Factors Affecting Cardiac Rehabilitation Referral by Physician Specialty

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- **PURPOSE:** Cardiac rehabilitation (CR) is widely underutilized because of multiple factors including physician referral practices. Previous research has shown CR referral varies by type of provider, with cardiologists more likely to refer than primary care physicians. The objective of this study was to compare factors affecting CR referral in primary care physicians versus cardiac specialists.
- **METHODS:** A cross-sectional survey of a stratified random sample of 510 primary care physicians and cardiac specialists (cardiologists or cardiovascular surgeons) in Ontario identified through the Canadian Medical Directory Online was administered. One hundred four primary care physicians and 81 cardiac specialists responded to the 26-item investigator-generated survey examining medical, demographic, attitudinal, and health system factors affecting CR referral.
- **RESULTS:** Primary care physicians were more likely to endorse lack of familiarity with CR site locations ($P < .001$), lack of standardized referral forms ($P < .001$), inconvenience ($P = .04$), program quality ($P = .004$), and lack of discharge communication from CR ($P = .001$) as factors negatively impacting CR referral practices than cardiac specialists. Cardiac specialists were significantly more likely to perceive that their colleagues and department would regularly refer patients to CR than primary care physicians ($P < .001$).
- **CONCLUSIONS:** Where differences emerged, primary care physicians were more likely to perceive factors that would impede CR referral, some of which are modifiable. Marketing CR site locations, provision of standardized referral forms, and ensuring discharge summaries are communicated to primary care physicians may improve their willingness to refer to CR.

K E Y W O R D S

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Substantial health risks continue following coronary events and procedures,[1] and cardiac rehabilitation (CR) improves subsequent prognosis.[2] However, most research demonstrates low utilization of CR.[3,4] A combination of factors exists relating to patients,[3,4] physicians,[5,6] and the healthcare system itself[7] that lead to low CR referral. In particular, physician referral and encouragement have been shown to be a strong motivating factor for patients to attend CR.[8,9] However, attitudes held by physicians about CR may affect their referral practices.[5,6] Previous research has shown that CR referral varies by type of provider such that patients receiving care from a cardiac specialist are more likely to be referred.[10] However, no research has explicitly examined what different perceptions and barriers cardiac specialists versus primary care physicians may have. The objective of this study was to

compare factors affecting CR referral in primary care physicians versus cardiac specialists.

METHODS

The protocol for this cross-sectional study was approved by the institutional research ethics board. A stratified random sample of Ontario physicians was selected from a database of all practicing physicians available through the Canadian Medical Directory (http://www.mdselect.com). Nonpediatric cardiologists, cardiovascular surgeons, and primary care practitioners were targeted, given that these are the most common referring physicians to CR in Ontario.[11] Using Canada Post definitions and designations, physician lists were stratified by rural or urban practice location and then further divided by sex and specialty to yield a matrix from which participants were selected for initial contact.

We attempted to randomly choose 75 physicians from each matrix cell; however, for some cells, the number of physicians was fewer than 75 so that all physicians were included. Where there were more than 75 results for a given search, a random number was generated for each entry, and then the list was sorted and all entries with values more than 75 were deleted from the sample. For female physicians, the random selection was as follows: primary care practitioners (75 rural and 75 urban), all cardiovascular surgeons (0 rural and 9 urban), and all nonpediatric cardiologists (1 rural and 48 urban). For male physicians, the random selection was as follows: primary care practitioners (75 rural and 75 urban), all cardiovascular surgeons (2 rural and 75 urban), and all nonpediatric cardiologists (75 urban; there were no rural male cardiologists). This random selection process identified 510 physicians for inclusion into the study. Each physician's sex, specialty, year and place of graduation, and practice postal code were abstracted from the database. The survey was mailed to the 510 physicians selected.

Participants

Of the 510 physicians originally contacted, 67 were deemed ineligible: 30 (45.4%) physicians had noncardiac practices, 25 (37.9%) physicians could not be located, 7 (10.6%) physicians were retired, and 5 (7.5%) for other reasons including not in practice, on a leave of absence, and deceased. Of the remaining 443 (41.8%) eligible participants, there were 185 respondents. No significant differences were reported between participants and nonparticipants with regard to sex, rural or urban location, location of medical school, or year of graduation. However, cardiologists (48.7%) were significantly more likely to participate than primary care (32.9%) or cardiovascular surgeons (25.6%; $P = .001$). However, this is likely due to the fact that more of the primary care physicians (45.2%) and cardiovascular surgeons (53.8%) were ineligible than cardiologists (11.1%) because they did not treat cardiac patients.

Measures

A questionnaire was developed on the basis of an extensive literature review and input from primary care doctors, internists, cardiologists, cardiovascular surgeons, and other healthcare professionals with expertise in CR before piloting. The survey included sociodemographic items (ie, sex, physician specialty, patient volume, size of practice location). Also included were 26 investigator-developed items scored on a 5-point Likert-type scale. Seven items asked to what extent patient characteristics influenced the physician's referral practices (eg, patient/family request, patient age), and response options ranged from "strongly encourages" to "strongly discourages." Nineteen items sought to elucidate factors affecting physician's referral practices. Sample items included "My colleagues generally refer patients to CR," "I prefer to manage my patients' secondary prevention myself," and "The CR program does not provide me with patient discharge summaries." Here, response options ranged from "strongly agree" to "strongly disagree." A final item asked physicians to list the most important factors that influence their decision to refer a patient to CR in an open-ended fashion.

Statistical Analysis

All data analyses were performed using SPSS, Version 15.[12] A dichotomous physician-type variable was created, grouping cardiac specialists versus primary care physicians. Sociodemographic differences between participants and nonparticipants were tested with χ^2 test and t tests as appropriate. Qualitative responses generated by physicians were coded. Finally, t tests were used to test for significant differences in factors affecting CR referral.

RESULTS

Participant characteristics are shown in Table 1. Of the 185 responding physicians, 56.2% were practicing family medicine and 43.8% were cardiac specialists (31.4% were cardiologists and 12.4% were cardiovascular surgeons). Primary care physicians were more likely to be a graduate of an Ontario medical school, be female, practice in a location with a population less than 25,000, have a rural practice

Table 1 • CHARACTERISTICS OF PHYSICIAN RESPONDENTS

Characteristics	Primary Care Physicians (n = 104)	Cardiac Specialists (n = 81)	Total (N = 185)
Graduate of an Ontario medical school	72 (69.2%)	40 (50.0%)	112 (60.9%)[a]
Female	55 (52.9%)	25 (30.9%)	80 (43.2%)[a]
Practice location with population < 25,000	60 (60.0%)	2 (2.50%)	62 (34.3%)[b]
Cardiac rehabilitation site within 30-min drive from practice	54 (54.0%)	80 (98.8%)	134 (74.0%)[b]
Rural practice location	60 (57.7%)	0 (0%)	60 (32.4%)[b]
Graduation year, mean (SD)	1987 (9.49)	1981 (9.19)	1984 (9.75)[b]
Number of patients seen per week, median (range)	110 (20–250)	25 (3–100)	75 (3–250)[b]

[a] $P < .01$.
[b] $P \leq .001$.

location, and see significantly more patients than cardiac specialists. Cardiac specialists were more likely to have a CR site within a 30-minute drive from their practice.

Factors Affecting CR Referral by Provider Type

Mean scores and standard deviations for the Likert-type items are presented in Table 2 by physician specialty. Primary care physicians were more likely to endorse lack of familiarity with CR site locations ($P <$ .001), lack of standardized referral forms ($P <$ .001), inconvenience (P = .04), program quality (P = .004), and lack of discharge communication from CR (P = .001) as factors negatively impacting CR referral practices than cardiac specialists. In contrast, cardiac specialists were significantly more likely to perceive their colleagues ($P <$ .001) and department ($P <$ .001) as regularly referring patients, intend to refer their patients ($P <$ .001), and enlist assistance completing their CR referral forms by allied healthcare professionals in their practice (P = .04) than primary care physicians.

When asked what the most important factors affecting referral to CR are, primary care physicians reported as follows: geographic accessibility (n = 39, 43.8%), patient motivation (n = 19, 21.3%), patient benefit (n = 10, 11.2%), medical characteristics of patients (ie, obesity, sedentary lifestyle, constellation of heart hazards, type of cardiac diagnosis) (n = 6, 6.7%), and other reasons (n = 15, 16.7%) including knowledge of available programs, the nature of the referral process, the quality of the CR program, patient age, it was another physician's responsibility, CR as the standard of care, waiting lists, and lack of French-language services. Cardiac specialists reported patient motivation (n = 15, 23.8%), patient benefit (n = 10, 15.9%), geographic accessibility (n = 9, 14.3%), medical characteristics of patients (n = 7, 11.1%), quality of the CR program (n = 6, 9.5%), CR as the standard of care (n = 6, 9.5%), and other reasons (n = 10, 12.4%) including the nature of the referral process, CR program feedback regarding patient progress, waiting lists, patient age, and knowledge of available programs.

DISCUSSION

Clinical practice guidelines[13] promote physician referral to CR, and physician recommendation is a strong patient motivator for CR participation.[8,9,14] Therefore, it is integral to examine physician perceptions of factors affecting their referral practices. In particular, it has been established that different types of providers have different rates of CR referral.[10] The purpose of this study was to explore the reasons for such differences. Overall, results showed that cardiac specialists reported positive attitudes toward CR referral of their patients, whereas primary care physicians identified some important barriers to their referral practices.

It appears that normative referral practices and assistance in referral form completion work effectively in promoting CR referral among cardiac specialists. Primary care physicians may receive less feedback about the CR referral practices of other physicians if they do not work in a group practice, and thus normative behaviors would be unknown. Disseminating clinical practice guidelines (and in particular the recent performance measures for referral to CR),[15] and targeting primary care physicians in referral promotion may serve to increase their referral intentions. The practice of soliciting assistance in referral completion could facilitate broader patient referrals, and it is unclear why primary care physicians were less likely to utilize this practice. This could be related to the amount of clerical support available in primary care versus specialist care settings. Minimizing barriers to referral completion by physicians would likely

Table 2 • ASCENDING MEAN SCORES AND STANDARD DEVIATIONS OF PHYSICIAN ATTITUDES TOWARD CARDIAC REHABILITATION (CR) REFERRAL BY TYPE OF PHYSICIAN[a]

	Primary Care Physicians (n = 104)	Cardiac Specialists (n = 81)	Total Physicians (N = 185)
1. Clinical practice guidelines promote referral to CR	2.03 (0.72)	1.91 (0.85)	1.98 (0.78)
2. I generally intend to refer patients to CR	2.41 (1.15)	1.59 (0.76)	2.04 (1.07)[b]
3. I am not familiar with the CR sites outside my area	2.29 (1.09)	2.88 (1.31)	2.56 (1.23)[c]
4. My department/practice generally refers all eligible patients as standard of care	3.17 (1.08)	2.18 (1.00)	2.70 (1.15)[b]
5. My colleagues generally refer patients to CR	3.03 (0.99)	2.32 (0.85)	2.70 (0.99)[b]
6. There is no standard referral form for CR, making it more effort to refer to sites closest to home	2.54 (1.23)	3.34 (1.44)	2.90 (1.39)[b]
7. Reimbursement policies are a financial disincentive to CR referral	3.23 (0.97)	3.37 (0.99)	3.29 (0.98)
8. Follow-up care, including referral, is handled by another healthcare professional	3.30 (1.16)	3.38 (1.04)	3.34 (1.10)
9. It is inconvenient to make a referral to CR	3.30 (1.14)	3.66 (1.13)	3.46 (1.14)[d]
10. I prefer to manage my patients' secondary prevention myself	3.44 (1.02)	3.59 (1.10)	3.51 (1.05)
11. I can prescribe an exercise regimen myself	3.50 (0.98)	3.69 (1.09)	3.59 (1.03)
12. I have patient education materials in my office that are sufficient for promoting behavioral change	3.63 (0.923)	3.82 (0.96)	3.72 (0.94)
13. An allied healthcare professional fills out referral forms on my behalf	4.08 (0.82)	3.73 (1.19)	3.91 (1.03)[d]
14. I am not familiar with the CR programs in my area	3.55 (1.27)	4.38 (0.90)	3.93 (1.19)[b]
15. CR program does not provide me with patient discharge summaries	3.65 (1.17)	4.23 (1.00)	3.93 (1.12)[b]
16. Female cardiac patients generally do not like to exercise	4.22 (0.71)	3.97 (1.05)	4.11 (0.89)
17. The available CR program is of poor quality	4.14 (0.85)	4.52 (0.74)	4.33 (0.82)[c]
18. I have had a bad experience with a CR program	4.35 (0.74)	4.45 (0.87)	4.39 (0.80)
19. I am skeptical about the benefits of CR	4.44 (0.71)	4.54 (0.72)	4.48 (0.71)

[a]Items were scored on a scale that ranged from 1 (*strongly agree*) to 5 (*strongly disagree*).
[b]$P < .001$.
[c]$P < .01$.
[d]$P < .05$.

increase CR referrals and decrease the inconvenience of making referrals. This could be achieved by utilizing a brief referral form, only inclusive of data central to care that cannot be obtained from patients.

Indeed, primary care physicians perceived the lack of a standard CR form as a barrier to referral. It is time consuming for providers to obtain referral forms for disparate sites, which request dissimilar information. Regional cooperation by CR sites to develop a standardized referral form may overcome this barrier. Indeed, the recent performance measures report provides a standard CR referral tool for both the inpatient and the outpatient settings.[15]

Primary care physicians were less often aware of CR site locations than cardiac specialists. Referral promotion to primary care should include provision of CR site location information. Within Ontario, and likely in other jurisdictions, CR organizations have online directories of CR programs and locations, with program and contact information. Perhaps incorporation of geographic information system software into these directories could enable healthcare providers to enter in the patient's postal code to locate the closest CR site. This could also include a link to the corresponding CR referral form for physician convenience and referral ease.

Although the mean scores indicated overall disagreement that the available CR program was of poor quality, nevertheless primary care physicians were more likely to perceive CR programs to be of poorer quality than specialists. This is disconcerting, given that CR care standards have been developed[15] and the accumulated evidence of CR benefit for patients.[2] This could also be related to the lower rate of discharge summary receipt by primary care physicians

than specialists. Not only would this lessen the amount of information primary care physicians receive about the quality of care patients are receiving but it could also lead to discontinuity in cardiac care.[16,17] CR programs should identify both specialists and primary care physicians involved in a patient's care to ensure intake and discharge communication is directed toward all providers involved.

Our findings are limited in generalizability to the Ontario CR model of care and by our 40% response rate. Moreover, caution is warranted when interpreting results due to the cross-sectional design and potential for inflated error rates due to multiple comparisons. With regard to generalizability, to optimize the survey response rate, we incorporated components of Dillman's total design approach,[18] including multiple contacts, personalized mailings, and a short questionnaire. In a review of physician response to surveys, demographic characteristics of late respondents (considered to be a proxy for nonrespondents) were similar to the characteristics of respondents to the first mailing.[19] Moreover, physicians as a group are more homogeneous with regard to knowledge, training, attitudes, and behavior than the general population. This all suggests that nonresponse bias may not be as crucial in physician surveys as in surveys of the general population.[19] Causal conclusions cannot be drawn because of the nature of the design. Finally, given the paucity of data in this area, a Bonferroni correction was not applied to control for the large number of comparisons made. Future research should examine physician perceptions of factors affecting their actual CR referral practices prospectively and more conservatively to see if current results are replicated.

In conclusion, CR programs have evidence-based beneficial effects for cardiac patients, yet all eligible patients are not referred. Many factors are present that culminate in underreferral, including government funding mechanisms, geographic inaccessibility, gaps in continuity of care, nonstandardized referral practices, meager marketing of sites and locations, patient nonadherence, and notably physician behavior. This study shed light on some of the different factors affecting the CR referral practices of cardiac specialists and primary care physicians. Where differences emerged, primary care physicians were more likely to perceive factors that would impede CR referral, some of which are modifiable. Marketing CR site locations, provision of standardized referral forms, and ensuring discharge summaries are communicated to primary care physicians may improve their CR referral practices.

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