All of us have cancer cells in our bodies. But not all of us will develop cancer.

Anti-cancer

A NEW WAY OF LIFE

DAVID SERVAN-SCHREIBER, MD, PhD

INTERNATIONAL BESTSELLER
A Lesson

• We all carry cancer cells
• We are all exposed to cancer promoting factors
• One in two men and one and three women will get cancer
• 25% will die of cancer
Childhood Cancers

Stelianova-Foucher et al., 2005 Lancet
Breast: Age adjusted incidence per 100,000
Key Difference = Lifestyle

Per 100,000

San Francisco
Shanghai

Sasco, 1989 Rev Med Int
Cancer Prevention and Control

- Nutrition
- Sedentary behavior
- Obesity
- Stress and social support
Meat Intake and Colon Cancer

Armstrong and Doll, 1975 in Willett, 1995
Trends in Colon Cancer Rates in Three Areas

*age-standardized incidence rates, 1963-1997*

INDIA, Mumbai

USA, Connecticut

JAPAN, Miyagi

Cases/100,000 person-yrs

1963-67

1967-71

1978-82

1983-87

1988-92

1993-97
Glycemic Load and ER+/PR- Breast Cancer

Larsson et al., 2009 *Int. Jnal. Cancer*
IGF-1 and Cancer Mortality

Caloric Sweetener Consumption

Welsh et al., 2010, JAMA
Soy Oil (omega-6)
Transformation of Food Chain

Omega 6/Omega 3

- Butter: x6
- Pork: x10
- Beef: x15
- Egg: x20

Advanced Breast Cancer

Breast Cancer Risk

Hazard Ratio

OM6-  OM6+  OM6++  OM6+++  

Gago-Dominguez et al., 2003, Brit J Cancer
Evolution of Diet

A NEW ERA FOR SCIENCE IN NUTRITION

Hunter-Gatherer  Agricultural  Industrial

% CALORIES FROM FATS

Total Fat

Saturated

PARTIAL LINES

CAD

n-6  n-3

(-4 x 10^6 years)  (-10,000 years)  1800  1900  2000

TIME (years)

The shape of things to come
Obesity Trends* Among U.S. Adults

BRFSS, 1985
(*BMI ≥ 30, or ~30 lbs. overweight for 5’4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1986

(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)

No Data  <10%  10%–14%

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1987
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1988
(*BMI ≥30, or ~30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1989

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1990

(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1991
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1992

(*BMI ≥30, or ~30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1993

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1994

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1995

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1996

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1997

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1998

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 1999

(*BMI ≥30, or ~ 30 lbs. overweight for 5' 4'' person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 2000
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 2001
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 2002
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 2003

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: CDC Behavioral Risk Factor Surveillance System.
Obesity Trends* Among U.S. Adults

BRFSS, 2004

(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: Behavioral Risk Factor Surveillance System, CDC.
Obesity Trends* Among U.S. Adults

BRFSS, 2005

(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: Behavioral Risk Factor Surveillance System, CDC.
Obesity Trends* Among U.S. Adults

BRFSS, 2006

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: Behavioral Risk Factor Surveillance System, CDC.
Obesity Trends* Among U.S. Adults

BRFSS, 2007

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: Behavioral Risk Factor Surveillance System, CDC.
Obesity Trends* Among U.S. Adults

BRFSS, 2008

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

Source: Behavioral Risk Factor Surveillance System, CDC.
Obesity Trends* Among U.S. Adults
BRFSS, 2009

(*BMI ≥30, or ~30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
(*BMI ≥ 30, or about 30 lbs. overweight for 5’4” person)
Prevalence of Obesity Among Canadian Adults (%)
Prevalence of Overweight and Obesity Among Canadian Adults (%)
Obesity and Mortality from Cancer

Calle et al., NEJM, 2003
Obesity and Mortality from Cancer

Calle et al, NEJM, 2003
Obesity and Breast Cancer

Ewertz et al., JCO, 2011
Obesity and Breast Cancer

Locoregional Recurrence

Hazard Ratios

- BMI >25
- BMI 25-29
- BMI 30+

Ewertz et al, JCO, 2011
Chemical Contamination

Synthétique organic chemicals

All chemical and allied products

Années:
- 1920
- 1940
- 1960
- 1980

Y-axis:
- 0
- 10
- 30
- 50
- 70

X-axis:
- 1920
- 1940
- 1960
- 1980

Graph showing the increase in synthetic organic chemicals and all chemical and allied products over time.
Pesticides

ATRAZINE - herbicide
1997 estimated annual agricultural use

- Atrazine changes sex of frogs in our rivers
- Exposed farm workers have higher cancer risks
- Their children too

Average annual use of active ingredient
Anticancer Phytochemicals

Surh, 2003 Nature
BRCA-1 and Variety of Vegetables

Breast Cancer Risk

Relative Risk

Minimal | Small | Moderate | Large

Prostate Cancer and Fish

Prostate Cancer Risk

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Cox-2</th>
<th>Cox-2 + Fish</th>
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<tbody>
<tr>
<td>Hazard Ratio</td>
<td>0.5</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

Fradet et al., 2009 *Clin Ca Research*
Anticancer Plate
Balancing Calories

- Enjoy your food, but eat less.
- Avoid oversized portions.

Foods to Increase

- Make half your plate fruits and vegetables.
- Make at least half your grains whole grains.
- Switch to fat-free or low-fat (1%) milk.
Physical Activity
Breast Cancer Deaths

 Holmes, et al., 2005 JAMA
Stress Does Not Cause Cancer

- 10,519 Finnish Women
- Prospective Study
- Stress of Daily Activities

Lillberg et al., 2001 *Int J Cancer*
Support vs. Helplessness

- 514 Australian Women
- Prospective Study
- Stressors in 2 Years
- Intimate Support

Breast Cancer

- Price et al., 2001 Cancer
Social Well Being

Breast Cancer Death

Relative Risk

Reference

Moderate

High

Epplein et al., 2011 JCO
Chronic stress promotes tumor growth and angiogenesis in a mouse model of ovarian carcinoma

Premal H Thaker\textsuperscript{1,10}, Liz Y Han\textsuperscript{1,10}, Aparna A Kamat\textsuperscript{1,10}, Jesusa M Arevalo\textsuperscript{2}, Rie Takahashi\textsuperscript{2}, Chunhua Lu\textsuperscript{1}, Nicholas B Jennings\textsuperscript{1}, Guillermo Armaiz-Pena\textsuperscript{1}, James A Bankson\textsuperscript{3}, Murali Ravoori\textsuperscript{4}, William M Merritt\textsuperscript{1}, Yvonne G Lin\textsuperscript{1}, Lingegowda S Mangala\textsuperscript{1}, Tae Jin Kim\textsuperscript{1}, Robert L Coleman\textsuperscript{1}, Charles N Landen\textsuperscript{1}, Yang Li\textsuperscript{1}, Edward Felix\textsuperscript{5}, Angela M Sanguino\textsuperscript{6}, Robert A Newman\textsuperscript{5}, Mary Lloyd\textsuperscript{7}, David M Gershenson\textsuperscript{1}, Vikas Kundra\textsuperscript{4,8}, Gabriel Lopez-Berestein\textsuperscript{6}, Susan K Lutgendorf\textsuperscript{9}, Steven W Cole\textsuperscript{2} & Anil K Sood\textsuperscript{1,7}
Development of a Model
Chronic stress promotes tumor growth and angiogenesis in a mouse model of ovarian carcinoma.
Effects of stress on tumor microenvironment

Mind-body Programs

- cognitive behavioral therapy
- individual and group psychotherapy
- relaxation
- guided imagery
- social support
- humor
- biofeedback
- yoga, tai chi, qigong
- meditation
- hypnosis
- emotional expression
- expressive arts
Psychologic Intervention Improves Survival for Breast Cancer Patients
A Randomized Clinical Trial

Supported by the National Institute of Mental Health (RO1MH51487) and the National Cancer Institute (ROICA92704, K05 CA098133, KA24 CA93670, and PO1 CA95426), with additional support from the American Cancer Society (PBR-89), the Lungaburger Company-American Cancer Society (PBR-89A), the US Army Medical Research Acquisition Activity (DAMD17-94-J-4165, DAMD17-96-1-6294, and DAMD17-97-1-7062), the Ohio State University Comprehensive Cancer Center (P30 CA16058), and the Wadler Cancer Institute.

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KEYWORDS: breast, cancer, recurrence, survival, psychologic, intervention, biobehavioral.
Cancer Prevention and Control

• Improve nutrition
• Reduce sedentary behaviors
• Reduce obesity
• Reduce stress and increase social support
Past Elders

• Plato: Dialogue between Socrates and Glaucon
  – Socrates: Plant-based diet and wine in moderation
  – Glaucon: Better to recline on couches...and have the usual dishes and dessert of a modern dinner
Past Elders

- Plato: Dialogue between Socrates and Glaucon
  - Socrates: Will result in a city that is suffering from inflammation
    Will need great quantities of all kinds of cattle...
    Will need medical men
    Will need more land
Past Elders

- Hippocrates:
  - Let food be thy medicine and medicine be thy food