CMBM

Webinar Series

This webinar is hosted by Kathie Madonna Swift, MS, RDN, LDN, Food As Medicine Education Director for the Center for Mind-Body Medicine, presented by Joel Evans, MD and made possible by a grant from the Scheidel Foundation.

Scheidel FOUNDATION

Built on the Love of Family and Community

Nutrition and Cancer

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Director

The Center for Functional Medicine

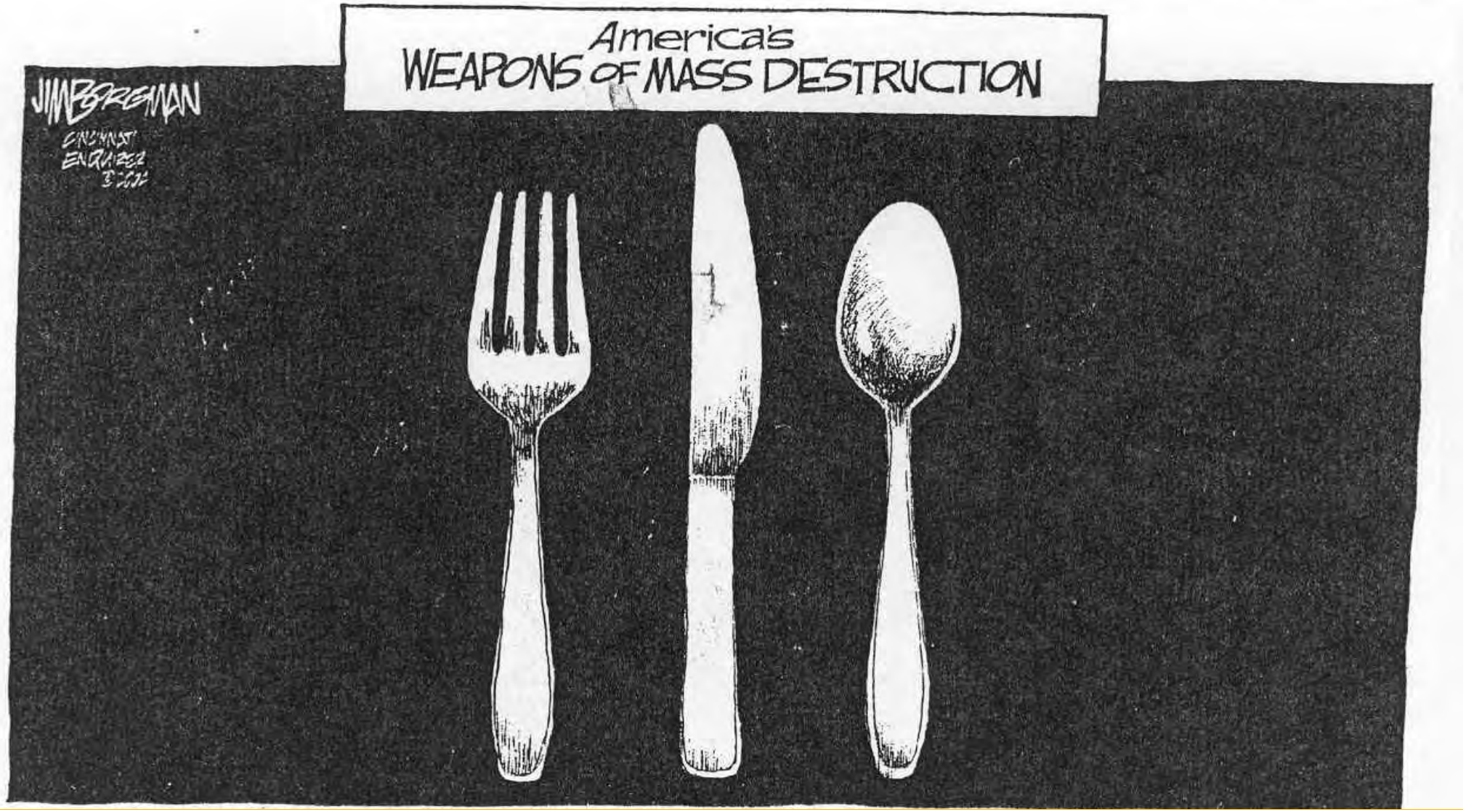
Stamford, Connecticut

Senior Faculty

Institute for Functional Medicine

Federal Way, WA

www.thecffm.com


America's
WEAPONS OF MASS DESTRUCTION
JIM BORGMAN
CINCINNATI ENQUIRER

Examining the relationship between diet-induced acidosis and cancer

Ian Forrest Robey[1*]
[*] Corresponding author
Email: robeyi@email.arizona.edu

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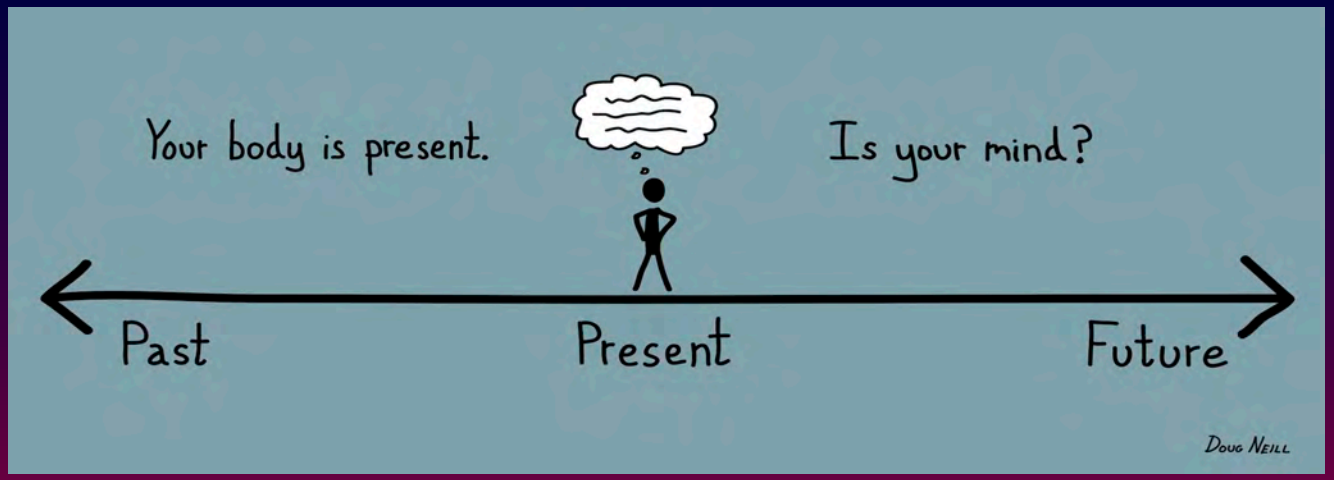
Dietary intake exists as the largest external or environmental epigenetic factor capable of driving the development or maintenance of cancer.

glucocorticoid, insulin growth factor (IGF-1), and adipocyte cytokine signaling, dysregulated cellular metabolism, and osteoclast activation, which may serve as intermediary or downstream effectors of carcinogenesis or tumor promotion. In short, diet-induced acidosis may influence molecular activities at the cellular level that promote carcinogenesis or tumor progression. This review defines the relationship between dietary lifestyle and acid-base balance and discusses the potential consequences of diet-induced acidosis and cancer occurrence or progression.

Nutrition & Metabolism 2012, **9**:72

It's not just WHAT we eat,
it's also HOW we eat…

MINDFULNESS



"Paying attention on purpose in the present moment, nonjudgmentally."

- Jon Kabat-Zinn

MINDFUL EATING

Mindful Eating

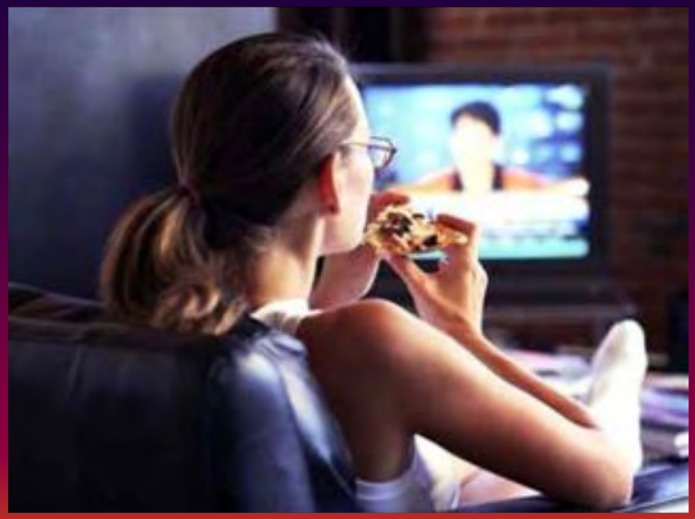
www.eatingmindfully.com

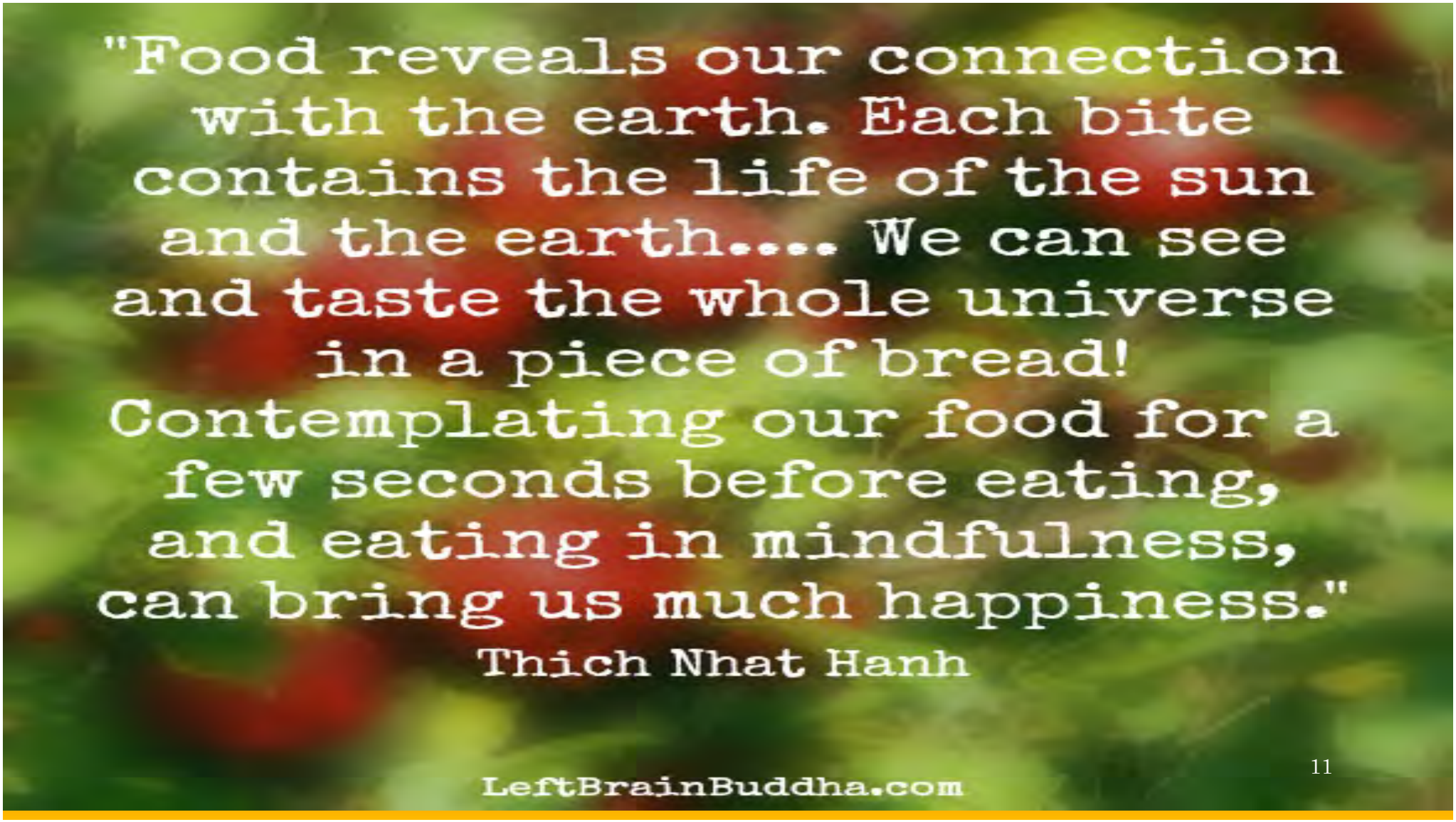
Mindful Eating Creates Change

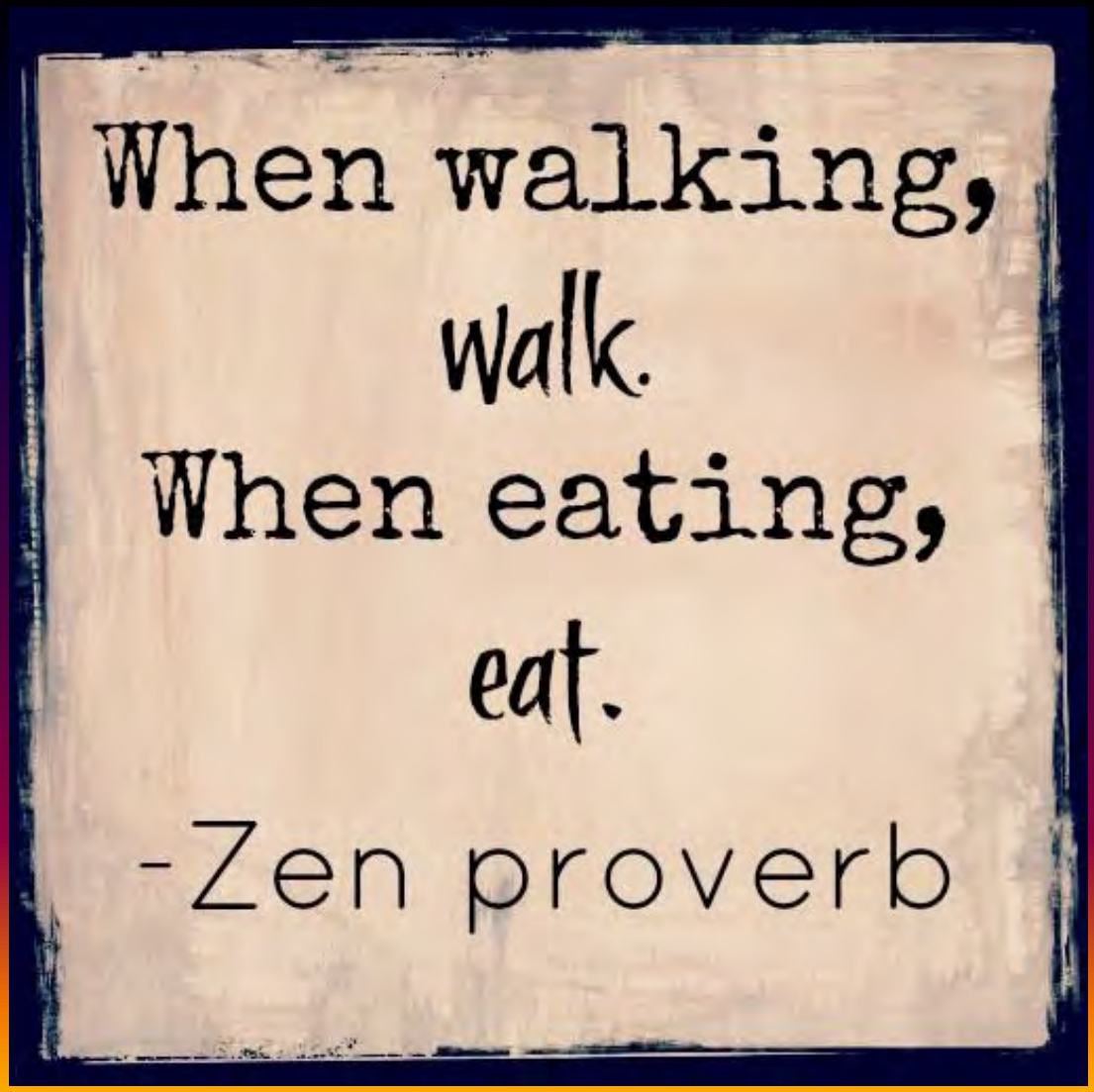
Mindful eating can make a difference in what we choose, in how we eat, and how we look at the rest of our lives.

Mindful Eating: Two Fundamental Benefits

- Increased awareness of hunger and satiety signals
- Reduction in mindless eating - eating cued by internal and environmental stimuli and not the body's needs
  - Advertising, Availability
  - Boredom, Entertainment
  - Emotional Eating




"Food reveals our connection with the earth. Each bite contains the life of the sun and the earth.... We can see and taste the whole universe in a piece of bread! Contemplating our food for a few seconds before eating, and eating in mindfulness, can bring us much happiness."
Thich Nhat Hanh
LeftBrainBuddha.com


When walking,
walk.
When eating,
eat.
-Zen proverb

What I will discuss today

- The Relationship of Body Weight and Cancer
  - Incidence
  - Survival
- Inflammation
- Macronutrients
  - Carbohydrates – Whole Grains, Nuts, Fruits & Vegetables, Glycemic Regulation
- Acid/Base Balance

The purpose of this talk is to give you science to support what you already know, as well as present some new information.

The Big Picture

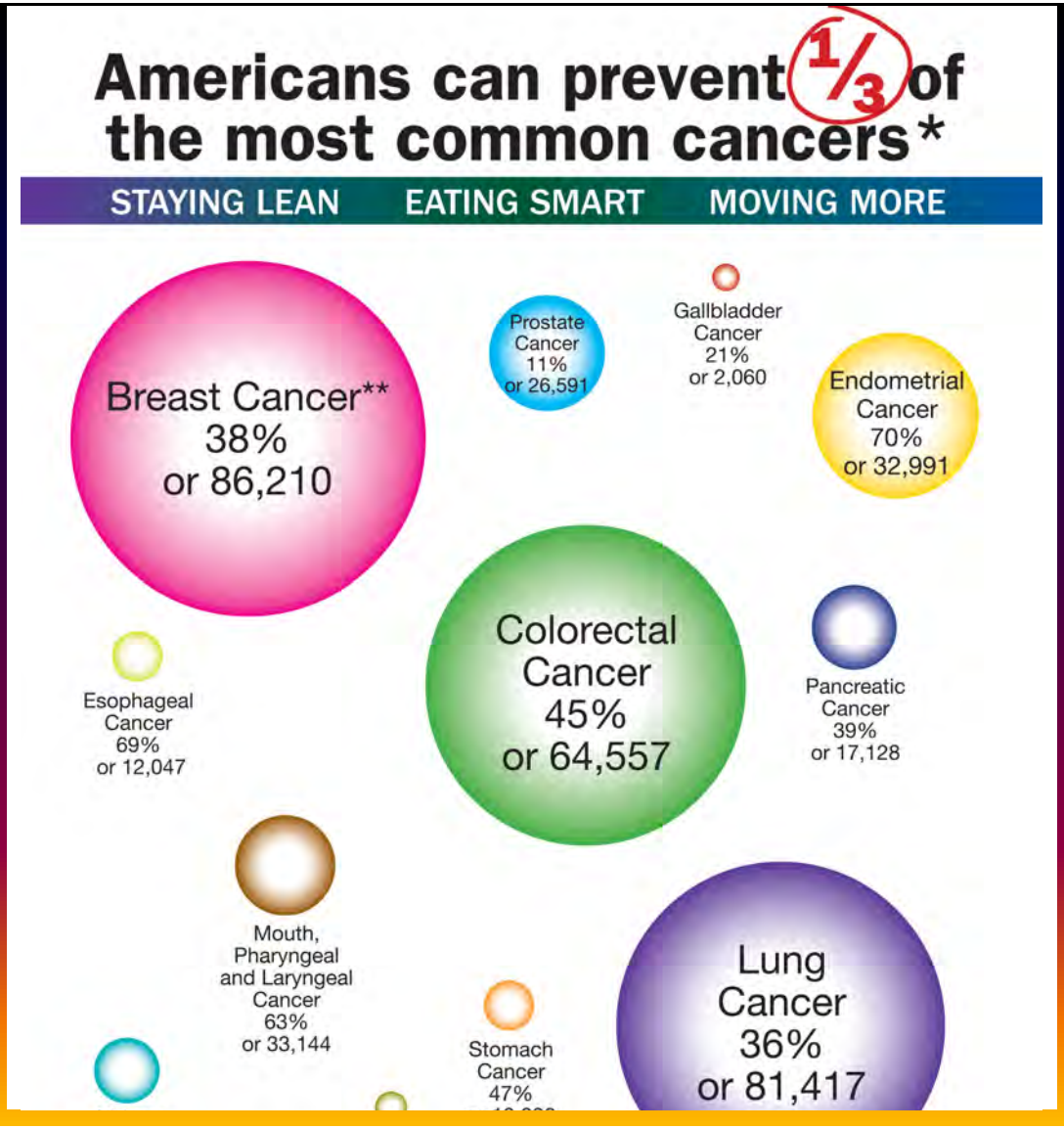
American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention

Reducing the Risk of Cancer With Healthy Food Choices and Physical Activity

Lawrence H. Kushi, ScD[1]; Colleen Doyle, MS, RD[2]; Marji McCullough, ScD, RD[3]; Cheryl L. Rock, PhD, RD[4]; Wendy Demark-Wahnefried, PhD, RD[5]; Elisa V. Bandera, MD, PhD[6]; Susan Gapstur, PhD, MPH[7]; Alpa V. Patel, PhD[8]; Kimberly Andrews[9]; Ted Gansler, MD, MBA, MPH[10] and The American Cancer Society 2010 Nutrition and Physical Activity Guidelines Advisory Committee

The Ameri ndation for its commu ty patterns among Am al panel of experts in ost current scientific e recommendations fo a community conte e presents recommendations for community action to accompany the 4 recommendations for individual choices to reduce cancer risk. These recommendations for community action recognize that a supportive social and physical environment is indispensable if individuals at all levels of society are to have genuine opportunities to choose healthy behaviors. The ACS Guidelines are consistent with guidelines from the American Heart Association and the American Diabetes Association for the prevention of coronary heart disease and diabetes, as well as for general health promotion, as defined by the 2010 *Dietary Guidelines for Americans* and the 2008 *Physical Activity Guidelines for Americans*.
CA Cancer J Clin 2012;62:30–67.

For many aspects of nutrition and physical activity, the most thorough reviews were the 2007 World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) report



What the Report Says:

eat right. American Dietetic Association

Commentary

Evidence-Based Nutrition Guidelines for Cancer Survivors: Current Guidelines, Knowledge Gaps, and Future Research Directions

KIM ROBIEN, PhD, RD, CSO, FADA; WENDY DEMARK-WAHNEFRIED, PhD, RD; CHERYL L. ROCK, PhD, RD

Cancer is one of the most prevalent chronic diseases in the Ur... of death ... were diagnose... breast, and c... Although only ... United States ... 1971 (3,4), th... (approximatel... increasing nu... early cancer detection and treatment (5-8). The survivor population is comprised largely of individuals who have been diagnosed and treated for breast, prostate, and colorectal cancer because these are common cancers and have the best 5-year survival (9). Because cancer is a disease associated with aging, 60% of cancer survivors are age 65 or older (4).

Although survivorship should be celebrated, the impact of cancer is associated with several long-term health and psychosocial sequelae. Common late effects of cancer and its treatments include cardiovascular disease (CVD) (10), diabetes (11) and other endocrine disorders, and osteopenia/osteoporosis (12,13), some of which could be prevented or managed by nutrition interventions (14-20). However, our ability to develop evidence-based nutrition recommendations for cancer survivors i... dearth of research in this area. This com...

cancer survivors are encouraged to follow the recommendations for primary cancer prevention

the current evidence-based diet and physical activity ... current knowl... ...ded to fill those

...IS AMONG

...cer survivors ...er rates, with almost one half of the deaths due to CVD (21-34). Cancer survivors have a twofold increased risk of functional limitations that may threaten their ability to live and work independently (35-47). In 2008, the US economic burden of cancer totaled more than $228 billion. Although 41% of these costs involved direct cancer care, the majority of expenses were attributed to increased morbidity, lost productivity, and premature mortality (48). The vulnerability of cancer survivors and their unmet needs for adequate health care led to a 2005 Institute of Medicine report (49), which called for increased efforts in survivorship, including a need to improve nutritional status and lifestyle factors (eg, diet and physical activity).

Data on cancer survivors' lifestyle behaviors have been accumulating over the past 2 decades. Initial reports on ...opulations suggest that cancer survivors ...ifestyle behaviors after diagnosis (50). However, data from larger subsequent population-based

J Am Diet Assoc. 2011 Mar;111(3):368-75

Achieve and maintain a healthy weight throughout life.

- Be as lean as possible throughout life without being underweight.
- Avoid excess weight gain at all ages. For those who are currently overweight or obese, losing even a small amount of weight has health benefits and is a good place to start.

Consume a healthy diet, with an emphasis on plant foods.

- Choose foods and beverages in amounts that help achieve and maintain a healthy weight.
- Limit consumption of processed meat and red meat.
- Eat at least 2.5 cups of vegetables and fruits each day.
- Choose whole grains instead of refined grain products.

If you drink alcoholic beverages, limit consumption.

- Drink no more than 1 drink per day for women or 2 per day for men.

What I will discuss today

- The Relationship of Body Weight and Cancer
  - Incidence
  - Survival
- Inflammation
- Macronutrients
  - Carbohydrates – Whole Grains, Nuts, Fruits & Vegetables, Blood Sugar Regulation
- Acid/Base Balance

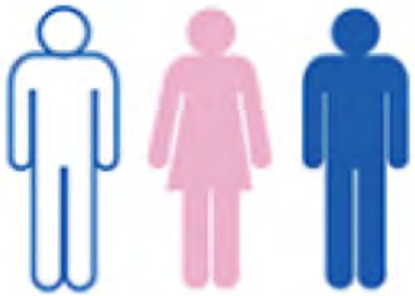
Being Overweight Increases the incidence of many cancers…

Overweight and Obesity, Physical Activity, and Nutrition

being overweight or obese increases the risk of developing 13 cancers: uterine corpus, esophagus (adenocarcinoma), liver, stomach (gastric cardia), kidney (renal cell), brain (meningioma), multiple myeloma, pancreas, colorectum, gallbladder, ovary, breast (postmenopausal), and thyroid.[11] Additionally, limited evidence suggests that excess body fatness is associated with an increased risk of non-Hodgkin lymphoma (diffuse large B-cell lymphoma), male breast cancer, and fatal prostate cancer. The link between

And that’s a problem because…

In the U.S.



more than
one in three adults

and
one in six children

are currently obese (70).

American Association for Cancer Research (AACR) Cancer Progress Report 2018

American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention

Reducing the Risk of Cancer With Healthy Food Choices and Physical Activity

Lawrence H. Kushi, ScD[1]; Colleen Doyle, MS, RD[2]; Marji McCullough, ScD, RD[3]; Cheryl L. Rock, PhD, RD[4]; Wendy Demark-Wahnefried, PhD, RD[5]; Elisa V. Bandera, MD, PhD[6]; Susan Gapstur, PhD, MPH[7]; Alpa V. Patel, PhD[8]; Kimberly Andrews[9]; Ted Gansler, MD, MBA, MPH[10] and The American Cancer Society 2010 Nutrition and Physical Activity Guidelines Advisory Committee

Abstract

The Americ dation for its commur patterns among Am l panel of experts in st current scientific ev commen- dations for a commu- nity contex presents recommendations for community action to accompany the 4 recommendations for individual choices to reduce cancer risk. These recommendations for community action recognize that a supportive social and physical environment is indispensable if individuals at all levels of society are to have genuine opportunities to choose healthy behaviors. The ACS Guidelines are consistent with guidelines from the American Heart Association and the American Diabetes Association for the prevention of coronary heart disease and diabetes, as well as for general health promotion, as defined by the 2010 *Dietary Guidelines for Americans* and the 2008 *Physical Activity Guidelines for Americans*.
CA Cancer J Clin 2012;62:30–67.

approximately two-thirds of Americans are overweight or obese

How Obesity Increases Risk:

- Increases Inflammation
  - –Obesity is an Inflammatory State
  - –Cancer is an Inflammatory Disease
- Increases oxidative stress

ORIGINAL CONTRIBUTION

Elevated C-Reactive Protein Levels in Overweight and Obese Adults

Marjolein Visser, PhD
Lex M. Bouter, PhD
Geraldine M. McQuillan, PhD
Mark H. Wener, MD
Tamara B. Harris, MD, MS

Context Human adipose tissue expresses and releases the proinflammatory cytokine interleukin 6, potentially inducing low-grade systemic inflammation in persons with excess body fat.

Objective To test whether overweight and obesity are associated with low-grade systemic inflammation as measured by serum C-reactive protein (CRP) level.

Design and Setting The Third National Health and Nutrition Examination Survey, representative of the US population from 1988 to 1994.

Participants A total of 16 616 men and nonpregnant women aged 17 years or older.

Main Outcome Measures Elevated CRP level of 0.22 mg/dL or more and a more stringent clinically raised CRP level of more than 1.00 mg/dL.

Results Elevated CRP levels and clinically raised CRP levels were present in 27.6% and 6.7% of the population, respectively. Both overweight (body mass index [BMI], 25-29.9

ADIPOSE TISSUE PREVIOUSLY WAS considered a passive storage depot for fat but is now known to play an active role in metabolism.[1,2] Among the recently discovered co
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flammation is t
protein (CRP).
spective studies
centration was
risk of coronary heart disease.[8] C-reactive protein levels well below the conventional clinical upper limit of normal of 1 mg/dL have been associated with a 2- to 3-fold increase in risk of myocardial infarction, ischemic stroke, peripheral arterial disease, and coronary heart disease mortality in healthy men and women.[9-13]

This study tested whether overweight and obesity are associated with low-grade

For editorial comment see p 2169.

Survey Design and Data Sources

The study in
ticipants of th
and Nutritio
(NHANES III)
was conducte
for Health Sta
Disease Control and Prevention.[14] The survey had a complex, stratified, multistage probability-cluster design for selecting a sample of approximately 40 000 persons representative of the noninstitutionalized civilian US popu-

"These findings suggest a state of low-grade systemic inflammation in overweight and obese persons."

JAMA. Dec 8, 1999 282(22):2131-2135

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ns, and non-
mpled at higher
rates than others. Eighty-one percent

for Research in Extra-
edicine (Dr Visser and
Amsterdam, the Neth-
graphy, and Biometry
Aging, National Insti-
(Drs Visser and Har-
Statistics, Centers for
Disease Control and Prevention, Hyattsville, Md (Dr McQuillan); and the Departments of Laboratory Medicine and Medicine, University of Washington, Seattle (Dr Wener).
Corresponding Author and Reprints: Marjolein Visser, PhD, Institute for Research in Extramural Medicine, Faculty of Medicine, Vrije Universiteit, Van der Boechorststraat 7, 1081 BT Amsterdam, the Netherlands (e-mail: m.visser.emgo@med.vu.nl).

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Available online at www.sciencedirect.com
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Mutation Research 523–524 (2003) 137–144
Fundamental and Molecular Mechanisms of Mutagenesis
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Review

Mechanisms and applications of non-steroidal anti-inflammatory drugs in the chemoprevention of cancer

Vernon E. Steele*, Ernest T. Hawk, Jaye L. Viner, Ronald A. Lubet

Division of Cancer Prevention, National Cancer Institute, National Institutes of Health, 9000 Rockville Pike, Bethesda, MD 20892-7322, USA

"many epidemiologic studies which point out that chronic inflammation correlates with increased risk of developing cancer"

"The data are convincing in a number of organ sites including colon, breast, lung, bladder and skin."

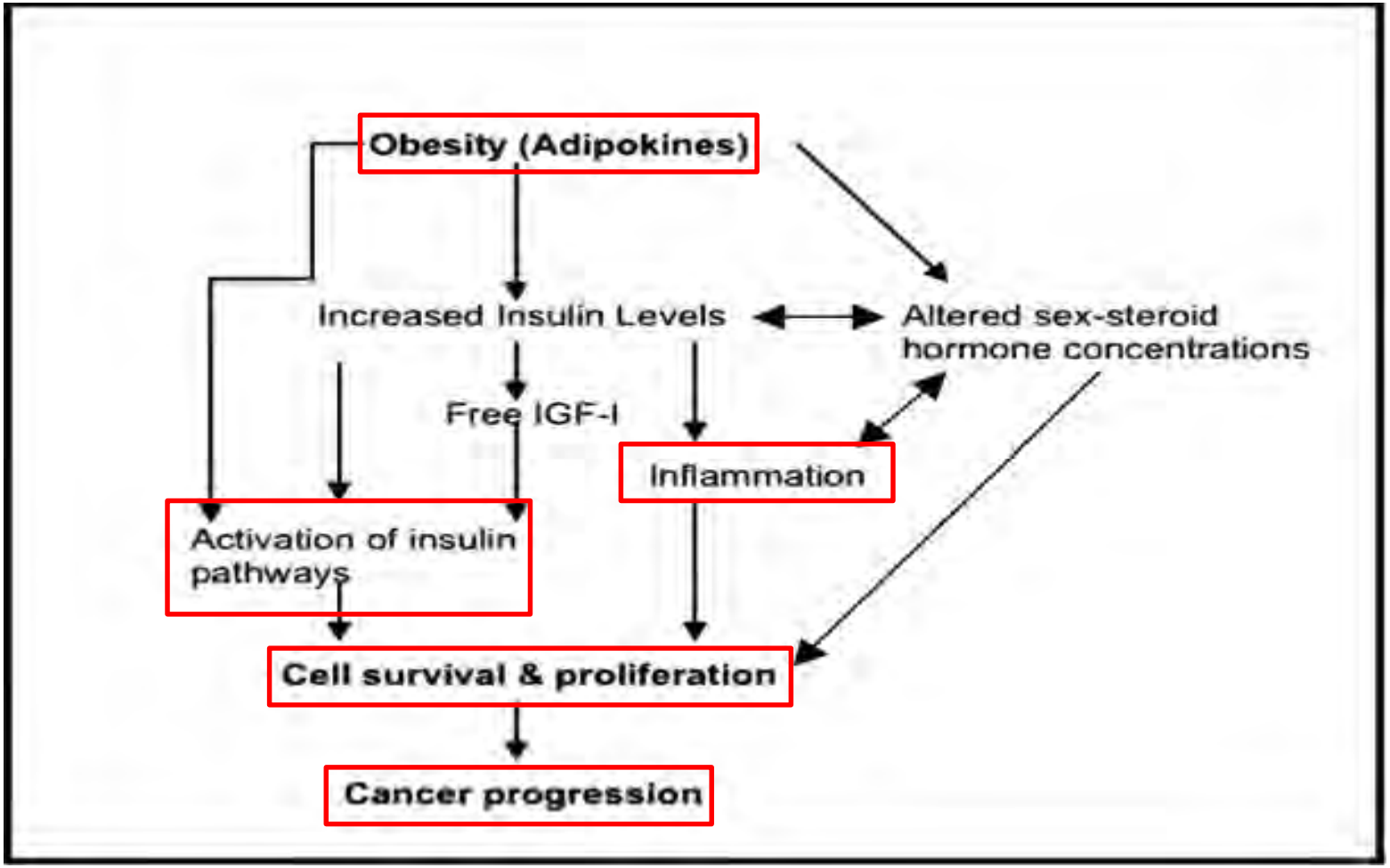
Division of Cancer Prevention, National Cancer Institute, National Institutes of Health

Mutat Res. 2003 Feb-Mar;523-524:137-44

Abstract

Biological a… l understood that chronic i… nderstanding comes in part from the many epidemiologic studies which point out that chronic inflammation correlates with increased risk of developing cancer in that organ which is affected. One of the hallmarks of chronic irritation is the increased activity in the arachidonic acid pathway which provides many of the necessary inflammatory biochemical mediators to this process. Arachidonic acid metabolism diverges down two main pathways, the cyclooxygenase (COX) and the lipoxygenase (LOX) pathways. The COX pathwa… leukotrienes (LTs) and hydroxyeicos… gical effects which enhance the devel… ural products have been discovered t… n that inhibition of the key enzymes … ata are convincing in a number of organ sites including colon, breast, lung, bladder and skin. More recently, double-blinded randomize clinical trials in human… imarily used non-steroidal a… icate that the LOX pathway … these enzymes in cancerous tissues make th… newer more specific drugs are developed with few adverse …

Published by Elsevier Science B.V.



Annu. Rev. Nutr. 2012. 32:311–42

Figure 1

Potential underlying biological mechanism of obesity and cancer progression.

How Obesity Increases Risk:

- Increases Inflammation
  - –Obesity is an Inflammatory State
  - –Cancer is an Inflammatory Disease
- Increases oxidative stress

Overeating: The Link to Oxidative Stress

- Excess calories are converted into fat for storage.
- Fat production uses up huge amounts of NADPH which is the body's ultimate antioxidant.
- That's why overeating leads to increased oxidative stress which means more free radicals which can damage DNA.

What I will discuss today

- The Relationship of Body Weight and Cancer
  - Incidence
  - Survival

Overweight and Obesity, Physical Activity, and Nutrition

Can
Fact

There is also mounting evidence suggesting that obesity increases the risk of cancer recurrence and second primary tumors, and decreases survival for several cancers.[15-18]

Healthy Weight

- Important for almost all cancers
- Help patients achieve Healthy Weight through optimal food choices and physical exercise during treatment.
- Proper Portion Size at each meal to reduce oxidative stress.
- Do NOT recommend high calorie foods (doughnuts and chips) to "keep your weight up". Instead, recommend eat nuts, seeds, avocado, nut butters, olive oil.

What I will discuss today

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- Inflammation
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  - Carbohydrates – Whole Grains, Nuts, Fruits & Vegetables, Glycemic Regulation
- Acid/Base Balance

MECHANISMS OF INTRINSIC AND EXTRINSIC INFLAMMATION IN CANCER

Experimental and clinical evidence points to the fact that inflammation, particularly chronic inflammation, affects all phases of carcinogenesis. Inflammation favors the initial genetic mutation or epigenetic mechanisms that drive cell transformation and cancer initiation: It acts as a tumor promoter by establishing a tissue microenvironment that allows the tumor to progress and metastasize and by establishing immunosuppressive mechanisms that prevent an effective immune response against the tumor. Inflammation also causes systemic metabolic alterations such as cachexia that often represent the primary cause of morbidity and mortality in cancer patients.

Annu. Rev. Immunol. 2012. 30:677–706

Keywords

What about Survival?

NUTRITION AND CANCER, *41*(1&2), 64–69

Measurement of the Systemic Inflammatory Response Predicts Cancer-Specific and Non-Cancer Survival in Patients With Cancer

Donald C. McMillan, Maqsood M. Elahi, Naveed Sattar, Wilson J. Angerson, Jennie Johnstone, and Colin S. McArdle

Abstract: *The ass*

Patients with a diagnosis of colorectal (n = 182), gastric (n = 87), breast (n = 99), or bronchogenic (n = 404) cancer and who had measurements of C-reactive protein and albumin were identified.

vanced cancer re
active protein co
clearly defined. Pa
182), gastric (n =
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tein and albumin v
time of sampling,
cancer patients to
cancer. On univa
type, a significant
vival and both log
trations (P ≤ 0.0002). On multivariate analysis, in each tumor type, log$_{10}$ C-reactive protein remained a significant independent predictor of survival (P ≤ 0.0002). When all

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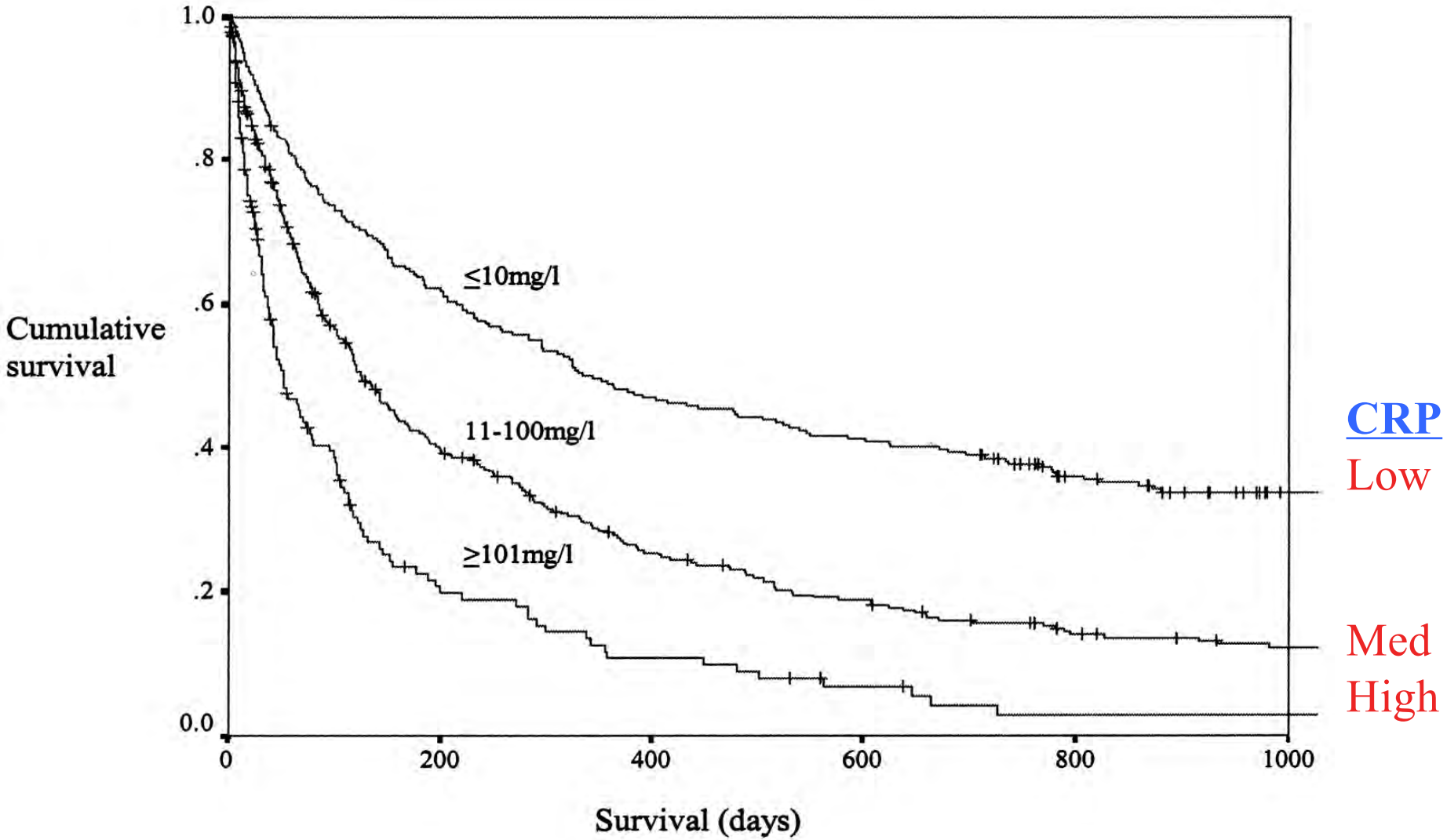
incidental measurement of C-reactive protein concentration as a prognostic factor in a large cohort of patients with a variety of common solid tumors.


Cumulative survival
1.0
.8
.6
.4
.2
0.0
≤10mg/l
11-100mg/l
≥101mg/l
0
200
400
600
800
1000
Survival (days)
CRP
Low
Med
High

Systemic inflammation, nutritional status and survival in patients with cancer

Donald C. McMillan

University Department of Surgery, Faculty of Medicine-University of Glasgow, Royal Infirmary, Glasgow, UK

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e-mail: d.c.mcmillan@c

Current Opinion in Metabolic Care 200

Purpose of review

There is now good evidence in humans that a chronic systemic inflammatory response results in the cardinal features of cancer cachexia, principally the progressive loss of weight (in particular lean tissue). This review examines the role of recent simple objective

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… it can be concluded that …the systemic inflammatory response…is a reliable tumour stage ***independent prognostic factor*** in patients with cancer.

Summary

A chronic systemic inflammatory response is clearly implicated in the progressive nutritional and functional decline in the cancer patients and their subsequent poor outcome. Systemic inflammation-based prognostic scores not only identify patients at risk but also provide well defined therapeutic targets for future clinical trials targeting nutritional decline.

Keywords

cancer, nutritional status, survival, systemic inflammation, tumour stage

Curr Opin Clin Nutr Metab Care 12:223–226

1363-1950

Can we do anything nutritionally about inflammation?

REVIEW ARTICLE

An anti-inflammatory diet: The next frontier in preventive medicine

Although a healthy diet has long been encouraged for many reasons, research now shows a correlation between the foods we eat and biomarkers of inflammation.

Ashley Greer,

- Foods that increase inflammation include refined grains, red and processed meats, fried foods, and sugar.
- Foods that decrease inflammation include whole grains, fish and poultry, fruits and vegetables, legumes, nuts, and olive oil.

The no-carbohydrate options, the possibilities can be confusing and overwhelming. A review of recent research finds that specific dietary patterns in addition to certain foods and nutrients can have a significant impact on the health of patients. These patterns and foods can be correlated with inflammatory markers to determine the effect of diet on the chronic disease state and associated risks. Although some of the advice may seem obvious, a look at the overall data identifies specific recommendations that could have a considerable effect on inflam and overall health.

tumor necro-

ted with
y, BP, and
els are driven
by insulin resistance. The reason for the association is still unknown, although hypotheses include the effect of cytokines on insulin resistance, oxidative stress, or the innate immune system.[2] Some authors have theorized that inflammatory biomarkers are linked with other chronic diseases,

TABLE 2. Effects of foods/food groups on inflammatory markers[9-13]

Food/ food group	Inflammatory markers	Effect on markers	Participants	Confounding factors (adjusted for)
Dark chocolate, 20-g serving every 3 d	CRP (P=.038)	Decreased	1,317	Age, sex, social status, physical activity, systolic BP, BMI, waist-to-hip ratio, food groups, and total energy
Fiber				
Intake >30 g/d (naturally occurring)[9]	CRP (P=.046)	Decreased	28 women, 7 men	Age, race
Intake >30 g/d (supplemented with psyllium)[9]	CRP (P=.03)	Decreased		
Fruits and vegetables[13]	CRP (P<.01)	Decreased	486 Tehrani female teachers aged 40-60 y	Age, BMI, and waist circumference
Grains				
Refined[10]	CRP (P=.01)	No change	50 obese adults with metabolic syndrome	
Whole[10]	CRP (P=.01)	Decreased		
Vegetables, apples, and flavonoids[11]	CRP (P<.05)	Decreased	8,335 adults	Gender; age; ethnicity; BMI; current smoking status; exercise; NSAID use; alcohol consumption; and total energy, vitamin C, vitamin E, and carotene intakes

Key: BMI, body mass index; CRP, C-reactive protein.

Maturitas 71 (2012) 227–239

Contents lists available at SciVerse ScienceDirect

Maturitas

journal homepage: www.elsevier.com/locate/maturitas

Review

Anti-inflammatory properties of culinary herbs and spices that ameliorate the effects of metabolic syndrome

Alois Jungl

Department of Bio *e 18, 1190 Vienna, Austria*

The effects of spices are enormously enhanced when the active compounds of fruits and vegetables are also included, which should be the case for a balanced diet.

A R T I C L E

Article history:
Received 22 Nove
Received in revise
Accepted 10 Dece

Keywords:
PPAR
Macrophages
Inflammation
Metabolic syndrome
Culinary herbs
Spices

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o-inflammatory
atty acids medi-
o-inflammatory
mediators via NF-κB or JNK. PPAR γ activators can inhibit the activation of NF-κB, down-regulating the expression of pro-inflammatory cytokines. Here we provide an overview of how different culinary herbs and spices exert anti-inflammatory activities and the extent to which they activate PPAR α and PPAR γ, inhibit the activation of NF-κB, and enhance expression of anti-inflammatory cytokines. Spices can play essential roles as anti-inflammatory agents in our diet, acting as pan PPAR activators and improving insulin sensitivity, counteracting dyslipidaemia and weight gain. The effects of chronic inflammation caused by obesity are counteracted and, consequently, the progression of diseases associated with chronic inflammation slowed.

Maturitas 71 (2012) 227–239

Contents lists available at SciVerse ScienceDirect

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journal homepage: www.elsevier.com/locate/maturitas

Review

Anti-inflammatory properties of culinary herbs and spices that ameliorate the effects of metabolic syndrome

Alois Jungbauer*, Svjetlana Medjakovic

Department of Biote
Austria

ARTICLE

Article history:
Received 22 Novemb
Received in revised f
Accepted 10 Decemb

Keywords:
PPAR
Macrophages
Inflammation
Metabolic syndrome
Culinary herbs
Spices

Thus, no clear cut distinction is made between food and medicine. Through anti-inflammatory herbs and spices consumed on a daily basis, the risk of chronic diseases may be reduced.

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Herbs and Spices

Culinary herb or spice	Component
Anise, coriander, fennel	Anethol
Marjoram, sage, thyme, holy basil	Apigenin
Cinnamon	Benzyl cinnamide
Oregano	Biochanin A
Chilli pepper	Capsaicin
Clove, fennel, oregano, thyme	Carvacrol
Cinnamon	Cinnamic acid
Cinnamon	Cinnamaldehyde
Lemon grass	Citral
	Chalcones
Cinnamon in polymeric form	4′-Hydroxy chalcone
Cinnamon in polymeric form	2′-Hydroxy chalcone
Curcuma	Curcumin [116]
Oregano	Diosmetin
Clove	Eugenol
Cinnamon, clove	Ethylcinnamate
	Ethylvanilin [123]
Cinnamon	Epichatchin
Ginger	6-Gingerol/10-gingerol
Oregano	Kämpferol
Marjoram, sage, rosemary, tarragon, thyme	Luteolin
	Paradols
Black pepper	Piperine
Dill, bay leaves, oregano	Quercetin
Marjoram, oregano, sage, thyme, rosemary	Rosmarinic acid
Black pepper, cinnamon, nutmeg	Safrole
Ginger	6-Shogaols
Vanilla	Vanilic acid [132]
	Zingerone

QUESTION OF THE MONTH

What Is the Anti-Inflammatory Diet?

Inflammation is a set of symptoms that include pain, swelling, heat, and redness of an affected organ or tissue. It is the natural way the body's immune system responds to attack, infection, or injury. Recently, there has been discussion regarding another form of inflammation that is not aligned with pain and is referred to in the literature as chronic low-grade inflammation or "silent inflammation" (1). The links between diet, inflammatory processes, and diseases are the topics of intense current research. A number of diseases, particularly chronic diseases of later life, such as heart disease, diabetes, arthritis, Alzheimer's disease, and certain cancers, are thought to be connected to chronic low-grade inflammation. The research to support specific interventions for the different medical conditions regarding inflammation is still lacking. The diet plan or the "perfect diet" for chronic low-grade inflammation is still unclear. In searching library collections using the WorldCat search engine (www.worldcat.org), nearly 300 books were listed for an anti-inflammatory diet. The eating plans from these books can range from general healthy eating guidelines for optimal health to extreme eating plans. Some of the extreme diets call for the elimination of large groups of foods or nutrients, such as wheat, corn, soy, dairy, eggs, red meat, and certain vegetables that are considered to promote chronic low-grade inflammation or are considered to be pro-inflammatory foods. Extreme eating plans that omit whole food groups are considered questionable by registered dietitians and other health professionals (2).

While each of the many diets has its own specific and unique guidelines, the basic concept for following an anti-inflammatory diet is the same. That is the belief that constant or out-of-control inflammation in the body leads to ill health, and that eating to avoid constant inflammation promotes better health and can ward off disease. Specifics vary from diet to diet, but in general anti-inflammatory diets suggest (2,3):

- eat plenty of fruits and vegetables;
- eat a good source of n-3 fatty acids, such as fish or fish oil supplements and walnuts;
- eat plenty of whole grains such as brown rice and bulgur wheat;
- eat lean protein sources such as chicken; cut back on red meat and full-fat dairy foods;
- minimize saturated and *trans* fats;
- avoid refined foods and processed foods;
- consume alcohol in moderation; and
- add a variety of spices, especially ginger and curry.

This article was written by ***Wendy Marcason,*** *RD, of the American Dietetic Association's Knowledge Center Team, Chicago, IL. ADA members can contact the Knowledge Center by sending an e-mail to knowledge@eatright.org.*

doi: 10.1016/j.jada.2010.09.024

J Am Diet Assoc 2011;110:1780.

How else can we reduce inflammation?

Achieve and maintain
healthy body weight

Effect of Weight Loss and Lifestyle Changes on Vascular Inflammatory Markers in Obese Women

A Randomized Trial

Katherine Esposito, MD
Alessandro Pontillo, MD
Carmen Di Palo
Giovanni Giugliano, MD
Mariangela Masella, MD
Raffaele Marfella, MD, PhD
Dario Giugliano, MD, PhD

Context Obesity is an independent risk factor for cardiovascular disease, which may be mediated by increased secretion of proinflammatory cytokines by adipose tissue.

Objective To determine the effect of a program of changes in lifestyle designed to obtain a sustained reduction of body weight on markers of systemic vascular inflammation and insulin resistance.

Design and Setting Randomized single-blind trial conducted from February 1999 to February 2002 at a university hospital in Italy.

Patients One hundred twenty premenopausal obese women (body mass index ≥30) aged 20 to 46 years without diabetes, hypertension, or hyperlipidemia.

Interventions The 60 women randomly assigned to the intervention group received detailed advice about how to achieve a reduction of weight of 10% or more through a low-energy Mediterranean-style diet and increased physical activity. The control group

THE RATE OF OBESITY AND THE numbers of dieters are increasing in parallel.[1,2] More than 54 million Americans are cur-

"A multidisciplinary program aimed to reduce body weight in obese women through lifestyle changes was associated with a reduction in all the parameters associated with inflammation".

JAMA 2003; 289: 1799-1804.

diovascular disease risk factors.[7,9-12] Moreover, several proinflammatory molecules, including CRP,[13] IL-6,[14] and IL-18,[15] have been prospectively associated with thrombotic cardiovascular events.

of IL-6, IL-18, and CRP, as well as adi-

sensitizing properties,[16] and their rela-

Author Affiliations: Center for Obesity Management, Department of Geriatrics and Metabolic Diseases (Drs Esposito and Pontillo and Ms Di Palo), Chair of Plastic and Reconstructive Surgery (Dr G. Giugliano), Department of Psychiatry (Dr Masella), and Cardiovascular Research Center (Drs Marfella and D. Giugliano), Second University of Naples, Naples, Italy. Corresponding Author and Reprints: Katherine Esposito, MD, Center for Obesity Management, Department of Geriatrics and Metabolic Diseases, Policlinico Universitario, Piazza L. Miraglia, 80138 Napoli, Italy (e-mail: katherine.esposito@unina2.it).

How else can we reduce inflammation?

Reduce Stress

Meditate

Join a Group

Stress is Pro-inflammatory

PERSPECTIVES

SCIENCE AND SOCIETY

Stress-induc… implications…

Ronald Glaser and Jan…

Abstract | Folk wisdom has lo… that stressful events take a to… The field of psychoneuroimm… is now providing key mechan… about the ways in which stres… the negative emotions that th… — can be translated into phy… changes. PNI researchers ha… animal and human models to… the immune system commun… bidirectionally with the central nervous and endocrine systems and how these interactions impact on health.

Stressors can increase susceptibility to infectious agents, influence the severity of infectious disease, diminish the strength of immune responses to vaccines, reactivate latent herpesviruses and slow wound healing. Moreover, stressful events and the distress that they evoke can also substantially increase the production of pro-inflammatory cytokines that are associated with a spectrum of age-related diseases. Accordingly, stress-related immune dysregulation might be one core mechanism behind a diverse set of health risks[1,3].

Nat Rev Immunol. 2005 Mar;5(3):243-51

…ase susceptibility to infec-
…e the severity of infectious
…e strength of immune
…es, reactivate latent her-
…ound healing. Moreover,
…e distress that they evoke
… increase the production
… cytokines that are associ-
…n of age-related diseases.
…lated immune dysregula-
…re mechanism behind a
…sks[1,3].

…ocrine interactions

…mmune response by the
… a complex network of
…s between the nervous,
…une systems (FIG. 1). The
…utonomic nervous sys-
… pathways for immune-
…n: stressors can activate the sympathetic–adrenal–medullary (SAM) axis, as well as the HPA axis, and thereby provoke the release of pituitary and adrenal

Eating Stressed Animals is Pro-inflammatory

Medical Hypotheses (2006) 67, 36–40

ELSEVIER

medical hypotheses

http://intl.elsevierhealth.com/journals/mehy

In addition, modern techniques of husbandry and agriculture can produce stress in the food chain, such that food itself can act as an illegitimate signal of chronic stress. Consumers of stressed foods may sense those signals – a phenomenon known as xenohormesis – and assume the stress phenotype.

Are w
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as par

Anthony

Stanford Uni *nited States*

Received 12 N

Summary Resource utilization may represent a central force driving evolution. A tight link between sensing energy availability and managing energy acquisition and utilization constitutes a common feature among all organisms. While

Improving Food Quality

- For non-vegetarians, I advise them to eat animals that have been raised without being confined (humanely raised), fed grass instead of grains (grass fed) and ethically slaughtered.
  - Not being confined (free range) means less stress.
  - Grass fed instead of corn fed means less inflammatory Omega 6 fats and improved FA profile

Ethically Slaughtered also means no bad Karma (If that is your or patient's belief)

Improving Food Quality

- For non-vegetarians, I advise them to eat animals that have been raised without being confined (humanely raised), fed grass instead of grains (grass fed) and ethically slaughtered.
  - Not being confined (free range) means less stress.
  - Grass fed instead of corn fed means less inflammatory Omega 6 fats and improved FA profile

Fatty acid profiles, meat quality, and sensory attributes of organic versus conventional dairy beef steers

E. A. Bjorklund, B. J. Heins,[1] A. DiCostanzo, and H. Chester-Jones
Department of Animal Science, University of Minnesota, St. Paul 55108

Furthermore, the GRS steers tended to have greater n-3 fat and had lower n-6 fat than the ORG and CONV steers. Consequently, the GRS (1.4%) steers had a lower n-6-to-n-3 fat ratio than the ORG (12.9%) and CONV (10.0%) steers.

Meat from
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conventional
centrate), or
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and Outreacl
May 2011. The CONV steers (n = 16) were fed a diet that contained 80% concentrate and 20% forage, and ORG steers (n = 16) were fed a diet of organic corn,

ved for ORG
all consumer
3) steers had
sumers. The
ng than the
nversely, the
off-flavor (0-
G (3.9) and
urrent study
for organic
, but quality
and consistency of the beef needs to be improved.

Key words: organic, dairy steer, grass-fed, n-3 fatty acid

What I will discuss today

- The Relationship of Body Weight and Cancer
  - Incidence
  - Survival
- Inflammation
- Macronutrients
  - Carbohydrates – Whole Grains, Nuts, Fruits & Vegetables, Glycemic Regulation
- Acid/Base Balance

What I will discuss today

- Macronutrients
  - Carbohydrates – ***Whole Grains***, Nuts, Fruits & Vegetables, Glycemic Regulation

Why whole-grains are protective against cancer:

- are fermented in the gut, producing short-chain fatty acids which may provide immune protection.
- improve insulin and glucose responses.
- contain many protective compounds: antioxidants, phytates, phyto-oestrogens such as lignan, plant stanols and sterols, and vitamins and minerals.
  - Slavin, Proc Nutr Soc. 2003 Feb;62(1):129-34.
- **Decrease CRP**
  - Ajani et al., J Nutr. 2004 May;134(5):1181-5

Critical Reviews in Food Science and Nutrition. 50:193–208 (2010)

ISSN: 1040-8398
DOI: 10.1080/104083908

Taylor & Francis
Taylor & Francis Group

Health Benefits of Whole Grain Phytochemicals

NEAL OKA
[1]Department of I
[2]Institute of Con

Whole grains contain many phytochemicals with health benefits that are only recently becoming recognized. The most important groups of whole grain phytochemicals are phenolics (phenolic acids, alkylresorcinols, and flavonoids), carotenoids, vitamin E, γ-oryzanols, dietary fiber, and β-glucan.

A who … onents—the starchy … psis. Whole grain food products can be intact, consisting of the original composition of bran, germ, and endosperm, throughout the entire lifetim … ibined to the rel … sociated with re … s Whole grain … unique phytoc … In this paper,

Increased consumption of whole grains has been associated with reduced risk of major chronic diseases including cardiovascular disease, type II diabetes, and some cancers.

What I will discuss today

- Macronutrients
  - Carbohydrates – Whole Grains, ***Nuts***, Fruits & Vegetables, Glycemic Regulation

[Frontiers in Bioscience S4, 109-120, January 1, 2012]

Cancer chemoprevention by nuts: evidence and promises

Marco Falasca

[1]*Queen Mary U*
Molecular Scie

TABLE OF C

It is well recognized that phytochemicals contained in nuts possess biological effects. Moreover, nuts are a good source of healthy fats, vitamins, antioxidants and minerals.

Nuts are very rich in different bioactive compounds whose anti-cancer properties have already been described.

Cell and

Table 1. Bioactive compounds contained in nuts and potential mechanisms of action

Compound	Mechanism of action	Sources and concentration (mg/100g)
Phytosterols	Anti-inflammatory	Pistachios (280), pine nuts and macadamias (198), almonds (187), pecans (150), cashew (138), hazelnuts (120), walnuts (113), Brazil nuts (42)
Betacarotene	Anti-oxidant, anti-inflammatory, anti-angiogenic, pro-apoptotic, anti-metastatic	Pistachios (0.21)
Quercetin	Anti-inflammatory, pro-apoptotic, anti-metastatic	Almonds (NA), pine nuts (NA)
Ellagic acid	Pro-apoptotic	Walnuts (59), pecans (3.3)
Resveratrol	Anti-oxidant, anti-inflammatory, pro-apoptotic, anti-metastatic	Pistachios (0.115), peanuts (0.084)
roanthocyanidins	Anti-oxidant, anti-inflammatory	Hazelnuts (501), pecans (494), pistachios (237), almonds (184), walnuts (67)
Phytoestrogens	Anti-hormone	Hazelnuts (0.107), pistachios (0.382), chestnuts (0.21), walnuts (0.14), cashew (0.13),
IP_5,	Anti-angiogenic, pro-apoptotic	Cashew (150), peanuts (60), almonds, pecans, pistachios, pine nuts, macadamias, walnuts, Brazil nuts (NA)
Tocopherol α-γ	Anti-oxidant	Almonds (452), hazelnuts (371.3), walnuts (321.1), peanuts (148.2), macadamias (122.3) μg/g oil
Squalene	Anti-oxidant	Hazelnuts (186.4), macadamias (185), peanuts (98.3), walnuts (9.4), almonds (95) μg/g oil
Anacardic acid	Pro-apoptotic	Cashew (NA)
Folic acid	Anti-DNA damage	Chestnuts (0.11), hazelnuts (0.113), almonds (0.050), Brazil nuts (0.022), cashew (0.025), pistachios (0.051), pine nuts (0.034), walnuts (0.031), pecans (0.022), macadamias (0.011)
Selenium	Anti-oxidant	Brazil nuts (1.917), cashew (0.020), walnuts (0.017), pistachios (0.007), pecans (0.038), macadamias (0.036), almonds (0.025), hazelnuts (0.024)
Caffeic acid	Anti-proliferative, anti-metastatic	Cashew (NA), walnuts (NA)

What I will discuss today

- Macronutrients
  - Carbohydrates – Whole Grains, Nuts, ***Fruits & Vegetables***, Glycemic Regulation

Anti-Oxidants

- Our body needs anti-oxidants from food sources (Dietary Anti-Oxidants) to adequately remove the ROS generated on a daily basis.
- What foods are richest in DAO?
  - Fruits and Vegetables

How can you tell if a food has high levels of dietary anti-oxidants?

Color

Color	Food Source	Phytochemical
Orange-Red	Carrot, Apricot,	Carotenes
	Squash, Yams,	Lutein
	Tomato, Pepper,	Lycopene
	Apricot, Mango,	Zeaxanthin
Purple-Red	All Berries	Anthocyanins
	Grapes	Reversatrol
	Red Wine	Catechols
		Ellagic Acid

Color	Food Source	Phytochemical
Green	Broccoli, Okra,	Chlorophyll
	Greens, Spinach,	Sulforaphanes
	Cabbage, Beans	Carotenoids
Yellow	Lemons, Citrus	Limonene
Cream	Cauliflower, Potato	Anthoxanthins
White	Garlic, Onions	Allium, Quercetin
Brown	Dried Beans	Isoflavones
	Soy	Saponins
	Peanuts, Lentils	Fiber

Importance of Fruits and Vegetables

- Vitamins
- Minerals
- Anti-Oxidants
- Phytonutrients
- Fiber
- Low Glycemic Index Carbohydrates

"Vegetables and fruit contain the anticarcinogenic cocktail to which we are adapted. We abandon it at our peril."

Steinmetz et al., Vegetables, fruit and cancer II. Mechanisms.

Cancer Causes and Control 1991;2:427

Pharmacological Research 65 (2012) 565–576

Contents lists available at SciVerse ScienceDirect

Pharmacological Research

journal homepage: www.elsevier.com/locate/yphrs

Review

Epigenetic impact of dietary polyphenols in cancer chemoprevention: Lifelong remodeling of our epigenomes

Wim Vande

[a] *Laboratory of Prote* *siteitsplein 1, Wilrijk, Belgium*
[b] *Laboratory of Euka* *ium*

Reciprocally, a reasonable good fraction of cancer deaths maybe prevented by modifying the diet composition (*i.e.* content of fiber, polyphenols, fat/oil, protein, spices, cereals, *etc.*) and regular physical exercise

ARTICLE

Article history:
Received 10 February 2012
Received in revised form 10 March 2012
Accepted 13 March 2012

Keywords:
Cancer
Chemoprevention
Diet
Polyphenol
Epigenome
Epigenetics

Cancer, as one of the non-communicable diseases, remains one of the leading causes of death around the world. Recently, epigenetic changes in DNA methylation patterns at CpG sites (epimutations) or deregulated chromatin states of tumor promoting genes and noncoding RNAs emerged as major governing factors in tumor progression and cancer drug sensitivity. Furthermore, various environmental factors such as nutrition, behavior, stress, and toxins remodel our epigenomes lifelong in a beneficial or detrimental way. Since epigenetic marks (epimutations) are reversible in contrast to genetic defects, chemopreventive nutritional polyphenols (soy, genistein, resveratrol, catechin, curcumin) are currently evaluated for their ability to reverse adverse epigenetic marks in cancer (stem) cells to attenuate tumorigenesis-progression, prevent metastasis or sensitize for drug sensitivity. Although polyphenols in fruit and vegetables may help to reduce the risk of cancer, few protective effects have been firmly established, presumably because of inappropriate timing or dosing of diet exposure or due to confounding factors such as smoking and alcohol. In this review will discuss the possible epigenetic contributions of dietary polyphenols in cancer chemoprevention.

Summary on Fruits and Vegetables

- Organic (www.ewg.org)
- 10 servings daily
- Choose from multiple colors to get the different phytochemicals (rainbow at the end of each day)
- Include dark berries or grapes to get resveratrol (highest in skin)


Resveratrol

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES
Issue: *Resveratrol and Health*

Resveratrol and cellular mechanisms of cancer prevention

Yogeshwer Shukla and Richa Singh

Proteomics Lab Lucknow, India

Address for cor arch (Council of
Scientific & Indu il.com;
yshukla@iitr.res

The use of no n and treatment of cancer is o Epidemiological evidence sugg ing data clearly indicate that t ncer by naturally occurring diet health benefits, including anti ities. Because of these properti ed as a potential chemoprevent sewhere suggest resveratrol to be a promising natural weapon in the war against cancer. Remarkable progress in elucidating the molecular mechanisms underlying the anticancer properties of resveratrol has been achieved. Here, we focus on some of the myriad pathways that resvera entive role and advocate that resveratrol holds tremendous potential as an efficient anticancer drug of the future.

Resveratrol affects all three discrete stages of carcinogenesis (initiation, promotion, and progression) by modulating signal transduction pathways that control cell division and growth, apoptosis, inflammation, angiogenesis, and metastasis,

Ann N Y Acad Sci. 2011 Jan;1215:1-8.

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES
Issue: *Resveratrol and Health*

Resveratrol and cellular mechanisms of cancer prevention

Yogeshwer Shukla and Richa Singh

Proteomics Laboratory, Indian Institute of Toxicology Research (Council of Scientific & Industrial Research), Lucknow, India

Address for correspondence: Yogeshwer Shukla, Proteomics Laboratory, Indian Institute of Toxicology Research (Council of Scientific & Industrial Research), MG Marg, P.O. Box 80, Lucknow 226001, India. yogeshwer_shukla@hotmail.com; yshukla@iitr.res.in

We….advocate that resveratrol holds tremendous potential as an efficient anticancer drug of the future.

The use of nov…nd treatment of cancer is or…idemiological evidence sugge…g data clearly indicate that th…r by naturally occurring dieta…ealth benefits, including antic…es. Because of these properties and their wide distribution throughout the plant kingdom, resveratrol is envisioned as a potential chemopreventive/curative agent. Currently, a number of preclinical findings from our lab and elsewhere suggest resveratrol to be a promising natural weapon in the war against cancer. Remarkable progress in elucidating the molecular mechanisms underlying the anticancer properties of resveratrol has been achieved. Here, we focus on some of the myriad pathways that resvera…entive role and advocate that resveratrol holds tremendous potential as an efficient anticancer drug of the future.

Ann N Y Acad Sci. 2011 Jan;1215:1-8.

Curcumin

Available online at www.sciencedirect.com
SCIENCE DIRECT®
Cancer Letters 223 (2005) 181–190
CANCER Letters
www.elsevier.com/locate/canlet

Mini-review

Chemopreventive and therapeutic effects of curcumin

Annelyse Duvoix, Romain Blasius, Sylvie Delhalle, Michaël Schnekenburger,

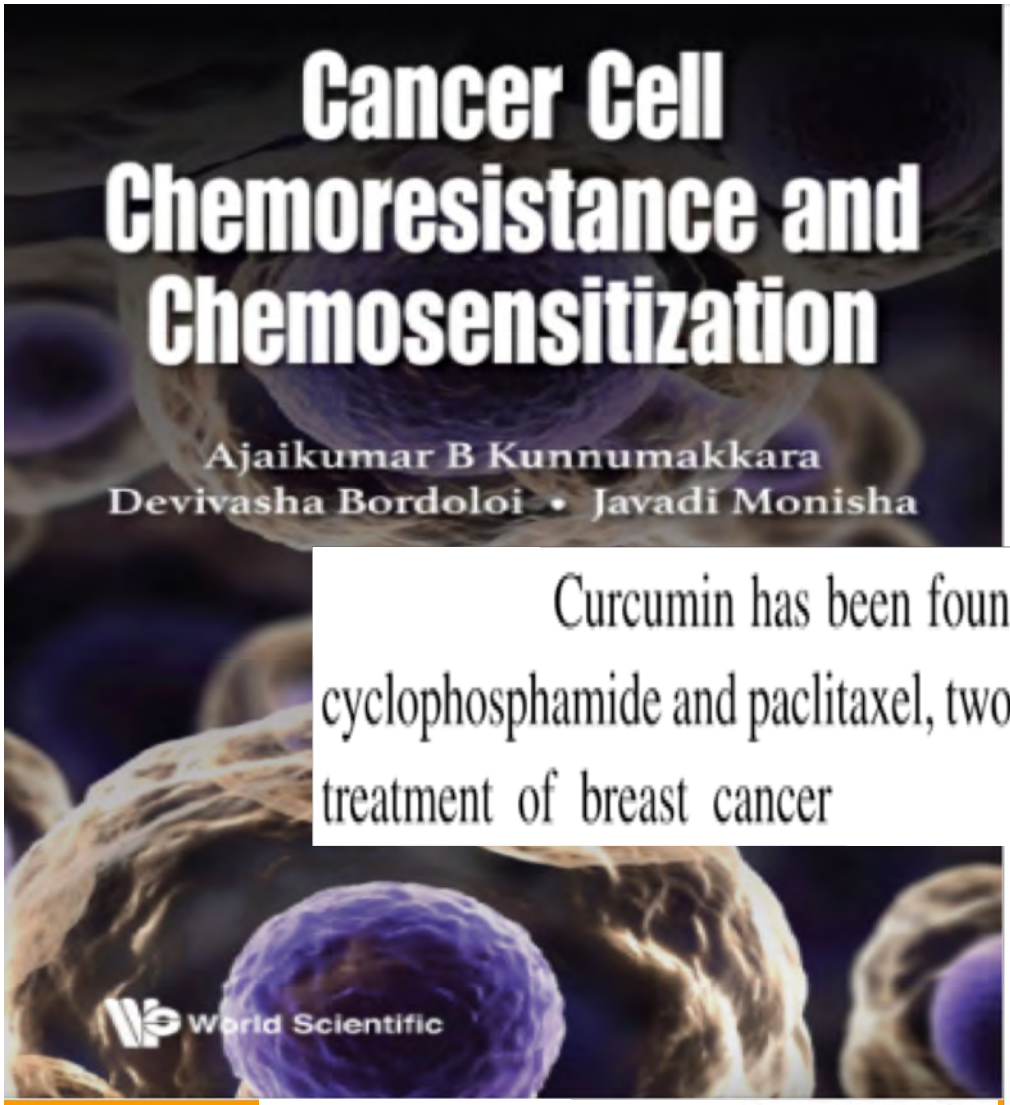
Laboratoire ... rg, Luxembourg

Curcumin is also described as an anti-tumoral, anti- oxidant and anti-inflammatory agent capable of inducing apoptosis in numerous cellular systems.

Abstract

Chemopr ... l to classical chemotherapy. Curcumin, one of the most studied chemopreventive agents, is a natural compound extracted from *Curcuma longa L.* that allows suppression, retardation or inversion of carcinogenesis. Curcumin is also described as an anti-tumoral, anti-oxidant and anti-inflammatory agent capable of inducing apoptosis in numerous cellular systems. In this review, we describe both properties and mode of action of curcumin on carcinogenesis, gene expression mechanisms and drug metabolism.

Keywords: Chemopreventive agent; Curcumin; Cancer; Apoptosis; Drug metabolism



ISBN 9789813208568

6

Phytochemicals as Chemosensitizers in Breast Cancer

ur, Ajurbo Mukherjee, jee and Jaydip Biswas

Curcumin has been found to sensitize breast cancer cells to cyclophosphamide and paclitaxel, two chemotherapeutic drugs used in the treatment of breast cancer

onset of adolescence, although. These are the mark of distinction on the upper ventral region of the woman and man, though these are more prominent in females (Javed and Lteif, 2013). Breast tissues are mainly classified as glandular and stromal tissues, of which glandular tissues are responsible for production of milk, whereas stromal tissues comprise the fatty and fibrous tissues of the breast. Stromal

*Author for correspondence: Madhumita Roy, Ph.D., Department of Environmental Carcinogenesis and Toxicology, Chittaranjan National Cancer Institute, Kolkata 700026, India. mitacnci@yahoo.co.in

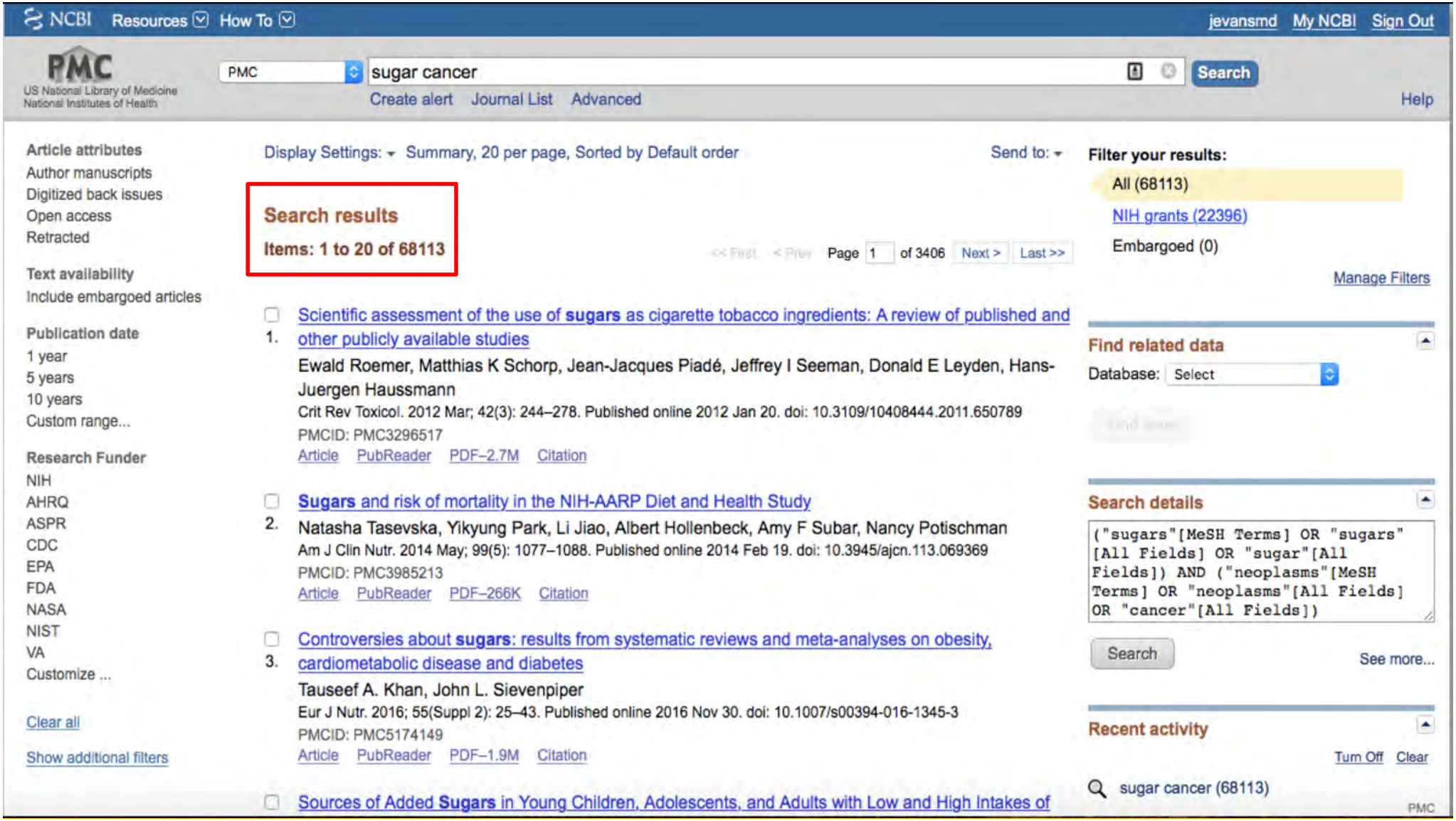
What I will discuss today

- Macronutrients
  - Carbohydrates – Whole Grains, Nuts, Fruits & Vegetables, ***Glycemic Regulation***

Sugar and Cancer

Is sugar really bad for cancer patients?

There are over 68,000 papers addressing that question on March 11, 2018!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Article attributes
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NIH
AHRQ
ASPR
CDC
EPA
FDA
NASA
NIST
VA
Customize ...
Clear all
Show additional filters
Display Settings: Summary, 20 per page, Sorted by Default order
Send to:
Search results
Items: 1 to 20 of 68113
<< First < Prev Page 1 of 3406 Next > Last >>
1. Scientific assessment of the use of sugars as cigarette tobacco ingredients: A review of published and other publicly available studies
Ewald Roemer, Matthias K Schorp, Jean-Jacques Piadé, Jeffrey I Seeman, Donald E Leyden, Hans-Juergen Haussmann
Crit Rev Toxicol. 2012 Mar; 42(3): 244–278. Published online 2012 Jan 20. doi: 10.3109/10408444.2011.650789
PMCID: PMC3296517
Article PubReader PDF–2.7M Citation
2. Sugars and risk of mortality in the NIH-AARP Diet and Health Study
Natasha Tasevska, Yikyung Park, Li Jiao, Albert Hollenbeck, Amy F Subar, Nancy Potischman
Am J Clin Nutr. 2014 May; 99(5): 1077–1088. Published online 2014 Feb 19. doi: 10.3945/ajcn.113.069369
PMCID: PMC3985213
Article PubReader PDF–266K Citation
3. Controversies about sugars: results from systematic reviews and meta-analyses on obesity, cardiometabolic disease and diabetes
Tauseef A. Khan, John L. Sievenpiper
Eur J Nutr. 2016; 55(Suppl 2): 25–43. Published online 2016 Nov 30. doi: 10.1007/s00394-016-1345-3
PMCID: PMC5174149
Article PubReader PDF–1.9M Citation
Sources of Added Sugars in Young Children, Adolescents, and Adults with Low and High Intakes of
Filter your results:
All (68113)
NIH grants (22396)
Embargoed (0)
Manage Filters
Find related data
Database: Select
Search details
("sugars"[MeSH Terms] OR "sugars"[All Fields] OR "sugar"[All Fields]) AND ("neoplasms"[MeSH Terms] OR "neoplasms"[All Fields] OR "cancer"[All Fields])
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See more...
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sugar cancer (68113)
PMC


I DON'T KNOW WHICH WORRIES ME MORE - TERRORISTS OR CARBOHYDRATES
WASSERMAN

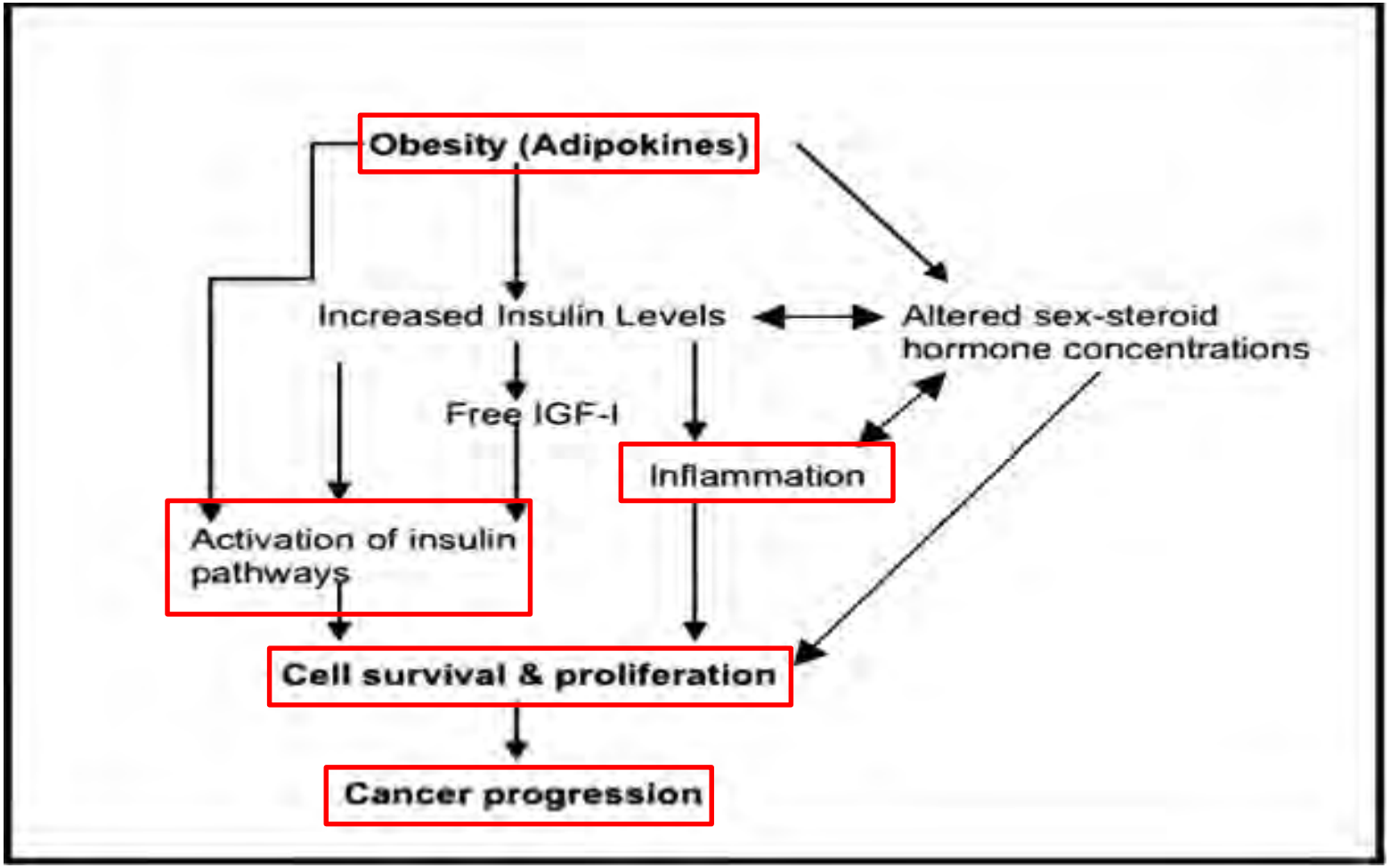
Cancer Cells and Sugar

- We know cancer cells need glucose for energy and survival.

- PET scans have shown that areas of tumor growth in the body have increased utilization and uptake of radioactive injected glucose.
  - Clinical applications of (18)F-FDG in oncology. J Nucl Med Technol 2002 Mar;30(1):3-9

Sugar, Insulin, IGF and Cancer

- Some carbohydrates, especially those devoid of fiber, have a higher "glycemic index", causing more insulin release. (www.glycemicindex.com)
- The more carbohydrate and sugar eaten, the higher the levels of insulin in the body.
- Obesity and lack of exercise also increase insulin and IGF levels.
- High levels of Insulin and IGF May Be CAUSATIVE for cancers of the breast, colon, prostate, endometrium and pancreas.
  - **Energy balance and cancer: the role of insulin and insulin-like growth factor-I.** Kaaks R., Proc Nutr Soc 2001 Feb;60(1):91-106
  - **Insulin-like growth factor (IGF)-I, IGF binding protein-3, and cancer risk: systematic review and meta-regression analysis.** Renehan et al.,Lancet. 2004 Apr 24;363(9418):1346-53



Annu. Rev. Nutr. 2012. 32:311–42

Figure 1

Potential underlying biological mechanism of obesity and cancer progression.

Review Article

Insulin Resistance and Cancer Risk: An Overview of the Pathogenetic Mechanisms

Biagio Arcidiacono,[1] Stefania Iiritano,[1] Aurora Nocera,[1] Katiuscia Possidente,[1] Maria T. Nevolo,[1] Valeria Ventura,[1] Daniela Foti,[1,2] Eusebio Chiefari,[1] and Antonio Brunetti[1,3]

[1] *Department of Health Sciences, Magna Græcia University of Catanzaro, Viale Europa (Località Germaneto), 88100 Catanzaro, Italy*
[2] *Clinical Pathology, Magna Græcia University of Catanzaro, Viale Europa (Località Germaneto), 88100 Catanzaro, Italy*
[3] *Endoc*

Corres

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Insulin re frequently
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like gr . Insulin and
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apopto n of reactive
oxygen possible that
the abundance of inflammatory cells in adipose tissue of obese and diabetic patients may promote systemic inflammation which can result in a protumorigenic environment. Here, we summarize recent progress on insulin resistance and cancer, focusing on various implicated mechanisms that have ow these mechanisms may contribute to cancer initiation and progression.

hyperinsulinaemia (a hallmark of insulin resistance) and the increase in bioavailable insulin- like growth factor I (IGF-I) appear to have a role in tumor initiation and progression in insulin-resistant patients

Exp Diabetes Res. 2012; 2012: 789174

REVIEW

Metabolic diseases and cancer risk

Malin H. Faulds and Karin Dahlman-Wright

Several in-vitro, animal and human epidemiological studies demonstrate that cancer development is promoted by high concentrations of insulin and insulin-like growth factors (IGFs) acting through the insulin/IGF axis

The incidence of breast cancer in individuals diagnosed with insulin resistance is also significantly greater than in healthy women with a relative risk of 3.6 for developing malignant tumors

Curr Opin Oncol. 2012 Jan;24(1):58-61

Fasting Insulin and Outcome in Early-Stage Breast Cancer: Results of a Prospective Cohort Study

By Pamela J. Goodwin, Marguerite Ennis, Kathleen I. Pritchard, Maureen E. Trudeau, Jarley Koo, Yolanda Madarnas, Warren Hartwick, Barry Hoffman, and Nicky Hood

Purpose: **Insulin, a member of a family of growth factors that includes insulin-like growth factor (IGF)-I and IGF-II, exerts mitogenic effects on normal and malignant breast epithelial cells, acting via insulin and IGF-I receptors. Because of this and because of its recognized association with obesity, an adverse prognostic factor in breast cancer, we examined the prognostic associations of insulin in early-stage breast cancer.**

J Clin Oncol 20(1):42-51, January 1, 2002

Fasting Insulin and Outcome in Early-Stage Breast Cancer: Results of a Prospective Cohort Study

By Pamela J. Goodwin, Marguerite Ennis, Kathleen I. Pritchard, Maureen E. Trudeau, Jarley Koo, Yolanda Madarnas, Warren Hartwick, Barry Hoffman, and Nicky Hood

Conclusion: Fasting insulin level is associated with outcome in women with early breast cancer. High levels of fasting insulin identify women with poor outcomes in whom more effective treatment strategies should be explored.

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Results: Fasting insulin was associated with distant recurrence and death; the hazard ratios and 95% confidence intervals (CI) for those in the highest (> 51.9 pmol/L) versus the lowest (< 27.0 pmol/L) insulin quartile were 2.0 (95% CI, 1.2 to 3.3)

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J Clin Oncol 20:42-51. © 2001 by American Society of Clinical Oncology.

J Clin Oncol 20(1):42-51, January 1, 2002

Med Oncol
DOI 10.1007/s12032-011-0109-4

ORIGINAL PAPER

Type 2 diabetes mellitus and prognosis in early stage breast cancer women

Muhammet Ali Kaplan · Zafer Pekkolay · Mehmet Kucukoner · Ali İnal · Zuhat Urakci · Hamza Ertugrul · Recai Akdogan · Ugur Firat · İsmail Yildiz · Abdurrahman Isikdogan

Received: 8 Septe

Median disease-free survival is 81 months (95% CI, 61.6–100.4) in non-diabetic patients and 36 months (95% CI, 13.6–58.4) in diabetic patients

Abstract It h
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free survival (DFS) following mastectomy for breast cancer patients. The cases included in this retrospective study were selected from breast cancer women who had undergone mastectomy and completed adjuvant chemotherapy from 1998 to 2010. Patients were classified into two groups: diabetic and non-diabetic. Patients' age, sex, menopausal status, body mass index (BMI), histo
gical features, tumor size, lymph node involvem
mone receptor and HER2-neu status, and treatment types

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diabetic patients ($P = 0.013$). Median disease-free survival is 81 months (95% CI, 61.6–100.4) in non-diabetic patients and 36 months (95% CI, 13.6–58.4) in diabetic patients ($P < 0.001$). The odds ratio of recurrence was significantly increased in those with HER2-neu overexpression and lymph node involvement and decreased with PR-positive
r results suggest that diabetes is an independent
factor for breast cancer.

Med Oncol. 2011 Nov 15.

The future on sugar and cancer…

Review Article

Targeting Sugar Uptake and Metabolism for Cancer Identification and Therapy: An Overview

Author(s): Marina Tanasova*, Vagarshak V. Begoyan, Lukasz J. Weselinski.

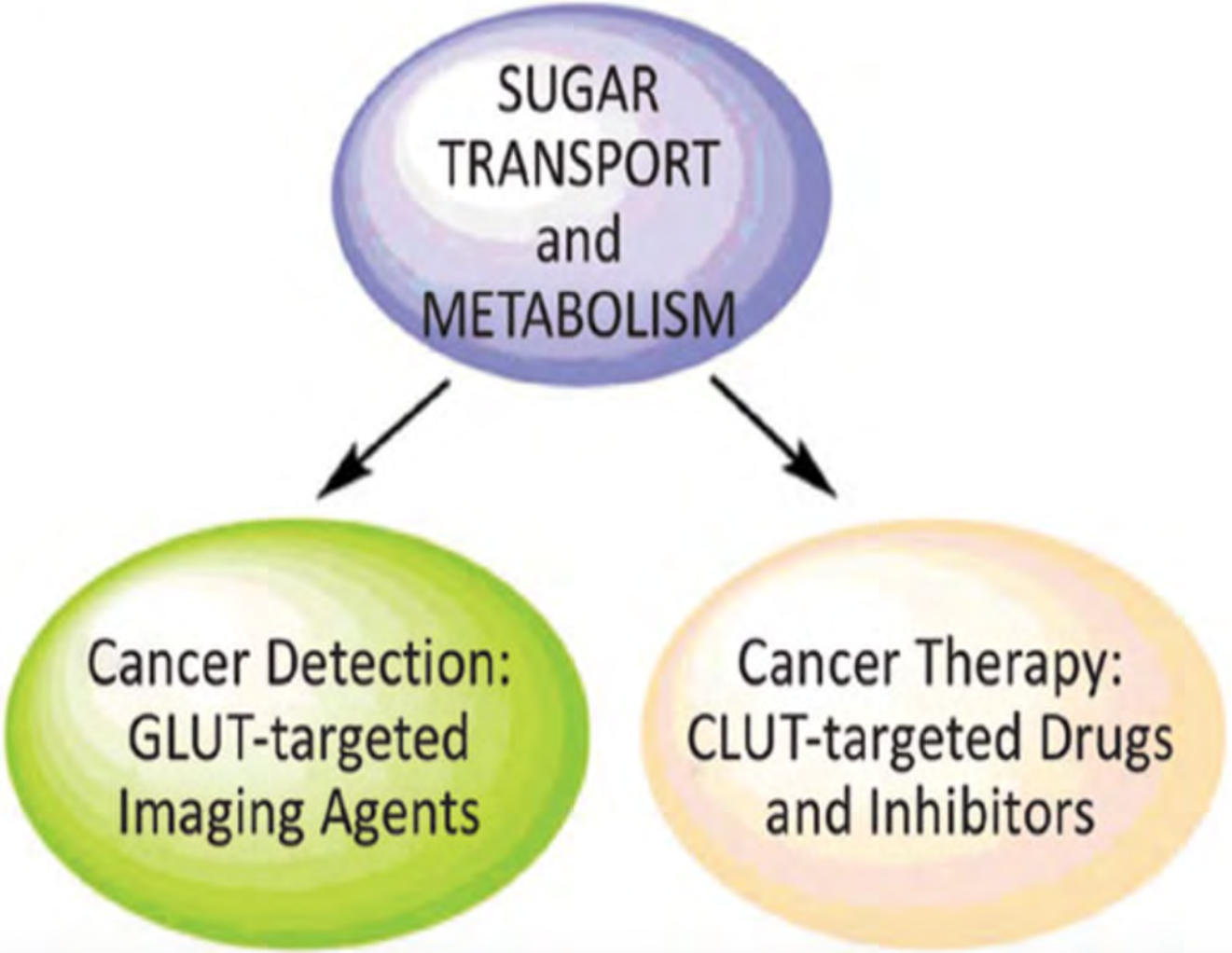
Journal Name: Current Topics in Medicinal Chemistry

Volume 18 , Issue 6 , 2018 **DOI** : 10.2174/1568026618666180523110837

Abstract:

Metabolic deregulations have emerged as a cancer characteristic, opening a broad avenue for strategies and tools to target cancer through sugar uptake and metabolism. High expression levels of sugar transporters in cancer cells offered glycoconjugation as an approach to achieve enhanced cellular accumulation of drugs and imaging agents, with the sugar moiety anchoring the bioactive cargo to cancer cells. On the other hand, high demand for sugar nutrients in cancers provided a new avenue to target cancer cells with metabolic or sugar uptake inhibitors to induce cancer cells starvation or death. This overview summarizes recent advances in targeting cancer cells through sugar transport for cancer detection and therapy.

Graphical Abstract:



Therefore I recommend that my patients….

- Achieve and Maintain *Healthy Weight*
- Eat a Low Glycemic Load Diet

  (www.glycemicindex.com)
- Know Hgb A1c, Fasting Insulin and Glucose

  Levels
- Include Daily Exercise to Improve Insulin Function

What I will discuss today

- The Relationship of Body Weight and Cancer
  - Incidence
  - Survival
- Inflammation
- Macronutrients
  - Carbohydrates – Whole Grains, Nuts, Fruits & Vegetables, Glycemic Regulation
- Acid/Base Balance

Acid-Base Balance and Cancer

- Cancer cells DO create acid and live in an acidic microenvironment.
- The body's normal healthy pH is alkaline
- The SAD is acid producing, mostly from grains, meat, cheese, milk, yogurt and eggs.
- The body must compensate for the acid load of the diet by leaching calcium and magnesium from bones (Contributes to osteoporosis).

– Sebastian et al., Am J Clin Nutr. 2002 Dec;76(6):1308-16

Examining the relationship between diet-induced acidosis and cancer

Acidity is a well known factor associated with cancer. Lower pH levels in the extracellular space promote the invasive and metastatic potential of cancer cells [5-14]. Extracellular acidity is mostly generated by tumor cells due to upregulated proton [H^+] and lactic acid

This phenomenon is distinct from 'acidity' caused by a net-acid diet. A net-acid diet or acidogenic diet is determined by the balance between acid and base-forming dietary constituents. Most fruits and vegetables are net-base producing foods

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balance and discusses the potential consequences of diet-induced acidosis and cancer occurrence or progression.

Nutrition & Metabolism 2012, **9**:72

Examining the relationship between diet-induced acidosis and cancer

Ian Forrest Robey[1*]
[*] Corresponding author
Email: robeyi@email.arizona.edu

[1] Arizona Respiratory Center, University of Arizona, 1501 N. Campbell Ave., Suite 2349, PO Box 245030, Tucson, Arizona 85724, USA

Abstract

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Specifically, persistent acidogenic diets have the potential to cause small decreases in blood pH and plasma bicarbonate, but not beyond the normal physiological range.

Nutrition & Metabolism 2012, **9**:72

Examining the relationship between diet-induced acidosis and cancer

Ian Forrest Robey[1*]
[*] Corresponding author
Email: robeyi@email.arizona.edu

Ave.,

Acid-base balance in the body influences adrenal hormone production of cortisol. When bicarbonate [HCO3-] levels are low the kidneys …trigger cortisol production. Dietary induction of acidosis increases serum cortisol concentrations

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cortisol signaling may exert biological influence on existing (prostate, breast, colon) tumors.

Nutrition & Metabolism 2012, **9**:72

The Center for Functional Medicine

Acid and Alkaline Food Diet Sheet

The body works best on a diet high in alkaline-forming foods those-foods which give Alkaline elements when broken down by digestion. A diet which contains 70%- 80% Alkaline-Forming foods is ideal for healthy living.

Common Foods To Avoid When Beginning To Alkalinize The Body. These Are High In ACID – 20-30% Of Diet Only

Acid Meats	Acid Vegetables	Acid Fruits	Acid Nuts and Grains
Red Meat	**Tomatoes**	Sour Fruits	Nut Oils
White Meats	**Potatoes**	**Strawberries**	Brown Rice
Fish	Artichokes	Cranberries	**Wheat**
Shell Fish	All dried beans	All preserved Fruit	Barley
Eggs	Asparagus	Sulphur covered dried fruit	Oats
Misc. Acid	Brussel sprouts	Olives	Walnuts
Rx Medications	Lentils	Blue Berries	Wild Rice
Cigarettes	**Egg Plants, Bell Peppers**		
Stress	Uncooked Onions		

Acid Beverages	Acid Dairy Products	Miscellaneous Acid Food	Acid Sugar
Coffee	Butter	Maple Syrup	**All Sugars**
Cocoa	**Milk**	Spices (curry)	
Sugared Based Sodas	Cream	Mayonnaise	
Alcohol	Cheese	Vinegar	

These Foods Can Be Eaten Freely They Are
ALKALINE Forming – 70-80% Of Diet

Vegetables
All are alkaline
Except those that
are listed above

Fruits
Apples
Ripe Bananas
Citrus Fruits
Dates
Peaches

Fruits
Apricots
Avocadoes
Pears
Pineapple
Papaya

Fruits
Grapes
Cherries
Melons
Mangoes

Miscellaneous
-Soy and Tofu
Eat in Moderation
-Cooked Onions are
Alkaline
-Honey

Nuts Grains
Almonds
Chestnuts Roasted
Millet
Buckwheat
Corn on Cob (1st 24 hours)

Beverages
Herb Teas
Black Tea
Coffee Substitute
Water Water Water

Dairy Products
Buttermilk
Whey

1011 High Ridge Road
Stamford, Connecticut 06905
T. 203.321.0200 F.203.321.0300
www.centerforwomenshealth.com

What I will discuss today

- The Relationship of Body Weight and Cancer
  - Incidence
  - Survival
- Inflammation
- Macronutrients
  - Carbohydrates – Whole Grains, Nuts, Fruits & Vegetables, Glycemic Regulation
- Acid/Base Balance

What about alcohol?

AACR
American Associat
for Cancer Researc

ndation.org |

Donate

Get a Copy

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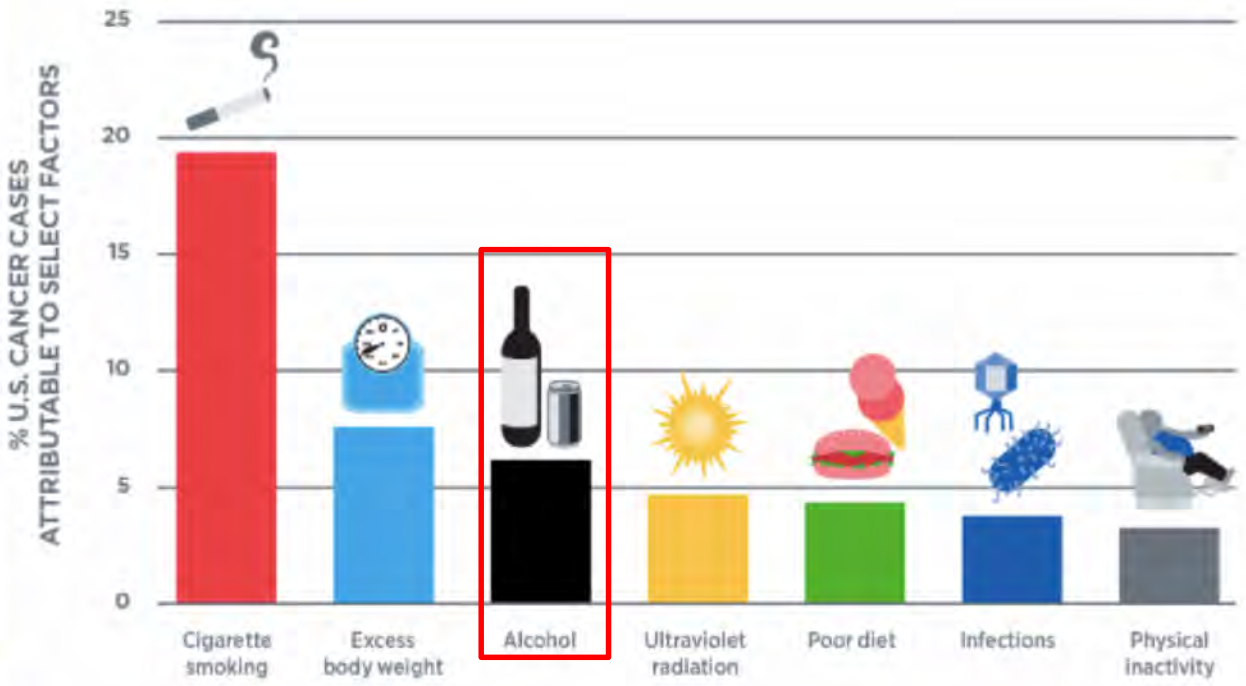
HARNESSING RES

FIGURE 3 **RISKY BUSINESS**

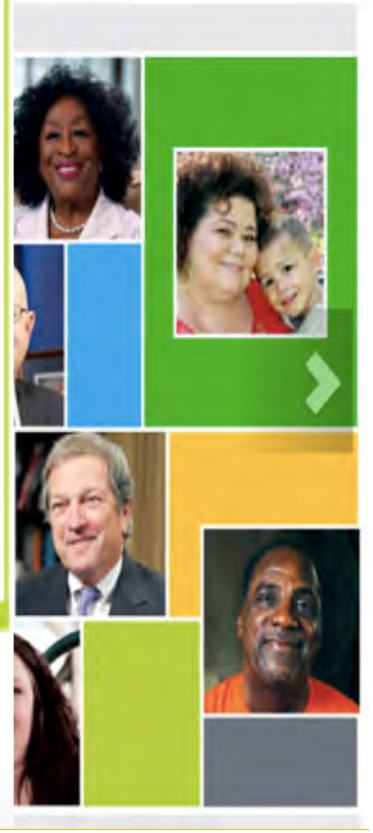


Research has identified numerous factors that increase an individual's risk for developing cancer. By modifying behavior, individuals can eliminate or reduce many of these risks and thereby reduce their risk of cancer.

Developing and implementing additional public education and policy initiatives could help further reduce the burden of cancers related to preventable cancer risk factors.

Adapted from (39).

American Association for Cancer Research (AACR) Cancer Progress Report 2018



World Cancer Research Fund

American Institute for Cancer Research

CUP Continuous Update Project

Analysing research on cancer prevention and survival

Limit alcohol consumption

For cancer prevention, it's best not to drink alcohol

Diet, nutrition, physical activity and **breast cancer survivors**

2014

Revised 2018

Journal of Global Oncology®
An American Society of Clinical Oncology Journal
OPEN ACCESS
Issue: 4 Supplement: 2 Page 124s Oct 2018

Strategy/Tactics: Overarching message: "Drinking alcohol increases your risk of developing cancer. Drink less to reduce the risk". Each day a target audience and message was identified:

Monday: Women – 1 in 8 breast cancers are caused by alcohol

TRACK 1 – MOTIVATING PRE

Ireland Takes Action on Alcohol and Cancer

A. Lyng[1], T. McCarthy*[1], R. Glynn[2], S. Costello[34], A. Harte[5], F. Bonas[1], ...

Abstract

What to do with all of this information..

Share it individually or in groups

THE JOURNAL OF ALTERNATIVE AND COMPLEMENTARY MEDICINE
Volume 00, Number 00, 2018, pp. 1–8

DOI: 10.1089/acm.2018.0154

JACM

Lifestyle Medicine-Focused Shared Medical Appointments to Improve Risk Factors for Chronic Diseases and Quality of Life in Breast Cancer Survivors

Conclusions: Breast cancer survivors could employ the prescribed lifestyle modifications to produce clinically relevant health benefits. Interdisciplinary teams of healthcare professionals may help breast cancer survivors with chronic diseases implement evidence-based, individualized, and effective lifestyle prescription through group medical visits.

Nutrition & Cancer Summary:

- Normalize insulin levels, eat proper portion sizes and strive to achieve healthy weight.
- Consume a low glycemic load diet, avoid sugar-laden foods and refined grain products.
- Enjoy a high intake (10/d) of colorful fruit and vegetables.
- Eat more fiber!
- Consume mercury free fish as a source of omega 3's.
- Eat less meat, animal fat and dairy products (alkaline diet), but eat grass fed, ethically slaughtered free range chicken and beef when you do.
- Organic foods when possible to avoid unsafe pesticides & hormones (www.ewg.org).
- Eliminate or Reduce Alcohol

Science goes back to table on how diet links to cancer risk

Posted 8/5/2006 9:11 PM ET

By Liz Szabo, USA TODAY

ATLANTA — Doctors have known for years that healthful diets help prevent heart disease.

But proving th sor at the Harvard Scho ty of Clinical Oncology.

"If you are 50 years old and have a cancer diagnosis and you suddenly start eating well, that is not going to do anything," says Barrie Cassileth, chief of integrative medicine at New York's Memorial Sloan-Kettering Cancer Center, who will speak about nutrition at the meeting today.

Scientists lon ds and fish, have lower cancer rates than those in countries whose diets are dominated by fats and red meat, Willett says.

Recent studies, however, have dashed hopes for a variety of proposed anti-cancer strategies: reducing fat to prevent breast cancer, increasing fiber to ward off colon tumors and filling up on fruits and vegetables to avoid cancer in general, Willett says. These studies are convincing because they followed participants over time and in some cases randomly assigned people to follow particular diets.

Adoption of a Plant-Based Diet by Patients with Recurrent Prostate Cancer

Jacquelyn Y. Nguyen, MD, Jacqueline M. Major, MS, Cynthia J. Knott, MS, RD, Karen M. Freeman, MPH, Tracy M. Downs, MD, and Gordon A. Saxe, MD, PhD

The Western diet has been associated with prostate cancer incidence as v
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in the rate of PSA rise. A pre-post design was employed in which each patient served as his own control. In this multifaceted intervention, patients and their spouses were encouraged to adopt and maintain a plant-based diet. The prestudy rate of PSA rise (from the time of posttreatment recurrence to the start of the study) was ascertained by review of patients' medical records. Die
were performed and prostate-specific an
ascertained at baseline, prior to the start of intervention.

*Keywords: prostate; prostatic neoplasms; prostate-specific anti-
; plant-based diet;
d alternative med-*

intriguing possibility that diet may play an important, relatively immediate, biological role in the progression of prostate cancer and may also have therapeutic potential in the management of recurrent disease.

mmonly occur-
among men in
tes, 1 man in 6
will develop prostate cancer in his lifetime.[1] Most patients who present with prostate cancer receive definitive primary treatment consisting of either surgical removal of the prostate (radical prostatectomy [RP]), radiation therapy to the prostate (RT), or surgical removal followed by radiation to the prostatic bed or
reatment, about one third of patients
will have a biochemically defined recurrence, marked

Integr Cancer Ther. 2006 Sep;5(3):214-23

So we have to choose what we believe…

This….

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Or this…

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occurrence or progression.

Dietary intake exists as the largest external or environmental epigenetic factor capable of driving the development or maintenance of cancer.

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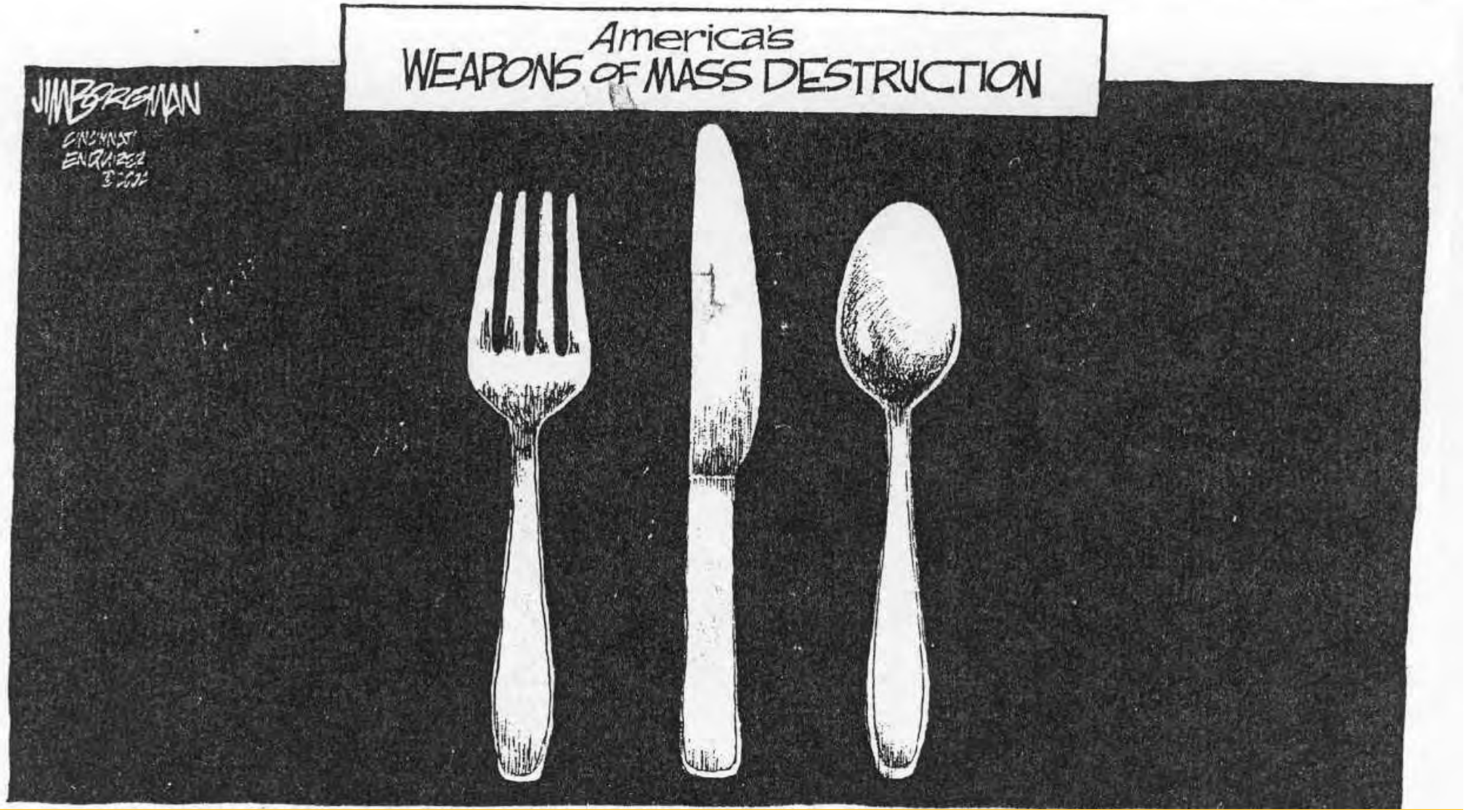
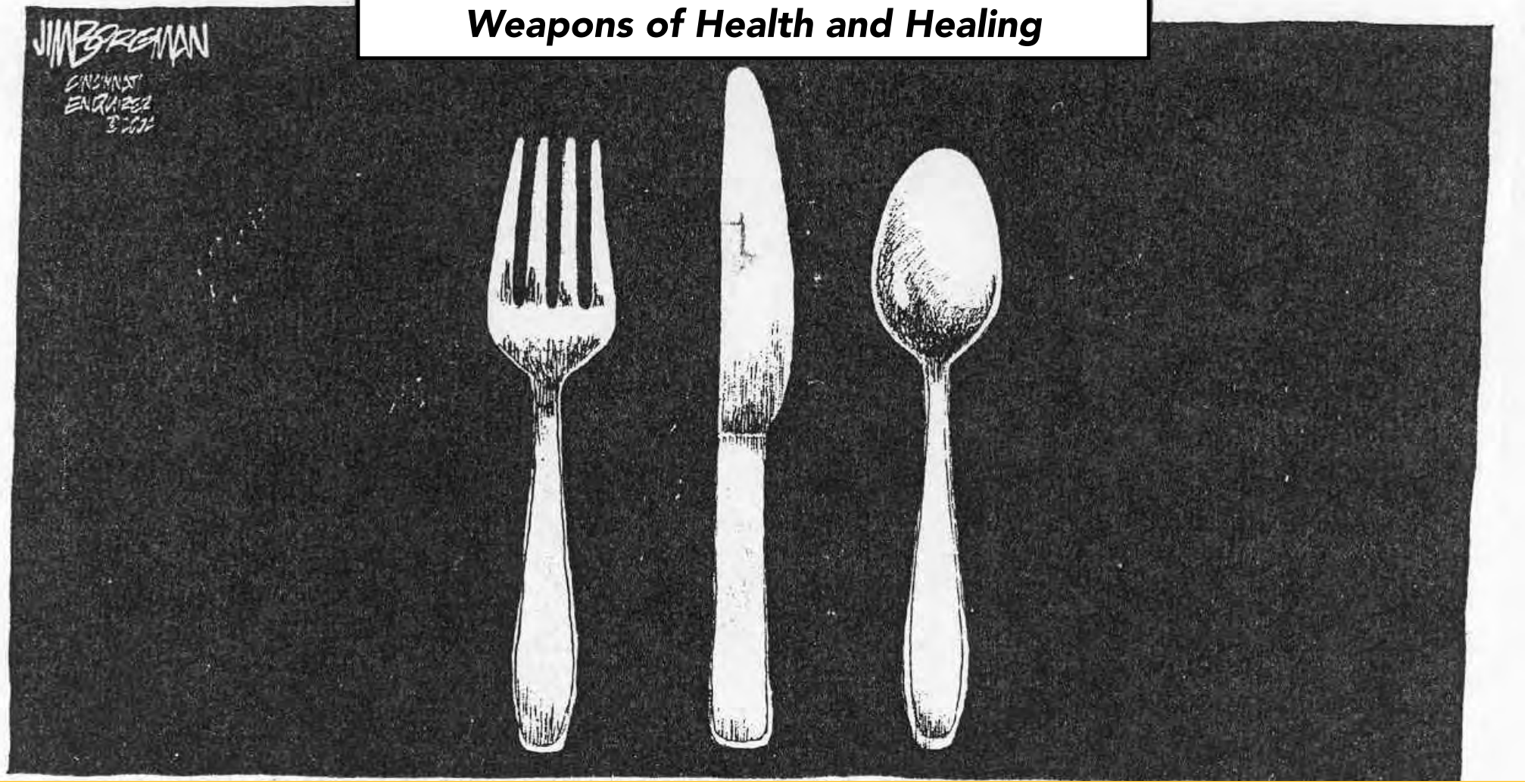
Nutrition & Metabolism 2012, **9**:72

Now you know why this slide…


America's
WEAPONS OF MASS DESTRUCTION
JIM BORGMAN
CINCINNATI ENQUIRER

Really Means…

America's
Weapons of Health and Healing



"If **I** have seen further it is because **I** have stood on the shoulders of giants."

Sir Isaac Newton

Dr. Jim Gordon

Center for Mind/Body Medicine

CMBM

Webinar Series

This webinar has been recorded. The presentation and the slides will be available within 24 hours at CMBM.org/webinar.

e New Frontier of Healthcare: Medical Cannabis

with Laura Lagano
S RDN Integrative Clinical Nutritionist

Thursday, November 15
12 PM EST/9 AM PST

Register at cmbm.org/webinar

Food As Medicine for Women's Health

May 19 – 24, 2019
Esalen Institute
Big Sur, CA


Kathie Madonna Swift, MS, RDN, LDN


James S. Gordon, MD


Amy Shinal, MSW, LCSW


Catherine McConkie, NC


Cindy Geyer, MD


Aviva Romm, MD

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