages without fussing as long as mother and baby are fine. So that's an example where the impact of EBP has been actually quite liberating.*
>
> Biringer 2:68

McCabe is one of the initiators and authors of the Ottawa Hospital Second Stage Guideline[24,25] which she and her colleagues introduced at two affiliated hospitals. At the time of her interview, McCabe used the experience of developing and implementing the guideline as an example of successfully using evidence to support normal physiologic birth and address variations in practice at her hospital. Her subsequent experience at the second hospital, reported in an evaluation of the guideline, was mixed. McCabe and her co-authors note that although the guideline supported practice change in the one hospital, it had little impact in another, citing attitudes and culture in this latter institution as barriers.[26]

Midwives repeatedly expressed that when EBP first started, it seemed to reinforce a majority of their practices which had often been marginalized and even considered less than scientific. Like Simkin and Kaufman, many midwives talked about how important it was to find that science seemed to be "*on our side*" (Saxell 47:222). Saxell, Krysanauskas and Payne practiced prior to the legal recognition of midwifery in Ontario and BC. They describe how the growing emphasis on scientific evidence in maternity care offered support for midwives in asserting and defending the legitimacy of midwifery as a profession and its practice of supporting physiologic approaches to birth:

> *I actually thought evidence-based practice was going to really usher in midwifery philosophy and midwifery standards of practice and it really looked like that in the early days. I thought it was actually on our side.*
>
> Saxell 47:222

> . . . *in my own practice, as I worked outside of regulation it became very important to look at evidence-based practice because it did, I believe, support women making choices and* [support] *me* [working] *outside of the hospital setting. I used it as my support. And I would use it when I talked in public discussions. So then I was really being more aware of it too because of all the political work I was doing, trying to get midwifery legally recognized.*
>
> Krysanauskas 32:26

> *I guess my history with it began as a midwife in attempting to change practice in the birthing environment in this country and evidence was our only tool to use as we were under a lot of scrutiny, especially working within the hospital before we were legal, before the midwifery program. And I remember Caroline Flint in Great Britain used to have a little binder with her. Whenever her practice was questioned, she'd whip out her binder with the evidence and I always thought it was a really good idea.*
>
> Payne 43:10

Payne refers to UK midwife Caroline Flint who carried research articles with her to

support evidence-based decisions which were outside of the norm of the hospital. Several midwives I interviewed reported it was common practice to be "armed" with the research in case interprofessional colleagues questioned midwifery approaches.

Midwives Kaufman and Robinson actively participated in research to try to make change. Kaufman used research to try to make a case for the integration of midwifery into the Canadian health care system. She talks about her experiences working from inside the system to legitimize midwifery, reflecting on attempts at McMaster to use RCTs to provide evidence for innovative approaches to care, such as nurse practitioners and midwives:

> *And they took that whole paradigm of the randomised trial kind of approach and applied it to the use of nurse practitioners. They took consenting family practices who were willing to incorporate a nurse practitioner and then randomised those practices to either get or not to get a nurse practitioner and they looked at patient outcomes and various things. So they had grappled with health services questions using a trial design. So when Murray* [Enkin] *and I were interested in trying to approach the whole question of could we have nurse midwives incorporated into maternity care . . . we designed something quite similar.*
>
> Kaufman 26:42

The plan at McMaster was to conduct a randomised controlled trial comparing midwifery care to physician care, following a similar trial of nurse practitioners. Interestingly, the research funding came through but the hospital did not give permission for the trial to be conducted, which Kaufman speculates was related to physician resistance to midwifery. Despite this, her experience convinced her of the potential to use evidence to make change:

> *So that's kind of what hooked me around the notion of incorporating research into questioning what you were doing and being able to use what research might be able to tell you to make some change.*
>
> Kaufman 26:117

Robinson also reflects on the early days of the EBP movement as contributing to positive change by supporting the introduction of midwifery in Manitoba:

> *The 1980s and early 1990s were exciting times in this particular context because midwifery was coming, people were talking about it. I was young and enthusiastic and really wanting to be a change agent and had been exposed to places where practice was different. Now there were emerging challenges in the literature. The Cochrane was starting to be talked about. Murray Enkin and all of that. Effective Care. People were starting to talk about where's the evidence? This was so affirming for people like myself*

> *who were right at the cutting edge, if you will, of trying to effect change here in the hospital. And at the same time working towards bringing midwifery in. So the '80s were exciting and we accomplished an awful lot in terms of changing the basic conditions for birth in the hospital.*
>
> Robinson 45:51

Houd described how she first learned to use evidence for change after noting the wide variation in practice in Danish hospitals in Chapter Two:

> *Yes, well evidence was important to making change because you needed something that could have a value in our society. So I was using it as a means of changing things and make people think.*
>
> Houd 22:87

Family doctor Owen Hughes talks about how he used research and evidence to question the routine interventions which were common in his institution and to support innovations such as laboring in water:

> *When I first moved to this hospital, this was a very traditional hospital. And Dr.* [Name] *and I were the only two physicians in Ottawa doing home births with midwives in the early days. We pioneered changes here. Birth bed deliveries, no draping, no masks, no shave, no enema. You know, asking the question each step of the way "Where's the evidence?" Same thing with ruptured membranes in the Jacuzzi. "Hey, where's the evidence?" We did the study and showed there was no problem with contamination.*
>
> Hughes 24:42

Hughes found that even when using evidence, change towards non-intervention was difficult to achieve. He asks the question "*why always so reluctant to accept the evidence?*" (Hughes 24: 44) He also described how he learned to use the practice of EBP to challenge himself to justify how he was practicing and offer choices. He talked about wanting to treat his patients "*like competent adults*" who were capable of making choices, even if the choices were seen as controversial by his colleagues, such as home birth or expectant management of post-term pregnancy. He indicates an awareness of medico-legal considerations and that using evidence wisely is part of justifying practice that may be outside of the norm:

> *I'd say to myself "What am I doing here? On what basis? Do I have convincing and compelling evidence that I can document here in writing why I'm doing this?" I have to be able to support that, and if I can't I'm out on a limb.*
>
> Hughes 24:44

Evidence for Choice

Using evidence for positive change was linked by many informants to supporting choice. Like Hughes who wanted to support his patient's choices even when they were not the norm and

the midwives studied by Michael Klein, informants from all provider groups discussed the issue of choice in relation to singular versus multiple interpretations of evidence. In some situations, care providers wanted to use evidence to support women and families to make choices about their care rather than promote one specific approach. McCabe explains:

> *We were really careful when we wrote our guidelines to say that above all else, what the woman wants is primary. There are a few approaches that are reasonable and should be offered. This has helped with consistency.*
>
> McCabe 37: 212

The goal for McCabe is consistency in choice being offered, not in finding one right way to treat all labouring women. McCabe described how the PROM and second stage guidelines at the Ottawa Hospital used evidence to avoid a tendency for institutions to enforce one right way to approach most clinical situations. They hoped to support providers to enhance the woman's participation in the decisions about her care by making it an overt part of the expected approach. This use of guidelines to assist care providers in providing information and choice and in grappling with the nuances of evidence represents an example of resistance to the use of guidelines for standardization and "cookbook" medicine. Interestingly, these guidelines also help with a consistent, although not always uniform, approach. McCabe and her colleagues ensured that all women are aware of what the care options are, through the policy expecting all care providers to offer choice and client handouts. This is a different experience than that described by Sue Harris in the previous chapter, where "*everybody*" (Harris 21:27) in her hospital seems to disapprove of offering choices in the case of term PROM.

Martin speaks to the importance of the language that is used in clinical practice guidelines or policies to how much she feels she can use evidence to facilitate choice:

> *I feel comfortable . . . to do things according to my own judgement and the reality of the situation as I'm actually seeing it and the woman's choice, when the evidence is presented in a way that something should be offered or something can be suggested. Whereas there are certain areas in which I feel there's just no manoeuvring room any more at all. Like breech delivery.*
>
> Martin 36:73

Members of all care provider groups spoke about using evidence to support offering choices. Midwives, however, described this approach to evidence as a mandatory part of their philosophy and model of care. They also described resistance from other care providers who believed it was a care provider's role to prescribe best practice rather than offer choices. In my interviews, non-midwife care providers acknowledged the legitimacy of offering women choices

based on evidence and many gave examples of how they incorporate choice into their day to day practice. At the same time, many conveyed a sense of regret about the many barriers to offering choice that seemed to be built into the maternity care system.

Informants talked about the barriers of lack of time, resistance from women, lack of support from colleagues and institutions, lack of support from professional organizations and medico-legal pressures. For example obstetricians felt that they could no longer offer the choice of vaginal breech birth or post-term expectant management because of a lack of support from their colleagues, professional organization and insurers. Family doctors spoke of being unable to offer the choice of IA because the nurses would not follow through on this decision. Nurses talked about lack of support both from physician and nursing colleagues and problems with staffing and workload as getting in the way of many physiologic approaches to birth. All non-midwife care provider groups talked about women expecting to be told the best approach by the doctor as an expert and authority. All provider groups mentioned concerns about medico-legal liability. Systems factors and professional and popular "birth cultures" which influence how evidence is used and not used will be explored in the next chapters. The fact that some informants from each of the professional groups identified barriers to their ability to offer evidence-based choices is significant in light of legal and ethical obligations for health care providers to inform patients about not only risks and benefits of recommended treatments but also about alternative approaches.

Reducing Practice Variation

There is a tension evident in informants' comments between recognizing how evidence can support choice and wanting to use evidence to reduce practice variation. Rory Windrim proudly describes the SOGC ALARM course as an evidence-based tool to bring the different maternity care professions together. Like other informants, Windrim hopes that working from the same knowledge base will improve care and relationships between professions. The ALARM course and its offshoot MORE^{OB} uses an interprofessional committee to regularly review the content and update its manual to include new evidence. These courses are also taught by an interprofessional team and offered to all maternity care providers. For Windrim:

> *It's been very altruistic, very Canadian, and every year as I say the evidence is rewritten into it again. And it's also multi-disciplinary which I like because I think it shouldn't matter whether you're a midwife or a maternal fetal medicine person and I think all of us would say they want the same thing. Healthy mom, healthy baby, and everybody to be happy. So it's been very pleasantly multi-disciplinary.*

Hughes expresses similar convictions about MORE^{OB} which in many places in Canada has become an important part of continuing education within hospitals. These courses have also been integrated into either residency or undergraduate education of physicians and midwives.

For some of my nurse informants with experience as leaders on labour and delivery units the courses and their standardized approaches empower them as administrators. The courses are a vehicle to address what nurses report as inappropriate variations in practice. This use of evidence as a tool to alter physician behaviour is described in the health policy literature as fraught with challenges.[27] SOGC courses and guidelines were seen by some of informants as tools to normalize birth and address the overuse use of interventions by setting national guidelines. Both nurses and physicians saw EBP as a way to alter what Kotaska called "*maverick*" (Kotaska 31:446) physician behaviour in Chapter Five and what Haidon described in Chapter Three as the "*inconsistencies*" (Haidon 13:33) in physician practice that make nurses vulnerable. Nurses not only talked about their use of evidence to moderate physician behaviour, but also spoke passionately about using evidence to make change in what they characterized as their sometimes very conservative profession:

> *I felt if they* [nurses] *were involved in the research like I had been, that maybe that would be more convincing. So I made a very purposeful process of involving bedside nurses, diploma nurses and baccalaureate nurses. I got six nurses from the unit who were direct caregivers who had never done anything* [in research] *as part of their core care studies. So I'm hoping that by having more involvement* [in research] *at the grassroots level instead of being ethereal and way up there, it will change practice . . . my focus has been on the bedside changes that we can make.*
>
> Dore 7:46

For some physicians, the ALARM and MORE^{OB} courses are ways of coping with a changing interprofessional environment, part of reassuring physicians that midwives are part of the team and not an unknown quantity. Several of my midwife informants mentioned the courses as helpful in this regard, while others noted that the claims to improve interprofessional respect were somewhat naïve. They noted that in some hospitals the courses in fact reinforced that there was only "one right way", making it more rather than less difficult to gain respect of interprofessional colleagues if they used evidence in a nuanced or individualized way which did not fit exactly into the MORE^{OB} recommendations.

Shifting from Change to Authority

Although Robinson and Wahoski describe the early moves towards EBP as affirming for the progressive changes they were trying to implement as nurse managers, they also describe a shift over time in the use of evidence as a potential barrier to change. This shift is concurrent with a move away from a broader and more political discussion of what is important about birth and the care of pregnant women and babies and towards a narrower and more authoritarian attitude towards evidence. For Robinson:

> *Something happened in the late '90s, and now that whole move towards "where is the evidence" that challenge or that imperative started to be introduced so that you can't change anything without the evidence. Well now we're stuck with a lot of stuff that we can't change unless you have the evidence . . . We did change some things. We certainly don't do any shaving. We don't do any enemas. We have moved to a certain point where we're not routinely starting IVs on people. And we are a little bit more liberal about allowing women to eat and drink and that sort of thing. But at the same time, electronic fetal monitoring is still used routinely and we are fighting over the evidence.*
>
> Robinson 45:54

In Wahoski's words:

> *Yes evidence has helped to make changes but I'd like to see more around environment. Just the environment, what does that do to women? We've got a lot of the science, but we don't have a lot of the softer stuff that we've looked at yet. And clearly to be able to shake people into listening to you, you've really got to have that support. You know, an example, we were talking at the Ministerial meeting a couple weeks ago about births having to go back to the community, when so many small hospitals have closed. And the statement was made that the communities are better if people birth in the communities. But we can't just make a statement like that. We need to be able to support that statement. Is there literature out there to support that statement? And we've got to support everything nowadays which becomes a bit of a pain in the neck.*
>
> Wahoski 53:211

Wahoski goes on to explain that it takes skills, resources and time and therefore funding to use the evidence most effectively, making the requirement to base all change on research findings an impediment to those who do not have access to a research infrastructure:

> *So whenever you want to do something, you've always got to turn to it. That takes a great deal of time, especially if you don't have a really good research department or CNSs* [clinical nurse specialists] *that can invest the time that it takes to do this stuff. Managers, we're tied up in the day to day stuff, we don't have a lot of time to go out and be creative and look and explore. We really need to get that evidence and get some more ideas and talk to more people. And I think that if we were able to do that and commit more time to that sort of thing, we'd be able to move programs a lot faster.*
>
> Wahoski 53:216

Brabant also describes a cultural shift within maternity care when the use of evidence seemed to change from being a transformative force towards physiology and humanization of care to being used for other agendas. For her, evidence is a tool that those in positions of power can use to influence directions in the application of evidence. Like many others, Brabant notes two phases in the impact of the EBP movement in maternity care, one which introduced a cautious approach to interventions followed by what she calls "the religion part":

> *If you will let me tell you my feeling of why at first we liked* [EBP] *and it's true that it confirmed, it went along our beliefs. But it's also that obstetrics was at a time where the principle of precaution was not applied to many of the interventions that were practiced at the time. So when research started looking at that, it looked at all those interventions that had been done over and over again without ever being looked at. So to me the reason why I liked evidence-based practice, I mean I agree it went along my beliefs, but it also obliged people retrospectively to use the principle of precaution. So they had to say "Whoops, we have to stop doing the routine episiotomy. Whoops, we have to stop shaving women." And then we got to the end of that in a way and then we moved into the religion part where it's such a powerful tool that anybody with power can grab it and then bring the* [application] *of the changes in the direction that he or she would really like them to go.*
>
> Brabant 3:86

Larry Reynolds described how evidence was at first used to "*speak the truth to power*", (Reynolds 44:324) and then how the reverse become true, that evidence seemed to be used most often to consolidate power. A number of informants expressed worries that the exploitation of research findings for political or professional purposes was a potent tool to serve vested interests. As Klein explains:

> *It's political. I mean we're talking about a whole series of studies that are methodologically strong in the sense that at least they're using some reasonable methodologies. They didn't used to do that. It was all opinion. But people have learned how now to hijack evidence-based medicine for political purposes . . . this is just unconscionable.*
>
> Klein 29:98

Harris concurs:

> *And I guess another thing is that I think sometimes what we do is we have trials that are well constructed and look like they should produce evidence, and we twist the conclusions to meet certain agendas*
>
> Harris 21:12

Several informants cited the use of the Lydon-Rochelle's VBAC data[28] by the American medical establishment, as described in Chapter Five, as the most frequent misuse of data towards an overt agenda. Several informants pointed to the political context for this shift in the use of

evidence about VBAC. They noted an increasing push back from American physicians to managed care approaches which attempted to reduce costs by encouraging vaginal birth. Health Maintenance Organizations (HMOs) frequently adopted evidence-based directives promoting a trial of labour. The VBAC guidelines were resisted by physicians as administrators and insurance companies increasingly dictating clinical decisions. This context created a ready climate for any data that would give an evidentiary basis for elective repeat caesareans. For some informants, the publication of methodologically weak research in the prestigious *NEJM* was suspect of using evidence for an agenda, particularly because the publication did not add significantly new information. The article was seen as a vehicle for the *NEJM* editorial by Greene[29] which made strong recommendations for repeat caesarean. Some informants saw this sequence of events as transparently designed to give obstetricians permission to recommend against VBAC. Penny Simkin points out that the data about the risks of VBAC hadn't changed but the way in which the facts were being used had changed. As she describes the same evidence is used in a different direction: to support rather than challenge an interventive model of obstetrics:

> . . . *when I think about what's happened around VBAC, you know, the evidence that supported VBAC is the same evidence that is now not supporting VBAC* . . .
>
> Simkin 50:207

It is worth noting that the American College of Obstetrics and Gynecology (ACOG) guidelines from 1999 [30] had recommended a "cautious approach"[31] and that rates of VBAC in the US were already diminishing.[31-33] However, what informants and other commentators[35,36] emphasized was that it was the 2001 *NEMJ* article and following editorial that tipped the scales towards a rapid decline in rates of VBAC and lack of access to the choice of VBAC for many women. This change in practice was so sweeping that *New York Times* published an article in 2004 about American women who wanted to choose VBAC being unable to find a physician or a hospital willing to provide care.[37] Canadian practice rapidly followed suit.[38]

The American debate influenced VBAC guidelines in Canada to shift from "recommending" vaginal birth to "informing" women about the risks of a trial of labour.[39,40] Part of what offended many informants was that the use of non-RCT evidence in this debate was not consistent with the EBP paradigm, yet appeared to be legitimized under the label of evidence-based practice. This is consistent with a flurry of critiques which followed the *NEJM* publications.[35,36,41-47] Feldman sees this process from the *NEJM* article and editorial, to the

changes to the VBAC guidelines and the decreasing VBAC rates as part of a larger push back from the profession of obstetrics. She sees this push back as a reaction to the previous success of challenges to medicalised birth. In her view, nurses, midwives and family physicians had been supported by evidence to work with women towards reclaiming childbirth as a normal experience. She wonders if this trend threatened the interests of the obstetric profession:

> *I think it is the empire striking back. And not so much the evidence itself but the New England Journal's spin on the evidence that they have in their editorials. And VBAC in particular, I see as the obstetrical establishment's attempt to take evidence and grab back obstetrical power from the other practitioners and women.*
>
> Feldman 14:22

Robinson also links the use of evidence with the exercise of power. She acknowledges different phases in EBP's impact on maternity care and expresses frustration with what she presents as a kind of philosophical trap. Having used the evidence to support changes that she believed in, she now confronts others doing the same but for different agendas. She describes the kind of conundrum faced by practitioners when they have used EBP to justify change that challenged others' beliefs and values, when evidence then turns against what you have been working towards. She describes how EBP has become the only factor considered in many health policy decisions and acts to silence other kinds of dialogue:

> *Belief systems, they're still very much evident. They're very powerful . . . In some ways* [EBP] *backfired on us. It's even more difficult to change things now. What do you do when the evidence doesn't support what you know is true or what you know, what you believe. That's tough. And now everyone is "talking the same language" because you need the evidence. You need the evidence. You are not going to be listened to you unless you have the evidence. And you can't just say "Well, I know that that's the way it should be", because you* [formerly] *used to criticize people* [for saying that].
>
> Robinson 45:216

Martin believes that many of the inconsistencies in how evidence is applied are not surprising, given most researchers and health care providers appear to believe that science and knowledge are neutral tools and therefore fail to take power relationships into account:

> [We] *have somehow failed to understand that human beings actually don't function on a rational basis. But evidence isn't produced, research isn't done on completely neutral grounds. There was some failure to understand that knowledge is never neutral, I mean this is to me this whole question is like the ultimate sociologic situation showing the inextricable link between power and knowledge and that somehow very powerful people began to take this agenda and make it for their purposes. And it really exposes, more than anything I can think of it exposes how absolutely true that is, that knowledge isn't neutral. It's not neutral, what you want to know, the questions you want to ask, how you*

ask them, how you're funded to ask them. All of that stuff is inextricably linked to some positions of power.

Martin 36:38

Opinion, Tradition and the New Authority

In his address to the University of British Columbia 2005 conference "Maternity Care in the 21st Century", Murray Enkin describes the challenge that EBP hoped to pose to opinion and authority. He also explains the context for the evolution of a new authority sited in the EBP paradigm:

> *A short two decades ago the strongest, most powerful, most accepted evidence in the world was the opinion of an expert, and our problem was how to replace that standard of evidence with unbiased scientific evidence.*
>
> Enkin 12:55

> *As a proud profession we were cozy and comfortable in our smug, self satisfied, somewhat misogynist paradigm. Paradise, but it was under threat. The two tiny burgeoning movements that challenged the status quo, now called family-centred care and evidence-based care, mutually reinforced one another and became stronger. Women began to question the need for the petty indignities that they had to suffer, and controlled trials provided the evidence that these indignities were neither necessary nor effective . . . In parallel, these movements grew into crusades and began to overwhelm the prevailing paradigm. It was like a revolution. Over the short period of a few decades we stopped a lot of unpleasant, unnecessary rituals, although we may have introduced a few new ones along the way. We learned to reject fallible expert opinion and came to base our maternity care practices on research evidence, as objective as we could make it. Doctors were no longer the ones who knew best, the statisticians were.*
>
> Enkin 12:32

Despite the centrality of the move away from tradition and expert opinion to EBP many informants stressed the persistent role of expert opinion and the rise of a new kind of almost unassailable authority centered in the claim of being "evidence-based". They identified this authority as "new" in that its power to influence or even dictate practice is based in the seeming but often flawed use of EBP. Under the surface, the authority came not from the opinion-free statisticians as Enkin and the EBP paradigm had envisioned but continued to flow from within the medical hierarchy. The influence of experts and mentors in shaping how evidence is applied was raised by informants in relation to the production of the tools of EBP, with guidelines and courses such as ALARM and MORE^{OB} and in their day to day work in health care institutions. Informants talked about both negative and positive aspects of the ongoing reliance on expert authority, as expressed by Baskett:

The perfected randomised controlled trial has become the gold standard. And when it shows up as a black and white result, it's very, very impressive and you cannot argue with it and you shouldn't. The trouble is it gets sort of modified and in fact I'm poor at epidemiology, but I know that things like meta-analyses can be quite misleading. And certainly if you're an ordinary person and you read a meta-analysis and it's in an authoritative journal, you tend to accept it. But in fact sometimes they may be quite wrong.

Baskett 1: 83

Lori Wahoski spoke movingly about the importance of making care flexible and compassionate for women and families around the time of birth. She was always committed to humanizing birth throughout her nursing career, but after her own son became ill and died in hospital she brought deep personal understanding of the importance of health care systems to her work as a nurse leader. She talked about the profound influence of medical and nursing leadership on the labour floor. She also spoke of her pride in the "*woman and baby-friendly low risk unit*" she has worked on creating in close collaboration with the physician leader of the department. Together they have established policies supporting normalcy and the social and emotional aspects of birth. However, she worries that the changes they have tried to build into the structure of the unit may not be sustainable because the whole culture of the unit can change with a change in leadership. She is an advocate for the inclusion of women and families in the governance structures of the hospital as a mechanism to try and ameliorate the power of nursing and medical leaders:

Things can change because one or two people leave and that shouldn't be the case. When you've worked so long to make things good, and you've got good outcomes, one person because of their own culture or their own philosophy or belief will come in and change the entire setting. So that's too much power. Much too much power. We don't have at this time any families or women on our councils or administrative teams but we need to go there. They'll put the brakes on for us. If we're not thinking for them, they'll help remind us.

Wahoski 53:279

Wahoski notes that old patterns of practice are very hard to change, even when there is an institutional commitment to evidence-based practice. As an example, she refers to trying to encourage a policy of keeping the newly born baby with the mother and to make the initial assessments with the baby in the mother's arms. She sees the roots of resistance to EBP in the persistence of opinion-based practice.

We all resist change. Administration, physicians, and surprisingly enough, nursing cause they're the ones that are working with the moms. And I guess we'd just taken the baby

away so often that we assumed that we were doing a good thing. We make so many assumptions about what women want and what they need, based probably again on tradition and history and that gets in our way. You know, we think we know without having to resort to the literature or what's been proven to be right or wrong. And that's the paternalistic approach that we've taken for so many years. And it's not going away fast. For some people I don't think it's going to go away. They are so resistant to giving women control and not making the decisions for them. So resistant. And they don't even see that they're doing it. It's become so much a part of what they do. So I think those kind of assumptions that we make for people or staff, that's a big hold out.

Wahoski 53: 235

The literature of knowledge translation, including a *Cochrane Review* on the topic, identifies the importance of opinion leaders and those recognized as expert clinicians (not simply those at the top of an institutional hierarchy) to the uptake of evidence[48,49] and many informants confirmed that this dynamic is a significant factor in maternity care. Dore makes a point that was echoed by others about the importance of teachers and mentors in influencing practice:

I think the other [influence] *is the mentors that we have in our system. We have some very qualified mentors who we admire and think highly of and we see them do it one way, so we want to emulate them and do it the same way regardless of what the evidence says.*

Dore 7:25

Robinson concurs that ". . . *it depends on who is educating who, and who the mentors are."*(45:194). For Haidon the reputation of the researcher and of those who do the work of knowledge translation is important:

I think evidence-based practice is great and can challenge [existing power relationships] *but I think it really depends on who does that research or who does that evidence or who is setting those guidelines and what kind of reputations they have in the community.*

Haidon 19:152

Although EBP has superficially changed the discourse of authority and eroded tradition of "*the master's preference*" as the right way to do things, many informants identified that opinion often operates under the label of evidence. The example of the Greene *NEJM* editorial on VBAC[29] having more impact than less opinionated reviews of the evidence was used by many to illustrate the steering effect of a leader's status in the health care community and the opinions of the audience. Some referred to an influential article by author Henci Goer, "The Assault on Normal Birth". Goer commented on Greene's impact noting "a striking disparity" between "what the study said and how the editorial frames the evidence".[31,32]

Informants conveyed that EBP operates within systems in which hierarchical structures

remains dominant. They gave many examples of how the opinions of those in local leadership positions can trump professional guidelines or international systematic reviews. As was noted in the previous chapter, even the authors of guidelines may disagree and resist implementation, as in the case of EFM:

> *This is really a critical view of medicine in general I think. This is an important criticism which is a speculative thing and we have no basis for why, but it's steeped in tradition. And so there's a reluctance to let go of tradition and what has become common knowledge. So you may notice a lot of the evidence-based guidelines the SOGC have published often are based on level three evidence which is opinion evidence, not factual evidence, not randomised trials, not cohort studies, but basically opinions. Some guru has said "I believe this to be so" and everybody follows along. That's why we've had this hankering after electronic monitoring whereas it's not shown to be any more effective in low risk cases. . . There is this big hurdle to get over: the gut feel that we are opposed to home births or opposed to VBACs or opposed to auscultation on the basis of a feeling rather than the evidence. We have to overcome* [this hurdle].
>
> Hughes 24:38

Physicians Sermer, Hughes and Mohide related how in their work on national guideline committees they met opposition to multiple interpretations of evidence. Their stories reveal that the mechanics or operations of EBP may not be very different from the past use of expert opinion. Mohide discusses how guideline writers find it stressful to interpret the evidence differently than other opinion leaders. He described how the SOGC guideline committee members acknowledged that in the case of screening for gestational diabetes the evidence is inconclusive and supports more than one approach, including not screening routinely. Despite a rational evaluation of the evidence and consensus about what was known and not known, there was resistance on the committee to publish a guideline which did not conform with the stance of the national American obstetrics organization, the American College of Obstetricians and Gynecologists (ACOG). Mohide describes his experience:

> [One committee member] *was so worried about it and he was calling* [a member of ACOG]. *And the Americans didn't want us to do this and they were worried about a Canadian statement. Finally* [the committee] *did the right thing and put* [all of the options] *in.* [The guideline] *didn't quite say what I wanted but got close enough to make me comfortable.*
>
> Mohide 41:118

Sermer also discussed being involved on the same committee at the SOGC and confirms Mohide's account. He contrasts the SOGC gestational diabetes recommendations with those from the Canadian Diabetes Association:

> *Well there were huge fights about the SOGC standards. There were a number of us who, unless they watered it down we wouldn't actually put our name down. It's nothing fancy, but I didn't want my name associated with it unless a number of recommendations were watered down. The Canadian Diabetes Association recommendations are very strong. And I had the opportunity to critique it. I was not an author of it, but they asked me to critique it. So I did critique and I eventually said ....* [thumbs down]. *Not very good. And they chose to ignore* [my critique] *and they published it as is. So it's very pro- screening, pro-treatment, very aggressive treatment. I don't think it's based on evidence. But they think it's based on evidence. And so they will say "based on evidence", and so it's evidence-based medicine, the evidence says you should screen. And then you have SOGC who came up with, based on a review of the same literature, a view which is very opposite to what the Canadian Diabetes Association came up with. So there's your evidence, right? So you can see that smart people often come up with very different conclusions based on the same evidence.*
>
> Sermer 49: 676

Hughes described a similar experience of strong opinion driving the content of an EBP product when working as one of the authors of the PROM chapter of the MORE^{OB} program. He acknowledged that the guidelines for practice in the chapter do not include the recommendation to offer expectant management for pre-labour rupture of membranes at term, consistently with the Term PROM trial findings. Hughes noted that the content was strongly guided by the opinions of particular individuals on the committee and by influential articles by those known to the committee members. Although he does not like his own practice to be influenced by powerful expert opinion, he comments that in working on this chapter the pressures towards opinion-based practice were very strong and that the opinions were influenced by relationships, status of experts and medico-legal considerations:

> *And we debated that in the committee session and of course the majority prevailed and* [other] *guidelines were tending this way. And that Dr.* [Name], *the big guru from the* [national body], *had written* [an] *article and said that this is what it should be. Therefore we'd be hard pressed to go against that, no it's not* [the only interpretation of the evidence] *but you see that's a good example of the SOGC acting on litigation, being conscious of medico-legal implications. It's evidence in their minds. Getting a group of so-called experts together and forming a committee and then making a statement on an honest opinion based on our experience, we believe, that's level three. That is not good evidence. Level two and level one evidence are the ones we go for. But they love level three.*
>
> Hughes 24:370

Hughes's ambivalence about this kind of use of the evidence is demonstrated by his moving from "*we*" (with himself as a committee member included) to "*they*" (those who base guidelines on opinion) as well as by his acknowledgement that although opinion is not good

evidence it is "*honest opinion based on experience*". Of note, both Sermer and Hughes use almost the same characterizations, "*they think it's based on evidence*" and "*it's evidence in their minds*", to describe a process of selective interpretation directed by opinion.

Dore notes that this tendency to value the opinion of experts is very understandable in the context of the day to day realities of the system. She explains that most health care workers will not look to the statistical findings in an article for "best practice" or have the time or skill to critically appraise the evidence themselves:

> *And I think, when you look at evidence-based practice, people can only believe it within the context of their reality. You also have to put it that way because a lot of it is written in a way that it's mathematically consistent and confirming, but if I don't happen to know statistics why should I believe because all I'm reading is the abstract and maybe the discussion at the end. I don't know what all this stuff in the middle means. And unless I have an expert come to my facility, to my practice, to whatever, or more importantly as we're sitting at a scrub sink together or something saying "You know, really this is a better way to do it", then I might think about it. Someone whose opinion I value confirming it.*
>
> Dore 7:70

In a twist on Sackett's vision of evidence used to protect physicians from opinion-based medicine, Baskett conveys the benefits of having trusted colleagues who are experts at understanding evidence to steer practitioners away from accepting evidence simply because it is a RCT or published in an authoritative journal. In his words:

> *And I don't understand all the statistics of it, but in other words we have to be wary of things that sometimes come under the banner of evidence-based medicine when they are not really proven solidly. The trouble is most of us who are clinicians need people to interpret that for us. People like* [name of obstetrician] *who is into that, he can say this is a bona fide absolute good study, or* [name] *is very, very good.*
>
> Baskett 1:79

Co-existing with observations about the persistence of deference to experts and reliance on expert opinion is the perception that the evidence itself has come to be a substitute authority for some. Informants were universally concerned about an approach to the application of evidence where practitioners rely unquestioningly on the products of EBP. For many, one of the most distressing and unexpected effects of the evidence movement was this emergence of EBP as a new authority. Again, many portray EBP as a new religion, evidenced by the common use of a wide variety of religious terms. As in the EBP literature, *ECPC* was referred to as a bible or a sacred text, RCTs a holy grail, the Cochrane database an oracle. Proponents of EBP are disciples and its leaders are gurus. EBP itself is called a cult that is evangelical and dogmatic, whereas

critique is called sacrilege and critics are heretical and blasphemous. Hall's comments embody this religious conceptualization of EBP:

> *The RCT has kind of become the catechism. It's a proxy for religion in a sense. In medical care, obstetric care, we have devout followers. I call them the consensus cult. It's a mind that isn't prepared to interrogate the revelations from on high and challenge them and continue discourse.*
>
> Hall 20:221

Hall is using the image of a "consensus cult" to refer to those who follow "consensus guidelines", that are written by an expert committee. Like those described by Hughes, Mohide and Sermer, consensus guidelines interpret and summarize the evidence and make recommendations for practice. In these guidelines, all of the evidence used is ranked and often despite taking the form of an EBP tool, due to the absence of convincing or quality evidence, the guidelines are largely based on the consensus opinion of an expert committee. Hall expresses worry that an uncritical acceptance of these guidelines is common and that the form of the guideline confers an authority that is not warranted. The sentiment is echoed by a rural midwife:

> *Once the evidence becomes established, that label 'evidence' I think has become almost holy.*
>
> Rural Ontario Midwives 46:34

Tonelli not only describes the religious status of EBP, he also portrays a clash of authority between the deposed clinical expert and the new authority which is based on clinical science rather than clinical experience:

> *And then what happened, and maybe this is why some people have sort of walked away or not been as pleased about EBP, is there has been this switch of authority, or this clash to see who can be seen as more authoritative.* [Name], *an evidence-based medicine authority, is brought in to make an authoritative statement. Doesn't matter what the topic, doesn't matter he never saw a patient with the disease. But he can be an authority to come in, look at the literature and give this authoritative assessment. Or it's the Cochrane database, right? You know, the Cochrane database now looks to me like the Oracle of Delphi. You know, we go to it and we expect, you know, this wisdom to flow...*
>
> Tonelli 52:126

For many informants, like many of the EBP critics from Chapter Four, the power of the EBP label is problematic when it places evidence products outside of what can, or should be, disputed. Martin describes "*agent-less*" knowledge and a "*god named Science*", when referring to EBP. Her comments point to understandings of evidence as free from human origin or error: like religion EBP is presented as outside of or above history, culture and politics:

The continuum was always on the one extreme, that something is true because it's my personal experience and I believe it to be so. And at the other extreme is that kind of agent-less knowledge. It has been demonstrated that, it is known that, do you know what I mean? so that it appears that there is no agent actually. The knowledge is so powerful, I mean it's some kind of god named Science creating it and no fallible human was involved at all, you know?

Martin 36:190

Guiding forces in health care that EBP had hoped to replace, such as the beliefs of individual practitioners and the traditions of institutions and opinions of experts, continue to dominate my informant narratives, explaining in part why evidence is applied in particular ways in particular places. Authority is seen as a resilient structure within health care despite the hopes of the evidence movement, with evidence itself assuming the role of a powerful authority. Enkin shares his disquiet about his realization of the power that being an evidence authority had granted him in work with the British National Health Service (NHS):

We had forgotten the warning to be careful what we wished for, and we got it. We were the new authority, possibly the new tyranny. I became most acutely aware of this when one of the English Health Regions asked me to tell them which obstetric interventions were effective, which they should pay for within the NHS. Imagine. Asking me, a colonial, with no understanding whatsoever about their local context, facilities, resources, priorities, or needs. Asking me what interventions and procedures they should cover in their national plan. Far out. Far out indeed.

Enkin 11:62

Conclusion

In this chapter, informants struggle with how evidence is used and directed by belief systems. Care providers appear to have an ambivalent relationship with the uses of evidence as revealed in my data. Although many acknowledge that it is naïve to see evidence as a neutral science separate from the individuals and institutions that apply it in practice, many seek "facts" which support their belief systems. The care providers I interviewed actively resist some evidence but are concerned when other evidence is not applied. They worry when others follow this same pattern but with different evidence or interpretations.

My interviews reveal that some uses of evidence are more consciously in service of agendas than others. Using evidence for change may be more deliberate than uses of evidence to support pre-existing practice or attitudes. Some informants chart a move from actively using evidence to promote change and increase women's choices in childbirth to seeing evidence used to support the status quo. The same informants who champion the use of evidence for change

towards care they believe in decry the use of evidence to resist change or reassert authority, with arguments often based on having *"science on our side"*. (Simkin 50:437). Mixed up in these reactions are competing understandings of the nature and limits of evidence. Some point to examples of multiple interpretations needing to be negotiated but many see evidence as "facts" which legitimate approaches they believe in. Some informants worried that underlying issues of power can be obscured when evidence is used to either assert or challenge power under the cover of a seemingly neutral science.

My findings show that attitudes and opinions direct how evidence is used. Themes emerge within informants' descriptions of the professional, institutional and popular cultures that influence these attitudes. How themes of technology, fear and risk as well as the managerial and industrial systems which organize health care play out in the application and misapplication of evidence will be explored in the next chapters.

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Chapter Seven: Birth Cultures: Leaning Towards Technology

Introduction

My conversations with maternity care providers are full of recurring references to the concept of "birth culture". This term is used to refer to popular societal beliefs about birth, often revealed through the ways the media portrays pregnancy and childbirth. Birth culture is seen to have a profound impact on popular and professional understandings of evidence about maternity care. A deepening social acceptance of the importance of technology in all aspects of life is identified by most informants as one of the strongest social contexts influencing the dynamics and directions of evidence explored in previous chapters. Rapidly evolving comfort with technology, both among professionals and the public, exerts a powerful influence that both constructs and is constructed by EBP. Many informants put forward a view that much of the evidence about maternity care challenges the routine use of technologies in childbirth and supports a simpler physiologic approach to birth. At the same time, there was almost universal concern about the seeming contradiction that both the production and application of evidence has taken a turn towards legitimating greater use of interventions in childbirth. The views of many informants confirm the scholarly literature which puts forward a "technological imperative" [1-4] which has become a default direction in which evidence is interpreted.

Informants often spoke of how women now "want technology". Many informants had personally practiced during previous decades when women's activist movements pushed for a turn away from routine procedures and interventions. Most acknowledged that they have been influenced by or saw themselves as part of these childbirth movements. Childbirth activists of previous decades critiqued the medicalization of birth and requested low intervention approaches, equating physiologic birth with empowerment and control. In their attempt to explain how evidence is currently applied, many paint a dramatically different picture of childbearing women today. Care providers from all backgrounds expressed a sense of discomfort with a cultural change which has made technologic intervention in birth readily accepted rather than critiqued. Many saw the media as playing an important role in constructing technology as the norm and in creating a kind of "quick fix" culture.[5]

The most dramatic example given by many participants to illustrate the shifting ground of both popular and professional birth culture was "caesarean on demand"; popular terminology for

what is technically caesarean section without a medical indication. Caesarean section is major abdominal surgery and like other surgeries has traditionally been performed only when needed. The appropriate indication for surgical birth is normally understood to be when complications arise during pregnancy or labour such that the benefits to mother or baby justify the risk of the procedure.

In planning my research I did not anticipate the focus on caesarean section on demand that would emerge during my interviews. Although a significant literature existed on this topic exploring the rise of the practice of caesarean without indication, particularly in Latin American countries, it appeared to be outside of the new EBP paradigm. Unexpectedly, media coverage of celebrities' choice of caesarean section on demand triggered a passionate and ongoing debate in the professional literature and in the media in Canada, the US and the UK. Professional defense of this practice often uses the language of both feminism and EBP, a practice which troubled many informants.

Questions about the role of evidence and professional responsibility for birth cultures and systems of care featured prominently in my interviews and also at the majority of professional maternity care conferences during this time period. The phenomenon of caesarean section on demand was used frequently to illustrate what is at stake in both professional and popular cultural debates about birth. For some, this turn in the ongoing controversy about intervention in childbirth signaled a kind of bankruptcy in claims to EBP as the dominant influence in maternity care practice. The debate also represented, for many informants, a very uneven approach to respecting maternal autonomy given the stark contrast with a seeming lack of concern for choice in the case of VBAC, vaginal breech and home birth.

Although all concurred that birth culture is changing, many informants were not comfortable with identifying women as the sole drivers of the lean towards either caesarean on demand or technology in birth more generally. They identified the role of professionals in creating a popular culture of birth that undermines confidence in normal physiology and women's ability to go through labour and birth without interventions. Care providers saw the lean towards technology and intervention in themselves and their colleagues and in the way in which evidence is used in EBM tools.

Women Want Interventions

Informants repeatedly told me that the way that evidence unfolds in practice is profoundly

affected by an increasing pressure from women to take a more high tech and interventionist approach to childbirth. Matthew Sermer illustrated the pressure from women towards technology by describing how his obstetric practice has evolved over time and the situation he now finds himself in as he discusses birth with his patients. In the past, prior to the "new paradigm" he presented less interventive options as either the norm (in the case of VBAC), or as reasonable options to consider (such as expectant management post-dates, or vaginal breech birth). He notes that in the past women were more open to discussion of physiologic approaches, but that this has changed dramatically. He linked this change directly to the way in which he himself now presents evidence: "*the more I talk . . . the more they are asking*". He also points to how the popular media coverage of evidence highlights the risks of childbirth and normalizes interventions. His comments provide specific insight into declining rates of VBAC. They also reveal dilemmas facing care providers who suggest lower intervention approaches when public opinion leans towards technology:

> *Right now you can't sell a VBAC. It changed overnight. Before I never discussed it and it was a standard practice to labour everybody so everybody was labouring. And then all of a sudden the New England Journal* [containing Lydon-Rochelle's paper] *came out and we had to start discussing rupture rates and fetal complication rates as a result of rupture. So right now the more I talk to them the more they're asking for caesarean sections. And our VBAC rate went phsssssh, straight down, our section rate went straight up . . . . In fact I don't think that they* [the study] *really gave us anything new. When it comes to rupture rate, you always quoted a half a percent. But* [the] *result was that since it was sensational, it was on CNN news and everywhere else and women would ask about this. And the standard practice is to inform. The second you inform and you say "There's an increased risk", if you use the word "increased risk" or "higher risk" or whatever, whichever way you put it. All of a sudden the perception of women is "You're putting my child at risk". And yes, it may be half a percent and most of those will survive, it's all true, but* [women say] *"what if I'm the one" and "my child comes first". So for me to sell a VBAC right now, it's impossible.*
>
> Sermer 49:231

Sermer's comments convey a sense of change and loss, and clearly convey the message that practitioners are balancing many factors other than their own reading of the evidence when they "inform" women. Sermer, Rory Windrim and Jan Christilaw all identify maternal altruism, expressed as "*my child comes first*" and "*it's better for the baby*", as a powerful driver towards intervention:

> *Getting back to breeches again, it is disappointing therefore to know that not only will I not have that as part of my practice, I mean obviously if a woman was insistent that she wanted a vaginal breech, I'd be happy to do it. But we're not seeing that. We're seeing*

> *women choose to have caesarean sections because they feel guilty... they think it's better for the baby, even midwifery clients which is pretty diagnostic of the fact that women aren't going to choose it. And I think in our heart of hearts we think it's wrong especially with an eight centimeter breech, but section is the current standard so we can't recommend* [vaginal birth].
>
> Christilaw 4:54

> *And the problem is I think that once you get into any difference in the fetal side at all, women are so altruistic towards their babies, I think, that no matter what the side effects, women will say well I'm out of there . . .* [if there is] *any risk to the baby, even if it's very small.*
>
> Windrim 51:114

Sermer and Christilaw are clear that it is not their own interpretation of evidence or their attitudes as obstetricians that limit their ability to promote less interventive approaches. The combination of influences they describe focus on the women they care for as a less than receptive audience for non-interventive approaches, but also implicate medico-legal concerns which will be discussed more fully in the next chapter. Sermer describes how he attempts to present a balanced view of the risks and benefits revealed by the evidence and the reaction that this often engenders. Women in his office often look at him in a puzzled way and ask why he is asking them to consider, for example, VBAC or vaginal breech birth:

> *Right now pretty well every single person I feel obligated to talk about risk versus benefit. And the second we tell them that there is an increased risk, if you use the word increased or risk, they automatically look at you and say "Why are you discussing this with me? It should be a caesarean section. How come you don't know that yourself? You're a physician".*
>
> Sermer 49:163

Sermer's characterization of the interaction between doctor and patient when using the evidence to discuss treatment choices conveys a pressure to present the possible approaches within a framework of risk. This focus on risk and the impact of EBP in producing "risk communication or "risk talk" has been the subject of critique in both the health care and social science literature[6-13]and will be explored in more depth in the next chapter.

Some informants pointed to a different concern related to women's perceived preference for technology, that what is common becomes normal and expected. Sue Harris wonders if women are conscious of the way in which they play an active role in the lean towards technology, or whether it has just become the unconscious social norm:

> *Their sisters and their friends and their daughters or whatever have been exposed to a system that's highly medicalised and they've accepted that as kind of normal and, in fact,*

I don't know if they actually see their part in it.

Harris 21:56

This concern about the normalization of technologic birth to the point that women's desire and capacity for physiologic birth is undermined is echoed in the maternity care literature. Jo Green and Beverly Chalmers are psychologists who specialize in research about childbirth. They participated in a 2006 roundtable discussion in the journal *Birth* titled "Why do women go along with this stuff." Green notes:

> As high rates of intervention become the norm, women no longer expect to give birth without technological assistance. If all your friends end up with a c-section, why should you be any different? The basic belief that your body can do the job unaided is slipping away.[14]

Chalmers talks about what has been labeled the "what is must be best" phenomenon. She explores what may underlie the well documented tendency for research on women's satisfaction with maternity care to find that women are satisfied with whatever care is offered.[15-17]

> Societal expectations change to incorporate what does happen to women as ''the best,'' rather than emphasizing what should happen to them as ''the best.'' Psychological dissonance has to be avoided for the sake of the woman's, her baby's, and her partner's mental health.[14]

The use of technology, it seems, breeds further use of technology. Technology is, by a kind of cultural default, automatically perceived as the desired care. As many informants pointed out, technology is inherently positioned to be seen as better care. Not only is technology more common in medicine, and specifically, in maternity care, the explosion of personal technologies, such as computers and cell phones, are seen to have improved our daily lives. Christilaw explains:

> *And when I said it comes back to the c-section on demand thing, the idea is that a c-section is clearly more high tech than a vaginal birth and so it's better. And isn't that obvious? So that's the prevailing culture, so high tech and risk aversion are your drivers. And that's become an incredible, complicated, and incredibly negative impact on the culture.*

Christilaw 4:337

Lee Saxell concurs and elaborates:

> *I think that people are really comfortable with the technology and I think that most women think that being induced is as good as going into natural labour. They actually see that an induction is putting them into natural labour. They don't get that it's a leap and what a leap that it is. So they think that well, if they don't go into labour themselves*

by Monday, then they'll just get themselves put into labour. They don't think of it as a forced labour when things aren't ready. As midwives we probably have more success staving it off because we can talk about it and go through the risks. But I don't think the risks are usually laid out for women. Instead of "Well it's risky because you know, the head is still high and your cervix isn't ready", I think it's just like "You're overdue. The risk of the baby dying in utero goes up. Let's induce you." You know, there's a leap to it where it's perceived as not even a really big intervention. Induction. And we see it with our clients where we have let them know that it really is a big intervention and that it can go bad and lead to caesarean. You know induction is so common that they've heard a bunch of induction stories from their sisters, their friends. They don't relate the induction to the problems in the fetal heart rate or maybe even to the section. They don't see the link.

Saxell 47:84

For some informants, the expectation of birth technology as best care lays the groundwork for normalizing the choice of increasingly more invasive technologies. A 2004 *CMAJ* opinion piece by Mary Hannah generated a storm of debate, and was frequently commented on during my interviews and at professional conferences. Hannah presents routine technological childbirth care as inevitable and so far from natural that it seems a small step to choose caesarean section without indication, rather than vaginal birth. Her description of vaginal birth includes multiple technologic interventions, most of which are not evidence-based:

> Lastly, labour and vaginal birth, complete with hospital stay, continuous electronic fetal heart rate monitoring, induction or augmentation of labour, epidural analgesia, forceps delivery, episiotomy and multiple caregivers, may also not be considered "natural" or "normal".[18]

Many informants agree with Hannah that the highly technologic vaginal birth she describes has become the norm. A set of Canadian Institute for Health Information (CIHI) reports, [19,20] released during my research confirmed this with media coverage noting "Natural birth is no longer the norm".[21] Informants also concur with Hannah that the impact of the normalization of highly medicalised vaginal birth works to reinforce a cascade of intervention and in part explains the consistent rise in caesarean section. However, they differ from Hannah in expressing concern and often sadness about this trend. Informants pointed to the need to improve care for vaginal birth, rather than accept the technologic imperative as inevitable. They often passionately disagreed with Hannah that the current high level of technology justifies offering caesarean section more broadly. Perle Feldman expressed this disagreement very personally:

You know, I've worked my whole life towards what I regarded as woman-centred birth, for women to feel powerful and loved and cared for in birth. And to learn the power of their bodies . . . I have four children and each of their births has been a peak experience

for me. And it saddens me that we're somehow losing that and that women are choosing [caesarean]. *One of the residents upstairs in obstetrics, every time she sees me she has to talk about elective caesarean section and how it's a good thing because she's so terrified. And it's just this fear. And like this under-estimation of how hard surgery is and an over-estimation of how hard labour is. And it's a fear of chaos. And it's a fear of letting go. And it really, really saddens me and it's not just medicine. It's not just medicine. It's what women want, or at least women buy into it.*

Feldman 14:126

Informants agreed that many women expect and often seek the technologic norm, identifying technology with good care. However, some noted that not all women have bought into the high technology approach. Sharon Dore commented about the group of women who continue to seek out non-technologic options. She sees that women actively seek out care providers who will support their view of birth. This observation was confirmed by bedside research conducted by nurses in her unit about attitudes to VBAC. She describes both the lean to technology and the reverse:

I think people self-select caregivers that will fulfill [their] *objectives. And so a woman coming to this obstetrician will say "Well I had a section last time and I just want a section. I don't want to go through that labour again." You know. And so that woman said "Why would anyone go through labour? What a horrible pain to go through. Just go in, book it, and my husband can get the day off work". The second response I got was "Who would want to miss the beauty of the birth?" And I thought they were diametrically opposed but I do believe the women we serve drive some of those mandates.*

Dore 7:170

The Debate about Caesarean Section on Demand

During the time period when I conducted my interviews the question of whether caesarean section should be available as a choice when there is no medical indication for surgery aroused a heated debate, not only in the medical and midwifery literature but also in the popular press in Canada. This debate was preceded by a long history of controversy about caesarean section in general. A 1999 *BMJ* editorial, titled "Politically incorrect surgery", called caesarean section "the most politically fraught of operations".[22] Called caesarean on demand, caesarean section by maternal request, elective caesarean or non-indicated caesarean section, the practice has been widely accepted in some countries. In the private hospitals of Brazil and Chile, caesarean rates can be over 80 percent and vaginal birth is associated with public hospitals and the lower class.[23-25] Scholars and professionals have critiqued this pattern of care as reinforcing class and gender inequity, linking it to a lack of information and lack of evidence-based quality care for vaginal birth.[26-28] The range of views on caesarean on demand is represented by the

contrast between a 2002 report from ACOG in which a conference presenter asked "Elective Primary Caesarean section - what's the big deal?"[29] and a position statement by the International Federation of Obstetricians and Gynecologists (FIGO) who assert that "performing caesarean section for non-medical reasons is ethically not justified".[30]

Controversy over caesarean section by choice was inflamed by intense media coverage of celebrity birth. The influence of fame and fashion on the perception that women were increasingly asking for caesarean section became known as the "too posh to push" phenomenon, named after Victoria Beckam (known as pop singer Posh Spice), a British celebrity who was reported to have chosen a caesarean without medical indication.[31,32] In the US, much attention was paid to Britney Spears who had an operating room built in her home in order to have a maternal request caesarean.[33] Over the past decade, pop culture interest in celebrity birth exploded on to the internet with multiple web sites and blogs focusing on the famous during their pregnancies and births. This focus on the famous worried the care providers I interviewed:

> *I think that when you look at the publicity that caesarean section has got, you know, too posh to push and who is doing it and it's the movie stars. And who has an impact on young women? It's the celebrities.*
>
> Hutton 25: 284

> *The media fire some of these debates about controversial things and in the end may do people a disservice. I think it's really important to be balanced and, not to say that media don't attempt to be balanced, I mean I think they do their best sometimes but it's not news sometimes unless it's extravagantly sort of off the wall. And you know I think about things like* [supermodel] *Claudia Schiffer saying that she had a c-section at some early gestational age so she wouldn't get stretch marks.*
>
> Christilaw 4:176

> *Did you see Rebecca Eckler in the paper? In the National Post. She's a columnist. She just had an elective section. And it said "Labour for two days? No thanks." And she couldn't find an obstetrician in Ontario to give her an elective section. She couldn't find one. So her boyfriend lives in Calgary and she commutes back and forth, so she went to Calgary... had an elective section, described the birth* [in her column] *and how she just felt so happy when she heard the first cry. She was so happy with the section. She could not find a doctor in Ontario and the Calgary doctors said that was nonsense. They said of course she could have a caesarean, she's a smart girl, and could make her own decision if she wanted a section.*
>
> Saxell 47:350

Celebrity birth and the influence of web culture on women's perceptions of birth has become a topic of interest to scholars who express concern about glamourizing interventions and conflating caesarean section with cosmetic surgery.[32,34-36, 37] These critiques are reminiscent of

the scholarly work on the overuse of caesarean section in South America.[23,26,27,38-40] For family physician informant Larry Reynolds:

> *Well I think it really is a form of cosmetic surgery. I think caesarean on demand when somebody has had obviously a hugely traumatic birth or had a horrible sexual assault experience that to me is an indicated caesarean section. I have no objections to that and the Scandinavian research supports that. I think it's partly control. I think it's a kind of perverse sense of re-shaping women. The episiotomy was supposed to result in perpetual virginity and now caesarean section. What drives I think the caesarean section rate is that women have to be perpetually sexually attractive and available and somehow birth removes this, damages that. If they haven't had a baby* [vaginally] *then they're still somehow virginal and attractive. It's making birth pathological.*
>
> Reynolds 44:392

Reynolds raises an important point about the way in which fear, often rooted in past traumatic life experiences including past sexual abuse or previous difficult birth experience can be the motivation for women to request caesarean section.[41,42] He refers to Scandinavian research that confirms fear and past trauma were the most significant motivators behind women's request for surgical birth and that counseling addressing women's concerns and fears often resulted in women choosing and being happy with the choice of vaginal birth.[43,44] As many informants and many scholars point out, the appropriate first response to fear is not unnecessary surgery.

Although media coverage has been sensationalized by a focus on the rich and famous, the debate in the medical press was for a time dominated by research into how often and why physicians would choose caesarean section for themselves or their partners. For many informants, this was a very important issue and many referred to colleagues who offer caesareans to colleagues upon request or who chose it for themselves without medical indication. Nicholas Fisk, one of the most outspoken British advocates of "caesarean for all",[45] discusses how his interest in the issue was sparked by requests from female medical students asking for caesarean section without indication. Because physicians were able to access the procedure, Fisk asked himself why this choice was available to them and not to all women.[46] Fisk and colleagues justify this question using the concept of informed choice[47] popularized by the feminist and childbirth movements which had a significant impact on British policy initiatives in the 1990s through the *Changing Childbirth* report. Policy initiatives directed maternity services to emphasize choice, control and continuity of care to improve services and focus on improving options such as access to a known midwife and choice of home birth.[48] Fisk, like other advocates for maternal request caesarean section applied the concepts of choice and control very differently and in a direction

not predicted by those wanting to change the maternity services through the *Changing Childbirth* project. Nonetheless they claimed the labels of feminism and choice.

Fisk and colleague's survey of London obstetricians showed that 17 percent overall and 31 percent of female obstetricians would choose caesarean section without indication.[46,49] An international debate followed the publication of the survey, with one side claiming that as "Obstetricians themselves are probably the most informed of consumer groups",[46] it is therefore self evident that all women would similarly want caesarean section, if informed. Others, such as UK obstetrician Susan Bewley, question the relevance of this finding to broad health care policy in the context of a maternity care system where all births are attended by midwives and obstetricians are called to attend only those that are abnormal:

> Much more is made than is justified of the finding of a 17 percent choice of an ECS [elective caesarean section] in an otherwise uncomplicated pregnancy by London obstetricians . . . A request for ECS for fear of the consequences of a vaginal delivery does not necessarily mean that the fear is rational. It is hard to put risks into proper epidemiological perspective when one's daily work relates to disease and damage to the reproductive and sexual organs.[50]

Jan Christilaw commented that women may fear a loss of dignity and during childbirth within our current culture of birth, and sees this as undermining women physicians most profoundly:

> [A physician conference participant] *stood up and said "Maybe the reason that women doctors are having c-sections is because they work in these hospitals and they just don't want to get too out there. You just don't want to scream and swear and lose it and bleed and pee and poo and all that stuff. They just don't want to lose their dignity." And that's what they're afraid of. And if we could somehow or other turn that around, I think it would be positive, hugely positive.*
>
> Christilaw 4:437

Research that followed Fisk's article revealed some interesting differences between countries. Studies about obstetricians' personal preferences for birth showed that seven percent of Irish, nine percent of Israeli, and eleven percent of those in New Zealand and Australia indicated that they would choose caesarean without medical indication as compared to only one percent of Dutch and Danish obstetricians.[32] Obstetricians Dickson and Willett report that four percent of UK midwives would choose caesarean.

> Midwives are probably in a superior position when it comes to making an informed choice regarding mode of delivery; they overwhelmingly aim to have a vaginal delivery . . . The discretionary practice of . . . female obstetricians is not to be confused with whether women ought to request a caesarean section [51]

It is interesting to note that Holland and the Scandinavian countries that have historically reported the lowest rates of intervention in birth with low levels of perinatal mortality and morbidity have maternity systems are based on midwives providing primary maternity care. The significant differences in obstetricians' reported preferences in different countries and the difference between midwives and physicians reinforce the importance of broader cultural attitudes towards birth and how profoundly norms about rates of intervention influence caregiver attitudes. British midwife Trish Weaver explains her concern that personal opinions will impact on care decisions:

> Of course what is at stake here is not just what obstetricians might choose for themselves but whether their stated preferences might colour their willingness to agree to caesarean section in the absence of clinical indications.[52]

Christilaw concurs:

> *And of course our personal choice is going to influence what we tell our patients and how we form the conversation. Do we truly inform our patients about the relative risks of c-sections versus vaginal birth? We really are not good at it at this point.*
>
> Christilaw 5:4

The debate about caesarean section without medical indication erupted in the Canadian media in March 2004. An *Ottawa Citizen* headline read "Canadian doctors agree to offer caesarean sections for women 'too posh to push".[53] The *Vancouver Sun* reported "C-sections to be available on demand CMA says".[54] The *Toronto Star* claimed: "C-section? You'll soon get to choose".[55] These articles were then followed by a flurry of radio and television coverage, and by editorials and letters to newspaper editors. All of this was stirred up by what appeared to be a misunderstanding of the opinion piece written by Mary Hannah in the March 2, 2004 edition of the *CMAJ*, "Planned elective caesarean section: a reasonable choice for some women?"[18] In the article Hannah referred to upcoming guidelines to be released by the Society of Obstetricians and Gynecologists of Canada (SOGC). By the next day, print, television and radio coverage referred to "new guidelines" as if they had been established by the Canadian Medical Association (CMA). By the end of that day, the SOGC responded by issuing a media advisory stating that the *CMAJ* article had lead to confusion. They clarified that no guidelines had been released and that their ethics committee was deliberating on the topic.[56] This advisory also clarified that to date "no decision has been made to support elective c-sections" and that vaginal birth is considered the safest option for most women.

By the following week, the SOGC released a strong statement endorsing vaginal birth as

the standard of care. They linked the debate about caesarean section on demand to the need for one to one care of women in labour, strained health care resources as well as to "international health issues".[57] Interestingly, there was no media coverage of the release of these statements. Jan Christilaw, as former SOGC President, was on the committee that was considering guidelines for maternal request caesarean. Both Christilaw and the current President David Young expressed concerns in their interviews about how the media polarizes and sensationalizes this issue perhaps more than any other maternity care controversy, but sadly commented that supporting vaginal birth apparently is not news.

This phenomenon of media over interpretation had also happened in the US with the release of a statement by the American College of Obstetricians and Gynecologists (ACOG) titled "Surgery and Patient Choice" in 2004.[58] ACOG's position on caesarean on maternal request was characterized by not taking a position and therefore drew strong criticism from both sides of the debate. Despite the neutrality of ACOG's position it was reported in the *Washington Post* with the headline "It is ethical for doctors to deliver a baby by caesarean section: even if the mother faces no known risks from conventional labor".[59] The inclination of the media to sensationalize the choice of caesarean section and to focus on fashion and convenience as the motivating factors, was noted by many informants as contributing to misinformation and to changing birth culture. The media seems to seek and perhaps create a conflict between medicine and the proponents of "natural birth". Informants indicated that the significance of media attention goes beyond the small group of women making the request for caesarean without indication. Their comments indicate that they see the debate and media reports both reflect and construct how we think about women and birth, about bodies and nature, about the role of science and technology. Christilaw sees rising caesarean rates and the question of caesarean by choice as symptomatic of the ways in which social views of technology are changing our culture:

> *There's also changes in terms of the popular acceptance of technology in our culture, how as a society we look at technology. It actually changes the way we experience life, it changes the way we experience nature and our relationship to it. All those things of course are almost impossible to measure. They're very subjective but still at the same time, when we talk about the* [caesarean] *rate rising, we are scratching the surface of these decision-making trends. And in fact the truth lies much deeper.*
>
> Christilaw 5:4

Contradictions and Inconsistencies

What astounded many informants about the sweeping nature of this cultural debate was that a profound change in health care practice was being suggested seemingly in contradiction to

the tenets of evidence-based practice. The debate about "C-sec for all"[45] was not sparked by RCT evidence, although those on both sides of this debate quickly began to present "lower level" evidence as well as opinion both for and against caesarean without medical indication. Many informants noted the irony contained in the fact that the Canadian debate was triggered by Mary Hannah's opinion piece on "Planned elective caesarean section: a reasonable choice for some women?".[18] Hannah's status as a leading advocate for EBP and the new paradigm's central mission to replace opinion with evidence, made her intervention into the debate with an opinion piece notable. Several worried that the Term Breech Trial results were being extrapolated by Hannah and others to justify the choice of caesarean for all women. Others worried that this debate was laying the groundwork to justify an RCT comparing caesarean without indication with vaginal birth. Several informants referred to this as a "Term Cephalic Trial", as if it was already in progress, and expressed profound concern about the idea of such a study. The introductory paragraph of Hannah's piece lays the ground work for the call for such a trial:

> A growing number of women are requesting delivery by elective caesarean section without an accepted "medical indication," and physicians are uncertain how to respond. This trend is due in part to the general perception that caesarean delivery is much safer now than in the past and to the recognition that most studies looking at the risks of caesarean section may have been biased, as women with medical or obstetric problems were more likely to have been selected for an elective caesarean section. Thus, the occurrence of poor maternal or neonatal outcomes may have been due to the problem necessitating the caesarean delivery rather than to the procedure itself. The only way to avoid this selection bias is to conduct a trial in which women would be randomly assigned to undergo a planned caesarean section or a planned vaginal birth.[18]

The article presents what Hannah considers convincing evidence for caesarean section for breech and then concludes:

> Unfortunately, for women not having a breech birth, such as those pregnant with twins, women who have had a previous caesarean section, older women, those who are having their first baby, those with incontinence problems and women who are afraid of labour, we have little information on the true benefits and risks of planned elective caesarean section compared with planned vaginal birth. Randomised studies are underway involving women with twins and women who have had a previous low-segment caesarean section, but the findings will not be available for several years.[18]

What seemed to be a deep contradiction to many was that although "growing demand" from women is asserted by Hannah and others as a significant factor contributing to the rising rates of caesarean, there is no evidence base for this claim. Many informants worried that what is called maternal request caesarean is often driven by physicians or sometimes others in the

woman's family. The international literature confirms that cases documented as maternal request in the medical record are frequently understood by women to have been recommended by their doctors.[23,26,27,39,40,60-62] Subsequent research in Canada and elsewhere shows that the demand for non-indicated caesarean section is low.[41,42,63-65] Several informants asserted that the focus on caesarean on demand in both the popular and medical press may be distracting attention and resources away from addressing more important factors contributing to rising rates of intervention in childbirth. For Christilaw:

> *There's been a lot of sociologic research done around the question in Brazil because the numbers are just so high. Well three quarters of the women having caesarean section on demand in Brazil did not feel that it was their decision. They felt it was either, and you're aware of that study I'm sure, but they felt it was either the doctor's decision, the vast majority thought their doctor had recommended it, and the rest felt that their husbands, they had to do it to please their husbands. So how is this empowering women? . . . And I think the other thing about it is if women are doing this because of misinformation or because they're trying to avoid pain in labour just to trade it off for post-op pain . . . My fear is that women are making this decision because they've lost the confidence in their bodies, that they feel they're not going to be successful at birth, that they're worried that if they lose it in labour that they'll, you know, that they'll somehow be shamed if they have an epidural for pain control or something else. Or that they'll be somehow or other less attractive to their husbands if they, you know, if they go through vaginal birth. That is not empowering women. That's disempowering women.*
>
> Christilaw 4:359

The various terms used to describe caesarean section without indication, "on demand", "maternal request", "maternal choice" and "elective", hide a troubled politics underneath the concept that it is women requesting intervention. At the 2002 Maternal and Infant Research Unit Conference (MIRU) in Toronto, Fisk supported his case by projecting a photograph of Germaine Greer with the caption "Feminists are on my side".[66] Informants worried about the way in which "choice" plays out in this debate. Christilaw explains her concerns with the use of feminist rhetoric to defend caesarean without indication:

> *And my concern is that the whole choice thing has been taken out of context . . . And so if you're pro-choice, that means that you're advocating women should have caesareans. And it's obscuring the nature of the beast. So women who see themselves as, you know, having personal power feel therefore that their choice should be caesarean cause somehow or other choice is equated with caesarean.*
>
> Christilaw 4:409

McCabe describes how debate about choice of surgical birth plays out on her unit:

> *Oh I struggle with that one. And it's very interesting because you know we can almost split my unit in half in terms of who says no, we're just not going in the right direction.*

> *There's too much intervention and stuff. And we're playing too much with nature. And then there's the other group who would say well why not? She can choose almost anything else, almost any other procedure she wants. Why not choose that one?*
>
> McCabe 37:288

Klein explains his reaction to how the terms "choice" and "rights" are being used:

> *I call it the cultural appropriation of the word 'choice' for political purposes. And 'rights' is the other word. Choice and rights have been appropriated by the obstetrical establishment. I mean as you know, a good example was several weeks ago when the American College of Obstetrics and Gynecology published their statement* ["Surgery and Patient Choice"[58]].
>
> Klein 29:105

Klein elaborated on his position in an article in *Birth* published in 2004.

> And for some women and some obstetricians the word "choice" has been transplanted from the debate on abortion rights. The debate is further confused by the uncritical use of the word "freedom." Who can be against such concepts? Although a woman's choice needs to be respected, for her to make a truly informed decision, she needs to receive detailed, accurate, and complete information.[5]

Although women's choice and autonomy appear to be the foundational arguments for supporting maternal request caesarean, many informants noted this respect for autonomy and choice about mode of birth did not seem to apply to non-technologic choices. The ease with which caesarean section is defended on the grounds of choice contrasts with the opposition, often by the same individuals or organizations, to choices such as home birth, VBAC, or vaginal breech birth. Payne explains:

> *I think it's very interesting, you know that whole issue around the use of choice. Once again, how we're using that in this debate . . . and yet not in the breech debate. It's very, it's like using that whole argument that we used for normal births and it's turning it around on us again.*
>
> Payne 43:300

Owen Hughes similarly finds a contradiction in the position of some of his colleagues who are comfortable defending caesarean without indication, but who do not support the choice of home birth:

> *The other issue is home births for example. I keep saying to the SOGC that the Task Force on the Implementation of Midwifery in Ontario clearly pointed that these are not profligate, wanton women who are taking their own lives at risk or their babies, they're actually basing* [their decisions] *on evidence. And we have in many countries like Holland and New Zealand and Sweden and Britain far better outcomes out of small hospitals, cottage hospitals, home births than we have in the high tech centres. Audrey*

> *Wise who is the British Labor MP was on the House of Commons Health Care Committee actually published an editorial in the British Medical Journal stating that, that in reality high risk women belong in high risk situations and low risk women don't belong there. In fact the outcomes are worse* [for low risk women in high risk centres]. *But we don't support those choices.*
>
> Hughes 24:38

Knox refers to an argument for non-indicated caesarean section that is based on preserving the pelvic floor, which she feels lacks an evidentiary basis but is nevertheless used as "propaganda":

> *I don't think this debate is around should some women be able to choose section for themselves. That's not what it's about. This debate is about something that's way bigger than that. When you have people walking around with no evidence saying to women that if you don't have a section, you're going to be leaking urine and feces for the rest of your life, it's not a debate around a few women choosing elective section. And you know what? I don't think the numbers would be huge without the propaganda.*
>
> Knox 30:252

Kotaska also points to inconsistency and emotionality in how evidence is used:

> *I presented at a journal club the two year follow-up of the term breech trial. And when I was finished, they just went at my throat. And they were using the recent epidemiological study out of the Netherlands looking at the effect on perinatal mortality of the term breech trials in the Netherlands and they basically dropped it by about one in 500, about .2 percent. And he was saying this is one of the most significant things and this is justification alone, just the fact that one in 500 fewer babies are dying because they've upped their breech section rate from 50 percent to 80 percent. And this is a guy who will vehemently defend VBAC which incurs the same risk.*
>
> Kotaska 31:292

It is important to note that, although many informants were deeply troubled by the implications of the caesarean debate for birth culture generally and for EBP, many explained they would defend the choice of a non-indicated caesarean if a truly well informed individual woman, whose fears had been adequately addressed, persisted in her request for caesarean. They did worry, however, that significant issues were often left out of the debate and the information given to women about caesarean section. Although many pointed out that caesarean may be as safe or even safer for the fetus in a first pregnancy, many noted that the research and the debate had not adequately addressed the risks to the pregnant woman and longer term risks to the baby or the risks over more than one pregnancy.

Feldman feels that we have downplayed the risks of caesarean section, in part to protect women who need surgery from feelings of guilt or failure. Promoting normal birth is always sensitive ground for care providers from all backgrounds as it can be associated with the risk of

making women who need intervention in birth feel guilty or that they have missed out. This often shuts down the conversation; a conversation which many informants feel has become urgent. Feldman explains her views about how comparison of outcomes should be framed:

> *But in the end, in the end then we go "Oh well it is a birth. It's a wonderful birth. You can make it good and it doesn't mean you love your baby less' and blah, blah, blah". But have we actually cut our noses off to spite our face because the fact is you know and I know that a good vaginal birth is much better than the best caesarean. You know, a horrible, traumatic vaginal birth and the torn from stem to stern and you have post traumatic stress after is worse than the best caesarean. But then again the worst caesarean is where you end up in ICU . . . with an open wound. I just saw a patient who had her third or fourth repeat and she had a huge wound infection with adhesions. Spent weeks and weeks trying to recover and is now three months down the road and is just starting to feel like a human. If you have a repeat caesarean your chances of being in the ICU, of having a wound infection, of having bladder damage just goes up and up.*
>
> Feldman14:150

At the time of my research, it was well accepted that caesarean increases risk of newborn respiratory distress and newborn intensive care unit (NICU) admission. As well, problems of placentation in the scarred uterus increase risk significantly for both mother and baby for each subsequent pregnancy. Risks to the mother include hemorrhage with increased rates of placenta previa and accreta, and risks to the fetus include a small but significant increase in stillbirth, and there are more asthma and allergies in the newborn after caesarean. These findings have since been reinforced by further research and have strengthened the case against maternal request caesarean.[67,68] And although caesarean section is much safer for the mother than in previous decades, due to improvements in anesthesia and reduction in risk of infection, the procedure is not risk free, even though it may be increasingly perceived as such by the public and even professionals.

As many informants pointed out, knowledge about the true risk of a single caesarean to the mother is limited. Because of how rare and controversial it is, conclusive data is not available comparing low risk maternal request caesarean section to low risk vaginal birth.[69] However, the risk of maternal death for caesarean appears to be about four times as high as the risk of vaginal birth.[70] Informants did not feel that many women would make this choice if they were aware of these risks in comparison to benefits. Many also pointed to subtle benefits to the "natural" process of birth that we may not yet understand scientifically, although a body of work is emerging showing benefits of vaginal birth to the neonatal respiratory[71] and immune systems.[72,73] Many informants pointed to higher rates of successful breastfeeding and its benefits to neonatal and

long term health as one of the benefits of vaginal birth which might not be taken into account, another area that is supported by recent research.[74-76] Hutton's comments reveal the ambivalence many informants expressed when considering an individual woman's choice and the sense that there may be much we do not currently understand about the benefits of vaginal birth:

> *So if somebody really believed that they wanted to have a caesarean section for their first baby, a primary caesarean section, the only thing that I would want them to give consideration to is what are your thoughts for subsequent pregnancies, because we do know that subsequent pregnancies then have additional risk associated with them. But I think that it's* [caesarean without indication] *a reasonable choice for a woman to make. Now when I say that to colleagues, to midwives, and to some physicians they're very perturbed and very upset and they have a very difficult time accepting that. And at many levels, I also don't believe that it's the right choice to make. I think there are probably things that happen when a baby is born or even when a baby experiences labour. I think there are probably things that happen that we don't really understand.*
>
> Hutton 25:138

Informants wanted to make it clear to me that their concerns about non-indicated caesarean were not really about the individual choices of a small percentage of women. Their worry is centred on the fact that the media and professional focus on caesarean section on demand was symptomatic of a loss of confidence in normal birth both among professionals and the public. They worried about the impact of this increased focus on caesarean as part of the broader lean towards technology on the resources and the culture of the maternity care system. They felt the priority of maternity care providers and the maternity care system should be to provide safe and humane care for vaginal birth. Some saw the caesarean on demand debate as a distraction from efforts to understand and lower rates of intervention. Many worried that the caesarean section on demand debate was part of a culture of acceptance of technologic birth. Some informants pointed out that the ever expanding list of reasons for a caesarean was in fact more worrying than whether a few women might choose non-indicated caesarean. In Hannah's opinion piece, the list of potential reasons for a caesarean with its inclusion of first babies and those with previous caesareans would eventually encompass all women.

Evidence and the Media

> *The press is not going to go back and examine the last 35 publications in terms of what's actually riskier and what's not. That's not going to happen. Those complexities will be lost in the popular press. They will always be lost. It's our job to be not exactly immune from the popular press, but to be if anything always accountable to answering what's out there in the popular press. And I've taken that on as part of my role in terms of the caesarean section piece to the best that I can. So obstetrical decision-making, living in a*

surgical world, as I said the technological world, means living in a world where I can talk to a reporter from Vancouver City magazine who is 26 years old and I'm trying to explain to her why it might be empowering to have a vaginal birth, and she has no idea what I'm talking about. She can't possibly see how it would be better for her to go through labour than to walk into a hospital and have a c-section at five o'clock. She doesn't get it. So anyways, there's just a complete disconnect in some ways between what we're saying is the evidence and what our society is getting.

Christilaw 4:4

Maternal request caesarean section was not the only example informants gave of the profound effect the media can have on the public and on professionals. Eileen Hutton explained that the dramatic uptake of the TBT evidence was linked to the fact that it was a large multi-centred trial with a dramatic result. This meant that it drew more media attention than the incremental compilation of evidence which characterized the EFM research. Hutton elaborates:

The term breech trial was a single, very large trial. A lot of times when you get evidence, sometimes it's coming from a meta-analysis of various small trials. And so you get a trial and you go "Oh that's interesting". And then you get another one that gets a similar result and you go "Oh, maybe we should pay attention to this."And you get another and you go "Oh it looks like this is what we ought to be doing. We should be talking about this." You know, and then you get the meta-analysis and it goes "Oh this is the way things are." And you go "Oh yeah, okay, I guess we should be doing this." But it isn't that same instant broadcast, that makes the press, big news, and everybody is on board with it.

Hutton 25:488

Another example of media impact on the production and use of evidence is the development of guidelines about GBS screening and prophylaxis in Canada and the US. Ohlsson notes that the decision to adopt GBS guidelines without clear evidence was driven by medico-legal concerns triggered by the media coverage of the emergence of activist consumer groups in the US and Canada. The Group B Strep Association was founded in the US in 1990 by a parent whose baby died of GBS infection; a Canadian chapter formed in 1992.[77] These groups effectively used the media to highlight individual baby deaths or illness and called for universal testing and screening, rather than for research about the best approach to GBS screening and treatment. Consumer activism was critical in the adoption of the initial guidelines which offered options in screening and treatment as well as the 1996 revisions to both the US Centre for Disease Control (CDC) and subsequent SOGC guidelines which recommend universal screening and treatment. The internet has helped promote parent-led initiatives promoting universal screening and treatment, such as the "Jesse Cause", named after baby Jesse Keith who died of GBS

infection. The parents of baby Jesse used their involvement in a Christian rock band to propel their work in support of the Group B Strep Association and the CDC:

> The Jesse Cause-Saving the Babies from Group B Strep, can claim a remarkable victory. The Keiths struggled to raise awareness by performing Jesse Cause music concerts, selling their three CDs at the concerts to help support the Cause, and distributing an informational pamphlet on Group B strep (GBS). They also appeared hundreds of times at women's groups and health conventions, as well as interviews with newspapers, magazines, radio and television, including a segment on "48 Hours" and CNN. Throughout it all, the Keiths worked closely with the Centers for Disease Control and Prevention (CDC). The goal was to reissue the 1996 Guidelines to include nationwide testing of all pregnant women for Group B strep, a bacterial killer that has a very low public awareness factor. At the urging of the Jesse Cause, the CDC called a new conference on Group B Strep and, in November 2001, held the historic meeting that included the Jesse Cause and many of the leading US medical associations and experts.[78]

Most of my physician informants asserted that the CDC and subsequent SOGC guidelines were medico-legally driven rather than evidence-based. They understood Ohlsson's critique of universal screening and treatment, and they acknowledged that the Canadian Task Force on Preventative Health Care (CTFPHC) guidelines and the *Cochrane Review* were more in line with research evidence. However, the overly simplified presentation of the issue as a "simple test, simple solution"[77] by consumer organizations and media was seen by many informants to have left health care providers with little choice but to screen and treat as per the CDC and SOGC guidelines. Both the media attention and consumer activism seemed to confirm the notion that women want treatment. Informants were clear that universal prophylactic GBS testing and treatment would not necessarily result in the greatest health benefits to individuals or public health. The rationale underlying this approach is to avoid "*those rare tragedies*" (Baskett 1:21) or "*the remote untoward outcome*" (Seaward 48:91). GBS testing and treatment works to avoid perceptions of blame for not treating and decreases medico-legal risk if a baby becomes ill. The following quote is from the Canadian Strep B Foundation pamphlet "Saving babies from Group B Strep: To all future moms", a pamphlet endorsed by the SOGC:

> The Canadian Strep B Foundation has been founded by Patricia Normand following her daughter, Chloë, being infected by Group B Strep (GBS) a few hours after her birth. GBS caused Chloë to have severe pneumonia and sepsis and stay almost a month in the intensive care unit of the Montreal Children's Hospital. The lack of information and the fact that she was not tested during her pregnancy, made it impossible to prevent the early-onset GBS infection. A simple test and common antibiotics could have easily prevented the infection. The foundation was founded to raise awareness on the danger of GBS infections in newborns and to promote the importance of being tested and treated. [77]

Midwife informants described their experiences with GBS in clinical practice differently. Many explained that they had adequate time in prenatal care to explain the issues around GBS to parents and felt comfortable with respecting parent's choices. They explained that most of their clients expected a thorough discussion of options, risks and benefits. Many midwife informants told me they offer to follow either the SOGC/CDC or CTFPHC guidelines. They explained that some women in their client population wanted to avoid routine use of antibiotics unless other risk factors were present. Fear of blame did not direct their care in this clinical situation. They explained that they felt an obligation to offer an option that minimized intervention in birth. However, midwives did worry that they often faced criticism from interprofessional colleagues who did not approve of offering choices to parents in this situation.

Many informants presented GBS screening as an example of the adoption of guidelines prior to the availability of evidence from a large well conducted RCT. They explained that without evidence from quality RCTs, the side effects of treating a high proportion of women in labour with antibiotics for this rare but potentially devastating disease have now become more difficult to understand. Several noted that you could no longer do an RCT, as it would now be unethical to withhold the "standard of care". They expressed concerns that, as many women (greater than 2000) may need to unnecessarily receive antibiotics to prevent a single GBS illness, the numbers needed to treat are very high. They worried that this approach uses preventive use of antibiotics at a time when the general consensus promotes avoidance of the overuse of antibiotics to decrease the development of antibiotic resistant microbes. Although some GBS deaths may be avoided, other deaths may be caused by the policy of routine screening and treatment. Informants were not convinced that the overall impact of the CDC/SOGC guidelines is to improve health, although the guidelines may help in the reduction of lawsuits.

Control and Technology

Heather Logan was a family practice resident with an interest in obstetrics when I interviewed her in New Brunswick. She links the desire for control over the birth process and lack of understanding of the risks of caesarean to the popularity of the procedure:

> *I think to some degree women want to have more control of the process, in terms of timing and for whatever reason maybe they're afraid of vaginal delivery and not really realizing that a c-section is a fairly major operation and you're going to have a much longer recovery time, much more fatigue, and much more pain.*
>
> Logan 34:231

Informants often linked the growing comfort with technology with a growing discomfort with the uncertainty inherent in childbirth. Expectation of a perfect outcome and desire for control not only of the outcome but also of the process were frequently referenced by many informants. Lemay touches on the need for control of the body in a society which exerts pressure on young women to use technology to "perfect the body":

> *And* [with] *young women, it's about the image and perfecting of the body.* [Its about] *imperfection and uncertainty and we want to control and there's technology, the miracle of technology for all that.*
>
> Lemay 33:106

Christilaw's comments about the "*ick factor*" touch on a concern that many voiced about how media representations of birth have trivialized the process and increased this discomfort with the messiness of the body and its processes:

> *I think in part it is the "ick factor". So you know you're pushing a baby out and you poo. And that's gross. And "I'm not doing that. That's just awful. And who would ever want to?"*
>
> Christilaw4:429

Perle Feldman uses a television episode to illustrate the pop culture themes of control and convenience where childbirth is presented as another appointment in a social calendar:

> *I think the lie now is that birth can be convenient and controlled and be completely a hundred percent safe and that nothing will change after you give birth. And I was watching an episode of Gilmore Girls and they were talking about just this issue. It was the father, having a baby with his new girl friend and she had booked an elective caesarean section and then she goes into labour two and a half or three weeks early. The father is out of town and the poor teenage step-daughter gets called in because her dad is out of town and all the woman's friends just abandon her. Her best friend is going "Well Sherry fucked up. She was supposed to wait. We were supposed to have this party and Sherry fucked up." It really speaks to what's going on out there. That this woman needed to have her life "day-timered" and that birth had to fit in . . . And I really think that that's part of what's happening is this idea that if you look at our poor great grandmothers or great-great grandmothers, they had no control over reproduction at all. And now I think part of it is to want to have it really, really controlled and to have it slip into your life and not change it or your body at all.*
>
> Feldman 14:90

John Kingdom also asked if the lean towards technology and the desire for control is linked with an underlying lack of tolerance for uncertainty. He wonders if confidence is involved and asks what is lost in the quest to avoid uncertainty:

> *What's amazing about being a woman is you're capable of giving birth to another*

individual. That's fundamental. And you know you can do it. Now do people choose these things because they feel they can't do it? Or do they choose it because they've made their lives so controlled professionally and personally that they're not willing to say "Okay, it will happen to me but I don't know what it's going to be like and I can't tolerate that". So I wonder if they're willing to deny themselves that experience because they can't tolerate any degree of uncertainty.

Kingdom 28:188

Gareth Seaward also sees the expectation of perfection as underlying the lean to technology:

I don't think it's the underlying belief that technology is better. I think it's the underlying expectation that every pregnancy is going to culminate in a perfect outcome.

Seaward 48:103

He explores the impact of demographic changes in the childbearing population and how issues of age and infertility justify and normalize use of technology and the quest for perfect outcomes:

I guess it depends on whether you're dealing with a high risk population or a low risk population. I definitely think an otherwise healthy mother with a healthy pregnancy and no concerns should be as far away from technology as possible, even within the confines of hospital birth. But there's definitely a percentage of the population that needs technology. I mean that's the fundamental difference between obstetrics twenty years ago and obstetrics now. We are in a position with technology to have successful pregnancies in women who otherwise would never have had children. And there I think technology has played a helpful role. In the average healthy woman, the technology has become too invasive and intrusive. Again there's an expectation that by using technology the event, the outcome is always going to be perfect.

Seaward 48:191

Many care providers linked the expectation of control and perfection with the rise in the routine use of genetic screening technologies, which can appear to the public to promise a certain outcome and raise the stakes around perfect outcomes in all areas of maternity care:

Some kind of general expectation has been created with genetic screening and other technology . . . . that perfection is possible. It's reachable. Perfection is possible.

Martin 36:164

A 1999 article in the *New York Times*[79] compared giving birth vaginally to an extreme sport. Several of informants discussed the analogy of extreme sport, worrying that normal birth is no longer seen as culturally or physiologically normal but a rather kind of lifestyle choice. In reflecting on why giving birth seems to evoke more fear than intense fitness regimes or wilderness expeditions, Kingdom comments that elements of control help explain the difference:

. . . but they might still plan fitness or outdoor adventures in their event planner, because that starts on Saturday in the palm pilot whereas spontaneous birth doesn't, right? And that is a definite difference in a broad sweep stroke between European and North

American cultural influences on obstetrics. On one side of the Atlantic it's pretty firmly entrenched in the view that [women] *can do it.*

Kingdom 28:192

Simkin wonders if the focus on convenience as an explanation for why women choose intervention may be hiding something more complex which motivates women's need for control. Simkin's work on the impact of a history of sexual abuse and sexual assault on childbirth informs this view.

The media coverage about why women want caesarean section can be trivializing but some women play into that too. At a cocktail party they'll say "You know, I made the date to have my caesarean and I had it", but if you talk to them in greater depth it would have been more than that. But they will present it often... as convenience but often something deeper is there that they may not want to talk about.

Simkin 50:757

Saxell believes the anxiety about going overdue that leads some women to pressure care providers towards induction is linked with anxiety about the timing of maternity leave. Although the terms convenience or control are often applied to the need to plan the arrival of the baby, this anxiety may be linked with broader social change. The generation of women who appear to want intervention in order to control the timing of birth is the first generation with a high proportion of employment outside the home whose mothers are also employed outside of the home and therefore unavailable to provide practical and social support. The grandmother, who in many cultures and periods of history automatically assumed the role of care provider to the new mother and baby, may often live in a different city or country and work full time. The increased anxiety caused by not knowing when a baby will be born when family members want to take time off work or buy a plane ticket because they are coming from another region points to more complex pressures on the need to control birth in order to gain the social support needed in the first weeks of early parenting. For Saxell, this anxiety about social support often underlies the demand for induction:

There's a lot of pressure around the due date that isn't even about being late but it's about maternity leave, it's about people coming into town for the birth. It's like a mind set. Where it's like Christmas and your presents aren't there. And so it's kind of anticlimactic after the due date. And we've actually talked in our practice about having a due week and trying to get away from that. But it would be hard to get away from the due date because so many markers are done on gestational age. So partly I think that it is fair to say that it is client led. It has changed over time and I think part of it has been that people are really, people are really anxious about mat[ernity] *leave. But I also think that the emphasis on the risks of post-dates is really exaggerated. And it's in the public*

domain, it's talked about, it's on the internet or whatever. You can counsel a client to stay cool. But if you actually encourage a client to be tense about that or even bring up the possibility of still birth, phffft, they're out of there into inductions usually, even though there are risks to induction too.

Saxell 47:82

Kingdom and Payne, both from the UK, repeatedly noted the differences in birth culture between the UK and Canada. Both Kingdom and Payne link this difference in "what women want" to systems of care in the UK that support more low intervention approaches and more choices:

I could not believe when I arrived here six years ago, everyone wanted an epidural, they weren't even in labour, proper labour, and they wanted an epidural. And then we put them on their back in a small room where pain is obviously much worse. Then we don't allow them to walk around and it gets much worse. Guess what happens? More intervention and more caesareans.

Kingdom 28:196

I think we have a better balance still in England. You know, I was just over there. And home birth, a woman has that choice there, and as a midwife you have to support her. And you know and it's accepted and I think people have a much healthier understanding of their rights and their choices and their bodies in a funny way there than they do here. And I firmly believe it's because midwives still are basically the gateway to births in that country.

Payne 43:218

For Kingdom this also relates to a less child friendly context in the US and Canada with fewer incentives and supports to have children. In his view, this contributes to a higher ratio of first births compared to repeat births and more births to older mothers. Like Seaward, Kingdom sees this demographic change as changing birth culture. He sees the higher proportion of difficult first labours leads to more obstetrical intervention which becomes the norm results in their being fewer role models for normal births. Harris also links this demographic trend to fears about the uncertainty of labour, the need for control and the lean to technology:

As women tend to be older, they learn more about what could go wrong. Whereas a 22 year old woman, not only will she tend to labour better but she'll tolerate pain better, she'll tolerate uncertainty better because she's younger. And she won't ask all of those desperately complicated questions. . . It's a function of growing a bit older I think too.

Kingdom 28: 225

Another thing in our society in addition to the whole technology thing is a control thing which is probably magnified as women age I think. And so if you can give them more information, maybe that fear won't be so great.

Harris 21:56

Caregivers Contribution to Birth Culture

Some informants resisted the idea that women were the main drivers behind the lean to technology. Most informants saw care providers, including themselves, as just as vulnerable to the assumption that technologic approaches must be better. Logan explains the lean to technology among providers:

> *Yeah, I am probably a little bit biased in that sometimes I think we try to prop up the technological approach to many things. Clearly when the results strongly suggest that less intervention is okay, people don't jump on that bandwagon. But when the results suggest that, well hey, we need to do this or else, then people are very quick if it means more intervention. They're a whole lot less willing to not play it safe by providing less intervention and less technology. So I think probably to some degree the weight of the evidence is stronger when it involves we should be doing this, we should be monitoring this. Whereas when it says well maybe we don't have to do that but it's a practice that's been in place for years, people are very uncomfortable with that. So maybe it's not viewed as, you know, as something that would change your practice.*
>
> Logan 34:243

Christilaw sees health care providers as particularly vulnerable to the allure of technology:

> *So I think that as a society and especially as sort of scientific health care providers within that society, we are very comfortable with technology. We trust technology. We think if something is more technologically advanced, it's better. We have an idea of progress which is, you know, the same as our economic process, progress indicators, progress good, more tech is better, and so if you're moving in that direction, if you're getting more high tech all the time that it's somehow better.*
>
> Christilaw 4:328

Some spoke of how care providers' comfort with technology can help explain a reluctance to apply evidence-based guidelines when they recommend non-technologic approaches. Harris and Simkin speak to an understandable sense of disbelief care providers often have if evidence supports low intervention approaches:

> *It's kind of hard to believe isn't it, in our scientific world of cell phones, cars, computers . . . technology is so deeply engrained it's very hard to believe that technology isn't better.*
>
> Harris 21:208

> *It doesn't make common sense that just listening once in a while to the heart rate is as good as or even preferable to listening to every single beat of the heart.*
>
> Simkin 50:141

The continued use of electronic fetal monitoring was the most common example of this disbelief in action, this "common sense" conviction that technology is superior. Like David Young in

Chapter Five, Matthew Sermer explained that many of his colleagues do not accept the RCT findings about EFM and believe that, with more and better research and larger numbers in the sample size the evidence will support EFM. Sermer, like Young, focuses on how the technology "should work":

> *And even for myself, it's kind of hard to believe that that piece of evidence is true. Because when I do a tracing and I see subtle rate decelerations, I know you cannot pick it up on auscultation. It makes perfect sense. The thing should work, it ought to work based on the science, it really ought to work. It's actually surprising that it doesn't work as well as it should.*
>
> Sermer 49:331

Tonelli links the ongoing use of EFM despite evidence and recommendations from national bodies to a belief on the part of care providers, insurers and patients that more information is always better:

> *There is also this notion "How can more information be worse?" Right? "All this is doing is giving us information. There's nothing about this machine, you know, that's hurting the fetus, it's just giving us information. Information is good. Ergo I'm not going to stop using it." There's the medico-legal approach. There's the patients who come to expect it, you know, and they like how technological* [it is] *and if you don't have the machine that goes bing they wonder where it is, especially if they had it with their first one.*
>
> Tonelli 52:222

Hughes discusses the disappointment he noted among the experts involved in the SOGC review of new technologies to monitor the fetal heart rate in labour.[80] He references work on ST waveform analysis technology, one of the approaches that advocates of EFM had hoped would perfect the technology:

> *Yeah. We get enamoured of technology, you know. Like Bill Cosby says, you go down to Home Depot and watch all these guys looking at the chrome plated equipment with a red light and a green light and they'll buy them and never use them again because we think this is a great piece of equipment. We're enamoured of it. Yeah, this has got to be a good gadget. But as I keep pointing out, I tell my residents "This is a fetal pulse for god's sakes. Don't reach huge conclusions on the pulse." There's been all sorts of attempts,* [Name] *for example has been trying this ST stuff, proven that it doesn't work. I met him the other day and he says "Hey, I'm so disappointed". A year ago he was flying high. "Oh I'm onto something here." Didn't prove to be useful. So really we kind of hang onto bits of technology in the hope.* [Name], *for example, from Montreal, who was part of the guidelines on the newer technologies, had to conclude at the very end that we cannot say any of the newer technologies actually work. And she was very disappointed because she had great hopes that we would be using a technology that would actually pan out and save lives or reduce cerebral palsy or whatever, and it's not.*
>
> Hughes 24:126

Care providers, like the women and families they serve, are uncomfortable with uncertainty and seek control through using evidence in ways that justify intervention in the birth process. Informants noted that they may be responding to their own discomfort with uncertainty, or use technology as a response to women's concerns about uncertainty. Hall paints a picture of how awkward it can be for care providers to acknowledge uncertainty:

> *I think it's partly that people, humans, are really bugged by uncertainty. The other interesting thing is providers of care are more bugged by uncertainty than Joe Sixpack and his spouse Sally. They're not as bothered by uncertainty. Providers of care don't like uncertainty. They avoid it even more vigorously and they like to have answers and they don't like to be in situations of having to say to a patient or a client or whatever "I actually don't know." Not only that, we don't know as a profession. We actually don't know. Patients ask: "What do you think?" I sometimes get into these pickles with patients where I don't really know what the hell to do and I'll say to them "You know, we really don't know all the stuff. I can give you some crazy feeble examples." And you'll wind up kind of getting into this weird default to the patient. "This is what I can tell you. I don't know what the hell to tell you to do." And often, sometimes the patient will still say to you "Doc, what would you do if you were me?" My answer to that is "I'm not you. I can't answer that. I don't know. I don't live in your socks. I can't answer that for you." So providers of care, as a generalization and all generalizations are wrong, providers of care don't like uncertainty or having to admit to patients "I don't have a flaming clue. I don't know."*
>
> Hall 20:445

Reynolds sees care provider's reactions to the Term Breech Trial as predictable, given our culture's obsession with certainty and control:

> *To me the results of the term breech trial were foregone conclusions. How can you come to any other conclusion in a culture that profoundly distrusts childbirth and that expects bad things to happen? And in a culture that deals with mystery and uncertainty which are deeply imbedded in labour and birth,* [a culture] *that deals with uncertainty by creating a liturgy of certainties in certain actions to reflect control over something we don't have control over. So to me the results of the term breech trial were a foregone conclusion, and I think the trial is deeply flawed ethically and methodologically but people rejoice. "Well here's an example that proves what we knew already."*
>
> Reynolds 44: 367

Houstoun sees a search for control and certainty as undermining care providers' ability to work comfortably in maternity care:

> *A comfort with uncertainty to me is a key part of being involved with pregnant women successfully. Because there is a lot of uncertainty. Now that doesn't mean being unrealistic or being blind. But you've got to accept that if you're going to work comfortably with this woman. And I think that the fear factor stuff is a discomfort with uncertainty and a need to control it or a perception that that's what you're doing. I mean you're not. I mean the cerebral palsies, the Downs Syndromes, the esophageal atresias, I*

mean they still happen. There's not a darn thing anybody can do about those. And a certain amount of loss is inevitable in life in general, and the concept that we can control everything is just absurd. And the more we try to do that I think the more distressed we get.

Houstoun 23:480

Lemay discusses the fact that evidence and the kind of certainty and control it appears to give is not an either/or proposition. She suggests that this relationship must be understood in terms of both the benefits of more certainty as well as taking into account the limitations of evidence when applied to a complex life process like birth. In Lemay's view, maternity care is best provided in a context of relationship, where the care provider is walking with the woman through the sometimes normal and sometimes complicated path of pregnancy and birth, rather than in a system of protocols, products and outcomes. Lemay's observation about the two sides of the use of evidence to give care providers *"some control"* has the ambivalent sense of Michel Foucault's warning about power that "everything is dangerous".[80] She explains:

Control is good. And it's a plus. Evidence gave us some control in practice. Wow. We know more. Good. But in another way, control is not helping. It's not helping, because life is not like that . . . the best way to adapt and learn and find health and life is with what we don't control, we don't know, with the unknown, uncertainty and all that.

Lemay 33:508

Informants from all backgrounds saw that care providers have a role in the lean towards technology and, more generally, in the creation of birth culture. Some, like Kingdom and Payne in their contrast of Canadian systems and British maternity care, see that not only the individual practitioner but also the broader system structures the kinds of choices that women can make and have a profound influence on "what women want". Christilaw concurs, using the language of "stewardship" to convey the responsibility of health professions in the creation of systems of care and ultimately cultures of birth:

We are stewards of the culture of birth and we need to take responsibility for this.

Christilaw 5:4

Harris repeatedly asserted that the way in which evidence has been applied has "*convinced women*" that birth is dangerous and that technology is the answer:

We've been so deluded by technology. You know, our whole life is run by it. We have Palm Pilots and we have this and that and the other thing. That a process [like birth] *that really isn't governed by technology the way it's supposed to be, we can't stand it or something. I mean I really can't figure this out. You would think that people would gravitate to less intervention, but I think it's a reflection of monitoring and all the*

procedures that we've introduced into obstetrics that have probably made people feel uncomfortable with that. And mostly convinced women as well. I don't think it's any surprise they're asking for elective sections. You know, we've basically said well first off you shouldn't have pain number one, which is ridiculous. And secondly, you know, you really can't get into labour on your own, and thirdly if you've got ruptured membranes you've got a little bacteria and you must have antibiotics, and if you're breech you can't do it, and you know, I mean it's all negative. It's all negative. And it all I think says to a woman that, you know, my body is a time bomb waiting to go off. And you know I better do what they say. I don't trust it or I'm afraid.

Harris 21:47

Is it because we have convinced women? I mean I think we do bear some responsibility . . . I do think that Henci Goer article [The Assault on Normal Birth], *there's some truth to that. We've given all these reasons why you must do it this way, and you must do it that way, and we must do this to you.*

Harris 21:75

Martin and McDonald believe there may be more going on in the way that caregivers use evidence than simply a default towards technology. Martin's attempt to deconstruct the impact of the ways in which the evidence is presented, hints at other mechanisms and interactions:

Well I mean you can say when evidence seems to support a more interventionist route it's picked up right away but I think that's perhaps a bit facile. There's something about that I'm not totally comfortable saying that's the reason. I think it's part of it. But you know, as I talk to you, I remember when Mary Hannah's study came out and I remember reading it really, really carefully, and really trying to understand the whole thing. The tone. The way it was written. The way, the order in which information is presented, do you know what I mean?

Martin 36:90

McDonald struggles to name the way in which technology may be linked with the operation of power:

So I think first there's no power in the soft things and there's a lot of power in the hard things, to use that kind of language. So I think there's no power in no technology. There's no power in I want to put a nurse in that room with a fetoscope when you could put a nurse at the desk to watch the technology, to watch the power. I don't explain it very well.

McDonald 38:84

Linda Knox rejects the claim that it is women who have demanded technologic care. She worries about the active role that care providers have played in the undermining of women's confidence in birth. She argues that the application of evidence-based practice in a context of fear has resulted in a crisis for normal birth. She describes this as a return to a view of birth as dangerous and damaging that she thought the childbirth movement had overcome in what she

calls the "pre-evidence era". For Knox, the ultimate expression of this interaction between evidence and fear is embodied in the discussion of "caesareans for all". She refers to *The Handmaid's Tale*, a futuristic novel by Margaret Atwood in which childbirth is ritualistically performed by a class of surrogates, to convey a nightmare quality she sees in this turn in birth culture:

> *It's the re-medicalization of childbirth. I mean there's been an undermining of women's ability to give birth. If you read the popular press, if you turn on your television, if you pick up journals, anywhere you go, we're back to birth being dangerous and to women's bodies not being able to do this. And for god's sakes, birth causes damage to women. I mean all of these things that are so fear based and so, I just think the threat to normal birth has never been as huge as it now. When you have people out there having debates about whether women should even give birth vaginally at all, how can that be, how can that be? And how can that be useful? And how can it be right? It's frightening. It's really frightening. It's the Handmaid's Tale . . . To me it's not fair, it's not fair to say that it's women that are demanding inductions and caesareans because somebody else is responsible for women believing that in the first place. And that accountability has never been put where it belongs as far as I'm concerned.*
>
> Knox 30:144

Enkin also sees a dystopia within our culture's obsession with certainty, manifested through caregivers using evidence against fear:

> *Science, or rather the technologies that we call science tells us there's a truth out there, a truth almost within our grasp. It tells us that there's a pill for every ill and it's just waiting to be discovered. You can hardly pick up a newspaper without some great scientific breakthrough. It preys on our fears which are growing exponentially. And I guess our biggest fear is uncertainty. We've got to have the answers. We don't dare to listen to Gertrude Stein who made a cogent aphorism. You want to know the answer? There ain't no answer. That's the answer. Dystopia raises its ugly head.*
>
> Enkin 9:53

Feldman refers to the history of childbirth practices and the work of Judith Leavitt, a historian who charts the complex interactions between medical interests and women's activism around childbirth. She uses the example of the anesthetic drug twilight sleep as a kind of a morality tale about an obstetric intervention which was supported by activists advocating for women's interests, by popular demand and by the medical community:

> *Leavitt's thesis is that medical interests are there but in the end it's women who demand the type of birth that they need, for example with twilight sleep, women, feminists and doctors wanted it. Worked together, and that was a huge thing. Women want technology. Within Brazil the idea of having a vaginal birth if you're a middle class women, it's considered ridiculous. And that's what's happening now is women want it and doctors benefit.*

Conclusion

The care providers I interviewed see both the public and health professionals as deeply implicated in the creation of birth cultures which use evidence to support technologic approaches and turn away from evidence that challenges what appears to be a technologic imperative in childbirth. In maternity care, evidence is usually readily accepted if it promotes a more interventive approach and strongly resisted if it leads to recommendations for practitioners to take a physiologic approach or offer choice or flexibility. The move in popular and professional cultures to justify rising rates of intervention using not only the label of evidence but the rhetoric of feminism and choice deeply troubled many informants, particularly in the case of caesarean section with no medical indication. Although many felt that technologies are often perceived by the public and health professionals as best care, technologies were sometimes used as means to different ends. Informants spoke of how technologies are used as remedies for fear and uncertainty, a theme which weaves through the next chapter.

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Chapter Eight: Evidence, Responsibility and Fear

Introduction

In describing the misapplications of evidence in previous chapters, informants have repeatedly raised issues of fear, risk and medico-legal liability. For many, the fraught medico-legal context of maternity care was as important in explaining the tendency to interpret and apply evidence in the direction of technology as the beliefs and attitudes of women and care providers. A litigious legal environment is commonly cited as a dominant concern of American obstetricians[1,2] and as an increasingly important focus of their Canadian colleagues.[3,4] Although Canadian physicians are less likely to be sued than their US counterparts, obstetrics is among the specialties whose members are most likely to be sued in both countries and single settlements are large, usually related to birth injuries.[1-4] Little is written from the perspectives of other maternity care practitioners, although research documents fear of litigation as a significant factor in recruiting family physicians to provide maternity care.[5-7] Obstetrical nursing is considered "high risk" for legal action by the Canadian Nurses Protective Society.[8] Although midwifery in Canada is still a very young profession in terms of case law, the existence of a joint statement in Ontario about professional liability between the midwives insurers and the Canadian Medical Protective Association would appear to indicate a high level of concern about the vulnerability of midwives to legal action as well.[9]

The need to avoid clinical error and legal risk were presented by informants as central but not always overt filters through which evidence is presented and understood in the literature, clinical practice guidelines and EBP courses. Informants described the fear of having failed to intervene when intervention might have made a difference to the health of mother or baby as significant. They see this fear as a force which directs the interpretation and application of evidence and the production of the tools of EBP. Many of the care providers I interviewed used the term "medico-legal" to convey multiple layers of meaning. The term is often equated with the fear of being involved in a lawsuit. For most informants the term was also used to convey a sense of responsibility for avoiding mortality and morbidity, commonly referred to using the term "bad outcome". The word "risk" is often used interchangeably with both clinical and legal meanings. Sometimes all of these terms were used interchangeably, conflating the clinical and the legal. At other times and for other informants they were perceived as separate.

The responsibility of the care providers I interviewed started, of course, with wanting to provide the best care and to not only avoid harm but to enhance the health of the women and babies they care for. However, "risk management" for most informants meant that even when a poor outcome could not be avoided evidence is used to mitigate the personal impact of poor outcomes in maternity care on care providers, whether or not legal proceedings follow. Informants made further distinctions between fear of the personal impact of a bad outcome, fear of self-blame and fear of professional liability, which was described as the fear of error or being seen to have made an error either by patients, peers, your institution, a regulatory body or the court. Although distinct, all of these nuances of meaning were seen as strong motivators for how EBP is used, and all could be referenced under the catch phrase "medico-legal".

In this chapter, informants describe how the emergence of a culture of risk aversion and risk management in maternity care is entangled with how evidence is used and is sometimes confused with EBP. Informants discussed the impetus and obligation to minimize professional liability risk, not only to themselves but also to their institutions, their insurers and their professions. Risk management for some implied following evidence-based clinical practice guidelines, for others this meant using procedures despite evidence they disagreed with in the interest of reducing risk and liability. Clinical practice guidelines are a key EBP product that affect and are affected by risk avoidance. The lean towards the use of technology is equated with a comfort within health care culture towards "doing something" to intervene in the birth process, rather than trusting in the physiologic process of birth. Within a risk aversion culture doing is often seen as safer than not doing, even when at odds with the evidence.

For some informants, the context for the themes of fear and risk reaches beyond the issues of responsibility and blame for morbidity and mortality in maternity care. Some informants found that colleagues used medico-legal concerns as an "easy" explanation for their risk averse behaviour but wondered if more lay under the surface. Informants talked about fear of birth, fear of uncertainty and avoidance of risk within a broader context using terms such as "culture of fear", terminology popularized in the post 911 years in which I conducted my interviews.[10] They also linked fear and risk aversion to the growing cultural expectation of perfection in childbirth touched on in the last chapter. Several informants posed the impact of the medico-legal context as not only a profound influence on how evidence is applied but as having evolved into an alternate paradigm for clinical decision-making: with "*court-based*" (Sermer 49:119) practice undermining evidence-based practice.

Fear and Responsibility

> *When you're delivering that breech in the middle of the night, your heart is there* [points to her throat], *and you call the OR in because you're not sure. And you get grey hair from doing this. So I mean what's that telling you? It's telling you that you're not sure about the outcome, that there's this doubt in the back of your mind, and I think that's what is fed by the trials. So in other words, we have this doubt. We know in the back of our minds that there's a risk here, and that's why we're so willing to change our practice.*
>
> Christilaw 4:80

Many informants talked about the challenge of living with fears and doubts about not being able to prevent a bad outcome. They talked about the ways in which certain applications of evidence can be seen as a remedy for the uncertainty and weight of responsibility that health care providers live within their day to day work. As pointed out by Christilaw, perhaps not insignificantly, maternity care work often occurs in the middle of the night when tiredness and anxiety can increase risk perception. The Term Breech Trial (TBT) was a common example given for the use of evidence as a remedy for both personal and medico-legal fear. Fraser's use of the term "*obvious*" conveys the sense from many informants that the medico-legal environment is such a strong driver in the case of breech birth it almost needs no explanation:

> *I think that there were a lot of factors that influenced the uptake of that information. One of them obviously is the medico-legal environment.*
>
> Fraser 15:45

Menticoglou's use of the term "*legitimate cover*" when describing the quick uptake of the TBT conveys a sense of wanting to avoid the responsibility for vaginal breech birth in order to avoid the fear, doubt and risk of professional liability associated with difficult birth, all of which contribute to personal stress:

> *Many obstetricians have always felt nervous about doing vaginal breech deliveries. And for the obstetrician it's a lot less worry and apprehension if you can just section the woman with a breech. The current breech trial gives legitimate cover for an obstetrician to say "Well you know, the study shows that this is the way you should be delivered." So that thing is readily accepted.*
>
> Menticoglou 39: 48

Christilaw describes decisions about breech birth in the context of obstetricians feeling of being "*constantly at risk*":

> *When I say risk aversion, I'm really talking about the whole culture and also the pragmatic reality of living in a world where we are constantly at risk of litigation. And then if you have evidence that a vaginal breech is more dangerous than a caesarean section and you choose to do that, what's going to be your status if you're sued? Is the*

CMPA still going to defend you? Or are they going to say "Look. Here's the evidence. You should have known better. We're not defending you." So there are really realistic aspects to it that change practice more quickly because of that.

Christilaw 4:316

The sense that obstetricians feel they are constantly at risk was repeatedly expressed by many informants. This concern emerged with rising rates of legal action against obstetricians in Canada in the 1990s. In 1999, the Canadian Medical Protective Association (CMPA) estimated that one in seven obstetrician-gynecologists was sued each year, with the largest awards related to obstetrics.[3] In 2004, the CMPA reported a decrease in new cases of 38 percent from 1995-2004. However, they report that one new legal action was opened for every twelve obstetrician/gynecologists, leading a CMPA official to comment that "the risk of being sued remains high".[11] Queen's University obstetrician James Low described this situation as a "crisis" in his 2005 article in the Journal of Obstetrics and Gynecology Canada. As evidence he points to Ontario obstetricians paying fees to the CMPA that are ten times higher than the average physician. He notes "These fees reflect the number of new files opened, threats of medico-legal difficulty, legal actions commenced, legal actions proceeding to trial, and judgments for the plaintiff."[4] Currently CMPA fees remain higher for obstetricians than any other specialty and are more than triple for a family physician in Ontario who does obstetrical and emergency room care, than for one who does not.[12] The fear that Christilaw expresses that a physician might not be defended for not following the recommendations of the TBT would seem to have more to do with the impact of EBP as an authority than with medico-legal context. The CMPA is well known for being "aggressive" in its defence of physician members,[13] and although the amount of financial awards in successful settlements and suits is increasing, only a minority of cases are decided in favour of plaintiffs.[14]

Pat Mohide talks in more detail about the degree of anxiety that practitioners felt about their own skills in attending breech births prior to the TBT. He describes how the potential for medico-legal repercussions and the attendant personal stress contribute to the perception that it is more convenient to recommend a caesarean section:

Why did term breech change things so quickly? I don't know. I wish some people would actually do some research on it, some social research on it. I think it was the right or wrong trial, depending on what you think of it, at the right time. I think people were having a lot of anxiety, practitioners and in particular new trainees about their skills in breech. Long before the trial came out I was having residents just saying they weren't, they just weren't getting the experience with them. They weren't seeing that many. We

> *had seasoned practitioners who would say flippantly, "All my breeches get a trial of labour and my section rate is a hundred percent" which is not really facetious because it was pretty much what he did, he found a reason to do a section. So I think people were already quite uncomfortable. The medico-legal thing didn't help at all. And also there are personal time and convenience things. Struggling with and sweating over a difficult breech and the question of are we going to do the section, watching the buttocks at the perineum. Are we going to do a section? Are we going to allow this to come out* [vaginally]*? It's a sweaty, difficult, risky thing and if things go wrong, things go very wrong and fast. And it's so easy to do a section.*
>
> Mohide 41:218

It is evident from my interviews that care providers both use and ignore evidence to address their personal anxiety and fears. Sharon Dore describes an experience with using a common anti-hemorrhagic drug often used as the second step in controlling excessive bleeding after birth and which, like most drugs, has the potential for a rare side effect. She acknowledges that her reaction to one frightening experience, to "*never use it again*", is against the specific evidence about the drug and against EBP's caution against anecdotal evidence. Dore, an educator and researcher who works at McMaster within the EBP paradigm, acknowledges this reaction is not rational but is nonetheless very powerful. As she notes, it is accepted within the informal culture of the health care system that most caregivers will have practices that are based on frightening personal experiences, which can temporarily or even permanently impact their way of working and their view of the evidence:

> *I had a case once where I gave ergot and* [the woman] *seized afterwards. I'm never using it again. And those are very powerful pieces of evidence. And we've all had those. And it may be a one off and who knows why, but it drives your life.*
>
> Dore 7:308

Eileen Hutton also speaks to the impact of dramatic and frightening events on care providers and to the lack of supports in the system to process this kind of fear:

> *It's that lived experience that people don't quantify well and probably they didn't sit down and debrief from it in a way that would have put it in context and maybe allowed people to put it on the shelf. So it still becomes a very living memory.*
>
> Hutton 25:321

For some, this type of fear explains not just individual but also systems level practices that are justified with claims of safety, despite lack of clear evidence or evidence supporting flexibility and choice. Anne Houstoun observes that when driven by fear, the most interventive and least flexible interpretation comes forward, as illustrated in her example about the combination of GBS screening and antibiotic treatment with early induction for pre-labour

rupture of membranes:

> *The worst aspect of what that evidence was giving us has been grabbed on so that we now induce plus antibiotics earlier than the study ever suggested. Again there's a fear factor in there. The fear factor is babies will die of strep. Despite the fact that the evidence shows that in our province strep has gone down significantly and there is some concern that there are other infections that are increasing that may be the result of too much ampicillin or penicillin in labour.*
>
> Houstoun 23:340

Laurie Wahoski talked about how fear of bad outcomes and litigation affects both physicians and nurses. Even in her hospital where there is a separate low risk unit and a philosophy designed to optimize support for normal birth, she sees that working in the same institution with high risk cases can impact the care of women who are at low risk. The trauma caused to care providers by the inevitable difficult case ripples to "both sides" and affects the attitudes and practices of both those in high and low risk units. She describes how a bad outcome leads to "steps backwards" in applying the evidence supporting normal birth:

> *And then you have a couple of bad outcomes, doesn't matter what side they're on. Everybody is super cautious and over reacts and we take more steps backwards and then we start again. Hopefully in the end we come out ahead. But we're cautious, and the physicians are so cautious and worried about litigation these days. And so are we* [nurses], *to be very honest, you know. If you have some high risk cases and they go bad we apply all of that to everybody and we're all scared. And then we settle down again and start focusing more on okay, we've got to get back to this philosophy.*
>
> Wahoski 53:109

Wahoski explains how medico-legal thinking operates after difficult cases occur. Rather than looking to the evidence for best practice, anecdotal evidence and fear of blame dominates. Like Dore, she sees this as a dangerous but powerful force pushing care in the direction of intervention:

> *The critical thinking goes out the door. Everybody has got to look after themselves and protect themselves, just in case. Which is sad. If we don't start curbing that, where on earth are we going to be? Then we will be sectioning everybody and what a shame.*
>
> Wahoski 53:257

Houstoun also worries that challenging cases have an understandable but "distorting" impact. She explains the vulnerability of the obstetrician who, because of how on call teams and shift work are structured, often has less of a relationship with the woman than the nurse, family doctor or midwife. This, combined with a greater concentration of high risk cases, may make obstetricians more vulnerable to lawsuits and contribute to the use of routine interventions that

may not benefit the low risk population:

> *Well it's got to be the fear factor because it drives so much. For me that's what drives obstetrical practice. And I understand that. Last summer I went to grand rounds and they were presenting on postpartum hemorrhage. Well in the space of two months, they had three women who almost died from postpartum hemorrhage. By the end of the rounds I was thinking "Oh my god, I'm never letting anybody out of there without . . ." I was terrified by the end. And you realize that* [obstetricians'] *view of the world is so distorted, why wouldn't you become sensitized to that? Why wouldn't you be over cautious for a much broader group of women? And I mean they pay how many thousands of dollars of malpractice insurance and they are the ones that get sued because they tend to have less of a relationship. And we know that's what increases your risk. Its the guy who breezes in at the last minute, says hello but* [the woman and family] *have no relationship with* [the obstetrician] *and then* [the obstetrician] *makes a decision and things go bad. Even though it has nothing to do with him, that's who you're going to hang it on. The buck does stop there. So you understand why for them the need to ease some of that, any opportunity to lower the risk why wouldn't you take advantage of it? And that's the technology part. So if there's any sniff of a problem,* [the obstetrician thinks] *"What's wrong with a caesarean? I'm a good surgeon." And they don't live with the consequences. It's not the same impact for them as for women giving birth, and they don't get it. Again no ill intent but they don't get it.*
>
> Houstoun 23:140

The Need for Proof

Care providers from all backgrounds presented fear and medico-legal thinking as the most powerful motivations behind the reluctance to apply the evidence in favour of intermittent auscultation (IA). They used this example as one of the most remarkable instances of resistance to EBP in maternity care. According to Wahoski, for nurses:

> *Sometimes they have this whole feeling that the minute they take the monitor off, something is going to happen so they have to keep monitoring. Because they're sort of nursing from this point of view that something bad is going to happen rather than that this is going to be a really normal, healthy process. And while you have to keep both of that in mind and you can do that with intermittent auscultation, I think nurses, I think that's one of the things, they're just so scared of what's going to happen when they're not seeing every heartbeat of the baby.*
>
> Wahoski 53:93

For Seaward the application of evidence in this field is:

> *A monumental task that we still haven't succeeded in is getting people to stop doing continuous fetal monitoring on all patients . . . people are afraid that their exposure to litigation is going to increase.*
>
> Seaward 48:41

Biringer, Dore and McCabe pointed to the medico-legal appeal of the computer print-out

that is generated from the electronic fetal monitoring (EFM) machine as central to resistance to the evidence, both at a personal and systems level. The common perception in the maternity care system is that "*there's no paper*", and there is "*no proof*" or "*validation*" when a nurse listens to the fetal heart with a stethoscope. Although it is true that auscultation is not recorded by a machine onto a graph, the fetal heart rate is documented in the woman's medical or midwifery record by the nurse or midwife. The concern expressed in informants' comments that auscultation "*is quiet*" when done with a fetal stethoscope is easily addressed by the use of a hand-held device called a Doppler which amplifies the heart beat so that parents and caregivers can hear. These issues raise questions about whether the anxiety for nurses and medical students described by informants below is caused by the lack of "paper" or a lack of a machine-based versus "*personal*" confirmation of the assessment of the fetal heart rate. Biringer explains:

> *I think one of the factors in terms of intermittent auscultation is the lack of documentation, the lack of hard things that you can look at, dissect, review, get second opinions about. There's no paper. Intermittent auscultation is something that is done, personally, quietly, and there's no proof. There's no evidence that you even did it. Right? So I think that nurses are anxious about not having that. And I think physicians are probably anxious about not having that. I think there's an anxiety there around lack of documentation. I think there is a skill base that is missing in a lot of the nurses, in actually most of the nurses now cause they haven't had to do it, so there's anxiety around not really feeling comfortable that they can do it well. They know they should be doing it, they know the theory of doing it. They may be right that they're maybe not that well trained at this point to do it. I think that patients like the reassurance of machines and monitors. It looks more scientific, it looks like it's going to protect their babies better. They like hearing the heart beat. There's that sort of public, you know, declaration that the baby is fine. We hear the baby. The baby is with us. There's tremendous anxiety around the lack of documentation there's huge anxiety around defense in terms of litigation. Huge anxiety.*
>
> Biringer 2:130

McCabe and Dore point out a lack of logic in the assumption of EFM as more reliable documentation. The method of documentation used for auscultation is routine in health care and similar to many other of the observations made during labour, such as temperature, blood pressure and vaginal exams. However, hands-on procedures such as taking blood pressure and pulse are increasingly able to be done by machine and recorded by machine, reinforcing the distrust of auscultation and human rather than machine recording of findings. For McCabe:

> *It's fear of litigation and it's driving so much of what happens. One of the things that we experienced is nurses felt that they wouldn't be believed. So if you put a heart rate down or maternal blood pressure down* [in the patient's record] *nobody questions that. But the auscultated heart rate people aren't going to trust that that's what it was.*

McCabe 37:64

Dore points out the context in a busy teaching hospital with many care providers involved:

> *I work in a teaching hospital. So we have many junior learners, clerks, interns, beginning residents. They see a patient in assessment. They'll say to the nurse "Where's the strip?" Because they feel that they can't go to the staff person and summarize the patient without validation. I use the example to nurses frequently. You write down the blood pressure and nobody questions it and you're comfortable doing a manual BP, but you can't feel comfortable doing a manual fetal heart? Which makes no sense. You know the medico-legal literature around intermittent versus EFM and I teach that to them. I've explained to them how the multiple experts will interpret that piece of paper in multiple ways.* [The response is] *"Hmmm, but I really want this piece of paper', and the clerk feels "I have to have a piece of paper cause I really don't understand this fetal heart stuff, you know. But if I have a piece of paper and I can show that to the physician. Then I'm not relying on the nurse saying its 140 regular rhythm, etc." What does that really mean? That* [auscultation by a nurse] *is not as technologically valued.*
>
> Dore 7:90

Electronic fetal monitoring has established a non-evidence-based norm that acts as the current standard of care despite the evidence supporting IA. This creates a lack of comfort with following EBP guidelines advocating IA, as many appear to believe that constant monitoring will be medico-legally protective. This perception also appears to reflect and potentially reinforce some negative interprofessional dynamics, with nurses feeling like they will not be believed.

Several informants pointed out that the use of EFM as medico-legally protective is not only counter to the clinical evidence about its usefulness in low risk cases; it is also counter to the evidence about litigation. They note that EFM is more likely to be used against a health care practitioner in court rather than to defend their actions. The EBP courses ALARM and MORE^{OB}, which are mandatory at many Canadian hospitals, explicitly teach participants to avoid EFM in low risk births and never to use the monitor to record IA. Despite the desire for a "paper trail", they assert that there is no medico-legal protection in an EFM computer print-out (often called a tracing or strip) done solely for medico-legal reasons.[15] Seaward and Windrim explain:

> *People are afraid that their exposure to litigation is going to increase if they're not doing continuous fetal monitoring. . . I mean the tracing is potentially more likely to hang you than not.*
>
> Seaward 48:45

> *I think that medico-legally it would be wise to drop EFM. I mean EFM is imprecise. You can get lots of serious variations in the heart rate which a lawyer and their expert opinion would say is the root source of the newborn's problems.*
>
> Windrim 54:250

Hughes and Young spoke in more detail about the fear of the expert witness or the lawyer who specializes in what they see as an unscientific but manipulative use of EFM computer print-outs in court proceedings:

> *The truth is that on a given day when it goes to court, the judge is not going to read all the evidence. He's going to be influenced by experts who some of it might be flare and pizzazz rather than content.*
>
> Young 55:50

Hughes explains the use of EFM in legal proceedings has motivated the drafting of guidelines which are aimed as much at medico-legal protection as clinical guidance. Hughes describes how the SOGC has moved away from support of EFM in normal birth with acknowledgement that EFM tracings can be too easily interpreted by the plaintiff's lawyers or expert witnesses to show fetal compromise. As Hughes' comments illustrate, this over-interpretation of EFM in a legal proceeding and the appearance of a scientific basis for interpretation, however flawed, mirrors the over-interpretation of EFM on the labour floor:

> *Now they* [the SOGC] *cover themselves because there's a lawyer in Toronto who is sort of the top dog in interpreting electronic fetal monitoring strips. Like he's made it his business to try and pinpoint where things went wrong on the monitor. In other words the SOGC's traditional statements supporting electronic monitoring are really to their disadvantage instead of being open minded about it. Which they are now. But at the time, at a certain time they were not.*
>
> Hughes 24:82

> *I go back to this monitoring issue. There are people out there who are quite prepared to throw down a monitor strip and point to the point where the baby went sour.* [Name], *I don't know if you met him, but he's a pediatrician in Toronto and has a huge CV. I mean the man is brilliant. But he goes to court quite often for the plaintiff and he actually points to the judge to say "Well on this monitor strip, that's where the baby went sour". I mean he times it from the moment of birth and looks at the gases and he has little graphs, I mean it all appears highly scientific is but not in reality any strong evidence I don't think. But he's getting credibility because he's able to sort of talk the talk.*
>
> Hughes 24:202

Reynolds explains that although many practitioners currently believe intervention protects them legally, this may evolve. He believes that overuse of all interventions, including caesareans, could eventually lead to complaints or lawsuits because of the greater morbidity and mortality associated with unnecessary procedures. His comments also reveal tensions between those who tend towards versus away from intervention:

> *I think medico-legal is again one of those things that I've tried to use effectively to batter away at the interventionists to say "One of these days you're going to get sued for doing*

an unnecessary caesarean section. Just you wait." And of course they're always saying to us non-intervention types "Oh, you know, these people are going to turn on you and bite you because you've been neglectful."

Reynolds 44:260

Wahoski agrees that worrying about lawsuits may lead to more lawsuits:

Well unfortunately I see it a lot from nursing and I think we all have to be cognizant all the time of medico-legal issues. However, it can't be our guiding light. We can't run our business based on what could happen and on the fear that we're going to be sued because if you do, you start doing silly things and I think we give more reason to be sued. Medicine especially, and they're the ones who pay the price, they're the ones who more often are sued, are very cautious. When we first opened, they were incredibly cautious here. There's still a few and, you know, it's their personality that they're going to be and they're not trusting and that sort of thing. They worry about the distance between here and the operating room, the skills of the nurse.

Wahoski 53:55

Although Wahoski, like Houstoun earlier, identifies obstetricians as the ones who "*pay the price*", Reynolds points out that in Canada it is the public purse which largely funds liability insurance fees for physicians. This is true of nurses and midwives as well. Young and Reynolds point to the problem that litigation is, for many parents of disabled children, their only recourse for financial support. Many informants suggest that one of the answers to the overuse of intervention motivated by medico-legal fear is ensuring an appropriate social safety net for disabled people, so that litigation is not the only option for financial support.

Most of the fees are covered by provincial systems. We need to address a kind of collective or communal responsibility to bad outcomes that aren't clearly negligence and make sure those kids and families get the appropriate kind of care and then they won't have to resort to litigation for care.

Reynolds 44:262

Young recommends professional regulation as an alternative to lawsuits:

Maybe if we had greater trust in our professional governing bodies our colleges of midwifery and physicians and surgeons and maybe getting that greater trust involves more public involvement, they should be the ones who decide what went wrong here and what the remediation should be rather than having some judge, you know, listen to expert A and expert B and see this poor child with obviously devastating consequences of childbirth. And what we do now is we, in order for that person, that family to get support, they've got to find someone liable, you know, legally...responsible. And that's.... a terrible system. And so I think evidence-based medicine has helped so we're better off than we were but still the medico-legal business, I just don't want to be the physician who is in that situation. And I could be.

Young 55:100

Personal Responsibility

Fears that often underlie care provider concerns about the rare cases of severe illness and death that occur in maternity care are often euphemistically referred to as medico-legal concerns. For informants, this fear is not primarily a fear of being blamed and therefore involved in a legal proceeding as the term implies. The fear of the "bad outcome" and the inevitable feelings of guilt and failure that follow are dominantly personal fears of having failed to help parents achieve the perfect end to pregnancy, a healthy baby and healthy mother. Soderstrom expresses how the price is personal rather than financial if there is a legal claim:

> *It's fear. And that's not just fear of litigation. That is fear about... what could happen. Because if you are there when that uterus ruptures, that baby is maybe not going to live. That mother might not live. That is personally terrifying to you and personally dramatic. You take it as a personal loss.*
>
> Soderstrom 51:476

Care providers told me that they are aware of the irony that their stress about poor outcomes is far out of proportion to the overall safety of birth in Canada. Informants described that although a poor outcome is unlikely, it has become almost unacceptable for a baby to die during pregnancy or birth or be born with problems or disabilities. Despite how safe birth has become for most women and babies, death and illness still occur in a small but persistent percentage of cases, often not related to the health care provided. Perinatal mortality (the intrauterine death of a fetus or death of a baby less than one month old) is about seven in 1,000 in Canada[16] and rates of cerebral palsy have remained stable at about two in 1,000 over decades.[15] The baseline rate of congenital anomalies is three percent.[16] For Hutton, the chance of problems during birth is higher than most women and families now expect:

> *We're a very blaming society. I mean we've moved from being a society who accepted fate. Maybe that's the religious thing that we've moved away from. We've moved from an acceptance of fate and that things happen to us, to a sense of control where we think we can control what happens to us. So when something doesn't happen the way that it ought to have, we don't accept it. And when we think about pregnancy and start looking at the numbers, how many pregnant women know that the likelihood of a problem with a pregnancy runs about one percent to five percent, one to five percent. It's high. And yet people don't know that.*
>
> Hutton 25:167

Later in her interview she reiterates:

> *But I think that socially we've fallen into the trap of the perfect baby syndrome and I think we need to educate the population that we can't guarantee this.*

Many care providers accepted the reality that some degree of mortality will continue to be an inevitable part of the process of childbirth, despite ongoing research and improvements in care. They accept that they will be involved in tragic outcomes but feel pressured to avoid what is in some cases unavoidable. In trying to explain why evidence that supports non-intervention is not applied, many noted that bad things do happen sometimes despite the overall safety of birth and that when things go wrong in birth, it is dramatic and devastating not only for parents but also for caregivers. Although informants seem aware and concerned that fear of bad outcomes is out of proportion to the safety of birth in Canada, they were less aware that their fears of litigation may be out of proportion to the actual incidence of lawsuits found against health care providers.[13,14] These disproportionate concerns may lead to "defensive practice" which some experts feel increases health care costs by steering providers away from EBP.[1, 17,18]

There is a substantive literature documenting the impact of medico-legal fears on recruitment and attrition in both obstetrics and family medicine maternity care. In a 2005 article in *JAMA* "Who will deliver our grandchildren?", the authors state: "It has never been safer to have a baby and never more dangerous to be an obstetrician."[1] As Harris and McCabe describe, this dichotomy makes it tempting to apply technologies "just in case" even in a normal birth:

> *Well the problem with obstetrics too is that, even those of us who feel there is too much intervention, we do have bad cases. And I think that what the astute caregiver has to do is they have to be watching for those. They have to have it in their mind, even in the most normal situation. I mean they can't just say this is a piece of cake and it's all normal and you don't need to do any of those interventions and that anybody who says this is overly medicalizing . . .*
>
> Harris 21:51

> *Bad outcomes are inevitable. It is part of what we do, and that's hard. And then there's also the guilt that sometimes we can carry, the family can carry, and the guilt drives a lot of what subsequently happens.*
>
> McCabe 37:272

David Young probably speaks for most health care workers when he says we all have our "*five worst cases*" that could be examined to reveal weakness in the way they were managed and errors in judgment. He is clear that although he may be medico-legally protected through liability insurance and the powerful legal defense that can be mounted by the CMPA, this does not diminish his desire to avoid error and regret:

> *I mean I've got, we've all got, if you said to me name your five worst experiences I can*

> *name them. And could they possibly find something in those cases ... And so I just don't want that to happen. And you know maybe I'd be able to because of my knowledge find experts that would present me in the best, present the truth in the best light. But I don't want, you know, to have to live with that.*
>
> Young 55:62

For Young this reality that all health care workers are human and prone to error explains the motivation to use evidence for certainty, to know that you have done things the "right way". When things do go wrong, EBP is a comfort, affirming that despite the bad outcome you did everything you could. Informants, like Wahoski, worried that this combination of the expectation of perfection and fear makes it easy for care providers to want to apply technology with or without evidence as a defense against fear and blame:

> *You know, nine times out of a thousand something bad happens or even less than that, but we are scared. And you get so dependent on that fetal monitor. It's been really, really hard. Even over here* [on the low risk unit] *where we do have Dopplers. We have them for use, in a shower, in the water, but it's very hard to get that monitor out of the room. I was quite disappointed when we first opened up and the monitor was in the room right away.*
>
> Wahoski 153:109

In the current social context of maternity care, where many women have fewer children later in life, providers noted that the responsibility for perfect outcomes can bring a different level of stress than in other health care situations, different than, for example, when treating disease or injury where perfection may not be as expected. In this context, the fears and pressures which are brought to how evidence is applied in maternity care were expressed by many informants as being as much about personal responsibility as professional liability. David Gass notes the dramatic impact, both personal and medico-legal, of a single perinatal death or a single suit:

> *One thing that affects us is the impact of a perinatal death. There isn't an equivalent. Maybe that's too broad a statement but it's pretty close. That's one feature. The second feature is that the medico-legal impact is greater there than probably any other area of practice because the insurers are so scared because single suits change things, they can double, triple the costs. And maybe it's both causes. It's the power of the single event is so great.*
>
> Gass 16:108

For Larry Reynolds, the personal discomfort caregivers feel goes beyond a fear of bad outcomes. He notes it is a fear of uncertainty and what he calls the mystery of birth that drives care providers desire to use evidence to control birth:

> *To me it's because birth is mysterious, it's profoundly mysterious. And we don't do well*

with mystery in our culture. We have to measure it, control it, turn the lights on, and have machines that go beep because we're all scared. Fear is the thing that drives us. And we have our kind of liturgy of control. And we're not really addressing the fear that birth is overwhelming, mysterious and profound and that we need to celebrate that rather than run away from it.

Reynolds 44:192

Reynolds holds the authoritarian nature of the medical system accountable for the public expectations of perfection, expressing this through a concept that many others also used: that "playing god" leads to blame for what may be unpreventable problems. Some credit Michael Klein with this concept, however in his interview, Klein credited Murray Enkin for this observation, which actually appears to have been coined or at least put in print by former WHO perinatal epidemiologist Marsden Wagner in a critique of medico-legal justification for rising caesarean rates.[19] Reynolds also uses the language of production, consistent with sociologist Emily Martin's work on maternity care structured as an industrial model,[20] a concept which will be further explored in the next chapter:

Well I think we've created the medico-legal crisis ourselves because I think there's been a sense that birth has been done to women by physicians mostly, we're delivering your baby, we are delivering a product here. And if the product is somehow deficient in any way then the person who produced the product, which is not the woman or the couple or the community, but the obstetrician or the specialist or the team is to blame. And we have created this: that labour and birth are highly dangerous. Things can go wrong. What happens here makes a huge difference to the future of, this child's future. And sometimes that happens, but it's rare, quite rare. But the sense that somehow put your lives, your body in our hands and you'll be fine. And we're paying for that in spades right now. Again, the line "When you play god, you start taking credit for natural disasters."

Reynolds 44: 67

Knox describes a very different cultural context when she worked in the less litigious environment of Holland, where an acceptance of the responsibility of parents for decisions about place of birth is a formal part of the health system. She uses a specific example of a home birth in Amsterdam to point to an acceptance of the fact that although birth is usually normal, some bad outcomes do occur and cannot always be prevented. She again returns to the underlying problem of lack of social support for disabled children and their families in the US and in Canada:

There's a family in this boat. That's where they lived. That was their home. They had no phone. They had no electricity. So I'm looking at the midwife and I'm saying "So what happens if this woman hemorrhages?" I picture how we will have to spring back, up the ladder, run across three boats and four blocks away, there were no cell phones then, and find a phone somewhere, call an ambulance. And then we have to get her out of the boat and she just said "I don't understand the question." And I'm kind of like, okay, okay,

hang on. And her answer was so simple. "It's the parent's choice." And in Holland, they don't get sued because it's assumed... that birth is normal. But also that bad things happen. You can't control them all. If the parents are told it's risky to do that and they choose to do it, there's a difference somehow in their legal process where that's accepted rather than battled and chipped away at and undermined. I think part of it is that here we have eliminated all the social safety nets. And so now we rely on practitioners' malpractice insurance to look after damaged babies or loss or whatever you want to call it. So that's a huge piece of the picture.

Knox 30:296

Professional Liability and Risk Management

As illustrated in the discussion of screening and treatment for GBS in the previous chapter, medico-legal concerns about rare outcomes can loom larger than actual clinical concerns. This dynamic happens when the number needed to treat is high and the chance of a poor outcome in a specific case is unlikely, yet procedures or treatments "just in case" are widespread. Informants reported a pervasive tendency for the need for "risk management", even in situations where the likelihood of a poor outcome was very small. This grows out of the context in which it is perceived to be safer to be a baby than to be an obstetrician.[1] Informants universally shared the assumption that medico-legal concerns drive practice. Martin suggests that given the overall safety of birth, it may be more common for care providers to act out of medico-legal concern than out of concrete clinical concern:

And fundamentally, care providers are not always as anxious about the actual outcomes for that baby or that mother as they are about the impact that it would have on them. You know what I mean? Their career. Their reputation. Their medico-legal situation.

Martin 36:146

For Christilaw, this need to "manage risk" is a profound cultural change in obstetrics and explains many of the dynamics and directions of EBP. What both Christilaw and Martin point to is that medico-legal uses of evidence may overlap with, but are different than, clinically indicated uses of evidence. Individual care providers or institutions may not always make this distinction between the clinical and medico-legal, as they become conflated through the concept of "risk". Christilaw explains:

There's no question that obstetrics has become a culture of risk aversion. And I think that is what has happened in our practice. If there is one thing that has really changed, it's the culture of risk aversion. Now, I'm not saying that that's necessarily wrong. But certainly that's the main driver in terms of deciding even which trials will be done and how evidence is used.

Christilaw 4:46

"Risk management" borrows strategies and systems to reduce error from industries such as airlines and other areas of health care such as anesthesia, with the goal of increasing patient safety and liability risk for institutions and insurers. Programs to promote risk management and "a culture of safety" in maternity care, such as ALARM, ALSO and MORE^{OB}, rely heavily on the use of evidence-based guidelines shared by an interprofessional team. Most of the care providers I interviewed believed these risk management programs were very effective "evidence products"; however, some expressed concerns about the lack of distinction between the concepts of risk, safety and evidence.

Martin worries about the way in which risk management terminology has blurred the issues of patient safety and liability for the health professional and the impact this can have on "*shaping*" care:

> *It's a horrible term. That's my first thing I want to say is I despise that term. I mean the things I've read about risk management, I'm thinking like whose risk are you actually managing? What risk are we managing? Whose risk are we managing? I think the most extraordinary sense I have is that yes of course, everyone with any kind of decency or heart or conscience cares about the well being of the mother and the child. But in fact they're not the people we're talking about. We're really not. If you deconstruct it, really we're talking about managing my risk. In other words: shape this woman's care to protect me.*
>
> Martin 36:502

Kaufman notes that although the concept of risk management reinforces the notion that all risk can be avoided or prevented, which in some ways can reinforce the culture of blame:

> *They talk about risk minimizing which may or may not be possible. But it carries the notion then that if something doesn't turn out right that it's because you screwed up, not because there's always a risk.*
>
> Kaufman 26:266

Soderstrom describes avoiding liability and managing risk as coming from different "directions" but with the same goal:

> *Well what I mean is as practitioners we are feeling at risk for being sued, so it's our own liability in that issue. Whereas risk management is coming at it from the other direction and saying "Well how do we either prevent an event from happening, or deal with it once it has happened?" I mean essentially they get at the same thing, but it's the direction in which you come at the question.*
>
> Soderstrom 51:204

Michael Klein uses the example of cord blood gas sampling, recommended by the SOGC CPG on monitoring fetal well being, as an example of a seemingly evidence-based

recommendation which is completely motivated by medico-legal protection and has no clinical purpose or evidence base:

> *The problem is, this is a beautiful example, that in the present SOGC guideline of fetal surveillance which is evidence-based, that recommendation* [for routine cord gases] *is in there. And it has absolutely nothing to do with fetal surveillance. It has to do with risk management . . . they will not acknowledge that they are doing it for protectionist or risk management reasons.*
>
> Klein 29:234

Klein's comments illustrate the point that risk management and patient safety may not always be congruent, but when presented in a CPG, risk management activities may appear to be evidence-based and important to clinical management. Enkin also points out that clinical risk is different from medico-legal risk and may not be proportional. He explains that the clinical risk is "very rare" while the fear of being blamed is "*major*":

> *I mean the risks to you of a bad experience are very different than the risks for the woman. The risk to the woman is, well the very rare possibility of something going wrong that otherwise wouldn't. The risk to you is being blamed for something. I think a really major thing . . . is that fear.*
>
> Enkin 8:650

It is this difference in scale between the actual clinical risk and the fear of blame that leads to the overuse of intervention. As previously noted there is also a difference in scale between the fear of blame and actual legal findings of negligence in the Canadian legal context. Informants pointed out that although in many obstetric situations the number needed to treat may be large, medico-legally the individual birth is the only one that matters. This means caregivers are prepared to over-treat and over-intervene in order to avoid the "*rare untoward outcome*". (Seaward 48:91) Hutton illustrates how this pressure is felt by individual care providers:

> *I mean one of the other things that we're really dealing with in, again in the North American/European context, in the developed world, is the risks are so tiny. And we're trying to move from a .09 to a .08. And it's just like that's what's really driving us to the point of insanity. And when you look at it, it has no meaning really for anyone until you get a bad outcome, then it has a lot of meaning for that individual. And you have some lawyer saying to you "Didn't you know, Ms. Van Wagner, that you could reduce this risk by .01?"*
>
> Hutton 25:222

Baskett's comments illustrate how difficult it is to resist using preventative treatments, even if they may be linked with long term problems across the health care system:

> *Well it is because with Group B strep, you have a healthy eight pound baby who within*

12 hours is overwhelmed and either dies or suffers very bad damage. So it's very hard to then say "Well we should be much purer and worry about resistant strains and we should limit [antibiotics]*." That's all very well, but not in my back yard.*

Baskett 1:337

Caregivers are aware that no matter how informed the woman is prior to a poor outcome, or how determined she is to avoid interventions, she may regret her decision and doubt her care providers if she has chosen to decline technologic approaches. Informants were clear that they live with a difficult reality. Although they are obliged to inform and respect the woman's choices, informed choice is never good enough in the face of a bad outcome. Some discussed personal experiences with how after a difficult birth, perception of what the information was can shift with hindsight. Knox asserts that the understanding that women and caregivers may experience regret and doubt after a poor outcome should not determine care decisions. She advocates for a style of care that benefits the majority of women and babies and is uncomfortable with the lack of support for those who choose to offer non-interventive options:

Well, and it's like if you're the one in a thousand post-dates, of course you wanted an induction. But what I'm worried about is what defends us to let those other 999 chose spontaneous labour, what supports us to say it's a very valid choice?

Knox 30:278

Harris also spoke about the problem of promoting non-interventive approaches, worrying about what is commonly called "the blame game", which she sees as particularly problematic in maternity care:

And you know in an institution like this where there's a lot of players, we have had neonatologists actually say "Oh this baby died from infection" when they didn't even know what the cause was, and in fact it turned out to be something completely unavoidable. I guess that's another thing that maybe influences how we practice. I think we're really quick in a maternity setting to be very critical of other people.

Harris 21:174

Dore explains how the nursing staff on a labour floor can "discipline" physicians who vary from accepted protocols. She illustrates this using a hypothetical case of waiting for labour past what has become the norm of 41 weeks.

And it's not just women. It's nurses. So in other words if this physician brought a woman in at 42 weeks or she came in labour and they had been waiting, right? I can hear the chatter in the nursing station now. "What on earth was he doing? Look at all the meconium we have. That baby is going to be sick. I mean what a stupid move. Mmmm, mmmm, mmmm, mmmm." So it's also nurses forcing the culture of the delivery area, which drives people to be the same. I am trying to promote the approach where you don't

book until 41 weeks and you don't do it until 41 and 3 . . . if you leave them most will not need induction. But it's very interesting the response to that. Everyone is looking at me like "Are you weird? Why would you wait?" And I feel like I'm this lonely little voice out there because even the nurses, I think they would rather get on with the induction. It's more controlled. And birth is an uncontrolled situation.

Dore 7:174

Although Simkin agreed that medico-legal concerns explain many uses of evidence, even from a US perspective she is reluctant to overuse this explanation and add to the culture of fear of litigation. She explains that although in the US medico-legal concerns often act as an excuse to intervene, this is not a universal trend. She refers to the use of misoprostol (trade name Cytotec) in the US for the induction of labour. Cytotec is a uterine stimulant which is not used in Canada for induction as it can cause fetal compromise and uterine rupture especially in VBACs. She describes the use of this drug as medico-legally risky but "seductive":

I hate to even bring malpractice into it. Well I think it's almost a too easy answer. I think it's something that everybody dumps on and just says "Well we're afraid because if we don't induce in time..." And I think that trial lawyers may be able to twist findings like those that were reported from the Hannah trial to say that he should have done it earlier and a jury would perhaps go along with that. Well and just like evidence, the malpractice fear comes up when convenient, but look at Cytotec And if they get a bad outcome with Cytotec, you can't sue Searle, the manufacturer cause they sent their dear doctor letter out. You can't sue the ACOG because they've couched their support of Cytotec by saying it's up to the physicians. They're out there on a limb. And you know, the buck stops with them on that but does that stop them from using it? The seduction of convenience and of fast labour and they'll give doses that will cause titanic contractions and uterine ruptures or whatever.

Simkin 50:69

The persistent use of misoprostol for induction in the US shows that medico-legal fears do not always trump other drivers of care such as the desire for convenience and efficiency, topics explored in the next chapter. For Martin and Knox medico-legal concerns represent an important yet insufficient explanation for what shapes the ways evidence is used. Their comments suggest the centrality of anxiety and uncertainty which may be about more than the legal context:

My understanding is pretty simple. EFM produces a graph, produces something that you can see. And with auscultation that poor nurse who has got to come in there and chart it. If that baby dies or something happens, well I suppose people take her word for it, but there's nothing hard. It's not the evidence, it's not on a rational level . . . but you see, this is where it gets down to that level of very unconscious kinds of anxieties, inabilities to live with uncertainty if you like.

Martin 36:419

> *It's about litigation should there be a bad outcome, but it's more than that. It's about being seen through the eyes of your peers because it's often about the group within which you function and the institution within which you function. And there's way too much regimentation and ownership around issues like that. Why in one hospital with a reasonable call group will people say "Well of course. If this criterion is met and the woman feels really comfortable and we're all comfortable that she really is making an informed choice, of course she can have a vaginal breech." But over here* [in another hospital] *with a different population of obstetricians close to retirement maybe who just want to get done their last five years and the fear level around breech, around VBAC, around all those issues, is through the roof. I don't know what the answer is, but I just, there is something terribly, terribly wrong with this picture. And something has to change.*
>
> Knox 30:268

For Knox, like Simkin, the claims to EBP and to medico-legal drivers of practice are suspect when the application of evidence is uneven. She references an article by Henci Goer called "The Assault on Normal Birth" [21] which identifies an underlying agenda in the US, particularly in the *NEJM*, to manipulate the evidence about VBAC to justify repeat caesarean section:

> *And the litigation piece, I get it, is absolutely huge. But excuse me. If you're going to change your practice based on that research because you think you have to from a litigation point of view, if that research is challenged, why wouldn't you think you have to change it back again? So when I read Henci Goer's piece about the assault on normal birth, I finally went yeah, exactly. That's exactly how I feel about it.*
>
> Knox 30:108

The Culture of Doing

Michael Klein explains the selective use of evidence and the contribution of care providers to an interventive birth culture with the concepts of omission and commission. He argues that for many care providers, especially physicians and nurses working within busy institutions and trying to manage risk and avoid error, it is much more comfortable to do than to not do. The culture of "watchful waiting" that is part of caring for normal physiologic labour has become almost impossible within mainstream maternity care systems. Klein describes a "natural" discomfort with non-intervention within the "*medical establishment*":

> *There's a natural propensity toward doing something as opposed to not doing things. There are two kinds of errors. There are errors of omission and there are errors of commission. If you don't treat somebody with antibiotics and they get a sick baby that is an error of omission. On the other hand, if you treat somebody with antibiotics and they have a reaction, a major reaction and they die what kind of an error is it? Is it an error? Because we are more comfortable with doing than not doing we say that's a side effect. There are no such things as side effects. There are only effects, some of which you like and some of which you don't. The whole medical establishment is predisposed to doing things, to committing things. And we all acknowledge that there are consequences,*

always. When you do something, you never, never can say that there are no effects that you don't like. But we accept that as the natural baggage that goes along with trying to do good works. So we are predisposed to doing things. We are much more comfortable with errors of commission than errors of omission.

Klein 29:169

Klein asserts that there is a clear perception that blame is more likely to result from not doing, whether it is self-blame, patients blaming caregivers or legal attribution of blame. Klein's assertion creates a framework for understanding the frequently expressed truism within maternity care that "you are never blamed for doing a caesarean, but you are blamed for not doing or doing a caesarean too late". The observations of other informants confirmed that action seems to act as a remedy against fear and uncertainty. For Harris:

I mean it's almost like there's this mesmerization with doing something.

Harris 21:47

Sharon Dore gives an example to illustrate that the urge to "do" is not unique to medical culture, but also impacts nurses. Her study of the traditional practice of cleaning the newborn's umbilical cord stump with alcohol to avoid infection found that it was advantageous not to treat the cord.[22] These findings challenged historical practice and left many uncomfortable with "doing nothing", despite an economic advantage. She describes resistance to adopting her findings:

We always like to intervene because we're doing something. My example actually with the cord care study was I had a lot of people want to adopt it because it was economically beneficial to hospitals to get rid of the alcohol. But there are certain centres who say "We're better to do something. What if? What if? What if?" And several centres repeated the study, Halifax notably among them, to prove that it was exactly correct. It's easier to intervene because as health professionals we're taught to intervene and make things better. It's like the physician who has to write a script before someone leaves his office whether they need it or not. So I think those [studies] *that generate intervention people say "Right, let's do it". Those that say "Stop doing something we've been doing"; it's very, very hard. And that's where the Term Breech Trial, it's convenient. We can book it and we don't fret so much about the long breech labour and therefore it's one of those "chance to cut, chance to cure" mentalities. And I think that is a very clear dividing line in terms of if it's more intervention, then let's do it. If it's less intervention, let's talk about it before we drop what we're doing.*

Dore 7:58

Comfort with doing and discomfort with not doing helps explain the pattern of over-application of evidence informants observed with post-term pregnancy and antenatal steroids. A common perception is that more is better, action is better than inaction, and technology is better than no or low technology. Windrim expresses discomfort with the application of evidence that

supports post-term induction as a safe option without assessment of the individual case to evaluate issues such as parity or the readiness of the cervix for labour. His comments that "*no one waits any more*" and that many "*bail out*" are indicative of a general discomfort with expectant approaches. (Windrim 54:100)

The urge to "do" is intertwined with over application and over interpretation and results in a strong preference for singular, simple and active approaches. There is a concomitant discomfort with multiple, complex and expectant or "watchful waiting" approaches. Harris links the urge to do with the desire not to offer choice even when the evidence supports giving women options. She refers to the PROM trial with the comment:

> *It was twisted to mean, well you better do something.*
>
> Harris 21:27

For Biringer and Gass, this widespread shift in the culture makes it much more difficult not to act. For Biringer, the need to act is fundamental to the current culture of maternity care:

> *It's a huge, huge cultural shift in terms of the expectation that one does everything that one can, and then you've done everything, right?*
>
> Biringer 2:274

Gass links the need to do with using evidence in the direction of intervention because of pressure to "*do everything*" if there is "*any chance*" of positive impact, despite potential consequences which cause "*trouble along the way*":

> *So if the vision of delivering low risk babies is to avoid disaster at all costs . . . one could say for fetal monitoring or CS for breech, maybe it leads to some trouble along the way, but if there was any chance it ever might do something positive, I would keep doing it.*
>
> Gass 16:30

The expectation of doing as medico-legal protection is linked to a pervasive culture of blame in the maternity care environment. Martin provided an example related to persistent beliefs about the efficacy of EFM despite the evidence. She notes if a baby is born with signs of asphyxia, it is not uncommon for care providers to judge others if EFM is not being used, even if there were no indications. She admits that she would ask herself the same questions in any individual case. However, she wonders why despite the apparent commitment to EBP, individuals and institutions do not seem to be able to understand that EFM is not improving overall outcomes. She answers her own question with reference to the previously cited truism about caesarean section as ultimate medico-legal protection through "doing":

> *I know at the Montreal Children's you know we did have a baby who was extremely flat*

and really, really not in good shape. I know that they believed that if there had been monitoring that baby would [not have been compromised], *and there's not one single time that I don't ask myself the same question. Which doesn't mean that I think EFM should be used on all women. How do they put that together though with* [the fact that] *the rates of cerebral palsy haven't changed. How do people put that together? Nothing has changed except the rate of sections. But you never get sued if you do a section. Because you've done everything you can.*

Martin 36:430

For McCabe, the question of doing versus not doing represents the ultimate medico-legal question:

Often the question is "Well did you do everything you could? Was there something that maybe you neglected to do?"

McCabe 37:283

For Reynolds, like Gass, the need to do is rooted in a belief system or philosophy of birth as a "*natural disaster*". (44:67) The dramatic and sarcastic tone of his comments reflect the difficulties and frustrations of a care provider attempting to treat birth as a normal healthy process, while working within a system that does not support his philosophy. The scenario Reynolds presents portrays how fear of birth drives medico-legal fear which drives caregivers to present fear-based information to women which can ultimately be coercive:

The dominant paradigm is bad things are going to happen, you're going to get sued, so whatever gets it over with, whatever . . . gets the baby out while the baby is still alive. It's very difficult to swim against that kind of stream . . . the woman's body as a ticking time bomb. That woman is at home with ruptured membranes, she's getting infected, she's probably had a febrile seizure from septicemia in the bathroom, she is going to be found dead the next day. I'll be on the front page of the Globe and Mail or the Toronto Star. No, we better keep her in the hospital where we can keep an eye on her and get the induction going here. Do you want to stay here where it's a safe environment and we'll watch your baby, and we'll get you into labour or do you want to go home and get a fever and die and have your baby come back dead? What choice would you like? "Oh, I'd like to go home and have my baby die, thank you." So we're going to call Children's Aid and have a caesarean.

Reynolds 44:159

Soderstrom, an expert on professional liability who counsels midwives about medico-legal issues, draws a distinction between the professions. She notes that while the medical system may tend to err on the side of intervention and midwives are not immune to these pressures, the philosophy of midwifery may mean that the errors of a midwife may also lie in the direction of non-intervention. She explains how this fits within Klein's framework:

Don't you feel there is quite a wide disconnect between philosophies? I am stereotyping, but the obstetrician of today is feeling more comfortable with commission and you as a midwife feel more comfortable with omission.

Soderstrom 51:308

Simkin and Martin give examples of the anxiety that "not doing" can engender:

What we have, it isn't maternal distress or fetal distress, it's caregiver distress. But I think it's usually in the territory of waiting, of seeing what happens. I think wanting to act is their way of treating anxiety. So whether it's evidence-based or not, it's end is action, to make the labour or birth happen.

Simkin 50:634

I remember this one client in particular who was just past 42 weeks and the way the nurses and everyone came into the room, and out in the corridor and people were just as [anxious] *as if she were about to have a pre-eclamptic seizure. It was at that level. I mean really, really, really anxious about it. Real anxiety about it. And I don't know, maybe it's driven by that predisposition to do something but there's some other predisposing thing going on here ...*

Martin 36:110

As a family doctor who holds a philosophy of birth as a healthy process that does not require routine intervention, Hughes described the need to be aware of the skill needed to "not do". Hughes explains that watchful waiting is not inaction, but is rather very active. Hughes presents an approach which combines "*vigilance*" and "*prudence*" as an alternative to applying routine technology as an antidote to fear. He sees the skills of watchful waiting as essential for those who interpret evidence in the direction of normal and offer choices such as breech birth or expectant management of post-term pregnancy. His example focuses avoiding on the added risks of routine caesarean section for breech when a normal birth is likely:

I mean setting up a section for somebody who could pop a breech out, you know, it's quite a difference in terms of outcomes and morbidity. Sure, there may be a little added risk for the baby, but that is minimal under controlled circumstances, with well trained people watching for things that might go wrong. I teach my residents that all the time, watchful waiting is not doing nothing. The two terms I love to harp on are vigilance and prudence. You know, vigilance being absolutely certain you haven't missed a trick, not just slapping on a monitor. You know exactly what's cooking here. And then being prudent. Prudent about when you want to intervene, not just intervening on everyone. That's where your skill comes in and where your wisdom comes in over the years as you develop more experience.

Hughes 24:297

Clinical Practice Guidelines

All informants talked about the profound impact of clinical practice guidelines (CPGs) on

health care generally and maternity care specifically. CPGs are seen by the care providers I interviewed and by scholars as not only the place that evidence meets practice, but also the site where evidence is likely to be interpreted through a medico-legal lens.[23,24] On the ground, CPGs are the "how to guides" and, as many pointed out, as evidenced by their name, they are meant to guide not prescribe. However, many informants worried that guidelines can become instruments of certainty. Some informants expressed ambivalence about the impact of the ever expanding number of CPGs. They acknowledged the need and potential usefulness of CPGs, both clinically and medico-legally, as well as worrying about their dangers.

Baskett points to how the medico-legal context plays into the tendency for CPGs to become "*law*". He explains that although they invariably include fine print that asks practitioners to use judgment in their application, CPGs can tend to "*intimidate*" and lead to inflexible practice for fear of medico-legal consequences:

> *The SOGC made a very good effort to produce good guidelines. They haven't always succeeded, but there was a lot in the nice try category and a lot of very good ones. But the problem is if you get one that's not good and it comes from a national organization, it becomes in a sense almost the letter of the law. And a lot of practitioners get very intimidated and they feel "If I deviate from this guideline, I am liable legally", which as you know it's a large sword of Damocles that hangs over all of us who do obstetric practice nowadays.*
>
> Baskett 1:221

Hutton and Hughes, also very involved as interprofessional members of the SOGC, point to the fact that professional associations uses guidelines and other EBP products to try to help providers avoid error and therefore increase patient safety and mitigate the impact of litigation claims and suits which are costly to the professions. Hutton's comments address the pressure to balance a "fair" evidence-based approach and medico-legal protection in how guidelines are used:

> *And I think if you read the guidelines, if you start going through the guidelines for SOGC, they are inordinately fair. I really believe that the legal system has had such an enormous impact on that* [how guidelines are implemented at the institutional level]. *At the SOGC offshore meeting somebody from the CMPA stated that one in seven obstetricians will be named in a suit every year.*
>
> Hutton 25: 166

In his reference to the SOGC's VBAC guideline, Hughes notes that evidence is not of high quality, as RCT evidence is lacking. This CPG mainly recommends informing patients of the risks rather than prescribing a course of action. Hughes expresses dismay with some of the legal judgments which are influencing practice, which he believes are "*incorrect*" in the sense of not

reflecting a scientific understanding of the evidence. For him, poor quality legal decisions drive the need for CPGs to define best practice and protect practitioners and the maternity care professions from wrongfully assigned liability:

> *Well the new guidelines for VBAC for example is classic. Sixteen recommendations all based on evidence, a lot of it Level II evidence, and basically saying "The decision is finally yours, but just be aware if you do this, this is the likelihood it might happen. If you do that, this is the . . ." Make your patient aware. You can take whatever chances you wish with an open mind. And that's where the evidence lies. Not "Thou shalt not induce VBACs", or "Thou shalt not have a VBAC at home". There's no such thing* [as a prescriptive recommendation] *because the evidence does not support it. But what the SOGC is saying, and I can see their point of view too, is the medico-legal issue is huge. The US litigation practices are moving to Canada and people are getting high settlements for nothing, for really incorrect legal judgments. And that's why the SOGC sort of want to put something on paper as a reference.*
>
> Hughes 24:82

Hughes's observation that "*US litigation practices are moving to Canada*" seems to name a fear that underlies many of my informant's medico-legal anxieties. For Payne this threatens what is seen as evidence:

> *And it is so driven by litigation. I mean I really think that in the US, it's the main evidence in a way.*
>
> Payne 43:226

An international comparison by Canadian legal scholar Joan Gilmour would seem to indicate that this sense that a US norm threatens other systems is not limited to Canada and in fact persists even in New Zealand's no fault system.[25] The strong statements of Hughes, Biringer and Sermer about "*incorrect legal judgments*" seems to be at odds with an increasing reliance on CPGs by courts to guide legal decisions. What may be at stake here is the distinction between medical standards and legal standards, when legal judgments weigh CPGs and expert testimony in the specific context of a particular case.

Menticoglou discusses how this attempt to protect caregivers through CPGs can backfire. The existence of guidelines can create greater liability because they tend to be interpreted more rigidly than intended in court. He explains the contradictory impact of CPGs:

> *Guidelines are many times helpful but other times its doctors handing lawyers the noose to hang themselves with. I mean whenever a guideline comes out, there's always the caveat that this information should be taken in context of the clinical situation and the circumstances or whatever. But actually it's quickly interpreted by lawyers and expert witnesses and whatever as a standard.*
>
> Menticoglou 39:84

Biringer agrees that despite the attempt to promote judgment, even a well considered variation from the standard practice may increase liability:

> *Again as family doctors this is never all we do, obstetrics is never all we do. So it's much safer to stay within guidelines than to be a heretic, right? It's much safer in terms of your exposure to litigation. And even if in your gut, you're thinking this is wrong, if you're practicing according to standards you are safer.*
>
> Biringer 2:230

Tonelli explains that EBP guidelines can undermine a nuanced and individualized application of evidence. "Actions with an apparent evidentiary basis are easily defensible, but deviating from guidelines is immediately suspect and demands justification."[26] The experiences of the care providers I interviewed reflect this dynamic. Practitioners from all professional groups expressed a belief that a good EBP practitioner should take the woman's needs, values and preferences into account and use their knowledge and judgment about the particularities of the clinical situation. Although in medical malpractice law judges can follow a minority opinion, informants repeatedly worried that it is difficult to justify any variation from CPGs. Wahoski recommends an approach to guidelines that integrates choice and judgment, but suggests that there is currently "no room" for such an approach:

> *We are so tied up in this legal stuff right now. The book says this how we have to do it. And I think we have to get the book to say that you have to be able to integrate choices and not write their rules so firmly or our policies so firmly that we have to follow them. And there's no room for decision-making or judgment any more.*
>
> Wahoski 53:31

Biringer concurs that using judgment in how evidence is applied can put a practitioner "*outside of the pack*" and therefore at risk:

> *The need that we all have for certainty and the truth business, I think it's compounded by the need to have guidelines upon which to base judgment of care. So in terms of standards of care and standards of practice, there's been a big drive not just in obstetrical medicine but of course in all of medicine towards guidelines-based practice. So guidelines to help you practice, but also guidelines against which you judge your practice compared to your peers. And I think as medico-legal considerations have just mushroomed, I think that having evidence has been part of that, that if you're not practicing with the group, with the pack, and the pack is sort of supported by the evidence, then it puts you sort of outside the pack. So I think that's part of it.*
>
> Biringer 2:62

Menticoglou and Ohlsson reinforce this view:

You're I guess a lot safer in court if you can say that you've followed the strict instructions of your national body to the T, and if you try to use any discretion or anything like this, you're in trouble.

Menticoglou 39:32

I think if people are afraid if it's obvious they're going against national guidelines or professional guidelines, they would be more in trouble I think. I think it's much more so in obstetrics than neonatology.

Ohlsson 42:481

For Wahoski, this hesitation to use guidelines in a way that respects women's choices raises ethical concerns. She describes a belief held by some of her physician colleagues, which also troubled other informants, that the need to follow guidelines and protect themselves overrides women's autonomy:

And then probably something that we don't do enough of here is review the ethics. I listened to grand rounds a few weeks ago where someone from CMPA was speaking to the physicians about when women refuse recommended treatment. Obviously this is a big issue because the doctors are caught between what their governing bodies say and what their peers are saying and what the woman is wanting. And if she is a maverick not wanting to go along with that, then they're caught with their accountability issues. And they're really feeling it. But I was so struck that not one physician in that whole hour said women have a right to make the decision. CMPA did, but not one of our physicians who attended that meeting. It was hotly debated. But I was just really, really concerned. And so what it told me was there is just so much fear among that group to stray outside the guidelines that they hesitate to really empower women.

McCabe 37:208

Midwives expressed fears that even when they feel the woman is making a "reasonable choice", if it goes against guidelines the practitioner does not have a defense:

And I think part of why we encounter that is that little cloud that sits over all our heads called liability. Medico-legal. Because to tell you the truth we have to think of that all the time. And so even though your gut and your how many ever years of experience as a midwife might say it's a totally reasonable choice, that little part of you is going "Oh my god, oh my god, what if something goes wrong? I don't have a legal leg to stand on." So I think it does influence.

Rural Ontario Midwives 46:269

Kotaska, like Baskett, has concern that guidelines can actually diminish the skill and critical thinking that EBP hoped to encourage. He uses the example of vaginal breech and the voice of a practitioner who is readily influenced to turn to planned caesarean. Like Christilaw in her earlier quote about breech, Kotaska paints a picture of middle of the night anxiety. Ultimately he argues for the art of medicine, which he feels current practices of EBP often undermine:

It is easier to follow a cookbook than it is to cook from scratch using an apprenticeship of your mother's and grandmother's years of expertise. "No, just this much of a pinch of salt." And so cookbooks basically have served the function of allowing average people to achieve much better results putting flour, sugar, water and oil together that usually was the domain of expert bakers or handed down recipes. Took a lot more effort to actually gain that experience as an art than it does to read a quarter teaspoon of salt or a teaspoon of soda. And I think the same thing is true that the art of doing vaginal breech deliveries is hard fought and hard won. And to be able to say it's actually just a caesarean section is a relief. Forget all that. That was an awful lot of work and people think "I've sort of put in a bunch of my time to [learn to] *do it but I don't feel really confident and it would take even more of my time* [to get confident] *and I've got all this other stuff to do. You know, writing papers and looking after the kids and trying to do my Pilates so instead of doing that I'm just going to section them all because I wasn't really good at the art of vaginal breech delivery." Even those who did them were thinking "I would do them because I was reasonably confident but at two o'clock in the morning I felt like I was standing on a slippery log. And most of the time everything went fine, but it wasn't a nice feeling. It's like you're standing on a slippery log. And so now somebody comes along and says "Section them all", you know, here's your cookbook recipe to that problem. And they let me off the slippery log. So you're asking me to go back up on a slippery log? I don't think so." It's harder to master an art than it is to read a cookbook.*

Kotaska 31:280

The explosion of CPGs as part of the EBP paradigm seemed to some informants almost absurd and counterproductive. The proliferation of guidelines leading to the need for courses and guidelines about how to use guidelines is seen as part of what some see as the expanding and self justifying EBM industry. Biringer notes a great deal of uncertainty created for the practitioner who is looking to guidelines to reduce uncertainty:

So there are about a bazillion guidelines about a bazillion conditions. The problems are that we've now gotten to a point in our lives where we have to have guidelines on how to interpret guidelines, and honest to god that's true. There are ways of looking at guidelines. So for example let's even think about one condition. Let's think about gestational diabetes or in family practice I would say cholesterol but we're talking about maternity care. But let's think about gestational diabetes. Think about all the players that are invested in expressing how this condition should be diagnosed, treated, whatever. And so the little practitioner has at the very minimum guidelines in Canada would have from the SOGC, from the Canadian Diabetes Association at the absolute minimum. You'll probably have a couple more because usually the Task Force on the Health Exam will weigh in on something like that as well. And then you have from south of the border you have the ACOG and then you have the American Diabetes Association and then you have the Cochrane. They're not just different guidelines on how to diagnose, treat, whatever, but there are also even just different parameters for the glucose tolerance test. There's the World Health Organization, there's WHO guidelines too. So the number one complication is that there are more than one set of guidelines for a condition. So then you don't know who to follow. And then when you actually look at

the guidelines, a lot of guidelines are based partly on evidence and partly on just consensus, people getting together and saying "I think this is a good thing. I think everybody over 40 should have a fasting blood sugar." Okay. On what evidence? We don't know, but the experts have proclaimed it as such. You've got the poor GP who says "Who am I to argue against the experts?" It's a huge problem to know which guidelines are tenable, which ones are credible, and which ones should govern our practice. Should I diagnose gestational diabetes like the WHO says, like the Canadian Diabetic Association says? It's complicated.

Biringer 2:210

Court-based versus Evidence-based Practice

For many informants the impact of medico-legal decisions and fears has come not only to shape EBP, but has also become a more dominant force than EBP. Throughout the interviews words such as "*huge*", "*enormous*", "*mushroomed*", "*large sword . . . that hangs over us*" and "*cloud*" created a sense of foreboding and fear. Most informants feel the line between what is EBP and what is risk avoidance is not always clear. Sermer notes the way in which medico-legal fears and risk adverse practice may divert attention and resources from more important priorities within the health system, using gestational diabetes (GDM) as an example:

The evidence is not strong one way or the other, although there is circumstantial evidence. My personal view is that in fact there is something to GDM, although the degree to which we see the morbidity and mortality is so little that maybe I don't put it high on my priority list of things to do. Cessation of smoking would be much more important. And a lot of it has to do with the fact that in order to prevent one morbidity you would have to screen so many, but when you go into such details people can't understand. They won't know. With GDM the problem though currently, really it's medico-legally driven, one hundred percent. I shouldn't say one hundred percent. There's an also personal bias against the evidence.

Sermer 49:95

Sermer's reference to medico-legally driven care reflects his work as one of the expert witnesses in law suit involving a child with cerebral palsy born in 1983 Smiths Falls, Ontario. This 2003 lawsuit, Crawford v Penney, resulted in the largest Canadian single case award to date at ten million dollars.[27] Although the case was appealed, it was upheld in the Ontario Court of Appeal.[28] Multiple informants referenced this case as highly influential to maternity care in Canada. Many saw it as not only problematic, but as paradigmatic. For some, EBP appeared to be a casualty of the legal environment. Others pointed out that civil law norms were undermined as the judgment appeared not to have followed the expected practice of using the test of "the reasonable practitioner" and standards of the time and of peers to evaluate the practitioner's actions. The outcome of the case hinged on the fact that the baby had macrosomia (high birth

weight) and the birth of the baby was delayed due to shoulder dystocia. The baby suffered hypoxia and cerebral palsy. The controversy over evidence-based practice in this case centres on screening for gestational diabetes, which, as described in previous chapters, has no clear evidentiary basis. The 2002 SOGC guideline[29] accepts not screening as an acceptable practice, as well as universal screening or screening based on risk factors. In this case the family physician did not screen, which as Sermer, Biringer and Hughes describe is not only currently acceptable practice as the SOGC guideline, but was the norm in 1983. The controversy lies in the fact that the judge based his decision on evidence from other experts which asserted that universal screening is the norm. This is an opinion which Sermer and Hughes claim is not evidence-based and not consistent with the SOGC CPG.

In describing this case, Sermer explains his acceptance that different practitioners choose to interpret evidence differently. He is troubled when legal decisions do not recognize appropriate evidence-based variation in practice and begin to determine medical practice:

> *I can stomach a disagreement with a local physician and we fight it out and we manage it differently. But if a judge who doesn't have a clue about medicine imposes a certain standard on society, then I find that a disturbing practice. So if we practice because of legal implications as opposed to what is right and then create a standard of the problem, then we always come semi-protected if we practice within the standard of the community. The difficulty in these cases is that he* [the family physician] *actually did practice within the standard of the community, within the standard of the time and of his peers. In fact his practice should really withstand* [comparison with] *any practice we have now. The evidence presented was in many ways black and white. There was data we had to suggest that screening actually wasn't done in the community at that time. It was care by the appropriate methods for 1983. Even though it was presented, essentially it was perhaps too much for the judge to understand. It was a very long court case. Obviously there was an opposing view that was presented. The judge essentially from my perspective ignored evidence or was not able to comprehend the evidence. I mean I can't speak for the judge . . . to me that's what it appears to be. And so he set standards. Well I would hope that most of the time . . . in the legal environment there can be acknowledgement of the best evidence or when there is no clear evidence. And most of the time . . . it does. But obviously not always. And to me this issue about macrosomia and gestational diabetes as far as that particular case is actually quite black and white. And it was turned upside down by the legal environment and I think that the legal aspect will change the standard of practice. And so we already see that effect. Its court-based rather than evidence-based practice.*
>
> Sermer 49:119

This case has been, according to many informants, influential in pushing the community of obstetric care providers towards routine screening, for GDM. In a more general way the case also reinforced the trend towards doing versus not doing and intervention versus non-intervention

despite evidence and guidelines. Sermer used the term "*court-based practice*" (Sermer 49:note) to describe not only the impact of the legal decision, but also the emergence of a powerful paradigm for medical decision-making that seems to trump EBP. The strong and emotional language used by informants like Sermer, Hughes and Biringer conveys the level of distress this case created by seeming to contradict expectations about legal norms of being judged in relation to your peers and the practice of the time period:

> *Yes, it was found against the family doctor because he didn't screen. And yet the guidelines are flexible. So in fact although I actually applauded that particular set of guidelines, I was horrified by the duplicity and the two-facedness, and I won't call it schizophrenic because that's a medical term but you know what I mean. It was ugly also because it's obstetrical standards applied to a family physician and it's obstetrical standards applied retrospectively, a long, long, long time ago against a family practitioner in a smaller community. So that to me is just beyond me. It's beyond me really.*
>
> Biringer 2:230

Biringer linked feeling of the vulnerability this case created with concerns about recruitment of family physicians into maternity care. Several informants described the negative impact especially on rural practitioners who do not have ready access to obstetrical referral. Hughes talked about this case and another court case where a family physician "*went by the book*" when using auscultation of the fetal heart:

> *Well the thing that disturbed me about that case is that we weren't all screening for gestational diabetes at that time. Well we aren't even all now. But we weren't all then for sure. So no one should be blamed for that. It wasn't the standard of care. No. There's another one going to go to court. About auscultation. It was in Scarborough I think. I don't exactly remember the location, but this poor GP who is now retired has sleepless nights and insomnia. Poor woman. She said "I didn't want to retire this way." It was her last case. She came in at four in the morning. She sat with that woman. She intervened appropriately at the end with forceps. I mean went by the book.*
>
> Hughes 24:462

Danny Farine, a maternal fetal medicine specialist at Mount Sinai hospital is involved in medico-legal issues in obstetrics. He described his experiences acting as an expert witness and organizing an annual conference called Obstetric Malpractice: A Survival Guide. Farine testified opposite Sermer in the Smiths Falls case. He was a member of the SOGC Maternal and Fetal Medicine Committee which reviewed and approved the 2002 SOGC guideline on GDM. In his interview, he noted that the impact of medico-legal cases on practice may not be all negative as it may have a kind of anti-authoritarian effect. He acknowledged that, like many obstetricians, he

has had the experience of being involved in a claim against him. Like most informants, Farine noted that a better system is needed to address the needs of children and families when a baby is compromised. He points to a deep inequity in a system that relies on negligence to provide support for children disabled with birth injuries:

> *The medico-legal climate does affect the way people think. I'm not sure that it's necessarily so bad because we used to be omnipotent, we used to be in control of everything, nobody could touch us. And that's not a good way to go about life in general. You have to be humble, you have to think. When you drive you have to look in the mirror to see who is behind you. And it's just smart to be cognizant of all the different issues. So I'm not really sure that the medico-legal system is all bad. Yes, it is really annoying. I have had to go through it a few times and every time it was like banging my head into the wall. But aside from the personal connotation, it just puts another balance into the system. Is it the right thing? Probably not. Should we have a no fault system? Yes. Should the baby that is damaged when the obstetrician is giving good care be deprived from the care that the baby gets when the obstetrician gave poor care? It doesn't make too much sense in my books.*
>
> Farine 13:206

Sermer and Mohide worry that the impact of medico-legal rulings has not been humility or improvement in practice, but rather practice contrary to evidence:

> *And right now there's plenty of evidence in the literature, expert opinions, that you should not either induce or do caesarean sections for macrosomia. And yet legal opinions or legal rulings will actually change, are changing practice already. We're seeing inductions for macrosomia. We're seeing caesarean sections for macrosomia. Patients are asking for it. So notwithstanding what is perceived to be medical evidence, evidence-based medicine, there are external factors that establish a standard practice. For macrosomia it actually goes contrary to what the evidence suggests, what are actually current practices. And it's essentially imposed from what I can see by the legal environment.*
>
> Sermer 49:99

Mohide explains that he stopped working as an expert witness because of how easily he felt evidence could be manipulated in the legal setting:

> *I mean when you get down to the nitty-gritty evidence-based medicine actually gives you strong tools to try to make argument. The question is whether those tools are used well. And the reason I stopped testifying in cases is because of my own distaste for my own expertise. I just became too damn good at it. And you know . . . I got to the point where I felt no matter what side of the, I knew enough about the law and I knew enough about evidence-based medicine that with a little craft I could probably win on either side, at least based on what I was able to testify about. I absolutely walked away at that point. That was not a role I wanted to play in life.*
>
> Mohide 41:182

Conclusion

The care providers I interviewed spoke passionately about the impact of fear and risk aversion on how evidence is interpreted in practice and described fear as both personal and professional. Practitioners fear making errors and fear the inevitable bad outcomes that are rare but are often an unpreventable part of maternity care. They fear blame in the context of popular and medical cultures that expect an impossible level of perfection in the outcome of pregnancy and childbirth. Some see that a view of childbirth as a natural disaster drives risk aversion and increasing rates of intervention. Others perceive that they themselves are at medico-legal risk disproportionate to the actual clinical risk. Fears may also be disproportionate to the actual number of lawsuits found against health practitioners in Canada but many expressed worry that the litigious culture of the US is spreading. Many worry that medico-legal decisions have become a powerful new driver of practice that overrides evidence and pushes practitioners to "*do everything*", and is therefore pushing the system towards higher and higher rates of intervention. Some wonder if medico-legal concerns represent an easy justification to explain the inconsistent use of evidence. A few informants asked questions about whether there are systemic issues that lie underneath what is explained as medico-legal pressures. The next chapter explores some of the potential systems influences on how evidence is used.

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Chapter Nine: The Birth Industry

Introduction

Care providers apply evidence and create evidence tools in the context of large health care systems where pressures for cost containment and competition for limited resources impact maternity care. They work within increasingly "managed" and "accountable" hospital environments.[1] Institutions, professions and care providers use evidence in a "systems" context where there is a need to manage time, workload and resources. Both the insurance industry and hospitals increasingly use evidence to standardize care in the service of risk management, quality and efficiency.[2] Most informants did not discuss the structural or economic factors influencing health care as readily or in as much depth as other themes. While many factors and patterns in the application of evidence emerged without prompting in my interviews, the vast majority of informants did not bring up economic factors without prompting. However, most alluded to systems factors which result in what *New Yorker* journalist and surgeon Atul Gawande has called "how birth went industrial"[3] and scholar Barbara Bridgman Perkins describes as "the medical delivery business".[1] Mark Tonelli refers to the influences of industry and management that may lie underneath beliefs and attitudes in medicine:

> *I think it's more than personal inclination or cognitive bias. I do. I mean I think that the industry of medicine and the culture of management has shaped our thinking in both subtle and not so subtle ways. There is a drug or a technology for every person and every disease, even for diseases you did not know you had . . .*
>
> Tonelli 52:140

Informants reflected on the pressures to manage workloads by structuring their work efficiently or conveniently, leading to a kind of assembly line mentality. Some pointed to a North American maternity care system that is specialist dependent and functions around acute care for mothers and babies in increasingly large academic health science centres. They worried about the influence of American approaches to health care and the influence of for-profit business interests such as insurance and medical technology companies. Others noted the impact of EBP itself as a burgeoning industry rapidly becoming part of the business of maternity care, with EBP's trajectory intertwined with the success of academic institutions, journals and career paths.

Although many informants presented these larger systems issues as having an impact outside of their sphere of control or even understanding, most saw these factors as centrally

important, even if poorly understood, to the ways in which evidence had failed to fulfill their hopes for a more woman-centred or family-centred approach to care. Interestingly, this was the only thematic area where informants repeatedly asked not to be quoted by name. It seemed that for some the reason was to avoid appearing as too radical through their critique of the system, for others it was to avoid offending others.

This chapter examines the aspects of the economics and business of maternity care which informants felt contributed to an industrialized versus evidence-based approach to care of childbearing women. The dominant themes that emerge in this chapter include: the pressures to manage workload in an efficient way; the use of evidence tools that help care providers save time and resources; the use of technologies to fill in gaps created with staffing shortages, especially when evidence-based practices are more labour intensive; "cheating" or working against evidence-based protocols; and practice motivated by convenience, job satisfaction, workplace culture or making the job easier. I also examine themes that emerged regarding financial incentives and other cost considerations which contribute to how evidence is used and not used.

Managing the Workload: "Getting on with it"

When asked why evidence is applied in the ways that it is, David Young concisely identified the desire "*to get on with it*", a factor that came up repeatedly in my interviews. In his view, the need for efficiency in the use of hospital resources results in a need to move women and babies through the system, creating a desire to "*get babies out*" faster. This pressure to manage the pace of events on the labour floor explains the tendency to use induction and caesarean section rather than expectant management which relies on physiology, providing an alternate understanding of the lean to technology. As noted by Young:

> *I guess sometimes we just want to get on with it. I think there's a lack of patience in many of us that we want to get on with a decision and do things. That's pervasive in all people: Patients, physicians, we've got busy lives, trying to crunch all these things in. Rather talk to the patients, sit down, get the information, go to the literature, find out all there is, deliberate on it, go back to the patient again, rather than have an inter loop, we want a cookbook. Bang, let's get on, we've got it. It's not because we're intrinsically bad. We've got a lot of pressures on us and it is hard. I think a lot of us we want to get on with one item after another.*
>
> Young 55:42

Young points to the appeal of the "*cookbook*" approach to evidence for care providers under pressure to manage their workload. He identifies the "*inter loop*" of interactions and dialogue with patients and the review of the evidence needed to offer choice and tailor care to individuals

as factors that can slow down the pace of work. Penny Simkin identifies this same dynamic in American obstetric practice. She talks about why care in the American system is often based on routine management procedures and not usually based on discussion or offering choices. The need for convenience and workload efficiency can make discussion of choices seem "*irritating*" to care providers. As Simkin explains, the need for efficiency acts as a barrier to using evidence in a way that takes patient preferences into account:

> *It may be that they're* [physicians] *having to see so many people so quickly, or they just find it irritating. I'm not sure. I think this carries over to nurses in labour and delivery who just have a way that they prefer to do things. So offering options is very inconvenient for them because they have to remember different types of care for different people. I think convenience may rule as much as fear of malpractice suits. How much time they have, that kind of thing.*
>
> Simkin 50:81

Lori McCabe illustrates the point raised by many informants that caregiver's need to manage workload intersects with a woman's attempt to plan her life around her pregnancy and birth, contributing to increasing popularity of induction of labour:

> *Inductions are popular, and so we were finding a lot of people were using them to manage their workload. They are popular both with women and physicians. They're popular with women because they're tired of their pregnancy, they want it over, they've got their visitors organized, their support at home organized. So there's that. It's popular with physicians I think too because it can help manage their workload a little bit. And I know that if women come and say "I just want this over with" that the doctors, well there is a tendency to say, "Well I'm on call on Thursday. Why don't I try and get you in".*
>
> McCabe 37:552

Anne Houstoun links the pressure felt by care providers to use technology to lack of overall resources in the system which puts pressure to "*do things faster*", creating a lower threshold for intervention:

> *My sense is that it's an economic issue. It's a resource. Resources in this province have been cut and cut and cut and cut and so the reliance on technology gets ever more and people are more pressed for time. So I mean we're lucky we've hung on to one on one nursing in the labour room. But that is only because of very vocal people who have trotted out the evidence time and time again because we believe that we've got to. Otherwise we're sunk. But, the education department has been withdrawn so all the nursing mentoring has disappeared over the years. The training they get has been contracted like this. The obstetricians now sometimes don't have enough residents so they're acting as staff men and residents. So there's always this franticness of doing more with less. And so you do things faster, you do things more easily, and that's where technology comes in ...*
>
> Houstoun 23:200

Kerstin Martin concurs that the language of "*getting on with it*" is commonly heard on the labour floor. She cites examples such as, "*can you just go in there and rupture* [membranes] *so we can get on with it, get this baby delivered*" (36: 121). She links this pressure to the need to work efficiency as well as to fear and anxiety:

> *I think the climate of anxiety around birth is so strong. I mean how extraordinary given how safe birth is. But the anxiety is tremendous. And so that anything that comes along that might suggest . . . a whiff of a problem, like if you wait an extra three days or hours or whatever. It's that classic thing of "get that baby out" and then everyone can relax. It's over. It's done.*
>
> Martin 36:122

Filling in the Gaps

For many, managing workload in the context of strained resources leads to an inability to apply evidence-based practices that require adequate staffing, such as intermittent auscultation (IA). Jan Christilaw explains that when nurses are required to care for more than one patient at a time EFM seems an attractive way to fill in the gaps in care when the nurse can't be in the room:

> *Auscultation is one of those things that should have been picked up a long time ago. But, in the real world, what's happening is that people are coming into labour units and there's one nurse and there's three labouring patients, and they get put on the monitor because she* [the nurse] *is not in the room. And there are things that happen like that. And then it gets left on because there's one deceleration which you never would have heard, but you hear it and so you keep the monitor on. And things like that happen.*
>
> Christilaw 4:320

Michelle Krysanauskas comments on the impact of chronic nursing shortages in a rural community. She explains how the system of electronic fetal monitoring known as "central monitoring" is being used to compensate for the nursing shortage or what some identified as an underinvestment in human resources. Krysanauskas's description "*everybody*" is "*wired*" refers to labouring women attached by belts to monitors which, along with epidural pain relief, confine them to beds in the labour room. Her portrait of the fetal monitor computer print outs "*feeding out to the counter*" evokes an environment reminiscent of a fast food chain, a metaphor for the nursing station where overworked nurses cluster to work on their charting for multiple patients. The evidence for one to one care and intermittent auscultation seems almost irrelevant to care providers struggling in this context. Krysanauskas explains:

> *Anything that needs one to one care is too inefficient in a hospital's eyes. They can't cope with one to one care. It's cost. And just basically not having the staff. It's unavailability of staff, which is sort of cost but it's not just cost. The staff are unavailable.*

> *The nursing shortage generally, I think, in our community anyway has been an issue. And now with epidurals happening in the last 20 years, nurses don't know how to give one to one care anymore. That's never the first choice. Once the pain starts getting too much,* [the attitude is] *let's get the epidural. Because* [without the epidural] *it would mean they would have to be in there giving one to one care and knowing how to give it. The nurse is often working more than three rooms at one time for one consultant. So basically everybody is wired and feeding out to the counter, so that she can do the massive amount of charts, which includes all her QA* [quality assurance] *and everything else. So she's not touching the woman, or in there doing the one to one nursing and doing the fetal heart. So it has been difficult to make IA happen in units.*
>
> Krysanauskas 32:84

Christilaw concurs that the "*crunch*" caused by nursing shortages impacts on the quality of care. She sees the caesarean on demand debate and rising rates of intervention as a wake-up call, with women seeking caesarean as a commentary on the lack of resources invested in our system. In her view, lack of resources to support adequate nursing or midwifery care make surgery look better than the impersonal care on offer:

> *We are in a crunch situation when it comes to maternity nurses. They're frequently over worked. Especially in community hospitals, we don't have the luxury of one to one nursing for obstetrical women. So is this a wake-up call to look at the quality of care that we offer labouring women? There's no question that this* [one to one care] *is quality of care. But then what's that going to mean? That's going to mean that you actually invest in increased care for women in labour, that you have better resources available to them. I mean which is not to say that it's always bad now. Many, many women get excellent care. It's just that our nursing colleagues are really stretched.*
>
> Christilaw 4:320

Young sees time pressures and workload as critical to the uneven application of evidence:

> *I'll give you some differences between the two. I'm not sure that they're the reasons why one is taken up and the other is not. Well the breech trial take up largely was aimed at obstetricians. The auscultation is aimed at nurses. The breech trial, it's a defined period. If we can do this thing* [breech birth by caesarean] *in 30 minutes to two hours, okay, let's go do it. The intermittent auscultation requires hours and hours of dedicated care, okay? And not only it has to be dedicated and present, but you have to have enough people to do it.*
>
> Young 55: 150

Convenience: "Cheating"

Closely linked to workload management is the concept of care provider convenience that was raised by many informants. Lifestyle considerations have been documented as one of the largest factors influencing recruitment and retention of providers in maternity care.[4] Spontaneous labour and birth create an unpredictable workload for the managers of the labour floor and for

care providers. Maternity care systems have to be designed to provide an unpredictable level and amount of care 24 hours a day seven days a week. Physicians and nurses often work 12 hour shifts. Midwives tend to work in systems that involve being on call most of the time to preserve continuity of care by a known care provider. In any system, the need for 24 hour coverage and the unpredictable nature of the timing and length of labour creates challenges for both the lifestyle of care providers and the management of staff and resources. The appeal of procedures that can be booked in advance such as induction and caesarean is influenced by workload management, convenience and continuity of care. Simkin emphasizes the importance of convenience:

> *I think convenience and lifestyle are huge for both care providers and women.*
>
> Simkin 50:229

> *I don't know if it is the preference for intervention that is responsible or if it's the quest for convenience. In this country* [the US] *we do about three times as many inductions for no medical reason whatsoever as we do for medically indicated inductions. I'll make a prediction. Induction of labour is on its way out because we're just going to go straight to elective caesareans.*
>
> Simkin 50:469

Sue Harris addresses the way in which caregivers go against evidence-based policies designed to limit induction of labour, something she calls "cheating". While referring to the tendency to induce labour on the day the physician is on call "self serving" and motivated by "convenience", she also alludes to the desire of care providers to be at the births of women they have cared for prenatally when call systems make this very unlikely. This desire to time births to accommodate call schedules works against waiting for spontaneous labour and increases the potential to use evidence to support induction. Harris explains:

> *Sometimes they* [physicians] *cheat for convenience. I know they cheat for convenience. Like they'll put the name down on the day they're in there. To me it sounds a little bit self serving, but it might be wanting to be there too and wanting to be there is a good thing.*
>
> Harris 21: 121

Sharon Dore agrees that the factors underlying convenience are mixed, identifying both job satisfaction and the financial incentives that are part of some systems:

> *Well it may be their call schedules. In other words, I'm on call Thursday so let's bring you in and induce you Thursday. You'll be 41 and 1 and that's good. Two things. It may be a caregiver/patient relationship that they would like to be the person doing the delivery. Two, they want to get their money from doing the delivery for the birth of the woman they've cared for. And the woman wants to be with someone she knows. So some of it is driven by how our call schedules are . . . You've met them for several months and*

you want to see the end point. There's some degree of personal and professional satisfaction in that.

Dore 7:178

Workplace Culture: "It's easier"

Convenience and workplace culture merge in informant's attempts to explain the resistance to IA and one to one care in labour. Nurses McCabe and Dore call it "easy" for nurses when women with pain relief provided by epidural analgesia are sleeping through labour, with the heart rate monitored by the machine:

Sometimes we do what's easier. Okay? And one of the issues here, low risk women who have epidurals don't need to have monitors but it's easy. So they get put on monitors because it is easier. Probably because they don't have to wake the women up. They don't have to reposition her. They don't have to sit and feel a contraction and then time the auscultation and then re-settle her back.

McCabe 37:84

But for nurses and EFM, let's talk about night shift. Let's get her her epidural, put the monitor on, and then I can go sleep for a couple of hours. Being honest. And sometimes on nights there are fewer staff. You have to really look at where your care is. And I think what do people value? What are they rewarded for as nurses? Is it sitting in the room with your patient, being supportive, doing intermittent auscultation? Or is it sitting at the desk chatting? And I think for a lot of nurses being in a room with a patient and remote from your colleagues feels very isolating. And it can be draining, helping her to do another contraction and we've got to do this and this and she's having trouble with that and you're trying to support her. It is very challenging.

Dore 7:78

Many informants from all professional groups echoed Dore's description of the preference of nursing staff to interact with one another rather than be in the room with the labouring woman. Nurses' preference to work at a central "nursing station" which is a typical feature of the layout of a hospital unit, is seen as part of why one to one care is hard to implement even when resources are adequate. Helen McDonald concurs with Dore that for many health professionals job satisfaction comes from social interaction with peers. McDonald explains that for nurses and midwives this can distract from the challenging task of labour support:

The nursing staff most of the time don't really want to be there. You're there because you need a job. I think the number of people who really like what they do and want to be there because they like what they do is very few and far between in most professions. I think that for people who don't want to be there, there are other reasons for going to work than providing care to people, especially the social aspects . . . it's a lot easier, forgive me, but it is a lot easier to put on a monitor than it is to go back every 15 minutes and listen to that baby. It's a lot easier to get an epidural than it is to sweat blood over some woman

as her labour support. So it's an easy choice in some respects.

McDonald 38:136

Arne Ohlsson comments that the monitor makes it easy to avoid contact with the patient:

> *It's easier. It's easier to look at the monitor than to actually look at the patient, to have contact with the patient. . . That is very sad.*
>
> Ohlsson 42:501

Anne Biringer talks about how overwork combined with a sense of being "*misunderstood*" drives nurses' lack of enthusiasm for implementing the evidence recommending IA. Her comments point out that lack of institutional support and resources for nurses to provide evidence-based care results in the request for central monitoring, reinforcing nurses ability to stay out of the patient's room. Like Ohlsson, she sees this as "sad":

> *I think the reason there is such resistance probably is because I think the front line feel that they are working too hard, that they are misunderstood, that they are not being supported. So I think they would respond much more receptively if they felt that their needs were being met.*
>
> Biringer 2:190

One of my physician informants asked not to be identified when she began to talk about her analysis of the attraction of electronic fetal monitoring for nursing staff. She challenged the commonly expressed idea that the inability to apply EBP is often linked with staffing levels. Like other informants, she worries that nurses do not want to provide the one to one care which IA demands; that they do not want to "*be in the room*" but would rather be at the nursing station with peers, monitoring the machines through central monitoring systems. IA specifically and unmedicated birth in general is perceived not only to be more work, but to be "*messy*" and out of control. On reflection, this informant clarified that it may not be the actual "amount" of work but rather the nature and the quality of work that is involved. She humbly acknowledges that she can understand this as she herself would "*rather be the doctor*" than be responsible to provide hours of labour support which are traditionally part of the role of a nurse or midwife. Her desire not to be named may be linked to a fear of alienating nursing colleagues, which could undermine interprofessional relationships and working conditions. She explains:

> *There is not the will to do one to one nursing. There is not the will to be with labouring women. There is not the will to be in the room providing comfort measures, providing support . . . It's bloody hard work. And you know what? It's nice for me to say they should be doing it. That's not my job description. And I think it would be really hard work. And having been the doula at my sister's unmedicated birth, man I'd rather be the*

doctor any day. And I think the expectation of the nurses again in our environment where most women have epidurals is of a fairly passive, quiet good patient, not someone who is running around, hanging from the ceiling, yelling and screaming, jumping in and out of the shower, where you just have to catch three seconds to hear baby, right? And that's a challenge for them and they don't like it. They actually don't like it. They don't like being around women in unmedicated labour. It's messy. It's messy. And there are comments always, when women are screaming, there are always comments. To me that's part of birth. But they don't like it.

Anonymous

In this informant's view, the influence of "not liking" to be with women in labour or of not liking the messiness of normal birth on the uptake of evidence is more deeply rooted and less overt than the commonly stated and seemingly more objective medico-legal or staffing concerns. As her reluctance to be quoted by name indicates, these factors of professional and workplace culture are difficult to overtly acknowledge and challenge. For this reason, she sees the resistance to the evidence in favour of IA as insurmountable, despite multiple policies and workshops to support IA:

It's not going to change. I don't see the will there. I see the will among the leaders, but I don't see the will among the people who have to implement it. I think again the reason there is such resistance probably is because I think the front line feel that they are working too hard, that they are misunderstood, that they are not being supported. So I think they would respond much more receptively if they felt that their other needs were being met.

Anonymous

Kris Robinson identified the need for prominent advocates, education about the evidence, and ongoing mentoring to maintain the buy in of the nursing staff for IA and normal birth on the low risk unit she was involved in setting up. She points to the influence of nurses attending births with midwives in her unit (which is not the case in all provinces) as providing important role-modeling for normal birth and specifically IA, because the forces of workplace culture and being "tired and busy" get in the way:

The reality though in three years post opening this particular unit is that we had an awful lot of buy in at the beginning. People like myself were very visible and we had [name of researcher] *who did the whole supportive care in labour piece for us when we participated in the trial and she came and we rolled that into supporting normal birth. One of the aspects was using intermittent auscultation. But now it's three years later. People are tired, they're busy and EFM is creeping back. In order to keep that going, you need constant, constant reminders and constant examples. One of the ways that's helped here is that we actually have nurses being second attendants to midwives. So midwifery has emerged as almost a salvation of a lot of normal stuff. Nurses they're skeptical. I mean they're skeptical of things and I guess they should be but they are very, very*

powerful in terms of either implementing something based on the evidence or not. I mean they have a huge influence on whether or not something will actually happen.

Robinson 45: 148

Like Robinson, Young sees nurses as critical to the uptake of evidence about IA and EFM. He highlights the difference in uptake and implementation between the TBT and the EFM research, pointing to the very different demographics involved:

> *Well it* [uptake] *would depend on who is involved. I mean in part you're looking at for example term breech trials at three to four percent of women, so it's a small discrete body of people that it affects. Intermittent auscultation affects one hundred percent of women and you then have a much larger body of care providers that have to be brought on side to deal with that and to make those decisions. It's the culture of nursing.*
>
> Young 55:440

Houstoun on the other hand, sees that "*practical realities*" of the labour floor often overwhelm attempts to champion less interventive approaches. In the case of fetal monitoring, Houstoun suggests this occurs even when the hospital has put an advocate in place to change practice and promote intermittent auscultation:

> *Yes, and so the woman labouring for 18 hours, forget it. You're not allowed to do that. And if you can't stay at home for that, you've got four hours and then you're getting oxytocin. Which begins the cascade. So the practical realities, if evidence fits with practical realities then you have a much better chance of it flourishing. But if practical realities go against it, then you're sunk. It's going to be a much more challenging thing to do. With the electronic fetal monitoring, they even have a nurse educator who her particular interest is fetal monitoring and despite that being in place, she's been unsuccessful in changing the practices of most of the nursing staff.*
>
> Houstoun 23:208

Throughout my research, practitioners often expressed frustration that members of their own professional groups, as well as "others", did not apply evidence in what they believed was the most appropriate way. Most were predominantly self-reflective and usually focused comments on themselves as individuals or focused critique on their own profession. The exception to this was the comments made by most informants about the impact of nursing culture and workplace norms on the acceptance of IA. This critique was remarkable in how often it was raised and how strongly nurses and others linked workplace management of resources and nursing culture to the inability to implement this evidence.

The "team" nature of maternity care was usually expressed by informants as a positive factor. However, in the context of considering the industrial nature of the labour floor, the division of labour between professions and the fragmentation of care in a shift-based model

seemed to offer an opportunity to transfer responsibility for how evidence is applied to others. This identification of others as responsible could, as in the instance of IA versus EFM, shift responsibility from physicians to nurses, in the case of breech birth from family doctors or midwives to obstetricians and with pre-labour rupture of membranes from nurses to obstetricians. Rory Windrim's comment below illustrates a shift of responsibility for how the evidence is applied from obstetricians to pediatricians in regard to Group B Strep screening:

> *Pediatrics have created the momentum for more widespread screening and treatment because they've been the ones looking after the babies including those babies that, the rare cases that are sick. Who has the right to say "I don't like this so I'm not going to do it?" I personally haven't gone along with doing it. There's absolutely no evidence to support that, but they want us to do it. So again, you tend to do what the people looking after the baby would want. Well it's kind of a request from a a colleague. Pediatrics as a body says "The evidence in favour of prophylaxis isn't huge, but we're the ones with the newborns. Please do it." In a collegial way, if you will, that's the way I think of it, OB as a practice said "Okay, we don't see these babies."*
>
> Windrim 54:262

There were many instances during my interviews where frustration with other team members seemed to create a kind of apathy about either applying or redirecting the application of evidence. The need to prioritize co-operation and relationship rather than confront others trumped the need to challenge team members about how they use evidence. The seemingly insurmountable nature of institutional policy also contributed to apathy. The sentiment was that evidence could often not be applied because of the opposition or lack of support of others.

Industrial Care

Using evidence to "*get on with it*" and "*move women along*" in a way that is most efficient for providers and institutions, often using technologies rather than human care to provide cost efficient "high tech, low touch" care, results in what some informants referenced as "*industrialized birth*" (Gass, Houstoun, Kotaska, Lemay, Saxell). Eileen Hutton presented a vision of an industrialized maternity care system reliant on planned caesarean section as a possible dystopic future, an idea expressed by many informants. Although case by case caesarean section may be more expensive than normal birth, a highly industrialized system may bring a kind of assembly line cost efficiency to maternity care. A cost analysis of the term breech trial showed this kind of efficiency in planned caesarean section.[5] Hutton shares her worries about how this industrial approach could unfold:

> *If we knew that 30 percent of the population was going to have elective section it would*

be cheaper because you could plan your OR and set yourself up. You'd tie up less nursing time in labour and delivery.

Hutton 25:272

Houstoun links industrial birth with the move away from birth based in small hospitals in small communities, and the shift toward birth as part of acute care rather than primary care. For Houstoun, gathering women in large tertiary centres to give birth results in a "*mechanized*" and "*highly technicalized*" approach that marginalizes "*all the other stuff*" that supports normal birth and humanized care. She compares the investment of high technology resources in birth to a loss of priorities within the health care system and our society, with governments and institutions undermining approaches that promote health rather than cure, for example, cutting breakfast programs and increasing cardiac surgeries. In her words:

It's the cookie cutter approach by the SOGC. It's the industry approach so it's a mechanized approach to improving efficiency and productivity. Well that's great when you're talking about hamburgers or putting wheels on cars. It doesn't work when you're talking about people. And again it's fundamental to where I work and practice because we see the same issue all the time. Primary care again is the sort of poor second cousin to the tertiary care fancy, highly specialized, highly respected, highly paid, highly resourced, highly technicalized. And all the other stuff is seen sort of kind of unnecessary and how the health care is funded. The resources go into the cardiac surgeries. And breakfast programs for children are being cut.

Houstoun 23:444

Christilaw concurs that a system based on industrial efficiencies does not provide the human care that is needed to apply the evidence about one to one care in labour:

How can we improve birthing for women? Well we know the answer to that, and we know that one to one care is better for women. We know that constant companionship with a skilled provider is the best possible way a woman can labour. And we know within midwifery care that women do get auscultation instead of fetal monitoring. But in a system where they don't have a midwife or they don't have a doula with them, they don't have that.

Christilaw 4:320

John Kingdom presents an approach that could help avoid this tendency toward industrialized birth and high rates of intervention based on his experience in the UK. He suggests a model of maternity care that is centred on smaller, more local units staffed primarily by midwives working with obstetricians who act as consultants rather than primary care providers.

The difference between Britain and Ireland and over here in that every woman by definition is in contact with one of the local midwives. For example, where I worked, you could actually have a home visit from a midwife or student midwife, and they would see

> *you in your home for your first visit, in fact they would be quite happy to conduct some of your care at home. We were an incredible team and it was me and a registrar and 18 midwives and we conducted 250 to 300 deliveries a year. You could have a home birth or a hospital birth, because the team worked in both environments. But you began with a midwife. I reviewed what we were doing with the midwives through pregnancy and we worked together. But here people kind of phone their family doctor who they've not seen for four years and then the records are faxed to me* [a maternal fetal medicine sub-specialist], *they come and see me. And then they have this terribly sterile debate about Down Syndrome, everybody's obsessed, the baby is completely normal and we won't even begin to talk about delivery until they're at least 20 weeks pregnant. And it's a very different experience, you know.*
>
> Kingdom 28:224

Kingdom focuses his vision on "*primips*" (or first babies) because lowering the rate of caesarean section for first babies has a ripple effect, leading to more normal births for subsequent births:

> *I wonder whether the way to get round it is to get primips to have their normal babies near where they live. Yeah. The problem there is primips they'd be saying "But can you guarantee me epidural?" People are clustering in big hospitals because they've got very instant access to an epidural if they want one. How do you actually provide that back up* [anesthesia] *service yet in a way that persuades people to try it* [normal birth].
>
> Kingdom 28:196

Many informants pointed to the focus in our system on specialists and acute care as contributing to the industrialization of birth and the use of evidence in the direction of intervention. In his contrast of British and Canadian cultures of birth and health care, Kingdom linked dependence on specialist care with a lack of confidence in primary care for normal birth and care of babies:

> *Another thing is that I think there's just a general culture. I think that the people are not as confident that their own bodies can do things normally. I think a much smaller narrower segment of the population believes that. And I think people are very driven to be doctor-dependent very early on. A good example is how many people choose a pediatrician from the point of birth when there's nothing wrong with the baby. They don't have the confidence in the family doctor to provide vaccination and general baby care. It's quite sad actually. It is very specialist centered.*
>
> Kingdom 28:73

Karyn Kaufman and Rory Windrim point to how the tertiary care centres, as university-based teaching units, are driven by the production of not only specialists but sub-specialists. Kaufman believes that the focus of the system on the large medical school health science centres takes resources away from basic care for women and orients the whole system away from primary care. She explains:

I do think that medicine, I mean much as the SOGC wants to spout their stuff about their investment in women's health, I think you [need to] *look at the training programs and what drives them, what drives tertiary care centers. They produce some nice people. Nothing about the personalities, but you'll notice that when they want to groom their best and brightest they're not usually general obstetrics. They are often into infertility. Huge field. Gyne-oncology. Increasingly. A lot of funding. And MFM. It's the sub-specialties that are driving it.*

Kaufman 26:238

The focus on sub-specialization leads Windrim to feel he has to emphasize "labour and delivery" as an essential part of obstetrics, because it often "gets lost" in the midst of all of the sub-specialties:

I mean in the end of the day what makes obstetrics different to everything else is labour and delivery. I mean, it's really what makes everybody who works in pregnancy unique is labour and delivery. And I've always thought that labour and delivery is interesting from an obstetrical point of view. You can do sub-specialty training after an obstetrics residency in cancer, in infertility and in incontinence, but as far as I know there is no two year fellowship in labour and delivery. It falls under the general ambit of maternal fetal medicine. But maternal fetal medicine has become so much medical complications of pregnancy and ultrasound that somehow labour and delivery gets lost in the middle of all that, and it's easily the most important focal point for care.

Windrim 54:62

Kaufman also links enthusiasm for evidence-based practice and its tendency to support intervention to the value system of the obstetric profession, one that is influenced by its desire for status within the hierarchy of the medical profession. Both sub-specialization and the production of evidence within sub-specialties influence a profession's status. Her worry about obstetrics being lost within this process echoes Windrim's concerns:

Why is it [EBP] *so appealing? And it has to be because it fits a value system. The dominant obstetric value system is so largely driven by the sub-specialty approach, whether it's maternal fetal medicine or uro-gynaecology or cancer. You take a look at obstetrics and gynaecology there's almost nothing left any more that anyone would call just obstetrics because you have to as a resident spend time in all of those sub-sets. That's driven by something – the need to be respected in the medical kingdom so that obstetrics isn't just the low person on the totem pole. If you don't have all of these acknowledged very special endeavors, with clinical trials going on and all these things, you're not up there with the rest of the big boys. And internal medicine is always the advancing light and obstetrics has battled really hard as a discipline to be respected.*

Kaufman 26:218

During his interview and in an article he published, Michael Klein analyzes the impact of structuring our system with most women receiving primary care from obstetricians. He argues

that surgical training defines the work of obstetricians in ways that may make it difficult to take a "watch and wait" approach:

> *And the reality is that obstetricians are surgeons. They didn't go into obstetrics to sit around and watch women in labour. They went into obstetrics to save lives. Sometimes I want to ask "Can you not honestly speak about what makes you an obstetrician and the values that you have as an obstetrician honestly?" You're there to rescue people and you're at your best and feel the best about yourself when you're in rescue mode, not when you're waiting, hanging around waiting for nature to do its job. But that's what makes midwives midwives. Not rescue mode. Who talks about this anymore? Nobody.*
>
> Klein 29:720

In his article on "quick fix" culture, Klein elaborates:

> Although certainly not a unified position of the specialty, why do some leaders of obstetrics and gynaecology find it easy to support caesarean on demand? To state the obvious, this is a surgical specialty, and most medical students who choose it do so because they are attracted to the surgery or the discipline's complicated and highly specialized aspects—infertility, reproductive endocrinology, oncology, maternal-fetal medicine. Many who select the birth or "delivery" side of the specialty are, as one resident told me recently, attracted to the task of rescuing the fetus from an unsafe environment. They do not usually enter the field to sit with women in labor.[8]

"Economics of course"

Economic factors were often presented as a self-evident influence on how health care providers are able or unable to apply evidence, and yet some informants appeared hesitant to discuss how and why. One had a wry smile on his face when he expressed his discomfort at being quoted about his view that the misuse of evidence is linked to capitalism, perhaps not wanting to be seen as a radical. The economic factors that emerged in my informant interviews were financial incentives, cost restraint and marketing.

Financial Incentives: "Losing the fee"

Financial incentives were seen by many informants to influence how individuals and systems apply evidence. Ohlsson comments on the impact of the fee for service payment system on obstetrician's use of interventions:

> *I think it is safe to say that even in a health care system that is free to everybody, this fee for service does affect the way evidence is applied. I think it would be a much more effective system if that was not applied. Because then there is not this urge to have* [so many inductions or caesareans]. *Of course it is nice for that mom to be delivered by the obstetrician she has seen through the pregnancy, yes. But if you look at it from health care provision type of view, then she should be delivered when she goes into labour. And people control their income by how many people they take on. And if you had a different*

system than fee for service, there wouldn't be an urge for some people to take on outrageous numbers of people where they couldn't possibly be at all those births. I honestly think that it's better for that pregnant woman not to push that delivery. There's no rush. You don't need to rupture the membranes or use oxytocin or whatever to augment the labour, to try and get her delivered within a certain time period.

Ohlsson 42:52

Young links the fee for service system to the way evidence is used to justify interventions that help "*get on with things*". He has worked in both fee for service and salaried systems and notes most practitioners are motivated by what they think is best care no matter what funding system is in place. However, he cautions that any system can be abused. He calls for incentives towards best care while pointing out the challenges involved:

We're paid in some cases to go from one item to another, which reinforces quantity and not necessarily quality. And although many of our payment systems in medicine are moving towards alternative payments, my own experience has been, because I've worked in salaried systems and I've worked in fee for service systems and I find that there's a bulk of practitioners in the middle that it doesn't matter which system they're in, they do the right thing. But in a fee for service system there'll be 10 to 20 percent who will abuse the system, and in a salaried system there'll be 10 to 20 percent who will abuse the system. And I'm not sure which of those systems actually does the most harm. And I think we've got to be able to provide incentives for the right things, and it's really hard to do that.

Young 55:42

Christilaw worries that payment systems which work as unintended incentives for interventions contribute to the global problem of rising rates of caesarean section, but presents this as a problem that happens elsewhere:

I was in Mexico at the FIGO meeting and this is one of the things they talked about. One of the main reasons for the caesarean rates in Brazil is that insurance companies pay for c-sections but not for vaginal births. Well hello. What's wrong with that picture? I mean let's then talk to the insurance companies and make sure that they understand what's going on here.

Christilaw 5:4

In contrast, Reynolds feels there are financial incentives in the Canadian system to intervene in birth and use evidence to justify interventions, although they may not be intended as such:

Economics is a factor. I mean there are incentives to do inductions. There are incentives to do caesarean sections. There are financial incentives. You get more stuff done, you get more payment for the number of births you're doing. So if you can line up a whole series of inductions on the day that you're covering, then there's a lot of induction income, there's a lot of fee for service income. I'm not sure how big a factor that is. I think

relationships are another thing. But it [income] *is a driver. And my sense is that we should try and minimize that driver.*

Reynolds 44:344

Reynolds' comments link payment systems and workplace structures that make a particular use of evidence and style of practice benefit the individual practitioner and the industrialization of care. "*Lining up a whole series of inductions*" means more fee for service payments and evokes the vision of the labour floor as a factory. He acknowledges that this approach is also influenced by "*relationship*" echoing Harris and Dore's acknowledgement of relationship in one of the factors leading to "*cheating for convenience*" leading to high rates of induction. Reynolds, like Young and Ohlsson, calls for reforms to create a different system. He advocates for a system not unlike the one in the UK described above by Kingdom where obstetricians are paid a salary to work as consultants to the family doctors and midwives providing primary maternity care. In this model, compensating obstetricians well to consult when complications arise reduces the incentive to do more to maximize income:

We should probably be paying for blocks of care given to populations of women and say "Well okay, now obstetricians, midwives, neonatologists, family doctors, nurses, here's the money. Let's pay the obstetrician $400,000 a year and they do the high risk stuff. And let's pay whatever the going rate is for family doctors and midwives and our agreement is that these women get this care . . . And there isn't any incentive to have a forcible consultation with an obstetrician either from a family doctor or a midwife or a forcible transfer of care.

Reynolds 44:344

Ohlsson also spoke of the different incentives built into a midwifery-based system based on his experiences in Sweden. He also notes that fear of "*losing the fee*" can act as a disincentive for physicians to transfer care to another hospital, even when resources are strained and the neonatal unit is closed:

There [in Sweden] *the mom at that time went to the midwives or the antenatal clinic 12 times during her pregnancy, and two of those visits were to a doctor. And if everything was fine, she is taken care of in labour by a midwife, and if everything is fine, that midwife does deliver her. The MD is not called upon unless there is some specific problem. Here it's done by MDs. They want their fee for service. They want to get that delivery during their time. If we don't have any beds in our unit, they do not want to send that mom to* [another hospital] *where they have space because they will lose their fee for service.*

Ohlsson 42:521

Cost Restraint and Contradictions: "We don't have the money"

As described in the discussion of resistance to intermittent auscultation of the fetal heart

which requires one to one care in labour, strained resources are often seen to be part of the story of why evidence gets applied in a particular way. Common examples of care that is evidence-based and not funded are one to one care and other non-pharmacologic tools that support normal birth, such as water tubs. Many informants pointed to the contradictions inherent in the tendency to fund high technology rather than low technology approaches, despite the costs associated with higher tech care. Lori Wahoski attributes the resistance to fund low technology approaches to economics:

> *What else? I think its economics of course. "Well that would be great but we don't have the money to do it."*
>
> Wahoski 53: 431

Lee Saxell similarly links the lean to technologic interpretations of evidence, particularly the tendency towards caesarean section to economic incentives:

> *I think it* [caesarean section] *is driven economically though particularly in the US. It's about money and the convenience of section and everything else. There's that element of it. And running a labour floor effectively in an industrial kind of way. Where you don't have nursing at the bedside which is very expensive and all of that.*
>
> Saxell 47:246

Wahoski questions the assumption that one to one care is more expensive. She feels she could justify the cost of more nursing care, but that "*nurses themselves*" do not always recognize the value of money spent on "*just being there*". Technologic approaches, such as "*the gamma knife*", tend to win the funding competitions:

> *I think there's enough support in the literature about the good outcomes of one to one for me to sell it to the accountants. To sell that to the financial people and to say "It's vital. It's so important." And nurses themselves, we resist. We think "I'm not doing anything. I'm just in the room. The partner is doing all the other stuff. I'm just there, so I'm wasting time. Somebody else needs my help." And if it's a gamma knife or another nurse for a patient that's in labour, the gamma knife is going to win. And that's too bad. That's the value of nursing. Having somebody there and not necessarily doing a task but just having somebody there. It's so valuable. And it's not really valued as much, not by anybody. Not by anybody. Nursing and medicine included. They don't see how, she* [the nurse] *just needs to be there.*
>
> Wahoski 53:439

Owen Hughes also questions the reluctance to commit financial resources to care in labour, an approach he concurs would be more cost effective than other well funded health system interventions:

> *The hospital administration would rather spend $30,000 on a monitor than $30,000 on*

extra nursing hours. And I said to people about this whole flu vaccine thing, I'm so opposed to the flu vaccine, not for high risk people mind you, but for the general public. They could take the $38 million they spent and have bought more nursing time. Paid the nurses more and had more one on one. To me you would have had a much better pay off than all this nonsense relying on a vaccine that didn't work anyway.

Hughes 24:309

Houstoun describes the way in which low technology equipment such as Jacuzzi baths are "*bumped down*" the list. She points to the lack of evidence for decisions which seem to show an uncritical acceptance of the benefits of expensive technology, which is then overused. She links economic decisions to the unconscious lean to technology and the default style of doing versus not doing. In her comments, Houston also references the concepts of the dominance of the subspecialties described by Windrim and Kaufman above:

We've got central monitoring. But only one Jacuzzi. Five years it's been on the equipment list. It's getting bumped down, bumped down, because the monitors, the computerized charting system, the ultrasound machines which cost a half a million dollars each so that you can detect earlier and earlier fetal anomalies, which again there is not a lot of evidence that all that resource investment actually gets us anywhere. But yet it's not questioned, it's not doubted. We do to do. All women should have three ultrasounds now to pick up fetal anomalies, lethal anomalies before they miscarry so we can know about it a little bit earlier. I mean it's ridiculous. But those are the guys that get the funding. And family-centred maternity care, uncomplicated stuff, there is not that same kind of pizzazz or something and so it just gets ignored.

Houstoun 23:196

Dore's concerns about allocation of funding extend beyond low technology approaches to care. She used the example of how increased staffing of ultrasound technicians to improve access to ultrasounds could help promote evidence-based care and reduce induction of labour (through more accurate due dates). Dore suggests that large scale evaluation of economics is often not part of the planning of care. Taking into account the cost implications and balancing the overall impact of how money is spent is not consistently done and is something that many in the system are not "*good at*":

If you look at resources and care delivery, we have a terrible time booking ultrasounds because time is so tight. To deliver best quality care we probably need two more nice, big ultrasound machines and the techs to go with them and maybe 12 hour days. Pay the techs for longer days so you could do some of the non-risky ones at night, the more routine ones, etc. Are they doing that? No. Is there evidence that everyone should get an 18 week ultrasound in a timely manner? Is there evidence that you should do a biophysical once you're monitoring post-dates? Yes. But if you don't have the resources to do it, it drives your practice to deliver at 41 weeks because you can't get the ultrasound. And can you put a business case together to say "If I had these ultrasounds,

> *I'd do less inductions" and it would be a balancing act. People don't engage in those mathematical games too well. None of us are particularly good at it. You need an MBA and a health economist to do that.*
>
> Dore 6:292

Marketing and the Search for Profit

The EBP movement promoted high quality evidence as a tool that could not only help individual practitioners to resist the powerful pressures from the marketers of drugs and medical technologies but also the system as a whole.[9,10] However, the explanation provided by some informants about the contradictions and inconsistencies in application of evidence lies in the power of marketing. Crosbie and McCabe link the marketing success of interventions to medico-legal fears:

> *Yeah, if it's technology let's go for it. Let's do that extra section. But why don't we put money into having one to one care, which has shown to be very beneficial in labour. And I mean it comes from, I think it comes from money, capitalism, selling the drugs, selling the surgery, selling the electronic fetal monitors. And then it all gets backed up with legal stuff. If you haven't done that, you'll be in trouble if she didn't have her antibiotics.*
>
> Crosbie 6:82

> *We are moving in an increasingly high tech area, like most of health care is. And so high tech is seen as good and better. The EFM manufacturers I have to say did a fantastic job of convincing people that that was the only safe way. And so we have the majority of nurses now have really only worked with that and physicians too. And so then to say we're taking that away from you and it's really not any better. I think there is too much fear.*
>
> McCabe 37:64

Crosbie reflects on how profit flows from the "*level of risk and fear*" as technology is offered as a remedy:

> *Well, I just think that the level of risk and fear is really good for the business of medicine, the business of medicine. It makes people need so many more doctors' visits, it sells more antibiotics, it sells more machinery, it runs ultrasound clinics, it runs genetic screening clinics. All big, big money things. Fear, fear, fear.*
>
> Crosbie 6:188

Sharon Dore, as well as other informants, noted that the introduction and uptake of the electronic fetal monitor pre-dated both acceptance of the need for evidence to support the use of a new technology and widespread cost-restraint, factors which may have facilitated its ready adoption. Although some informants linked trends in the US and Canadian systems others make clearer distinctions. Dore references differences between our public system and the for-profit American health care system in which hospitals compete for patients by offering the newest

technologies:

> *EFM came in when people were buying things. The economic restraints are of more recent origin, so I think the more recent new toys are having a harder time selling. I know when I go to some of the major conferences and go around and speak to the vendors, once they find out you're Canadian they have far less interest in talking to you because the likelihood of you purchasing something is less than your American counterpart.*
>
> Dore 6:284

An informant who was reluctant to be named when speaking on this topic makes a broad statement about the driving forces behind how evidence is used:

> *Once again I'm going to be very uncomfortable if I get too widely quoted on this, but I think it's a function of the capitalist system. When I used "American" that was really what I meant, I mean once you think in terms of a competitive rather than a cooperative world, once self interest becomes narrow as opposed to say with the general good, evidence will be misused.*
>
> Anonymous

The EBP Industry

A few informants voiced concerns that the evidence movement itself had become an "industry" with its own trajectory and interests to protect and its own links to the very economic forces its champions hoped to counter-balance. These concerns echo the evidence debates described in Chapter Four.[11] Informants worried that the integrity of what appears to be evidence needs to be questioned rather than simply accepted. They cited pressures from both academia and industry as potentially biasing how the science was produced and also how it is disseminated and applied. Informants were not always sure about how this process operated but they were clear about the need to be aware that the label of evidence can be misleading and that economic forces may underlie what appears to be science. Some spoke with concern about what they perceived to be a deliberate production and interpretation of evidence to justify a bias towards technology and explain constantly rising rates of intervention.

Perle Feldman questioned some of the dominant interpretations of maternity care evidence by prominent American medical journals, such the *New England Journal of Medicine's* opposition to VBAC and vaginal breech birth. She feels this stance taken by the *NEJM* was motivated by the need for a scientific rationale for the increasing use of caesarean section and to push back against the evidence in favour of low technology approaches. She also wondered if resistance to midwifery in the US is driven by economic rivalries inherent in the American for-

profit health care system:

> *But I think in the US remember it's very money driven and it would not surprise me whatsoever if there were some kind of, I hate to sound like a conspiracy theorist but there it is, it would not surprise me if there is some kind of conspiracy to take back market share, particularly from midwives.*
>
> Feldman 14:26

Linda Knox references Henci Goer's critique of the *NEJM*'s uncritical acceptance of evidence which justifies intervention [12-14] within her reflections on the "spin-doctoring" she sees linking interpretation of evidence with the need to market a high risk approach to birth:

> *I can't help but feel as Henci has pointed out that it's almost as if there's this subtle spin doctoring going on that is making it okay for all of this* [intervention] *. . . it's almost like this really good marketing on the part of the obstetrical community. And that's what's frightening. And then I can't help but turn around and say "Why would they want to do that? Is it all about money? Is it all about control?"*
>
> Knox 30:164

One informant, who asked not to be quoted, challenges the claims of advocates like Guyatt and Sackett[9,10] that one of the foundational arguments for EBP was that it would provide information free of bias from the pharmaceutical industry. He points to the problems when the label "evidence-based" is applied to research or guidelines funded by industry. It is important to note that his comments were made prior to the Vioxx scandal which helped reveal drug company "ghost-writing". There has now been substantial scholarship about the depth to which the label, language and tools of evidence-based practice have been adopted by industry and the ways in which major medical journals became intertwined with and compromised by problems with industry funding.[15] My informant stated:

> *Some of what is being promoted as evidence-based is substantially based on pharmaceutical industry, for example, the work of the Canadian Diabetes Association on its guidelines. The people who are participating were supported substantially by the industry as was the sponsoring not for-profit organization. And when one takes apart and looks at those recommendations, I might not want to be quoted on this for the record, some of the ones that are consensus would seem to have more than their share of direction in terms of implying the use of pharmaceuticals, i.e. screening is only useful because there's evidence that a pharmaceutical will help, and the evidence for that is a single trial. And so it could be wrong. And so one of the concerns about guidelines now increasingly is are they just a front for the industry, it's being promoted as evidence, that these are evidence-based guidelines, all of them, and evidence-based doesn't mean they use* [quality] *evidence, it means any evidence from the industry . . . So there's a skepticism coming in about some of the guidelines from some people. But the power is there because if you in fact go against them, they're international and then what about the liability.*

Anonymous

Kaufman comments about the way in which production and application of evidence is always "revenue driven". She notes that despite this the label "evidence" is seen as "*revenue neutral*" which may help to explain why fewer informants pointed to economic factors, in comparison to factors such as beliefs and attitudes. She connects the assumption of "*neutral knowledge*" neutrality to the assumption that evidence can be applied universally:

> [EBP] *is assumed to be neutral knowledge, a body of knowledge which of course is never neutral and is always driven by who asked the question and why. And where were they coming from in the first place. I worry that because evidence is never produced neutrally and never applied in a vacuum it is always revenue driven but is assumed somehow to be kind of revenue neutral. By revenue I'm not talking just about dollars. Therefore it is assumed that it can be just simply picked up and used as a kind of isolated fact or body of facts. And so whether you take it to North Dakota or PEI or South Africa it doesn't really matter because it's an objective body of facts and it will work and it will make a difference in the same way. Not only is that intuitively wrong but it's a contradiction of what we know because we're all imbedded in a far too multi-layered context for any simple study to ever answer something that's fundamentally probably not only value driven but culturally driven.*
>
> Kaufman 26:98

Kaufman points to the power of what appears to be "neutral" evidence in forming health care policy. It is no coincidence that her examples below mix an RCT (the breech trial) with practice trends based on much lower level evidence (VBAC and elective caesarean). She emphasizes that it is dangerous to base policy on what may appear to be evidence:

> *But I think also, when you look at something like the breech trial, probably the VBAC stuff, the elective caesarean on demand, I mean that's not evidence but it's forming policy....*
>
> Kaufman 26:214

Kaufman asserts the need for not only Sackett's critical appraisal skills, but also a more social and political critique of how evidence is produced and applied.

Conclusions

Workplace pressures and economic factors shape evidence-based practice. Caregivers interpret and apply evidence in ways that help them cope with busy workplaces and strained resources. Approaches which work to "*get on with things*" fit with institutional culture more easily than those which require patience and expectancy. Fiscal incentives and the need for job satisfaction create conditions which mean that using evidence in the direction of intervention and technology appears more efficient and brings financial and personal reward. This exploration of

systems, more than any other theme, revealed interprofessional tensions and was marked by some reluctance to be quoted by name.

Systems factors are less understood, or perhaps more reluctantly expressed, by most informants than factors such as attitudes or social and cultural influences on how evidence is applied. Some worry that maternity care providers are vulnerable to marketers and those who profit from the sale of medical technologies and drugs. Despite a less focused analysis by informants of systems forces, an industrial approach to care is seen to be a critical part of explaining uses of evidence and rising rates of intervention in childbirth.

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Chapter Ten: Cascading Intervention, Loss and Revision

Introduction

The early EBP movement was inspired by the need to address concerns about inconsistent and increasing rates of intervention in childbirth. After several decades focused on producing evidence about the care of childbearing women, rates continue to increase to the point that birth without intervention is no longer the norm in Canada. This phenomenon was documented in a Canadian Institute for Health Information report[1] that many informants had read and was highly publicized in the popular press.[2,3] Many of the care providers whom I interviewed described a pattern that has emerged in maternity care, of using more and more intervention to address smaller and smaller potential risks. This dynamic often operates both despite evidence-based recommendations and also using evidence-based recommendations as justification. This "more and more for less and less" pattern flows from the overlap and intersection of factors discussed in previous chapters: cultural belief in technologic answers; fear, risk talk, medico-legal concerns, and workplace and systems pressures.

Discussion by informants of the failure of EBP to address rates of intervention in childbirth evoked a finding that was both unexpected and consistent across care provider groups: a sense of loss and grief. The losses identified included loss of skills, loss of access to care and loss of choice. Grief was expressed about the potential, which some saw as inevitable, to lose normal birth. Some worried about the losses involved in EBP's ripple effects on long term outcomes and on a global scale, where high rates of intervention in systems with far fewer resources could have much harsher consequences.

Although for some, many of the losses are regrettable but unrecoverable, others found hope in initiatives which resisted harms that flow from what they see as the misuse of evidence. Many informant interviews evolved into a discussion of what to do about the unwanted effects and uses of evidence. Some informants talked about specific activities they engaged in to influence how evidence is produced, framed and used. These informants called for the EBP movement and the users of evidence to take responsibility for re-envisioning EBP.

In this chapter, I explore informants' concerns about the ironic failure of EBP to address rising and inconsistent rates of intervention and the resultant feelings of loss that wove throughout my interviews. I conclude with a hope shared by many informants to re-envision what evidence-

based practice could be and how it could be applied.

More Intervention for Smaller Levels of Risk

The irony that rates of intervention in birth continue to increase in high resource countries despite pregnancy and birth being safer than at any point in history was expressed by many informants in previous chapters. It is a basic principle of evidence-based practice that both screening and treatment will be less effective in a low risk, healthy population. When rates of problems are small, it takes more intervention to prevent the rare poor outcome. If routine care of healthy women is aimed at reducing rare outcomes, a pattern emerges of using interventions in more and more situations where it is unnecessary, with a minimal impact. Several informants point to this lack of benefit:

> *To me it's a mountain of work to produce a molehill* [of benefit].
>
> Menticoglou 39:244

> *The most problematic use of evidence-based practice is I think legitimization of inducing, despite the fact that even the Hannah trial shows the benefits are quite marginal if at all.*
>
> Klein 29:138

Jan Christilaw points out that intervention rates are rising overall in Canada and are variable between regions, when one of the expected effects of EBP was to reduce variation with the adoption of practices based on evidence:

> *What the Canadian Institute for Health Information report showed when it came out in May of this year is that rates of intervention were rising across the country and the variation is really substantial. It's hard to explain. Maternal and newborn outcomes are really very good in Canada, in fact among the very, very best in the world. And as you know, as you've seen many times already in the last few days they're not improving further whether or not the intervention rates are going up. The caesarean section rates in Canada keep going up. The trend seems to be continuing. VBAC rates on the other hand, as you know, have fallen for a number of reasons. The regional variations in terms of intervention rates are absolutely substantial.*
>
> Christilaw 5:4

This problem of variation is documented in the CIHI report, as well as in a subsequent Maternity Experiences Survey[4] and Canadian Hospital Maternity Policies and Practices Survey,[5] both of which were conducted by the Public Health Agency of Canada:

> Rates of intervention in labor and birth showed considerable variation across Canada, suggesting that usage is not always evidence-based but may be influenced by a variety of other factors. [4]

Murray Enkin links the problem of numbers needed to treat with the fact that even in low risk healthy populations there is always a small risk inherent in pregnancy and labour. This means that large enough trials of interventions such as induction and caesarean can show they reduce risk simply by shortening the length of pregnancy or avoiding labour. If the potential benefits of continuing pregnancy or going through labour are not measured as part of the research, a trial focused on a single intervention or outcome may make it appear that intervention makes birth safer. Enkin suggests that you have to answer a philosophical question about how you see the process of childbirth in order to determine what level of risk justifies intervention:

> *If you prolong pregnancy by an extra 20 hours, that's 20 hours in which something could happen to the baby. So you know, if your trial is big enough, you can find a difference. There's always going to be a difference. It can be very small, but it's going to be a difference. So it's the problem of viewing labour and pregnancy as inherently risky or usually healthy.*
>
> Enkin 8:556

Savas Menticoglou asks how to weigh risks to the mother and fetus and illustrates how different the answers may be. He is clear that the trend to ever increasing rates of surgery is not his vision of obstetrics:

> *I don't know what the right answer is. I guess that's what makes delivering babies hard. If all we cared about was baby, we would section every woman. If all we cared about was mothers, instead of having a 25 percent section rate, we'd have a two percent section rate. I don't want obstetrics just to become a surgical specialty.*
>
> Menticoglou 39:144

Danny Farine points to research findings that show that pregnant women may be very risk averse or what informants called "*altruistic*" (Christilaw, Sermer, Windrim) when it comes to the fetus but not to themselves.[6-10] He expresses what many seemed to be struggling with when he says ". . .where is the balance?":

> *The real question is what kind of risks are reasonable? What kind of risk justifies a c-section? And we just finished a survey that I found to be very, very distressing. And what we found in the study is that 43 percent of women are willing to have a c-section for a risk of one in a million. And the truth is that the risk for bad outcome in labour is about one in 800. So if you do a thousand deliveries, you are lucky to have one bad outcome that it related to intrapartum events. And the real question is now that the c-section is very, very safe, where is the balance? And I don't know where the balance is. And I don't think that even people that advocate for* [elective] *c-section know where the balance is and I spoke to one of them* [name] *and actually he does lots of vaginal deliveries against what he preaches.*
>
> Farine 13:202

Worry among informants about evidence being applied trial by trial and guideline by guideline without a broader vision or accountability for the overall impact on rates of intervention draws attention to the acknowledgement in *ECPC* that scientific evidence could never determine objectives of care. Farine, like others, expresses distress about there being no social consensus about "what level of risk is reasonable" and not knowing how to find the balance between avoiding risk to the fetus and newborn and the ever increasing rates of intervention. His comment that caesarean is "*very safe*" reflects advances in both anesthesia and obstetrics that reduce the risks of surgery for birth. However, the vision of surgical birth as potentially risk free obscures risks for the mother and is consistent with what feminist theorists call "disappearing the woman" through a focus on the fetus.[11] This dilemma illustrates the lack of broader discussion in our health care system about finding the balance between risk and benefit.

Arne Ohlsson referred to an example from pediatrics that reveals important dynamics in the production and application of evidence related to the search to eliminate small risk. He describes how ongoing research into routine intravenous immunization of preterm neonates has persisted despite evidence showing lack of benefit. He points out that it is hard for researchers and clinicians to give up on a treatment when a short term benefit is shown by research (in this case, a small reduction in the rate of infection) but when no long term impact can be demonstrated (in this case, no reduction in death or bleeding in the brain). He describes the difference between statistical and clinical significance by calling this approach "*an effective treatment*" that "*doesn't matter*". His description of decades of resistance to abandon both research into and use of an intervention that many feel "should work" is reminiscent of the EFM versus IA debate. The problem of practitioners continuing with a treatment with demonstrated short term but no long term benefit is, as he noted in his interview, similar to the Term Breech Trial that he co-authored:

> *So I think we have the evidence, but I don't think it has been applied the way it should. And the evidence might change of course because one has to be aware that there is new evidence coming over time. And sometimes there is enough evidence to stop doing something. Like in my area, the automatic use of intravenous immunoglobulin to try and prevent infections in neonates. You know in our unit our infection rate is very high. And there now are about five thousand patients have been enrolled in trials and if you give these preterm infants intravenous immunoglobulin on a daily basis through their hospital stay, you would reduce the risk of nosocomial infection by three percent, it could be as low as two percent or as high as four percent. It's an extremely narrow confidence interval because five thousand patients have been enrolled. But it's not associated with any other advantages like increased survival or decrease in intraventricular*

> *hemorrhage... So here you have a three percent reduction in an outcome that is really not very important. And therefore they should not be given, and there should be no further trials. It was known already back in '91 that this is the case. But since then another three thousand patients have been enrolled. So these patients have been enrolled in trials when we already know that this is an effective treatment but the effect size is so small that it doesn't matter.*
>
> Ohlsson 42:213

Matthew Sermer used the example of his experience recruiting for the Twin Birth Study, a trial that was ongoing at the time of my research about whether planned vaginal birth or planned caesarean section is indicated for an otherwise uncomplicated twin pregnancy. He observes that the existence of the trial legitimized the choice of caesarean section and increased rates of intervention even prior to the results of an RCT:

> *And now that the trial is on we need to explain the trial to the patient and the rationale as to why we randomise them. So now it's tough recruiting to the trial because women are actually asking for caesarean sections. A year ago they all went for vaginal delivery. Now we don't even have the evidence, yet they are already asking for the caesarean section because they said "I don't even want to go there." So this evidence-based medicine is actually so far increasing our intervention rate.*
>
> Sermer 49:175

The Twin Birth Study results were released, prior to publication, at the 2013 North American Maternal Fetal Medicine Conference. Contrary to many informants' fears, the trial found no advantage to caesarean section for twin pregnancy. Principle author Jon Barrett is quoted in a press release as hoping that the findings will "help decrease the rate of unnecessary caesarean sections".[12] Ironically, Sermer's experience is that the trial itself is part of what contributed to the increase in caesareans for twins.

Ripple Effects of High Intervention Rates

Many informants worried that the net benefits of trying to eliminate all risk through increased intervention was questionable, given the inevitable "side effects" of the treatments themselves. Some who discussed concerns with the ripple effects of high rates of intervention also raised concerns about a kind of fragmentation that EBP and its focus on RCTs seems to engender. In answering a single question, RCTs seem to many informants to fail to take into account "*all of the different kinds of ramifications*" that flow from a single intervention. Kris Robinson, for example sees the pressure to use interventions as "*despite all of the evidence*" whereas many others see evidence itself driving the trend. She points to the dilemma that a rare outcome is still "*catastrophic*" at an individual level:

> *Well I mean it's that scary thing, you know, that despite all of the evidence, you have to do all of these interventions to prevent one catastrophic outcome. And people tend to ignore the other things that come with the intervention. I mean that is the problem. It's still a fear factor. I mean you have to do this on such a large scale but you're going to save one. Is that worth it? Well I don't know. If you don't actually do an analysis of all the different kinds of ramifications of that intervention in and of itself, how can you justifiably equate them?*
>
> Robinson 45:229

Michael Klein references the concept of the "cascade of interventions" and its long history as a term used in the childbirth education literature to discuss these "*ramifications*". The term is ubiquitous in popular literature about childbirth and is also occasionally used in the medical literature. The concept has been credited to British social anthropologist and childbirth activist Sheila Kitzinger whose book *The Experience of Childbirth* was first published in 1962 and became one of the foundational texts of the childbirth movement.[13] Some credit UK midwives Sally Inch and Caroline Flint who worked alongside Kitzinger for the term but its original use is unclear. The cascade of intervention is understood as the process by which one intervention in birth leads to another as rates of intervention and attendant complications spiral and reinforce iatrogenic effects of unnecessarily medicalised approaches to birth.[14] Klein makes a distinction between the need to "*live with the cascade*" when intervention is needed and iatrogenesis. He points to the complex of factors that can contribute to the unnecessary justification of intervention under the label of evidence-based practice, including convenience, medico-legally defensive practice and the culture of risk aversion:

> *Now the starting point is induction. Or early admission. Now, if the reason for induction and/or early admission was truly bona fide, that there was an issue, we were dealing with the issue, you live with the cascade. You cannot escape the cascade. You live with the cascade because you're optimizing the outcome. If your reason for starting at the beginning with either early admission or induction was not good enough, let's say the induction was, put it in crude terms, let's say the induction was for the fact of doctor convenience, woman convenience, mother-in-law convenience, partner convenience, you've got the cascade and that's all you've got. You have no opportunity to optimize anything and you've simply got the cascade. Now I've been talking that way for 35 years. I mean there's nothing new. The only thing that's new is studies of variable quality that have pushed people into practicing defensive medicine. Most wouldn't call it defensive medicine. They would simply say "I'm practicing evidence-based medicine."*
>
> Klein 29:964

For Klein one of the ripple effect of the cascade of interventions is that it is "*telling women they are biologically flawed*", a factor that may be dynamically involved as both cause and effect of

rising rates of intervention. This view of the female body as flawed is the subject of extensive critique in scholarly work about birth[15-17] as is critical scholarship about the gendered body.[18-20] Klein links the concept of the flawed body with the power of risk talk:

> *But if the evidence is poor and if it's biased toward doing things instead of not doing things, the larger societal impact of this is to tell women that they're biologically flawed. That they are unreliable incubators and that they just better submit to everything we can dish out because they are at risk. That language of risk is just so undermining.*
>
> Klein 29:964

Menticoglou and Gareth Seaward pointed to another kind of ripple effect of overuse of interventions on the health care system. They identified how ever increasing use of induction as prevention versus treatment contributes to scarcity of resources such as space, operating room time and staff on the labour floor. They paint a picture of a labour floor so crowded with women having inductions of labour that care for those who need emergent care is compromised:

> *And what gets forgotten is the more inductions you do at 41 weeks or with ruptured membranes, is what is happening to all the other patients who aren't 41 weeks, aren't ruptured membranes. If you make nurses and midwives spend more time inducing people at 41 weeks or with ruptured membranes, it means less time for the women who are there because they have hypertension or whatever. So you might see some marginal gain in the group that you're inducing. What never gets reported is the bad things that happen to the other women because the nurses were too busy looking after the women being induced.*
>
> Menticoglou 39:208

> *People are calling pregnancies post-dates when they're 40 plus. And then one gets into a tricky situation where interventions occur. Just talk about the impact of the move in that direction on a place like our hospital. Well it's swamped our resources. We're doing unnecessary inductions which are very labour intensive in terms of monitoring and the potential for caesarean or other operative interventions.*
>
> Seaward 48:95

A Manitoba midwife raised similar concern about the side effects of widespread use of antibiotics in labour due to GBS guidelines, as well as the large numbers needed to treat and the attendant costs to the system.

> *So the evidence shows that treatment or swabbing women at 35 to 37 weeks and then offering antibiotic treatment reduces the number of GBS deaths. But the impact on the rates of thrush and possibly now the rise of other bacteria being more of a problem than GBS, I don't know if that was something that was anticipated. And I just question* [this] *because the evidence, because the reduction in the number of deaths really, it's significant but it's not huge. When we're talking about two or three babies in a thousand getting very ill with GBS, that means 997, 998 women are having antibiotics unnecessarily. It just seems crazy the amount of resources that are going into it.*

Manitoba Midwives 14:16

Perle Feldman sees a pattern emerging from EBP that has "*messed up*" her normally "*wait and see*" low intervention style of practice. She notes the two different populations of women she serves, the Orthodox Jewish community and women seeking a more natural and holistic lifestyle who she calls "*granola bars*". She also notes a concerning increase in "*C-Diff*" or Clostridium difficile, an infection which is often hospital acquired, antibiotic resistant or related to use of antibiotics. Both groups value a non-interventive approach to birth and she worries their choices are limited by uses of evidence which promote intervention:

> *Okay. There are several pieces of evidence that have significantly changed my practice. The first being the post-dates trial. That messed me up in a big way. Pre the post-dates trial I was a wait and see-er. So at 40 ½ weeks I'd do an NST, at 41 weeks I'd do an NST, at 41 ½ weeks I'd do an NST, and then at each point giving the mother the option to induce after 41 weeks. And at 42 weeks, or at 41 and something I would induce. And also I have a very large Orthodox population that I serve, not to mention my granola bars, and they were not thrilled with the idea of being induced because induction just takes away your likelihood of a non-medicated, non-interventionist birth. And so with the post-dates trial, I really now felt that it behooved me to induce people at 41 and something. And with the pressure in this institution, it's drifting closer and closer to 41. And when I read the evidence,* [the benefit] *it's small, it's really small. You know, number needed to treat is huge. And the same with the term breech trial. Number needed to harm is huge. And then there's the god damn GBS stuff which I never thought was reasonable. Again the numbers needed to treat are gimungous. And we have a huge problem right now with* [antibiotic resistant bacteria like] *C-Diff. And yet we're like busily loading women full of antibiotics. I would say almost half the women that are delivering here are getting antibiotics for one reason or another. Now I don't recall my patients dropping dead of endometritis or babies dropping dead of group B strep in the first 15 years that I practiced here. So why are we being so afraid now?*
>
> Feldman 14:38

Lee Saxell, like Feldman, uses emotional language to describe what she saw as the swing from evidence supporting normal birth to evidence used to promote an approach which is "*completely medicalised again*":

> *GBS wrecked it. We got through the ruptured membranes. We had the evidence and we were able to expectantly manage ruptured membranes. And then GBS* [guidelines] *came along. And that was a huge disappointment because it was completely medicalised again. And they did coincide that way. At least where I work, nobody would freak out if you brought somebody in with 48 hours with PROM. GBS wrecked it. So I hate GBS. GBS is particularly bad to deal with because it so medicalises the birth even before there's labour with IVs and antibiotics. Evidence-based care was a disaster for PROM although there isn't a lot of evidence but there has been a lot of hysteria. The thing about GBS that strikes me is that there's an incredible amount of fads in obstetrics. I've been*

> *around long enough now to see the fads. And GBS is the new gestational diabetes. So then I sort of look and think... what will be next? Well it seems like caesarean section on demand is the new GBS. That's a bummer because we were really pushing expectant management, post-dates. There's actually a fair bit of support to stretch out post-dates where I work because there's enough family doctors, there's a lot more family doctors where I work. And a lot of the family doctors are probably more relaxed. But 41weeks and 3 days is relaxed for a family doctor. It isn't 41 weeks. And it usually isn't 42 weeks. You just don't see a lot of people on the floor at 42 weeks. You just don't. It's rare.*
>
> Saxell 47:118

The concerns of Saxell, the Manitoba midwives and Feldman about the ripple effects of the overuse of antibiotics in birth were echoed by many informants and foreshadowed subsequent important work on the microbial environment of the newborn which have made potential links to immune and auto-immune disease and other long term health issues such as obesity.[21-23]

Sermer returns to maternal altruism and medico-legal pressures to explain what is for many a troubling problem. Any risk to the fetus or newborn appears to be too high for practitioners and the public alike:

> *The perception of interventions, what I see is that the biggest impact* [on perception of benefit] *is fetal health. So if you tell the woman that fetal health is just marginally compromised, most women will take inductions, caesarean sections, pulmonary embolisms, you name it, bleeding, infections, because even though the risk of fetal complications is low, the price they perceive is high. And they're willing to take the price of infections with caesarean sections or whatever, because the perception is that they're benefitting their child in some way. Take fetal monitoring for example. When you say "There's an abnormal fetal heart, the baby may be in distress, the baby's heart rate decelerates", the anxiety of that woman increases so dramatically. Even though you may feel the likelihood of this baby being compromised is very low, that seems to be such an imprecise science that you are unable to pick up the very few that are compromised. You are more likely to perhaps perform caesarean section because being 99 percent correct is not good enough. One percent incorrect, that means once every five days at this hospital you'll have an abnormal outcome. And so there's so many lawsuits right now. You know, in this institution you look at adverse outcomes from abnormal fetal heart beat strips that were not acted upon and the baby turned out not so okay, that even though for the positive predictive value evidence says it may be low, in obstetrics low is too high.*
>
> Sermer 49:179

Although my interview questions were about maternity care in Canada, some informants worried about global effects of evidence promoting intervention in low resource countries. Anne Biringer reflects on how the ripple effects may be much more damaging than the benefits in this context:

> *Because a lot of the studies on which we base our practices, the populations are tertiary care referred patients who have certain problems and it doesn't apply to our primary care practice. And so with the breech study, again the implications and ramifications for those "answers", they may apply to some context but they really, really, really don't apply for example to the developing world. So I think that's an example of one area where that particular bit of evidence has sold us short.*
>
> Biringer 2:74

Saxell noted the irony of overuse of intervention in high resource countries while many women still die from lack of basic services and drugs in many poor countries. She worried about the long term effects of a rising caesarean rate, such as the dangers of multiple repeat caesarean sections and the ripple effect of increasing rates of placenta previa and accreta leading to both neonatal and maternal deaths. She explains that she wants to encourage midwives to be aware of the implications of this trend on international campaigns for Safe Motherhood:

> *Anyways, if* [caesarean without indication] *really becomes a phenomenon and it starts happening, I think that midwives have to ensure it is included in how we track maternal deaths. And what's equated to caesarean section and what's not.*
>
> Saxell 47: 350

Eileen Hutton referred to the work of South African obstetrician Justus Hofmeyr, who is a leader in the EBP movement in the area of external cephalic version for breech pregnancy, which is also Hutton's research focus. She pointed out that the fact that the term breech trial is basically irrelevant in the South African context:

> *They have such a high rate of HIV that they know they could, if they sectioned those women, they could decrease the vertical transmission rate. So if you want to have an impact, if you wanted to use caesarean section to have an impact on outcomes for babies, that's the population you would be looking at. As it turns out they can't afford caesareans for anyone. So you need to look at the context and at what level can we reduce risk. And when you can reduce risk by 50 percent by sectioning women with HIV to prevent the vertical transmission versus reducing it a potential that's five percent for a population of babies that's breech, there's no question. And they have a higher number of HIV positive women than breech women.*
>
> Hutton 25:232

Victories May be Losses

Informants repeatedly pointed to the fact that although in their experience many elements of care have improved because of the combined influence of the childbirth and the EBP movements some of the victories may in fact only act to make interventions in childbirth more palatable. For example a more social approach to childbirth has become accepted. It is no longer controversial for women to have partners or other support people with them in labour, babies are

no longer routinely separated from mothers for days and "rooming in" is the norm. Hutton explains:

> *Well it's very interesting because we've seen the caesarean section rate rise across the board. We know that's happened. But at the same time I think that birthing has really become for many women a much less medicalised process, I think women are better supported in birthing. And there's a better understanding of the impact of the birth process on their long term kind of view of the world. When I think back in the '70s when I did my nursing education and when I was first practicing in obstetrics, really the notion even for example having somebody else with you in the delivery room was so new and so scary. Dads could only come in if they had special training and they had to go to courses and your mother couldn't come in with you because she wouldn't know anything about it. And that's as recently as the '70s. So from that period of time I mean we've moved to the party birth room, where you can have many people. Generally speaking there's a lot more relaxed sort of approach to birthing. I mean the whole sterile environment, the draping, the washing with* [antiseptic] *of the perineum. Shave preps and enemas were done in the '70s. So I mean we've certainly seen a shift from that. On the other hand we're seeing increased rates of induction, we're seeing increased rates of epidurals and analgesia, we are seeing much increased rates of caesarean sections. It's hard to know what the explanations are, but certainly in terms of the humanity, the birthing environment is much more humane kind of thing.*
>
> Hutton 25:78

Despite Hutton's claim that the birth room has become more humane or even a "*party room*", many institutions still limit the number of support people and where and when they can be with the labouring woman. There is Canadian evidence that in a post SARS environment the hospital is a less friendly environment for family-centred maternity care.[24]

Some informants felt that we may have traded off one intervention for another. A common example they gave to illustrate the idea that victories may be losses was episiotomy. Although the evidence for lack of scientific justification for routine episiotomy has been accepted and rates of episiotomy have gone down, more women have surgery for birth. Larry Reynolds expresses a very personal sense of defeat and loss in having worked to reduce rates of episiotomy, only to worry that this has had a ripple effect in contributing to increased caesarean section. Like Klein, he expresses concerns about underlying social attitudes about birth and female bodies "*reshaping women*":

> *Okay? So we kind of cut the head off episiotomy and everybody said "Oh, you know, it's somewhat abnormal to have episiotomy in birth", which is great. Except we didn't extract the underlying, fundamental distrust of childbirth. So episiotomy was part of the reshaping of women, part of genital mutilation and cosmetic surgery streams that attack and reshape women. So we got rid of one and I was feeling victorious. We didn't deal with the issue so that we replaced episiotomy with caesarean section and high induction*

rate. These women won't have torn sphincters, they won't have these vaginal caesareans. Now they're having caesareans. I'm thinking, "What have I done?" We should never have done this. We'd be better off with a 70 percent episiotomy rate instead of a 50 percent caesarean rate. You know, we haven't dealt with the real, fundamental cultural attitude towards women.

Reynolds 44:59

Enkin refers to a lecture given at McMaster by sociologist Barbara Katz Rothman where she discusses the childbirth reform movement's success in changing so much, but in fact changing so little.[25] His understanding that feeling and passion were not enough to change maternity care practice is part of what led to his belief that evidence could be a powerful tool for change:

Barbara Katz Rothman in a lecture at McMaster just a few weeks ago put it so beautifully. She said "We won all the battles. Everything we fought for. But we're losing the war." Dystopia. The worst of all possible worlds. Again. We felt strongly, we fought strongly, but if feeling and passion couldn't stem the tide, what could?

Enkin 9:39

Sharon Dore reflects on the sense of naivety and optimism that so many alluded to in the chapter about hopes for EBP. Her description of having "*forgotten*" about the limits of science is common among informants who noted the promise of EBP seemed to distract from a critical perspective that could have been helpful. In Dore's words:

[EBP] *has medicalised birth in my opinion in the sense that what we've investigated are things that are quantifiable. And to me much of birth was more that qualitative piece which is not well received in many research circles. And certainly qualitative evidence doesn't change practice like quantitative evidence does. So what we investigate are those things that we can measure. And a lot of birth is not a measurable experience. So in high risk situations, do you use drug A or drug B, it probably has some sort of role. And is perfect. In the healthy woman who is birthing a baby, I'm not sure where you can measure some of those same things. . . Because I was involved back in the Murray Enkin era looking at ways to measure how midwifery was going to really be positive for birthing, getting rid of the silly things we've done for years.* [We were] *optimistic. Or maybe because I believe as much as possible in a non-interventionist mode for many things, maybe I just thought of course it would support that because that was right. And I forgot at that time that science was so quantifiable, measurable, and black and white.*

Dore 7:336

In her address at McMaster, Katz Rothman suggests the way in which the "war" of childbirth ideologies has been lost. By challenging the idea that childbirth is a disease or pathology, the childbirth movement opened up the space for the much more subtle and perhaps more persuasive concept of "risk". The more general shift to a "risk society" worked perfectly to

support an interaction between the emerging evidence movement and the growing the cultures of fear and perfection. This interaction emerged throughout my interviews as fundamental to the "*re-medicalization of birth*" as described by Linda Knox:

> *Because what is normal birth anymore? Five years ago I had a pretty good picture of what it is and now I'm not so sure because of what am I hearing from this population of women who have all this information. I feel like the fear factor is greater and the whole risk thing is more in the foreground than it was before. I think that this* [EBP] *has done more to undermine women's confidence in their bodies. This is the re-medicalization of birth. I remember back to 1993 when we had the ICM* [International Confederation of Midwives] *here and I did that rather contentious exposé of medical practice around birth, the history of childbirth, and it was pretty brutal. And I remember when I was writing it being so pissed off that women were propagandized so much into giving up so much without even realizing what they were doing. Well guess what? When I enrolled in a Master's program a decade later, the first paper I wrote in that program was looking at what's changed. And at the end of the paper it was like nothing at all. Because it's just, it's just a different format now. My paper looked at all the things that were being done and that we challenged and that we thought were going to change. They just have a different face to them now.*
>
> Knox 30:59

Loss and Anger

One of the most unexpected and widely shared themes in informants' discussions was a recurrent sense of loss related to the use and directions of EBP. Many across all of the professions talked about their perceptions of loss: loss of care provider skills and confidence in an ever more technology dependent environment, loss of the normalcy of birth, loss of "the social" in birth, loss of personalized care during a profound life experience, loss of access to care for physiologic options in a system increasingly dominated by technologic approaches. Many linked their feelings of loss to other emotions, repeatedly using words such as loss, sadness, grief, heartbreak, mourning, angst, tragedy, and disappointment, disillusionment, undermined. Some expressed a sense of anger, of being "*pissed off*" (Knox 30:59) when EBP is seen to have undermined practice or "*wrecked it*" (Saxell 47:118). There was also anger in relation to changes in practice care providers felt forced to make, for example relating to "*god damn GBS*" (Feldman 14:38). Informants also sometimes sighed or conveyed through body language a sense of being demoralized, being overwhelmed or even fatigued when I asked about certain clinical topics. *Oh god. VBAC. Ohhh.* (Knox 30:366). Penny Simkin's sense of sadness is in part about evidence not having fulfilled its promise to guide and control rates of intervention in birth in the US:

> *So I feel that academic side of me, the side of me that hoped evidence would help, is very demoralized. Now in this country I think they leapt on no breeches and inducing, and*

they just keep moving the induction date up closer and closer. They don't even follow what Mary Hannah found. But I don't know why.

Simkin 50:52

Informants expressed disillusionment and grief at the way in which EBP has changed maternity care and the broader public culture of childbirth. Many observed that EBP has diminished rather than enhanced women's choices. EBP is seen to be an important factor in normalizing technology to the point that physiologic birth was seen as akin to an endangered species or ecosystem. Some took this further and wondered if the unintended effects of EBP would pass a point of no return, unless a significant resistance movement emerges, with women losing the option of normal birth or even vaginal birth altogether.

Anne Houstoun used the words "*loss*" and "*lost*" multiple times throughout her interview. She describes how in a system dominated by evidence justified technology there is "*great loss*" to women and families. With a focus on evidence rather than values, some of the most important aspects of birth which she learned from "*women themselves*" are not able to be measured. Echoing Dore's previous statements about what can't be measured, and that not all questions can be answered by RCTs, she worries this means that subtle and social aspects of birth are rendered invalid:

What I learned in medical school and in the traditional model, although it was technically helpful, it wasn't really very helpful from my point of view in terms of caring for pregnant women. I learned from the women themselves and from other people that I worked with who had different ideas about birth not having to be done in this medicalised way. And now my perspective is that we have totally medicalised birth to a great loss, to me a great loss to women and their families. And that's what's hard to characterize in talking about evidence. That's the challenging part, you know. We think that evidence can answer all our questions. Well what about what we don't have evidence for? And those are some of the most fundamental and important things, but we can't quantify them necessarily. We can't put them down on paper and so they're not given the same validity. And that to me is one of the big conundrums in maternity care.

Houstoun 23:38

Many informants also used the term "*sadness*". In talking about the sense of loss among care providers following the term breech trial and during the debate about caesarean section without indication Feldman commented "*I really feel the sadness*". (14:130) She also expressed sadness that her lifelong work towards woman-centred birth inspired by the *"peak experience*" of her own children's births, is coming under threat by the way in which evidence-based practice is unfolding; "*And it saddens me that we're somehow losing that... it really, really saddens me.*"

(13:126)

Loss of Skills and Knowledge for Complicated Vaginal Birth

Many care providers appeared to mourn a loss of hands-on clinical skills and clinical judgment needed for complicated vaginal birth which they perceived as an unwanted side effect of prioritizing population-based evidence versus individual clinical expertise. Hutton talked about the "*angst*" and "*grief in the room*" when the short term results of the TBT were announced to the core research team. Despite the stance of equipoise the RCT researcher is expected to take, she reports that many of the researchers had hoped the trial would help keep the already diminished practice and skill of vaginal breech birth alive. They were disappointed at the short term results and worried that evidence-based practice would contribute to a process of "*de-skilling*". Hutton describes the first reactions to the trial results:

> *I think it* [evidence that supports technologic approaches] *has created an incredible amount of angst and I just look at the term breech trials as a classic example. And I was at the meeting where they presented those findings and there was so much grief in that room. It's because there is a tremendous sense of loss, it's like a de-skilling process. You know,* [care providers] *have enjoyed birth because of all of the positive things that are associated with birth, but also as a practitioner you enjoy birth because there's a certain challenge in getting a baby born. And most often women do it very nicely on their own but occasionally you're in a situation where you think you made the difference. And breech I think is one of those classical examples where you really feel like you have to do a really good job to get that baby out and you have to work really closely with the mother to get the good outcome that you know that you can get because you have a skill set. And when people come along and say "Well, actually, as it turns out it's not good enough and so you have to let go of that and move to section" which you think just about anybody who has surgical skill can do . . . You lose the art and it becomes strictly, it becomes procedure.*
>
> Hutton 25:94

In Hutton's story, the grief emerges for the researchers because the preliminary findings of the trial are accepted as fact and it appears necessary to end the trial and recommend caesarean section for breech birth. Some informants feel this decision was premature and contributed to the controversy about the trial. Some informants conveyed a sense of inevitability about the loss of vaginal breech birth, whereas others were critical of those who would change practice after only one RCT. They blamed the quick uptake of the TBT on a naive belief in the methodology which suspended critical analysis. Some were engaged at the time of my interviews in acts of "resistance" to the loss of vaginal breech, articulating critiques of the TBT through writing articles, working on policies to promote access to vaginal birth in their hospitals or professional

associations and seeking further training from European experts in order to offer vaginal breech birth. The concept that breech birth was lost was a major theme across all professions. Interestingly many, like Hutton, referred to the "art" of breech birth as what was being threatened by the science of EBP.

Breech as a Lost Art

As we have seen in previous chapters, the rapid adoption of the TBT is linked to a pre-existing change in practice that had already undermined the skill of vaginal breech birth. Most informants saw that the TBT had "*put a nail in the coffin*" (Fraser 15:46) by further restricting opportunities for young obstetricians to learn the skills. Many informants referred to the loss involved when older obstetricians retire and the skills have not been passed on. The link between loss of skills and medico-legal pressures is clear in the reflections of Wahoski and Payne:

> *It's going to go away as the older guys retire too. There are so few opportunities for anybody that's up and coming to deliver a vaginal breech any more. It's no wonder they don't want to do it. You know, the days of* [name of obstetrician] *and I'm sure* [name of obstetrician] *still does them, but those days really are gone. We have a few good obstetricians that can do a wonderful vaginal breech. But you know, when they're gone, the skills are gone. And that whole "I'm going to be sued if I even attempt to do that" is taking over.*
>
> Wahoski 53:395

> *I'm very sad to see that really vaginal breech delivery has probably disappeared because there'll be no clinicians who are able to feel comfortable performing them.*
>
> Payne 43:80

Many informants indicated that they knew clinicians who were highly skilled at breech birth and some included themselves in this category. Like Robinson, many expressed a sense of outrage that highly skilled clinicians would be unable to practice or pass on their skills:

> *Surgery seems to be the answer. Well it isn't. We certainly know it's not a quick fix. I mean the Term breech trial much to the disappointment of so many people, so many people were just outraged and disheartened by the results and didn't believe them and you've read the dialogue on that. Really for people who had a long experience and experience is so important in delivering breeches.* [Name of obstetrician] *who is everybody's model here, the obstetrician who mentored everybody: I mean who would think that he couldn't do a breech? But now you have this dictum that the evidence suggests, but it's not relevant to him and those he has trained. We would say absolutely not. But you know, you're losing a whole generation of people who are going to do it. So that essentially is gone probably. So there's the effect of that. So I don't know. Surgery, it seems like it's easier. It's not easier.*
>
> Robinson 45:134

McCabe expresses one of the fundamental concerns about the loss of hands on skills as an unwanted effect of the TBT. She points out that planning caesarean sections for breech birth will not prevent vaginal breech birth from occurring:

> *Well I've certainly talked to physicians who are really disappointed, who really believe, they really believe that they can manage breech births effectively. And they enjoy them. And I've certainly worked with some of the older physicians, some have retired, who really did the most beautiful breech births. But now it'll be a lost art. And then the problem is we have women who present with breeches on the perineum and who really has the skills* [to assist them safely].
>
> McCabe 37:399

Ohlsson shares this concern, pointing to the broader impact of de-skilling on safety:

> *You have to look at the impact on not just that birth but subsequent births and in the larger population. There has to be a population-based study to see what the impact is. I can't say but there would be a few breeches undiagnosed that will come precipitously I would think. Then the skills will not be there and what do you do?*
>
> Ohlsson 42: 301

The link between loss of skill to the potential for greater risk when vaginal breech births do happen has been echoed in the obstetric literature. Like many informants, US obstetrician Bernstein argues that a policy of caesarean section for breech results in a systemic lack of skill in handling breech birth. He notes that vaginal breech births will still happen, some women will give birth too quickly for surgery or will choose vaginal birth, but that care providers will not have the skill to conduct the birth safely. The resulting harm caused by lack of obstetric skill might equal or surpass the harm of the rare bad outcomes from offering vaginal breech birth to well selected candidates, according to Bernstein. This potential harm is an unintended impact that the RCT could not have measured. It also illustrates that evidence applied in a singular way can do more harm than good by failing to take the long term impacts and ripple effects into account. As Bernstein explains:

> Recently one of graduating residents was bemoaning the fact that she had not ever had the opportunity to deliver a singleton breech presenting baby vaginally. I found this extremely disturbing. The delivery of breech babies is rapidly becoming a lost skill, largely based on the results of a single randomized controlled trial . . . Even if it becomes widely accepted that singleton, breech presenting babies at term should be delivered via caesarean, there will still need to be vaginal breech deliveries done because some are only recognized in the late stages of labour when it is too late to perform a caesarean delivery. Within a generation these patients may be left in the care of physicians such as our graduating resident, who have extremely limited experience in performing these sorts

> of deliveries. From a public health perspective, this may result in larger numbers of poor neonatal outcomes than were potentially averted by the policy recommended by the ACOG Committee on Obstetric Practice.[26]

One of the Manitoba midwives notes how much has changed since she was a student in Britain regarding the management of breech birth:

> *You know when you think back, my midwifery training in the UK was 18 months and I saw lots of breech births. I didn't see that many that went that bad in all honesty compared to normal head first. But I think it was like, I think unfortunately they're losing the talent of how to do that, you know, how to catch a breech birth.*
>
> Manitoba midwives 4:338

Christilaw worried about a general loss of skill linked with the move to more and more caesareans. Young (51:286) talked about a similar concern about the loss of clinician skill and judgment regarding forceps delivery. Critique of the overuse of forceps has led physicians to default to using caesarean for prolonged second stage. Christilaw links a set of skills she refers to as "*the technical art*" that she sees as based on skill and judgment learned through mentoring and experience, rather than research evidence.

> *I think we're seeing an era end. In other words, that really experienced, really skilled obstetrician is past. I'm speaking specifically about obstetricians as opposed to midwives because I'm thinking about things like the technical art of delivering twins, delivering breeches, difficult mid-forceps where you know you can get it because you've done 300 before, and those things are lost.*
>
> Christilaw 5:51

Christilaw's use of the word "*heartbreak*" indicates how personally some obstetricians feel this loss:

> *I think the reason I used that word* [heartbreak] *is on a personal note, I've delivered over a hundred and probably closer to 125 breeches, uh, not tons and tons but that's a fair number . . . and they've all gone very well. Which is not to say the next one wouldn't have been terrible and I realize that. At the same time, I always felt it was a wonderful skill that I had and a wonderful thing to be able to offer women, offer the fact that it was very safe as long as I followed the rules. As long as I did what I was taught to do by my professors who with their mass of experience, knew how to handle these. Now interestingly, when you talk about mass of experience, it's not Level 1 evidence is it?*
>
> Christilaw 5:50

British obstetrician Susan Bewley has written about the potential for the loss of not only obstetric skills but for the loss of the profession of obstetrics as a whole if planned surgery is seen as the optimal approach to everything but the most low risk birth. She posits that if obstetricians abandon the skills of assisting difficult vaginal birth, then midwives (for low risk births) and

general surgeons (for planned and emergency caesareans) would be more appropriate birth attendants. She argues strongly against the obstetric profession abandoning its quest for skill and knowledge about complicated vaginal birth.[27,28] Jon Barrett, principle author of the Twin Birth Study, an RCT which was released at the time of writing, echoes these concerns for the art of hands on skills for complicated birth. As noted earlier, this trial was in progress during my research and many informants worried would lead to a recommendation for caesarean for twins. The research showed strong support for vaginal birth and Barrett hopes that the study which "will serve as a 'heads up' to physicians to keep vaginal delivery skills in practice, so we don't lose them".[12]

Baskett talks with guarded optimism about maintaining skills that are falling into disuse, such as breech and forceps, through simulated learning. He describes how students can practice the same manoeuvres used in vaginal breech birth when they deliver a baby through the incision made during a caesarean section. Baskett describes learning the Lovset manoeuvre and the Mauriceau Smellie Viet (MSV) manoeuvres which are manual procedures used to assist a breech birth if the fetal arms and head are not born spontaneously:

> *There is a loss of skills, but the thing is you can offset that to a degree. The way I've come around to this is that I believe we must continue to teach the manoeuvres for a safe assisted breech, vaginal delivery, and internal version and breech extraction for the second twin because there may be occasions where you're stuck with it. And for the modern trainees in a hospital like this where virtually all breeches are delivered by caesarean section, you can practice the manoeuvres with mannequins which is what they did 400 years ago and you can practice them when you're delivering it by caesarean section through the lower uterine segment. And exactly the same safeguards apply. And you can go over all the manoeuvres. So we make our residents do that, go through the ritual thing Lovset, MSV* [maneuvers for delivering a vaginal breech baby], *protect the head and so on. So even though the evidence says "You must deliver all breeches by elective caesarean section if you can", when you can't you still need to be prepared.*
>
> Baskett 1:107

Goodwin is skeptical of replacing expert teaching with simulation. He mourns a loss of skills and knowledge in history taking, physical exam and other hands-on manoeuvres, such as those learned for breech birth and forceps, that he feels can only be learned from expert clinicians. For Goodwin, this kind of learning is undermined both by increasing reliance on technologies and looking to the evidence rather than to the skilled teacher for "best practice". For Goodwin, this loss of respect for learning from the expert clinician is an unwanted side effect of EBP's questioning of the authoritarian hierarchy in medicine:

And there is in all of medicine a tendency to abandon the skills of physical examination and history. You know, the old thing in residency training: see one, do one, teach one. And there's still a lot to be said for that. We're now caught in the dreadful position - how are we going to teach residents how to deliver a breech if they have to? Suppose you come in with a full term, all of a sudden there's a full term primip breech and she's got a prolapsed cord and she's fully. Section her? Oh come on. You know, I mean you can help to free up the cord and you can get her to push down. Maybe she's in the process of pushing. Are you going to stop her and take her to the OR? And now people say "Well we'll teach on a mannequin". Come off it. A mannequin? A mannequin is fine and I can teach people how to do Lovset's [breech manoeuvre] *but you've got to actually be there and be doing it on a living human being to be able to get the confidence, to be able to get the steadiness, so you don't get into a panic about it. And we're going to breed a whole series of people who are just going to be in a terrible panic.*

Goodwin 18:269

Mark Tonelli has written extensively on the impact of EBP on the loss of the clinical expert as a source of knowledge.[29,30] He explains: "EBM has diverted interest in understanding and teaching the portions of clinical judgment that are not related to empirical evidence" leading to the "risk of producing a generation of physicians who cannot help but practice cookbook medicine – for they have been provided with none of the insight or skills that would enable them to successfully deviate from the recipe.". [29]

Losing Hands-on Care in Labour

Similar grief about the loss of hands-on nursing skills for women in labour was also expressed by many informants. Many like Payne and Biringer, worried about the loss of nursing skills as one to one care is replaced by technology. IA and continuous support in labour were the most common examples of loss of nursing skills:

It's one of my, you know, saddest things when I walk through the delivery suite and I still see the banks of monitors and I still see the hospitals buying more monitors and the evidence has been out there for so many years. And I think it's many different things. I think it's training of nurses. They don't have the training to auscultate properly anymore. And the most comfortable thing is to shove on a monitor. And have a woman in bed where they can be nursed, you know. And it saddens me. I think we're going backwards actually in that regard despite all the evidence.

Payne 43: 118

Biringer refers to the loss that happens when nurses and other caregivers prefer to be at a central desk rather than with women in labour:

They're the ones that are requesting central monitoring, right? It's the nursing staff and the physicians, the OBs. They're requesting it which is very sad.

Biringer 2:190

One of the Manitoba midwives reflected on the loss of subtle skills involved in understanding labour progress from observing the pattern of the labour and the woman's behaviour. She feels that "*something gets lost*" when plotting routine vaginal exams on a graph called a partogram mean that midwives and nurses may not be taught observational skills:

> *I think it's hard for certain things to be studied. Like if you're not going to do a vaginal exam to check dilation, how do you know how a woman is progressing. And there are ways of knowing that, but who is teaching that? And if you don't, then that's something that gets lost and you just become, it just becomes the norm to have to do vaginal exams. And then of course your charting starts to reflect that because then you start to use the curve and it has to be plotted on there. How can you use that curve and plot things on there if you're not doing the vaginal exams, right? You can't put it on there because you suppose that she's at a certain point. But certain people could be very sure that she's at that point.*
>
> Manitoba midwives 35:121

In her consideration of hands on skills, Houstoun reflected on the evidence about whether epidural analgesia increases the rate of caesarean section. She linked the cascade of interventions associated with the widespread use of epidurals with lack of confidence in supporting normal birth, both on the part of women and nursing staff. She sees epidurals replacing hands-on skills when used as a "*panacea for care*". In her view, lack of adequate resources and skills leads to a spiraling overuse of this intervention as nurses sympathetically promote pharmacologic pain relief because they cannot provide "*good support*":

> *I don't know what the current evidence is with epidurals because I've heard so many arguments for and against and up and down. My personal belief is that epidurals have their place, but they are grossly overused. And again we've undermined women's confidence and abilities and belief in their own ability to handle a strenuous event. And we've limited our resource people to help support them in that, so therefore you have a bigger need for having this analgesic. But for my own personal practice, if they're done too early it does lead to increased interventions including caesarean section. If you're in very active labour, I think there's much less potential for that happening. There is still some because if you lay flat on your back and don't move, I mean all that movement has some benefit to urging this baby through the birth canal and gravity usually helps. So intuitively it makes sense to me that if you're suddenly lying flat on your back and snoring or playing cards or whatever, that it's not going to be as useful. There's a whole challenge though of the sort of sympathy thing, of poor women, "Oh my god, she's a hurting". They call me when somebody arrives in hospital to give me their report of where they're at now, are they going to be admitted and often times the first comment is "Oh man, she's a hurtin." and I say "Well how far dilated?" She's 2 cm you know, not effaced at all and she's contracting every six minutes. Well, she's not in active labour yet. And they want to take her down the hall and get her epidural. So, it's a panacea for care.*
>
> Houstoun 23:400

In Houstoun's view, the overuse of epidural pain relief leads to over-diagnosis of dystocia or lack of progress in labour, which then justifies use of the drugs to speed up labour or a caesarean section. She describes wide variation in how this indication for intervention is defined and the influence of practitioner attitude and skill on whether more physiologic approaches such as change of maternal position and "*all the other things*", are used prior to intervention:

> *Well we know that* [over use of epidural] *is going to lead to increased intervention. And also the diagnosis of dystocia is the single biggest reason why the caesarean section rate is going up. But we can all make a definition and expand it or contract it to suit our purposes and it's like the post-dates thing, I think. If you want to speed up the process, you put on the label of dystocia and off you go. And you don't have to wait very long. There are some practitioners that an hour and a half at the same dilatation is dystocia. And other people, it's four, five or six* [hours] *with changing positions, doing all the other things.*
>
> Houstoun 23:400

For Houstoun, what is lost for the majority of women in this cascade of intervention is that with appropriate support and encouragement they could have normal physiologic births. She argues that technologies can be "*life savers*" when needed but that for most the opportunity for a powerful and valuable life experience is lost when interventions are routine:

> *There are a percentage of women where it's an absolute life saver and to me those are when you have difficult births or when you have a difficult life experience that diminishes your ability to cope with that. Those are the people that really would benefit. But there's a huge group of women that with good support, family support, good staff support, and other encouragement would do beautifully and would be so enriched by their achieving what they wanted to do. And that to me is what's so lost with all this. And that's caesarean sections, epidurals, I mean it's the whole thing.*
>
> Houstoun 23:400

Loss of Normal Birth and Loss of Nature

Most informants viewed the uptake of evidence-based practice in the context of increasing social embrace of technological solutions as having an overwhelming negative impact on normal birth. Informants were often unexpectedly emotional about this topic:

> *I think almost it's undermined it. Evidence-based has undermined practice. Undermined normal birth.*
>
> Krysanauskas 32: 688

> *I don't think it's* [normal birth] *is doing very well. It's very sad actually. I'm very saddened by the medicalization of births.*
>
> Payne 43:292

Some described the loss of a "natural process". Christilaw is referring to the 2004 Canadian Institute for Health Information (CIHI) report on childbirth in Canada:[1]

> *But I think what we are responsible to is the fact that under our watch birth has lost its glow in terms of a natural experience and you know the CIHI data showing natural birth is no longer the norm. Birth as a surgical event instead of a natural process. I think this is such an important concept, that we think of birth as an event, a passive event that women allow themselves to undertake as opposed to actively participating in a natural process.*
>
> Christilaw 5:4

Several informants shared their perspectives that physiologic labour and birth are an endangered ecosystem and drew analogies with the destruction of the natural environment:

> *It's like you know what image came to me*? [Normal] *birth is an endangered species.*
>
> Lemay 33:86

> *I feel the loss of nature. I do feel that people's choice and their ability to be calm about birth in particular is, you know, clearly eroded. And the more we go to the deeper and deeper, tinier questions, I think the more that's influenced.*
>
> Soderstrom 51:550

> *And it's definitely that overriding culture. Who was that anthropologist who wrote that wonderful book? She said that really the overriding culture is that science is superior to nature. And I really think that's a belief that drives what is going on.*
>
> Payne 43:336

Many informants wondered why we have lost respect for the physiology of labour and birth. Sue Harris points out that "we have lost sight" of a perspective which sees birth as a normal body function that works best without interference. She draws analogies to other physiologic processes to help illustrate how the lean to intervention in birth is more extreme than in other situations where medicalization comes only once pathology is present:

> *Another thing that's kind of shifted the whole thing is that we've lost sight of the fact that vaginal birth is like breathing. I mean it's not something that you say "Well this is the bad outcome from breathing. You might get lung cancer so therefore you should stop breathing." We don't actually do that. And I think you know we're almost treating it as if it's an experimental procedure and it probably will be if there's a term cephalic trial. You know, that's the worry. There are many natural processes. I mean, you know, if somebody said, "Give me a colostomy bag so I don't have to have hemorrhoids." I mean, we don't do that to defecation. We don't do that to menstruation. You don't actually tamper like that and so why are we, why are we having this idea that in fact birth is the dangerous thing. You should be at all costs avoiding making it as natural as possible.*
>
> Harris 21:258

For Christilaw the sense of endangerment of the natural process leads to a need for stewardship. She calls on those who see the importance of environmental stewardship to contribute to preserving a culture that respects normal birth, "*something very, very precious*":

> *I just wanted to end with a concept of stewardship. And I think this is one thing that the next generation of people who have come of age caring for our environment and caring about Kyoto can contribute. In a way we're stewards, as people in the room who do maternity care, we're really stewards of something very, very precious I think. And we're stewards in a context of risk and safety. And sometimes this gets skewed a little bit. You think if you do the lowest risk thing that you've done your job, but I would say we are stewards of something much more complex and precious than that. We are stewards of the culture of birth and we need to take responsibility for this.*
>
> Christilaw 4:4

Others worry about the cultural damage and loss that may occur if reliance on technology means that "*birth is removed from culture*":

> *It's a big challenge and I think we have to really start exploring those areas because we're on the brink of something. I remember when we had the first discussion here at* [hospital] *talking about elective section and it was a very mixed audience because there were anesthetists, nurses, OBs, family practice doctors, midwives. And toward the end of the debate one of the midwives just stood up and said "Has anybody ever thought about what happens when you remove birth from a culture?" And you could have heard a pin drop. There was just silence in the room. Because it's a very scary concept.*
>
> Knox 30:204

> [Name] *is a midwife here. She asks about what the consequences will be down the road if section becomes the norm, c-section becomes the norm, to our children. I mean what does it, what will it do down the road? Will we lose the ability to have a vaginal birth? And how will that change our culture?*
>
> Payne 43:296

Linked with a lost culture of birth as a physiologic process, is the loss of confidence in birth that has been raised in previous chapters. In their interviews informants express their sense of loss of confidence as one of the unexpected effect of EBP:

> *I think in our culture women have lost the confidence that they can give birth naturally. It's tragic. But it's very tragic. And I think we're going there, you know. I really do.*
>
> Payne 43:312

> *With women sometimes I find myself in a bit of a dither because I'm trying to answer both ends of the spectrum and explain risks and benefits when what I want to say is 'You know what? Trust your body. Just trust your body.' You know? But I also want to make sure she has all the information that she feels she needs in order to do that. It used to be acceptable for us to encourage women to trust their bodies. And it doesn't feel that way anymore.*
>
> Knox 30:546

It's like technology has undermined confidence. There's that wonderful book from the early '90s by Barbara Duden. It was wonderful and it really talked about how ultrasound is a tactic she found undermined our own knowing, and how our own knowing about our body was very different once and now only science can tell us about our bodies and not ourselves. And it's really a tragedy I think of this day and age that we've lost the confidence and the ability to do that. And I think partly it is because of the scientific evidence.

Payne 43:38

One of the most resigned expressions of grief and loss came from Simkin who spoke very personally at the end of her interview about normal birth in the US:

I don't think there's anything we can do in this country to save normal birth. I think it's lost. All I want to do is write down everything I know about how to support normal birth so that if someone later wants to re-discover it, I will have written it down.

Simkin 50:written note

Some informants spoke evocatively about the loss of the beauty and celebration of birth and its potential to change lives. They identified value and richness in childbirth that RCTs just cannot capture. Reference to what cannot be measured is a reoccurring theme throughout my data. Two informants whose eloquent and emotional comments about the beauty of birth made them stand out were physicians, a family physician and an obstetrician, a finding which challenges stereotypes about caregiver attitudes:

You know that great expression of Murray Enkin's. There are some things worth measuring that are not worth knowing and some things that are worth knowing, they're not measurable. But this is critically important. It is no longer fashionable to talk about the power of birth as a value. The transformative nature of birth, the maturational nature of birth. That's all touchy, feely . . . What matters is urinary continence and your sex life and your marriage. Never mind that the data on all of that is [flawed]. *It's no longer fashionable to talk about all the values associated with vaginal birth. Spirituality, mastery, control, power. It's a celebration, as opposed to having an elective caesarean section which is a surgical experience no matter how pleasant we try to make it . . .*

Klein 30:29

Birth is so much more than pushing a baby out. It has social and cultural and anthropologic parameters to it. It's such a rich tapestry of human experience that to reduce it to a single event is, I think it's not only short-sighted but that it's actually wrong. And I think when we try to boil it down to one point where you can randomise people to two groups . . . and you can only answer one question and you have to decide what that question is before you start . . . When you think about birth and all of its splendor, trying to do that is just so difficult.

Christilaw 4:30

I think our concern and the concern of many practitioners when it comes to this [elective

caesarean] *is that we treasure birth in all its messiness and all of its uncertainty, we treasure it. And to see it reduced to either have a c-section or push the baby out but really, other than that, there's no decision to be made.*

Christilaw 4:76

Loss of Access to Care and Choice

One of the most troubling ripple effects of EBP for many informants was the unintended loss of access to care for options other than technologic birth. Many described an increasing limitation in the choices available to women when hospitals and individual providers apply evidence in a way that restricts choice. Informants linked loss of skills for complicated vaginal birth and medico-legal fears to growing unwillingness to provide care for situations that would formerly have been considered routine for most obstetricians. Loss of respect for the importance of birth as a normal physiologic process means there is little to counter balance concerns about the "risks" of spontaneous labour or vaginal birth. As a result, planned induction, or planned caesarean often become the only options available to women. In contrast to the democratic hopes of EBP, Simkin warns of danger for a woman who might have made decisions for her care based on her interpretations of the evidence that are different from her care providers:

And I find myself having real trouble helping people because once they've sorted it out, let's just say that someone decided she wanted intermittent auscultation or she was going to refuse an induction at 42 weeks or she wasn't going to take her antibiotics. Then she is treated like such an outlier that they might reject her for treatment. They'll say "I don't have to take care of you if you're going to be like that." So even if she does give it tremendous thought, she seems as such a radical, it isn't safe for her to be too strongly persuaded by the evidence because her caregivers aren't guided by it, and she often can't find a caregiver who would be.

Simkin 50:149

Simkin's description of women being "*rejected for treatment*" in the US is echoed by my Canadian informants. Hutton talked about this problem of restricted access to non-interventive choices as an unintended effect of some of the key RCTs. Her comments refer to the flurry of professional and public press coverage of Hannah's opinion piece about non-indicated caesarean section discussed in Chapter Seven. The press misinterpreted this article as a position statement from the obstetric profession. Like most of the care providers I interviewed, Hutton worried that as a ripple effect of over interpretation and over application of evidence women's choices have been reduced in a way that is inconsistent with the EBP, even though the debate about access to caesarean section "on demand" seems to centre around choice:

> *Looking at that article where there was nothing to suggest that caesarean section ought to be recommended, or available to all women on demand and within a one week period of time the buzz across the country was that that's the way it was going to be. How does that undermine women's ability to maintain the choice of vaginal birth? I think that's a valid worry when you look at the post-term trial and the recommendations from that and the fact that now pretty much at 41 weeks, you're induced. And the options for women to not be induced are really diminished. And we know for women who want to have a vaginal breech birth, that option is greatly diminished. Like all of those kinds of things where the evidence gives us information which we think should be a good thing. We believe that information should be good in order to help practitioners and to help women make choices. But what happens is the system takes that information and puts policy in place that in fact restricts choices. And that's a real concern of mine, how, it's not so much what the evidence . . . says, it's how the evidence is used . . .*
>
> Hutton 25:146

Hutton's worry that the move to more readily offer the choice of caesarean section has an inverse effect on choices for vaginal birth is echoed in the literature. An article in the American journal *Obstetrics and Gynecology* warns:

> Clinical and social externalities are especially problematic in the context of expanding access to planned caesarean delivery. Such expansion has the potential to limit access to low-intervention births as labor and delivery wards further orient toward clinical practices that, however well intentioned, bring higher probabilities of multiple interventions. As many have noted, access to low-intervention birth is being increasingly challenged by institutional policies, liability pressures, and practice patterns; if demand shifts too strongly toward caesarean delivery, it may impinge on women's access to vaginal delivery.[31]

Andrew Kotaska has spoken and written extensively about the coercive elements of the way in which the evidence around breech, VBAC and post-term pregnancy has been presented and applied. In his interview, he notes a pervasive lack of discussion of the long term results of the Term Breech Trial which found no difference between vaginal birth and caesarean section. Kotaska believes that access to care for vaginal breech birth is fundamental to an ethical maternity care system. He writes:

> The principles of patient autonomy and informed consent suggest that women with persistent breech presentation at term should have information about and access to an alternative to pre-emptive caesarean section. Even using the Term Breech Trial alone as a basis for a consent discussion, the current practice of "not offering" women a trial of labour while providing ready access to caesarean section is coercive, especially given the equivalency of long term neonatal outcome. Now, with a more comprehensive understanding of the components required to make short term outcomes of vaginal breech birth equivalent as well, it would be unethical not to provide this information to women. Although it may be difficult in some settings to offer vaginal breech birth routinely, its

availability elsewhere should be disclosed and assistance offered to obtain it if requested. To offer only Caesarean section is ethically and legally difficult to justify if a reasonable alternative is available.[32]

Linda Knox expresses anger and dismay at a colleague's refusal to offer vaginal breech birth to a well informed woman. Her report of her conversation with "*one of our favourite obstetricians*" reveals how fear can influence reluctance to practice outside of EBP standards:

> *I had a conversation with one of our favourite obstetricians and I said to him "So if a woman comes in to you and says I'm having a vaginal birth, what are you going to do?" He said "I won't do it because I could lose my license and then I can't look after anybody." And I just said "That's bullshit. That's absolute bullshit. If it's the woman's choice and she's fully informed and she says I'm having a vaginal birth, you wouldn't care for her?" Like what's that about? How can we have a whole segment of our care providers who are that fearful?*
>
> Knox 30:264

Payne talks about lack of access to care and choice as a "*toll*":

> *Well it's kind of a toll to all of us who care about normal births and care about women's choice because women are losing their choice again.*
>
> Payne 43:338

Soderstrom's worry about "*going down a path*" which may not be able to be reversed seems to describe the concern of many informants that the entrenchment of technologic care as the only option offered in many settings:

> *If the evidence is overwhelming, then you feel good. I mean even if you don't necessarily like the answer, you feel good about following it eventually. But if it's questionable or varying levels of question yet there is compelling community pressure to follow that particular evidence as in the case with the breech trial, then I feel a bit sick about it because we're going down yet another path that we may never recover from. And losing so much choice for women, and maybe we'll never be able to say that we were wrong.*
>
> Soderstrom 51:72

Many informants described growing lack of access to VBAC as another key example of EBP restricting access to care. Rural midwife Krysanauskas describes the change in practice that has dramatically reduced the number of women who are offered the option of vaginal birth especially in small centres:

> *And they aren't necessarily having the trial of labour which is something that's started to evolve in front of us.*
>
> Krysanauskas 32:338

Several referenced the unexpected controversy which erupted in July 2004 when the SOGC

published a guideline which recommended "immediate" access to caesarean section as a requirement for offering VBAC.[33] Many smaller hospitals responded to this guideline by deciding not to offer VBAC, so that women's only choice in their local hospitals was repeat caesarean. Although the intent of the guideline was not to restrict access to vaginal birth to large tertiary care centres, informants reported that many smaller hospitals feared the guideline had increased their medico-legal risk in offering VBAC. The response was so dramatic that the SOGC promptly revised this guideline in February 2005. The revised guideline stated used the term "timely" access to caesarean so as not to undermine access to VBAC in smaller hospitals equipped to conduct caesareans.[34] For the informants who reflected on this experience, it represented a stark example of the powerful unintended impact EPB guidelines could have and a warning about how easy it is to undermine access to care.

Kotaska directly links lack of access to care to a coercive application of EBP that "its founding fathers" would not approve of, calling on the legacy of Archie Cochrane to once again hold up obstetrics as an example. Several decades after Cochrane first criticized and then praised obstetrics for its uptake of EBP the problem Kotaska identifies is not lack of evidence, but a failure to use evidence in the context of "patient values and choice". Kotaska believes Cochrane would disapprove:

> More overt and troubling is health practitioners' coercive refusal to care for women who do not take their advice. When a woman decides not to take a recommended course of action, increasingly, she is not ''offered'' care. This is, in essence, abandonment. Centers not ''offering'' vaginal birth after a previous caesarean section (VBAC) or vaginal breech births are guilty of this type of coercion and of seriously undervaluing women's autonomy. Individuals have a right to self-determination based on their values. The job of clinicians is to provide information and competent care, not to question values. Practitioners accept the right of a patient dying from hemorrhage to refuse a blood transfusion (a risk of 1/1), but an increasing number of centers will refuse to accept a woman's decision to have a VBAC (associated risk of perinatal death of 0.5-1/1,000). The founding fathers of evidence-based medicine, strong advocates of the critical role of patient values and choice in the application of evidence, would not approve. Perhaps obstetrics, once awarded Archie Cochrane's ''wooden spoon'' for the least evidence - based practice, now deserves a ''wooden club'' for our keen ability to ignore the autonomy of women who deviate from ''evidence-based'' dogma.[35]

Knox believes there is something "*terribly wrong*" in the inconsistency in access to care, even between hospitals in the same city:

> *It's about litigation should there be a bad outcome, but it's more than that. It's about being seen through the eyes of your peers because it's often about the group within which you function and the institution within which you function. And there's way too much*

regimentation and ownership around issues like that. Why in one hospital will people say "Well of course. If this criterion is met and the woman feels really comfortable and we're all comfortable that she really is making an informed choice, of course she can have a vaginal breech." But over here with, you know, a different population of obstetricians close to retirement maybe who just want to get done their last five years and the fear level around breech, around VBAC, around all those issues, is through the roof. I don't know what the answer is, but there is something terribly, terribly wrong with this picture.

Knox 30:268

Lack of access to options which support normal birth have led to concerns in Canada [36], the US[37] and the UK[38] about the "free birth" or "do-it-yourself birth" movements. Advocates champion unattended home births or births outside of the hospital in high risk situations because they feel that women's choices will not be respected by care providers or institutions. For the care providers I interviewed and the commentators in the professional literature these protest movement mark the need for a more flexible approach to evidence that respects choice and autonomy. In this view, access to maternity care is a fundamental right, even when choices do not fit with the EBP standard of care.

Loss of Vaginal Birth – The Term Cephalic Trial

Many informants referred to fears of the possibility of a "Term Cephalic Trial" (TCT), an RCT of vaginal birth versus caesarean section for normal low risk birth when the fetus is in a cephalic or head down position. Although this was not an issue that I asked about directly, it came up in many interviews. For some informants, an RCT of normal birth versus caesarean section was an inevitable outcome of the confluence of the evidence movement and the caesarean section on demand debate. Most informants expressed significant hesitation about the possibility of a TCT. Some used the idea as an ironic reference to the Term Breech Trial or as evidence of a dystopian trajectory for the over application of the evidence-based paradigm. None of the care providers I interviewed advocated such a trial. They conveyed discomfort at discussing the idea as if something important and vulnerable was at stake. Although many left the reasons for their discomfort unstated, they often conveyed by comments or meaningful looks that they expected me to understand the weight of their concern and the unarticulated rationales. For some it appeared to be awkward to acknowledge a desire not to conduct research. Others were clear that the question of vaginal birth versus surgical birth for healthy women was the wrong question and the RCT methodology was the wrong methodology. Some saw such a trial as inevitable and referenced it as if the preparations although not announced, were in process.

Those informants that took a clear position on the unacceptability of a TCT, often returned to Enkin's assertion that one of the problems with EBM is that "*not all that matters can be measured*" (Klein 20:39). The idea of a trial of vaginal birth was referenced with a tone of anger, despair or even horror. The TCT seemed to represent a kind of nightmare of evidence-based practice gone completely wrong:

> *I'm terrified for that trial. But I think there will be lower mortality for the babies. I think it will be slight. But we'll see the women die, with more frequency. So then you have to ask what you value more. And I think from midwifery's point of view, we have no choice but to value the mother. You know what I mean? It's like obstetricians have moved closer to fetal apprehension, imprisoning women. I hope that midwifery would always stand opposed.*
>
> Saxell 47:326

> *Well I suppose the strongest feeling I have now is that the evidence-based movement has somehow been turned upside down in some way from its original intents. I remember Murray Enkin and* [colleagues] *and where that came from in 1989 when Effective Care in Pregnancy and Childbirth was published and so forth. The way in which things* [EBP] *have been transformed and have led us directly to this insane situation of actually beginning to discuss vaginal birth as an option. Do you know what I mean? That's the most classic and perfect kind of end point. And I could see it coming three, four years ago. Do you know what I mean? You could see it with the term breech trial, and Hannah's work on post-term pregnancy and so forth. And then getting a sense of "Oh my goodness, they are actually really going to look at the risks of vaginal birth versus the risks of caesarean births."*
>
> Martin 36:26

Baskett illustrates the troubling logic that leads to the idea of a term cephalic trial. He and many others acknowledge that if the goal is to eliminate all risk for the fetus, evidence might prove that normal term birth or normal spontaneous labour presents a risk to the fetus as compared to caesarean:

> *The trouble is I think if you look at it epidemiologically with massive numbers, there's as big an argument for delivering everybody at 38 weeks as there is at 41. Following this logic therefore we might get to the spontaneous labour and normal delivery versus elective section trial.*
>
> Baskett 1: 249

Enkin worried that he may have initiated the discussion of the potential for a TCT at one of the collaborator meetings of the TBT group. He described how he made a sarcastic remark trying to point to the absurdity of using caesarean section to remove every last element of risk. A suggestion he believed was ironic and meant to raise questions about the limits of RCTs was

taken seriously by other researchers. At the time of his interview, with the idea of a TCT in the air, Enkin expressed significant regret that he may have contributed to such a project:

> *But it hit me when the* [TBT] *results were presented. Because as the results were presented, of course short term mortality would be less, inevitably, because no matter how carefully a labour is conducted, there's going to be an occasional problem. And you won't believe this. This is true. I got up at the meeting to ask questions. And I thought I was being sarcastic and ironical as hell and I suggested we should now do a trial of cephalic birth. I started it. I thought I was being sarcastic. I suggested it at that meeting thinking everybody would laugh and say of course how ridiculous can we be. And to my horror people took it as a serious comment, that's where I really learned the lesson. Irony doesn't get you anywhere because reality outstrips satire. Because we're living in such a bizarre world. So yes, in a sense you could say I was responsible for that.*
>
> Enkin 8:316

The majority of informants concurred with the SOGC's statement on elective caesarean section that vaginal birth is safer than surgical birth for the majority of women and fetuses.[39] They opposed a TCT, feeling it would simply act to justify the unjustifiable. Given the experience of the maternity care community with the limitations of the evidence RCTs can provide and the history of misapplication of RCT findings many informants felt that the dangers of an RCT outweighed the potential information it could provide. From this perspective the risks of unnecessary surgery are not balanced by a small short term decrease in perinatal mortality but they feared a trial would show short term benefit to fetal and neonatal outcomes and create more pressure for women to choose caesarean. Many informants worried that the benefits of vaginal birth are long term, complex and multifaceted and not easy to demonstrate through an RCT. As Enkin expresses, more information does not always mean we have enough information to answer a question:

> *Now some of the more evidence-based* [purists] *would say well we have to find that* [the risks and benefits of vaginal birth versus caesarean] *out. Women need to know that. We need to know...so they can make the choice. As a member of the* [health care team], *you have a responsibility and a part of that responsibility is to provide the information that will help people make the right choice. But you're only going to get part of the information. Which part should you get?*
>
> Enkin 8:579

Many referenced the emerging literature on the benefits of vaginal birth and felt optimistic that more evidence would emerge over time about the risks of caesarean. Several informants see the information provided by EBP as necessary to justifying intervention. Windrim defends seeing the "*default*" as normal birth and non-intervention:

> *The default is usually normal. I mean if you leave them alone and do nothing most women are healthy and well. Most babies are healthy and well. Most labour and deliveries hopefully should go normally. So when the default is normal, I think that it really puts a lot of emphasis on evidence-based medicine if you're going to offer an interference. If you're going to change, if you're going to vary from the normal default, you should have good evidence on your side for you to do something.*
>
> Windrim 54:88

In discussing the SOGC's position that for most women vaginal birth is the safest thing, Baskett also articulates support for "*keeping the premise*" of vaginal birth but defends the need for more information. He focuses on concerns about the long term consequences of repeat caesarean:

> *Well I think it's reasonable to keep that premise* [that vaginal birth is safest] *and work from it. But we urgently need a lot more information for women. That's why we're looking at these, the morbidity for the mom and the morbidity for the infant. They need to be able to say "Look here, this is okay by me." or "This is not". And we also need cumulative morbidity. If you only have one caesarean, but if you have two these are where the risks pan out for you and your baby in the second pregnancy. And if you have three, now we're starting to talk major increase in risks if you've had three sections.*
>
> Baskett 1:273

Christilaw, one of the authors of the SOGC statement about caesarean without medical indication, hopes that we will look back the debate about mode of birth as "ludicrous":

> *Well, I think that when the dust settles and this is all done and we get a chance to really reflect on everything we've learned, what I hope and I'm an optimist like you are, what I hope is that women will look at the information that's been given to them and they'll look at this, they'll look at this whole question of elective caesarean. And they'll look back and see a debate that happened around this point in time and they'll say "This is ludicrous." How did we ever even start talking about this? How did anybody ever try to tell us that a c-section would replace vaginal birth? How did anybody ever think that having a surgical, passive surgical event would be in any way equivalent to my going through labour and dynamically taking control and pushing a baby out and having a birthing experience? How did anybody ever think that those two things could be the same? And I think, I'm optimistic enough to think that we'll come back to that. And that women will own it again.*
>
> Christilaw 4:349

Interestingly, an RCT of term cephalic birth has not been conducted to date, although rationales for an RCT comparing vaginal birth to caesarean section have shifted. Advocates initially argued the importance of looking at the potential short term benefits of caesarean on fetal outcomes. Arguments have now emerged about to the need to examine the increasing evidence for the long term risks of surgical birth to not only the mother but also to the fetus. This 2012 call

for an RCT of mode of delivery demonstrates this new focus:

> Birth by caesarean section is rising rapidly around the world and is associated with a range of adverse short and long term outcomes in offspring. The latter include features of the metabolic syndrome, type-1 diabetes, and asthma. Though there are several plausible candidate biological mechanisms, evidence of a causal relationship between mode of delivery and long term outcomes remains lacking. Here we review the evidence to date, and examine ways in which future studies might advance understanding. We conclude that a randomized controlled trial of mode of delivery for the healthy term, cephalic pregnancy, is neither unethical nor unfeasible and should be seriously considered as the optimum means of addressing a question of great relevance to public heal

Revisions: A Different Kind of EBP

Out of the sense of loss, disappointment and anger, informants often suggested the need for a different kind of EBP. Although many expressed feelings of betrayal and naivety most wanted to return to what they saw as the original intent of the founders of EBP in maternity care and rehabilitate the use of evidence rather than abandon it. For Houstoun:

> *There doesn't seem to be any subtlety involved in the way that evidence is applied. But I don't think that's what Enkin and the others implied. Or envisaged either that that would happen.*
>
> Houstoun 23:130

Re-envisoning EBP for many involved remembering the values described in the early phases of the evidence movement as it grew alongside childbirth reform. They called for a balancing of evidence with judgment and the use of evidence in an "informed choice" context where decisions are equally informed by evidence, clinical judgment and patient values and preferences:

> *Even the gurus and the leaders of evidence-based continually say "This must be placed in the clinical context, the experience, and the particular circumstances and wishes of the woman at the time."*
>
> Baskett 1:190

This hope to learn from the limits of the application of evidence in maternity care is consistent with critical science scholars such as Donna Haraway's call for a better, more feminist science integrating social science understandings of the contextual nature of scientific knowledge.[41] Enkin, like critical science scholars, asks for a more reflective production and application of evidence that is aware of and takes responsibility for interpretation:

> *Let's go back to what the very beginning. The leaders in the field have always hedged their remarks. This has to be individualized and this has to be considered in context. What they, or I should say we, you, I've, forgotten is that people are going to ignore those caveats. You can say it till you are blue in the face, but that's just a way of*

weaseling out. Because you need to take responsibility for the fact that people won't listen to the caveats. Recommendations speak, and you've got to [ask] *"How will what I say be interpreted?"*

Enkin 8: 756

Although few informants seemed aware of the growing body of literature calling for the re-envisioning of EBP, the desire not to abandon but to re-envision EBP was beginning to be articulated in all areas of health care.[42] Many informants called for a renaming of EBP, a suggestion which has found a place in mainstream discussions of EBP.[43]

I wish we could . . . just change the language a little bit to talk about evidence guided or evidence supported practice rather than evidence-based practice because the word evidence-based means that, it just makes that so central and I really think it's just one of the pieces and we're always working it together.

Kilthei 27: 185

Houd gave an example of how she would put evidence in context as "one component" of how she would plan care:

But let's say that it's showing that in general in a population it's safer to have a caesarean section with a woman having her first breech birth. And with my knowledge and experience as an old midwife, I've been catching, helping women with many, many breech births and with very good experiences. So I have the individual, my own experience, the research, and then if I had a woman in front of me where the baby was in the breech, I have that individual situation. So I have these three points of reference. I think that the knowledge of the breech is also a thing you can use together with the woman's feeling, with your individual evaluation of her situation and so on. I don't think I would blindly just say "Oh you're having your first baby, and so caesarean section." I think it becomes a component of importance in your judgment of the situation, but the individual woman is also a very important component. I don't like to call her a component, but you understand what I'm saying. And my own experience is also an important component. So between the three components, you make a decision together with the parents about this. That's how I feel.

Houd 22:105

Several informants described themselves or others as heretics (Biringer, Hall, Kotaska) or as marginalized (Reynolds) within the evidence movement or the maternity care community because of their positions as EBP critics. Kaufman commented on the heretical stance Enkin has taken. She references with palpable compassion, how challenging it has been for some individuals involved in the new paradigm, like Enkin, to witness the misapplication of EBP. She calls for a more individualized and nuanced application of EBP:

I mean well you know if you've talked to Murray he's beside himself that he ever wrote this stuff. Which is too hard. I don't think that it should be rejected, but Murray you

know, just as he pushed the whole EBP approach thinking that this can help us, now he wants to push it all back the other way to say "Look, pay attention". And EBP is only one piece in the entire puzzle. The way it's been applied it's just too lazy. It is far too lazy. And of course that's what makes it so hard. It makes it incredibly hard because it means to do a good job you have to individualize every situation. And none of us really want to do that. And hospitals don't want to do that. And busy practitioners don't want to do that. They can't.

Kaufman 26:117

Some saw that just as the evidence movement had swung from supporting normal birth to promoting technology, the pendulum would swing back as different researchers and different questions emerge. Feldman's concept of evidence as a "two edged sword" not only conveys the sense of an ideological battle in which evidence is a weapon, but also conveys ambivalence about using science in political ways.

Okay? Evidence is a two-edged sword so what's going to happen is the evidence is already starting to come that we're doing harm with this approach.

Feldman 14: 138

Houstoun calls for a back push against a "*belief in technology*" that has gone "*too far*":

And our society has come, I mean the 20th century has lead us to a belief in technology as solving all our problems, and society has taken that on hook, line and sinker to the detriment of intuition, feeling, experience. And I think that's a problem. We need to get a better balance because we now, I mean having the technology is wonderful in its appropriate place. I wouldn't want to go back to a time when we didn't have available caesarean section. I mean that would be absurd. But the pendulum has swung too far the other way and it's now this technology is being implemented unnecessarily or over used for no apparent benefit, and from my point of view to a real loss to women and their families. It needs to swing back.

Houstoun 23:36

Reynolds has some optimism that the system can "*correct itself*", and notes that there is much work to be done by caregivers supported by the women and families they care for:

And we know the system will probably correct itself again hopefully in our lifetime. And we wouldn't do this if it weren't for the women and families that are supporting us. And we have made some impact. We have changed the child birth culture in most hospitals in North America to a much more woman-centred culture. We haven't gone far enough. Breastfeeding rates are recovering. The episiotomy rate has been dramatically lowered. There are disadvantages to that because other more invasive interventions have taken over.

Reynolds 44:324

Some informants had become part of projects which sought to actively interpret evidence to support normal birth. Christilaw was working on an SOGC statement about caesarean section

without medical indication. Klein was engaged in a research project about how beliefs and attitudes of care providers influence their understanding of evidence. Kotaska was at work on several articles on his concerns about the TBT and he and Menticoglou were working with the SOGC on what would become a statement about the option of vaginal breech birth. Saxell was designing an information pamphlet to inform women about the choice of vaginal birth at her hospital for breech and VBAC. Soderstrom was working on an approach to "risk management" and CPGs for midwives that looked at how evidence can support normal birth. At the time of writing the AOM has produced an impressive set of CPGs guided by a "values based" approach. These CPGs attempt to provide guidance to midwives hoping to support normal birth and informed choice and look at multiple rather than singular interpretations of evidence.[44] Reynolds who described himself as marginalized by his critical perspective on EBP and industrialized birth and called for a coalition of those who want to speak for normal birth:

> *As a marginalized person you just speak the truth to power. I think that's what we have to do. I still think what is missing from the family doctor, midwifery, and nursing component is organization. That we need organizations to speak effectively for us. That is not the SOGC. We need, there should be a coalition of family doctors, midwives, and maternity care nurses who speak for normal birth.*
>
> Reynolds 44:324

Others such as Kingdom and Ohlsson saw audit as an essential component of a re-envisioned EBP. Audit of the impact of evidence-based guidelines and policies is essential to understanding the real world impact and to adapting and addressing unexpected effects and uses.

> *You need to reassess* [EBM approaches] *because almost all these interventions have been tested in randomised controlled trials under trial conditions, so they might not be as effective in real life. Like in the post-term trial obviously or in the term PROM, any mother going into such a trial would be assessed and she and her fetus would be healthy at the time of going into the trial. Now outside of the trial there might be mothers who are not so optimal and then the same intervention is applied and it might not be as effective in that situation. So therefore you need a surveillance system where you collect the data on these conditions, analyze the data, and then respond to what you find. And if there is no reduction, then you have to rethink, right? You might find a different adverse outcome or improvement in another outcome. And that has rarely been done to date you know. Very few guidelines have actually been looked at for their effectiveness.*
>
> Ohlsson 42:234

Most informants remained consistently committed to a re-envisioned EBP despite their concern over its misapplication. They called for what Phil Hall labeled "*a more humble use of evidence*" (Hall: email correspondence) understood as necessary but not sufficient to quality

health. Enkin describes this humble approach to EPB. His map analogy attempts to illustrate that it is the user of the map who determines what the destination is:

> *And I think honest research is an attempt to diminish error, but not to find truth. So that when we do a study and if we do it in as unbiased a way as possible, and you can do that with qualitative research just as much as with quantitative research, you can say "This idea was wrong". You can never say "This one is right." But as you whittle away at the error, you may get more satisfaction. Another way to look at it is maps. You can draw hundreds, well infinity of different maps about how to achieve your goal, how to get to a particular place. The question is no longer "Is this the right map?", but "Does this map get me as close as possible to where I want to go?" Lots of maps can do that. Lots of different models can do that. It's no longer a question which model is right, they're all right if they get you to where you want to go.*
>
> Enkin 9:95

Conclusion

The care providers I interviewed were worried about rising rates of intervention in birth and disappointed that EBP had not fulfilled its promise to address the over-use of intervention in birth and wide variations in practice. They saw more and more intervention being done for less benefit. They saw potential for harm from unintended and long term impacts of applying evidence in isolation of understanding its ripple effects. Many saw that some of the victories of the childbirth movement had turned to losses for those who hoped to humanize birth.

Many, from all backgrounds, conveyed feelings of loss and sometimes anger about the dynamics and directions that EBP has taken in maternity care. They worry that loss of skills and loss of access to care may make birth not only less humane but also less safe. A sense that normal physiologic birth was threatened by EBP evoked strong emotion from many informants. Despite the sense of grief and anger, informants continue to look to EBP to answer questions and promote their approaches to childbirth, while wanting to re-envision how it is applied to maternity care. The desire of care providers from all backgrounds to remake EBP invokes the unmet challenge of the authors of *ECPC*: to use evidence guided by objectives of care and social values. A reconsideration of EBP asks users of evidence to see EBP as a process inside rather than above history and politics and asks EBP practitioners to re-engage with a discussion about the philosophies and politics of childbirth.

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Conclusion: Reconsidering Evidence-based Practice

Maternity Care and the Evidence Movement

Evidence-based practice (EBP) was first advocated, and then widely adopted, as a more scientific and objective approach to health care. This "new paradigm" is similar to other projects which claim the label of science. EBP is often assumed to be based on facts which are fixed and separate from history and social relations. EBP is presented as a neutral tool and advocates do not address the application of evidence in health care as a social process. This study of an interprofessional group of maternity care providers explores evidence-based practice from a critical science studies perspective to try and understand the social inside the science.

First called evidence-based medicine (EBM), the new paradigm was championed both within and outside of obstetric medicine. Significant support came from childbirth activists and feminist scholars who hoped better science would "humanize childbirth" and reduce rates of obstetrical intervention. Public and professional advocates for change looked to EBP to determine which interventions were justified and which could be abandoned. Good evidence, it was argued, would guide care providers and empower women to be active and informed participants in decisions about their care. The enthusiastic acceptance of EBP by medicine, midwifery and nursing appears, however, to have had unexpected effects. Rates of intervention, such as induction of labour or caesarean section, have continued to increase. Some evidence is adopted quickly while other evidence is widely resisted. Access to some types of care has decreased with the adoption of EBP, in the case, for example, of vaginal breech birth and vaginal birth after caesarean section (VBAC). Trends to limit access to care persist, in some cases despite evidence, guidelines and leadership in place to support choice of these birth options. EBP has also worked to obscure some of the politics of childbirth underneath patterns of care previously uncovered by childbirth activists and feminist scholars. An almost exclusive focus on science, embodied by the new paradigm, has come to dominate professional and public discourse about birth.

I explored the EBP's roots in maternity care by reviewing the publications which first promoted the application of evidence in the care of childbearing women[1,2] and by speaking to early advocates of EBP. Through semi-structured interviews, I asked care providers about their initial hopes for EBP and how they have seen evidence being interpreted and applied since its

introduction. My goal was to ask them to describe some of the qualitative "hows and whys" of a seemingly quantitative topic. My interviews with family physicians, midwives, nurses, obstetricians and several EBP experts were conducted between 2004 and 2006. I also attended professional conferences where EBP was both promoted and debated. The time of my interviews was an important and interesting moment in maternity care to assess the impact of EBP. Almost three decades after the first steps taken by Chard and Richards in *The Benefits and the Hazards of the New Obstetrics*[1] and a decade after the naming of the new paradigm,[3] the evidence movement was firmly established as the dominant model for health care decision-making. Several key research studies were changing maternity care practice, but were not adopted in uniform ways. Second thoughts and dissent about EBP were beginning to surface. My interviews uncovered dynamics, directions and unexpected effects of the application of EBP to the care of pregnant and childbearing women.

Themes that emerged from maternity care providers' concerns resonate with those found in the passionate debates about EBP in the broader health care community. I examined the explosion of literature about EBP published in the decade following Guyatt et al.'s foundational 1992 article in *JAMA*.[3] EBP advocates assert that it offers a better, more scientific approach to practice than the "old paradigm", which is often labeled as "opinion-based" practice. This claim that health care should be based on the best scientific evidence may seem to be self-evident. However, as critics reveal, this claim is not substantiated by the paradigm's own methods. Critics worry that population-based statistics can provide valuable information to inform, but cannot not determine, the care of individuals. Experimental methods of randomised controlled trials and meta-analysis may not always produce results that can be reproduced in the complex "real world" setting of health care. Concerns also emerge in the literature about what counts as evidence. The hierarchy of evidence established by EBP devalues and excludes other forms of knowledge and, for some, diminishes the "art" of health care. EBP is seen to have established a new authority with sweeping power. EBP is often compared by critics to religion, an irony given its claims to science and democracy.

Like the vast majority of health care providers, the care providers I interviewed were uniformly motivated by wanting the best outcomes for those they care for, usually defined in terms of safety for mother and baby, although they expressed different visions of how best to achieve that goal. Many across all care provider groups expressed a strong desire to provide care which respects the deep social and cultural meanings of the childbirth experience. They wanted to

know and do the "right thing". Most trusted the evidence movement would provide clear answers to how best to assist women during pregnancy, labour and birth. The expectation was that EBP would reduce the wide variations in practice between countries, regions and hospitals that seemed to undermine the legitimacy of individual providers' and maternity systems' claims to a scientific basis for practice.

Given the strong link between the childbirth reform and evidence movements, many expected EBP to support a more woman-centred and physiologic approach to childbirth care and a less authoritarian model of health care. The hopes of maternity care providers for EBP were high and, at times, contradictory. Many wanted EBP to be a tool to support their philosophy of birth and, simultaneously, to produce clear and objective answers about the use of technology in birth. They wanted EBP to challenge the hierarchical power structure of health care and yet hoped to use EBP to discipline others. When informants looked back on their hopes, they often saw themselves as naïve. They pointed to unwanted effects and uses of evidence which they had not anticipated but felt they should have foreseen.

Messiness and Patterns in How Evidence is Applied

The care providers I interviewed worried about uses and effects of EBP in maternity care which seemed to be unintended or even paradoxical. Care providers were thoughtful and self-reflective, focusing their analysis of EBP on their own practice and their own profession. However, some were also critical of other professionals working in the maternity care field, especially when they felt their own work was constrained by others with a different view of the evidence. Many had participated in the creation of EBP tools, such as guidelines, courses or hospital policies. Some care providers expressed dissent about the way institutions and authorities, such as hospitals or professional organizations, directed the application of evidence. Others described the flexibility and exemplary leadership provided by EBP research findings and tools. These informants were sometimes frustrated by individual and institutional resistance to applying these tools in more than singular ways. Some were also very critical of researchers.

As they described their concerns and their views of the problems with the application of EBP, informants identified several dynamics that appeared to be operating. Evidence is often applied unevenly. The almost universal example given for this pattern was the almost instantaneous uptake of a single trial about breech birth which changed practice internationally. Informants contrasted this rapid adoption of research findings with the overwhelming resistance

to apply the evidence in favour of intermittent auscultation (IA), listening to the baby's heart beat manually. The continued, almost universal use of electronic fetal monitoring (EFM) persists despite multiple RCTs, meta-analysis and national clinical practice guidelines and courses supporting the use of IA.

Evidence is also applied beyond what the research justifies. For example, according to many informants, the research suggesting induction of labour between 41 and 42 weeks gestation is frequently applied as a rationale for induction at 40 to 41 weeks. Many worried that this trend is leading to increasing rates of caesarean section, with associated increases in complications for mothers and babies. Informants also reported problems in the interpretation of evidence. Under interpretation happens when one aspect of the evidence is ignored. In the case of pre-labour rupture of membranes at term, only the option of induction of labour was included in guidelines despite evidence for offering the choice of waiting for spontaneous labour.

When evidence is over simplified, "one right way" emerges and is disseminated in protocols, policies and guidelines, ignoring complexity and context. The concern is that this singular and over generalised approach does not always apply to a specific population or an individual woman. One example given was of the recommendations for caesarean section for breech birth being applied to women from remote northern communities. The consequences and risks of caesarean section for women living far from a tertiary care hospital were not considered in this example of the over simplified and over generalised application of evidence. The process of interpretation of evidence is often invisible, with research findings or guidelines presented as fact, despite the potential for multiple or alternate interpretations. To many informants, patterns of uneven and over application of evidence appear to be at odds with the early goals of EBP in maternity care to reduce variation in practice and overuse of interventions.

EBP, as it is described by the care providers I interviewed, has a universalizing and a reductionist effect. Attempts to define "best practice" based on "best evidence" have often led to the creation of EBP tools, such as clinical practice guidelines (CPG), which aim to standardize care. Many informants expressed that their reading and interpretation of the evidence is different and more nuanced that what was translated into hospital policies or CPGs. Informants reported that the move towards standard care sometimes limited their ability to use their skills and clinical judgment to respond to difference and nuance in clinical situations. They also worried that standardized care can limit communication with women and families and constrain opportunities to respond to women's preferences and values.

Some informants, however, used the move towards standard care in their institutions to promote and champion evidence that supported what they saw as a better approach to practice, hoping to influence the actions of others. Applying EBP as standard care sometimes led to what informants saw as positive change in their institutions. At other times, change was resisted, and evidence-based policies ignored. Simultaneous with reporting a trend to standardization, informants describe a system in which the application of evidence is uneven, partial, and messy. Far from making life simpler and answers more clear, the application of evidence-based practice is filled with contradictions. Informants both conform to and critique evidence and ask others to conform and critique.

Messiness and Patterns in Why Evidence is Applied

Why do care providers and institutions apply evidence in these patterns? The themes which emerged in my study reveal uses of evidence in the direction of belief systems, the strength of popular and professional cultures that "lean towards technology", and the use of evidence as a remedy for fear, uncertainty and medico-legal vulnerabilities. The structure of the health care system also has a profound impact, directing the application of evidence towards what some called "industrial care".

Most informants acknowledge that evidence is much more readily accepted when it reinforces beliefs and agendas. However, many care providers demonstrated that they also use evidence to challenge themselves and others to consider new approaches. The use of evidence for legitimation operates at the individual and institutional level. Evidence is used to support agendas for change and to support the status quo. The adoption of the short term results of the RCT showing that caesarean section is safer for breech birth was an example of rapid uptake based on pre-existing beliefs and practices. The long term results of the same trial showing no difference between vaginal birth and caesarean section did not result in the same kind of change in practice, or even discussion, a finding that reinforces this analysis.

Many informants felt that a powerful cultural trend to trust technological solutions has had a profound impact on how they provided care. In this view, "women want interventions" and increasingly prefer medical and surgical approaches even when alternatives are offered. This trend was noted to be in contrast to the popularity of "natural" childbirth among previous generations of childbearing women. The media, and celebrity culture, are seen to play a role in exaggerating risk and glamourizing technologic "fixes" when reporting on evidence. Informants

struggled with the confluence of questions about maternal autonomy, choice and evidence in the debates that emerged during my research about caesarean section without medical indication. Some care providers reported feeling pressured by women to take the more interventive approach, even when they see the evidence supporting more physiologic approaches. Others argued that care providers contribute to the technological imperative and have to take responsibility for having created a "birth culture" in which normal birth is no longer the norm.

Maternity care providers spoke eloquently about the difficulty of living with uncertainty given the weight of responsibility they feel for clinical decisions. They acknowledge that a social expectation of perfection in the outcome of birth for mothers and babies creates fear of "*those rare tragedies*" (Baskett 1:21). Some embrace and integrate uncertainty into the way they use evidence, offering women choices and alternatives. Others use evidence against uncertainty and resist partial and contingent understandings of best practice. Many linked rising rates of intervention in birth to the phenomenon of "risk talk", the necessity "to inform" produced by and reinforcing the combination of evidence and fear. The desire to "manage risk" by using evidence in a standardized way to avoid error and litigation is both embraced and resisted.

I found that many care providers were reticent about the systems factors that had an impact on the use of evidence. Payment structures and strained resources contribute to pressures to work quickly and efficiently. These pressures steer interpretations and applications of evidence to fit a culture and structure that some informants called "industrialized". Although EBP was intended to democratize health care, many informants report systems that often remain highly hierarchical, and their comments reveal how power relations can have an impact on how evidence is interpreted and applied. Care providers also use evidence in ways that contribute to job satisfaction. Efficiency, convenience and job satisfaction were offered as explanations for the use of induction of labour beyond what the evidence supports. Resistance to intermittent auscultation of the fetal heart (IA), which requires one to one nursing care, was explained by limited nursing resources and workplace culture. Some saw that the medical technology industry had very effectively "sold" electronic fetal monitoring (EFM) and that the power of this marketing worked against EBP. Some informants saw that EBP itself was an industry with its own interests that needed to be understood and taken into account.

Evidence-based practice in maternity care has not eliminated debate and opinion although some reported that EBP has had a chilling effect on dialogue about the philosophies and values that inform care. It has not produced the clarity which some hoped would address decades of

public and professional controversy about rates of intervention and differing philosophies of birth. While many care providers acknowledge instances where EBP has led to improvements in the care of women and babies that are unequivocal, many areas of controversy remain. Although there was general agreement across the professions that EBP has contributed to a cascade of intervention, many informants asserted that this did not need to be the inevitable outcome. There was also agreement that more and more intervention is being used to address smaller and smaller risks, with unclear benefit and potentially unwanted ripple effects. Some care providers are concerned that normal birth is "at risk" perceiving physiologic birth as a fragile ecosystem. Many worried about a loss of hands-on skills necessary to support vaginal birth.

A repeated and unexpected pattern was evident in my informants' emotional reaction to EBP. Many related a move from hope, excitement and enthusiasm to a sense of disappointment, disillusionment, loss or anger about how EBP has been applied within the maternity care community. Despite these feelings, the care providers I interviewed remain committed to EBP. Many were engaged in projects hoping to address some of the unwanted effects and misapplications they described. Informant's passion for projects to correct and redirect EBP was expressed with a degree of enthusiasm that echoed initial hopes for EBP.

Interactions in the Directions of Evidence

The themes that emerged in my research do not operate in isolation but often overlap and interact, exaggerating effects or creating unintended consequences. Belief systems combine with workplace pressures to result in divergent interpretations and applications of the same evidence in different institutions and communities. Evidence can work as permission for intervention or to resist interventive guidelines when interpreted by different providers or policy makers. Within a popular culture focused on risk and fear, a care provider worried about medico-legal risk will respond to women requesting interventions differently depending on the strength of local support for low intervention evidence-based alternatives. Evidence used as a remedy to reduce the risk of institutional or professional liability through using technology can result in treating risk rather than clinical indication. This over application is reinforced by caregivers' perceptions that women trust in technologic approaches and the combination of motivations creates patterns of application that can appear counter to the evidence itself. The resultant high rates of intervention normalize technologic birth for both women and their caregivers, creating a reinforcing cycle of discomfort with physiologic birth and comfort with technology. Within both popular and professional

cultures, birth is no longer seen as a healthy physiologic process, but as uncertain and risky. Informants suggest that this perception of risk is ironic and out of proportion to the marked and historically high level of safety for childbirth in high resource countries.

There is also an interesting interaction between evidence and "choice". Using evidence in a culture of fear can mean that open discussion of risk and benefit may unexpectedly diminish rather than enhance choice. Informed choice, often viewed as an indisputable good, can combine with EBP to become part of the proliferation of "risk culture". In this context informed choice can undermine confidence, rather than empower women and families. For some care providers, supporting women's autonomy and choice means using evidence to justify interventions which have no medical indication. For others, evidence combines with choice to justify low intervention birth options, such as home birth or VBAC. Current debates about choice often centre on whether science can justify choice, rather than on the ethics or social implications of choice. Maternal autonomy is often used as a supporting argument rather than an organizing principle.

Patterns of application in an increasing industrialized system tend to focus on short term results and on the fetus. Conversely long term results and, in some cases, maternal risk or maternal choice can be ignored. Evidence applied in the current medico-legal climate of maternity care can restrict access to care, as is the case when the adoption of guidelines for "risk management" means professionals and institutions decline to provide care for vaginal breech or VBAC. Lack of access to care is also restricted when the adoption of EBP approaches has the ripple effect of de-skilling practitioners. The care providers I interviewed worry that lack of access to care interacts with loss of skills to make birth less safe, an unintended consequence that works against the goals of EBP.

The dynamic interaction between evidence and social forces leads to contradictory and variable applications of evidence. My research points to the need to understand these patterns in the application of evidence as social phenomena. Understanding the whys and hows of EBP in context is a critical step to improving evidence-based practice and maximizing its potential. The need to understand and address the impact of unexpected uses and effects of evidence and contradictions in its application has led many to call for a revisioning of EBP.

Difference and Congruence between Professions

Maternity care is characterized by the existence of differing professional cultures and "philosophies of birth". The existence of a profession related continuum of beliefs which impact

on the way evidence is interpreted and used is increasingly supported by research.[4] Although differences between professions were sometimes evident in my research, what was most striking was the congruence between the observations of those from different professions. Although predictable interprofessional differences in attitudes and beliefs exist there is also "cross-over" between groups, a finding which is reinforced by the work of Klein et al. [4] In my study, there was also more concurrence than difference expressed about problems with the application of evidence in maternity care between those who were positioned as EBP critics and those more identified as advocates.

My findings reveal maternity care providers passionate about their work and about providing the best possible care to women and babies. Although they are often frustrated with the systems around them, many were actively engaged in work to improve these systems. Their desire and commitment, to both the day to day work of caring for pregnant women and attending births and the broader issues of policy, was remarkable. Enthusiasm for the work of maternity care crossed the professions, with the interesting finding that some of the most lyrical descriptions of the beauty or importance of normal physiologic birth came from physicians. Nurses and midwives may have made the assumption they did not need to express this to me, assuming that as a midwife I would understand and support normal birth. Physicians may have felt the need to ensure that I knew that they too understood and cared about the value and social meaning of physiologic childbirth. Nonetheless, this finding works against stereotypes and may represent an important common ground for work to support normal birth.

When considered as a group, the most outspoken critics of EBP were physicians. Perhaps because of their relative position of power in the health care system, they felt more emboldened to speak. Nurses and midwives tended to see the potential of EBP as tool for positive change and gave many examples of how they have used evidence to support their agendas. For nurses, this often involved influencing physician behaviour by establishing normative practices within institutions. For midwives, this often involved using evidence to defend alternative approaches to care that may not be the norm. It is also possible that nurses and midwives felt less empowered to critique evidence than their physician colleagues.

I found care providers across all professions were aware of the social context of their work and seemed to crave the opportunity to explore the nuances of applying evidence in complex situations. There appeared to be a high degree of receptiveness among care providers to consider how the scientific and social intertwine. It is my hope that greater insight into the "hows

and whys" of the application of EBP will enhance the ability of care providers and policy makers to be thoughtful about the directions and operations of evidence.

Evidence and More than Evidence

Many informants proposed ways to use evidence in a more integrated and nuanced way. Some overtly stated that they would never want to abandon the project of EBP however, most wanted significant reforms. They talked about discussing risk while putting it into perspective. Informants gave me examples of guidelines that overtly aimed to build rather than undermine confidence about normal birth. Their comments leaned towards ways to interpret and apply evidence that are plural rather than singular, and transparent rather than authoritarian. Through their critiques, care providers called for recognition and discussion of cultural and systemic factors that seem to push evidence to be applied in narrow and inflexible rather than contingent ways. Many informants advocate caution when evidence appears to reveal "one right way". Some described an approach to EBP that values presenting "evidence-based choices" in order to individualize care. Others argued that the best care asks the provider to use judgment and experience to tailor the application of evidence. Hall asked for "*humility in our claims*" (Hall 20:email) for evidence-based certainty. Enkin's retrospective look at his role, in both maternity care and the evidence movement, illustrated and called for seeing evidence inside the social and inside history.

Informants appeared to want what could be called "evidence and more than evidence". From the early beginnings of the evidence movement proponents of EBP have acknowledged the importance of the integration of clinician judgment and patient values and preferences. Both through their critique and their optimism about EBP, informants asked care providers, guideline writers and policy makers to go beyond these statements. They hoped for, and were often in the processes of documenting, approaches which could guide care providers in how to avoid a dichotomous or hierarchical application of evidence and other forms of knowledge. This project of refining the "art" of using evidence to inform, but not dominate, decision-making meant learning to use scientific evidence in the context of the different life circumstances and meanings women and families bring to birth. It also meant acknowledging and resisting the singular or convenient uses of evidence in the midst of a busy health care system with limited resources. Many informants felt very comfortable with how to provide care guided by an evidence-informed approach, however, often felt constrained by either medico-legal vulnerabilities or institutional

policy.

The Benefits and Hazards of the New Obstetrics[1] and *Effective Care in Pregnancy and Childbirth*[2] inspired many care providers by articulating a clear commitment to the value of physiologic birth for the health of mothers and babies and to the centrality of women's autonomy. Informants pointed to the importance of interprofessional collaboration and leadership as expressed in *ECPC*. Both texts invited not only more and better medical science, but more and better social science to inform care providers. The care providers I interviewed were also inspired by an overall vision of best practice for birth that *ECPC* provided in its guide, *GECPC*, [5] and its summary lists which integrated best practices. Many advocated a return to the sense of holism provided by this vision and by having a shared set of values and concepts to guide the application of evidence. For many, *ECPC* appeared to promote evidence-based practice in balance and to advocate the most social and least medical approach to birth possible for safe care. This stance was expressed in 1977, in the introduction to *The Benefits and Hazards of the New Obstetrics,* as care which has "the scientific and human approaches in the right proportions".[1,6] The explosion of EBP and the internet since that time has led to a very different, more fragmented and less social experience of using evidence.

There is a clear understanding expressed in *ECPC*[2] that EBP cannot answer important questions about the objectives of care or the values that guide health care decision-making. Despite the intentions of its early advocates, it seems clear that EBP in maternity care has at times silenced rather than encouraged discussion of goals and values. The enthusiasm and thoughtfulness of the care providers I interviewed, however, indicates a willingness and capacity among care providers in all of the professions to engage in dialogue about how to move beyond a narrow approach to EBP. Underneath many of the debates about the "right" understanding and application of evidence, there are unacknowledged but important debates about values, priorities and system structures. My findings indicate that a more conscious and reflective use of EBP requires open dialogue about goals, values, philosophies and systems. This dialogue is vital to the care of individual women and families as well as to public and professional debates about the science of maternity care. Reconsidering how and why we use EBP, and to what ends, will enrich the use of evidence in maternity care at all levels of the system, from the bedside of the labouring woman to the boardrooms of policy makers.

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Appendices

Appendix A: Acronyms

ACOG	American College of Obstetrics and Gynecology
ALARM	Advances in Labour and Risk Management
BMJ	British Medical Journal
CDC	Centres for Disease Control
CMAJ	Canadian Medical Association Journal
CPG	clinical practice guideline
CMPA	Canadian Medical Protective Association
CTFPHC	Canadian Task Force on Preventive Health Care formerly the Canadian Task Force on the Periodic Health Exam (CTFPHE)
ECPC	Effective Care in Pregnancy and Childbirth
EBM	evidence-based medicine
EBP	evidence-based practice
EFM	electronic fetal monitoring
GBS	Group B Streptococcus
GECPC	Guide to Effective Care in Pregnancy and Childbirth
MFM	maternal fetal medicine
JAMA	Journal of the American Medical Association
MIDIRS	Midwifery Information and Research Service
MIRU	Maternal and Infant Health Research Unit University of Toronto
MORE^{OB}	Managing Obstetrical Risk Efficiently
NEJM	New England Journal of Medicine
ODPT/ OPEU	Oxford Database of Perinatal Trials/Oxford Perinatal Epidemiology Unit
PROM	pre-labour rupture of membranes
RCT	randomised controlled trial
SOGC	Society of Obstetricians and Gynecologists of Canada
TBT	Term Breech Trial
VBAC	vaginal birth after caesarean section

Appendix B: Definitions of Evidence-based Medicine and Evidence-based Practice

Evidence-based medicine de-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision-making, and stresses the examination of evidence from clinical research. Evidence-based medicine requires new skills of the physician, including efficient literature-searching, and the application of formal rules of evidence in evaluating the clinical literature.[1,2]

Clinical decisions should be based on the best available scientific evidence . . . [3]

The ability to track down, critically appraise (for its validity and usefulness), and incorporate this rapidly growing body of evidence into clinical practice has been named 'evidence-based' medicine . . . evidence-based medicine is a short-hand term for five linked ideas: first that clinical and other health care decisions should be based on the best patient and population-based as well as laboratory-based evidence; second, that the problem determines the nature and source of evidence to be sought, rather than one's habits, protocols or traditions; third, that identifying the best evidence calls for the integration of epidemiological, economic and biostatistical ways of thinking with those derived from pathophysiology, and personal experience (examples including using likelihood ratios to increase the power of diagnostic information, considering inception cohorts in making prognoses, incorporating meta-analyses of randomized trials into decisions about therapy, and integrating odds ratios into judgments about iatrogenic disease); fourth, that the conclusions of this search and critical appraisal of evidence are worthwhile only if they are translated into actions that affect patients; and fifth, that there should be continuous evaluation of performance in applying these ideas. [4]

Evidence based practice is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients . . . integrating individual clinical expertise with the best available external clinical evidence from systematic research . . . and compassionate use of individual patient's predicaments, rights and preferences in making clinical decisions about patient care.[5]

The term evidence-based is perhaps ill-chosen and occasionally misapplied, and the concept of EBM does take varied forms. First, EBM deals with the issue of knowledge in medicine, defining optimal ways to develop knowledge and describing hierarchies of medical evidence . . . Next, EBM attempts to describe a clinical practice centered on evidence derived from clinical studies.[6]

Decisions about clinical practice should be based on the combined weight of the evidence from available reports. . . Meta- analysis is a method that permits such synthesis by combining the systematic review of available literature with statistical tools to combine quantitatively the data in such a review.[7]

Evidence-based approaches in health can be described as health policy and health care delivery driven by systematically collected proof on the effects of health-related interventions from the social and health sciences.[8]
The underlying thesis of this book is that evidence from well-controlled comparisons provides the best basis for choosing among alternative forms of care in pregnancy and childbirth. This

evidence should encourage the adoption of useful measures and the abandonment of those that are useless or harmful. [9]

The resultant movement for "evidence-based medicine" established a hierarchy of evidence for therapeutic effect: from systematic reviews (most reliable), through RCTs, non-randomised trials, and non experimental studies, to expert opinion (least reliable). Adherence to a strict methodology of systematic review and RCT now constituted evidence. Nevertheless, expert testimony and practitioners' individual experience have a long historical pedigree and persist in many practitioners' personal hierarchy of evidence.[10]

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Appendix C: List of Informant Transcripts and Coding Numbers

1.	Dr. Thomas Baskett	1
2.	Dr. Anne Biringer	2
3.	Isabelle Brabant, SF	3
4.	Dr. Jan Christilaw	4
5.	Dr. Jan Christilaw (conference: CMCH)	5
6.	Colleen Crosbie, SF	6
7.	Sharon Dore, RN	7
8.	Dr. Murray Enkin	8
9.	Dr. Murray Enkin (conference: Ryerson Speaker's Series)	9
10.	Dr. Murray Enkin (conference: CMCH)	10
11.	Dr. Danny Farine	13
12.	Dr. Pearl Feldman	14
13.	Dr. Bill Fraser	15
14.	Dr. David Gass	16
15.	Dr. James Goodwin	18
16.	Tiffany Haidon, RN, RM	19
17.	Dr. Philip Hall	20
18.	Dr Sue Harris	21
19.	Susanne Houd, SF	22
20.	Dr. Anne Houston	23
21.	Dr. Owen Hughes	24
22.	Dr. Eileen Hutton, RM, RN, PhD	25
23.	Dr. Karyn Kaufman, RM, RN,PhD	26
24.	Jane Kilthei, RM	27
25.	Dr. John Kingdom	28
26.	Dr. Michael Klein	29
27.	Linda Knox, RM	30
28.	Dr. Andrew Kotaska	31
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30.	Celine Lemay, SF	33
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32.	Manitoba Midwives	35
33.	Kerstin Martin, RM	36
34.	Linda McCabe, RN	37
35.	Helen McDonald, RM, RN	38
36.	Dr. Savas Menticoglou	39
37.	Dr. Pat Mohide	41
38.	Dr. Ahrne Ohlsson	42
39.	Sarah Payne, RN	43
40.	Dr. Larry Reynolds	44
41.	Kris Robinson, RM, RN	45
42.	Rural Ontario Midwives	46
43.	Lee Saxell, RM	47
44.	Dr. Gareth Seaward	48
45.	Dr. Matthew Sermer	49
46.	Penny Simkin, PT	50
47.	Bobbi Soderstrom, RM, RN	51
48.	Dr. Mark Tonelli	52
49.	Lori Wahsoki, RN	53
50.	Dr. Rory Windrim	54
51.	Dr. David Young	55

Appendix D: Conferences Attended

2002

Midwives and women together for the family of the world. International Confederation of Midwives 26th triennial congress. Vienna: Apr 14-18, 2002.

Choosing delivery by caesarean: has its time come? University of Toronto Maternal, Infant and Reproductive Health Research Unit (MIRU) conference. Toronto: Nov 7, 2002.

2003

Women's rights or an assault on normal birth? The debate about choosing caesarean section. Ryerson Midwifery Education Program Speaker Series. Ryerson University, Toronto: Mar 31, 2003.

Debates in midwifery: implications for the profession. Association of Ontario Midwives 19th annual conference. Toronto: Jun 4-5, 2003

The ethics of care and the ethos of risk. Canadian Association of Midwives 3rd annual conference. Montreal: Oct 1-3, 2003.

Between the ivory tower and the front Lines: Research Women and Health. Enkin lectureship. McMaster University, Hamilton: Nov 13, 2003.

Evidence-based obstetrics: utopia, dystopia or oxymoron. Ryerson Midwifery Education Program speaker series. Ryerson University, Toronto: Nov 27, 2003.

Pregnancy and birth: what is best for mothers and babies? University of Toronto's Maternal, Infant and Reproductive Health Research Unit conference. Toronto: Nov 28, 2003.

Informed choice: the difficulties in informing women about risk. BC Women's Hospital, Departments of Obstetrics, Family Practice and Midwifery. Vancouver: Dec 2003.

2004

What counts? Interpreting evidence-based decision-making for management and policy. 6th Canadian Health Services Research Foundation annual invitational Workshop. Vancouver, BC: Mar 11, 2004.

Current issues in perinatal care. Perinatal Partnership Program of Eastern and Southeastern Ontario (PPPESO) annual conference. Ottawa: May 28, 2004.

Debate on caesarean section on demand. Atlantic Centre of Excellence. Dalhousie University, Halifax: June 15, 2003.

Bridging midwifery borders: evidence to build best practice. Canadian Association of Midwives and the American College of Nurse Midwives 2nd joint clinical symposium. Calgary: Sept. 15-17, 2004.

Midwifery : A bridge to the sacred. Midwives Alliance of North America (MANA) annual conference. Portland, Oregon. Oct. 15-17, 2004.

Family medicine forum (FMF) 2004. College of Family Physicians of Canada. Toronto: Nov 25-27, 2004.

Pregnancy and birth. Maternal, Infant and Reproductive Health Research Unit (MIRU) Toronto. Dec. 10, 2004.

2005

Obstetrical malpractice: A survival guide. Faculty of Medicine, University of Toronto and Mount Sinai Hospital. Toronto: Jan 15, 2005.

Inaugural F.L. Johnson day in reproductive health research. Michael G. DeGroote School of Medicine and McMaster University. Hamilton: Jan 19, 2005.

Maternity care in the 21st century: interprofessional collaboration and research. Collaboration for Maternal and Newborn Health (CMNH), University of British Columbia. Vancouver: Feb 3-5, 2005.

A day in low-risk obstetrics: nurturing the low risk accoucheur. Family Medicine Obstetrics and Maternal Child Program. St. Joseph's Healthcare, Hamilton: Feb 23, 2005.

Nurturing normal birth: advancing midwifery skills. Association of Ontario Midwives Annual Conference. Toronto: May 10-12, 2005.

Third annual refresher in primary care obstetrics. University of Toronto and Mount Sinai Hospital. Toronto: May 13th, 2005.

Society of Obstetricians and Gynecologists of Canada 61st Annual Clinical Meeting. Quebec City: Jun 16-21, 2005.

Midwifery: pathways to healthy nations. The 27th Triennial Congress of the International Confederation of Midwives, Brisbane, Australia, July 24-28, 2005.

Bridging the distance. Rural and Northern Health Research Conference. Quebec City: Oct 27-9, 2005.

At the heart of families. Association of Women's Health Obstetric and Neonatal Nurses (AWHONN) 16th Conference. Montreal: Nov 17-19, 2005.

Midwives in the Balance: partnership and practice for normal birth. Canadian Association of Midwives 5th Annual Conference. Halifax, Nov 9-11, 2005.

Ontario Hospital Association. HealthAcheive2005. Toronto: Nov 1-2, 2005.

Society of Obstetricians and Gynecologists of Canada 24th Ontario Continuing Medical Education Conference. Toronto, Nov 24-26, 2005.

Family medicine forum (FMF) 2005. College of Family Physicians of Canada. Toronto: Nov 17, 2005.

Using the best scientific information to guide health decisions. 4th Canadian Cochrane Symposium. Montreal: Dec 2-3, 2005.

Pregnancy and Birth. University of Toronto's Maternal, Infant and Reproductive Health Research Unit (MIRU) Conference. Toronto: Dec 9, 2005.

2006

Reducing the risk of medical malpractice. The 12th Annual Canadian Institute Conference. Toronto: Mar 27, 2006.

Creating synergy: collaboration for better care. Collaboration for Maternal and Newborn Health (CMNH), University of British Columbia Vancouver, BC, May 4-6, 2006.

Fourth annual refresher in primary care obstetrics. University of Toronto and Mount Sinai Hospital. Toronto: May 12, 2006.

The Cascade of Normal: Reclaiming Confidence in Birth. Canadian Association of Midwives 6th Annual Conference. Ottawa: Oct 18-20, 2006.

Pregnancy and Birth: Current clinical issues. University of Toronto's Maternal, Infant and Reproductive Health Research Unit (MIRU) Conference. Toronto: Dec 15, 2006.

2007

Fifth annual refresher in primary care obstetrics. University of Toronto and Mount Sinai Hospital. Toronto: May 12, 2007.

Tipping points: the power and influence of midwives. Association of Ontario Midwives 23rd Annual Conference. Toronto: May 15-17, 2007.

Pregnancy and Birth: Current clinical issues. University of Toronto's Maternal, Infant and Reproductive Health Research Unit (MIRU) Conference. Toronto: Dec 14, 2007.

Appendix E: Schedule of Interview Questions

The emphasis on different questions will vary with the background of the informant e.g. midwife, physician, evidence expert

1. Has/how has the move in obstetrics and/or midwifery towards evidence-based practice (EBP) influenced your practice? Why do you think EBP has become such a popular approach?

2. Do you/how do you integrate evidence with other factors such as your own judgment, the specifics of the clinical situation, the woman/family's preferences and choices.

3. Do you have written (or informal) practice guidelines? How were they determined? (How) have these been influenced by evidence? Do you think they are evidence-based? Are they influenced by factors other than evidence? Describe.

4. Can you give me any examples of the way in which evidence-based practice guidelines facilitate what you see as good practice? Can you give me any examples of the way in which evidence-based practice guidelines do not facilitate good practice?

5. I would like to discuss some specific clinical situations and discuss the role of evidence and other factors in how you would make decisions about them with your patients/clients.
In terms of pre-labour rupture of membranes (or postdates, or breech etc) Give me a quick summary of what you see as the evidence in this area. Are there hospital policies or protocols that influence your practice in this area? How do present evidence - both in terms of the concept of evidence, and of the specific facts and presenting them to clients? Do you think you would want to practice differently in any of these areas? Why?

6. Do you have any approaches to practice that differ from what you believe to be the "standard of practice" and/or the evidence? Why do you take this approach and how do you negotiate this difference from the community standard?

7. How you handle situations where patients/clients refuse to follow recommendations.

8. Does EBP have a role to play in other aspects of health care besides patient/client care? (E.g. risk management, managing resources in the health care system, dealing with caregiver anxiety etc., training of and care provision by students)

9. Does EBP affect your relationships with patients/clients/other health care workers? How?

10. Has EBP affected the medico-legal environment - both in terms of professional regulation and civil litigation of health care workers? How?

11. What do you see as the relationship between EBP and the use of technologies in childbirth? In your observation of yourself and others, what happens to practitioners who are working to support childbirth as a normal healthy process when evidence supports use of technology? What happens to a practitioner oriented towards technologies when evidence supports non-intervention?

Appendix F: Thematic Coding Guide

1. Biographic information

2. History of EBP

- hopes for EBP
- emerging concerns
- new paradigm
- anti-authoritarian movement
- childbirth/women's movement

3. EBM as religion

- new authoritarianism
- heresy/dissent
- "one right way" /science as fact/truth

4. Applying evidence

- EBM and belief /caregiver attitudes/philosophies
- using evidence to fit an agenda
- using evidence to support technology or intervention
- using to offer choice
- using evidence to promote change, humanization
- evidence applied too widely/over application and over interpretation
- uneven application of evidence
- balance with experience/judgment/ women's values
- populations vs. individuals –generalizability
- evidence and guidelines

5. Evidence and informed choice

- framing
- talking about statistics

6. Unexpected effects/uses of EBM

- loss of skills/lack of skills
- rising rates of intervention
- role of liability
- role of economics: managed care, business of obstetrics, cost restraint
- EBP as remedy for uncertainty

- Caregiver/system benefits: convenience, preference, financial gain, "managing" workload, pace

6. Limits of RCTs/EBM

- complexity
- only answers one question
- may ask wrong question

7. Clinical Issues

- postdates
- PROM/ GBS
- Breech/ECV
- VBAC
- EFM vs. IA and one to one care
- CS on demand

8. EBM and Birth Culture

- culture of perfection
- culture of fear and risk
- quick fix culture
- EBM and normal birth
- valuing normal birth
- undermining confidence in bodies and birth
- loss, sadness and grief

Appendix G: Informed Consent to Participate in Research

Vicki Van Wagner
Women's Studies, York University

Thank- you for agreeing to be involved in my research project. I am conducting this research as part of my PHD program in Women's Studies at York University. The university requires that all participants in research are informed about the project they are agreeing to be involved in and about their rights as participants.

The goal of my research is to explore the history and the politics of evidence-based practice (EBM) in maternity care. My thesis is that like many other scientific practices that might appear to be objective, the use of EBM is set within a historical and political context. I hope that an exploration and analysis of what influences understandings and applications of EBM in maternity care will support clinical practitioners and health care policy makers.

I plan to accomplish this by examining the literature about EBM and by conducting structured interviews with physicians, nurses and midwives. I may also ask to review relevant documents such as practice protocols or guidelines or policies.

As part of taking a participatory approach to research and in order to ensure that I am accurately conveying the ideas and opinions of my informants I will send participants, on request, the quotes I intend to use and if needed clarify any information.

All participants have the right to not to participate, to withdraw from this research at any time. All participants have the right not to answer particular questions, without prejudice.

All participants have the right to confidentiality and anonymity, unless agreeing to be quoted as below.

I have read and understood the above and agree to participate:

Name: _____

Date: _____

I agree to be identified by name and position.

Name: _____

Date: _____