

Dietary Fats and Cardiovascular Disease

A Presidential Advisory From the American Heart Association

ABSTRACT: Cardiovascular disease (CVD) is the leading global cause of

Frank M. Sacks, MD

“ . . . *Replacement of saturated with unsaturated fats lowers low-density lipoprotein cholesterol, a cause of atherosclerosis*, linking biological evidence with incidence of CVD in populations and in clinical trials. Taking into consideration the totality of the scientific evidence, satisfying rigorous criteria for causality, we conclude strongly that lowering intake of saturated fat and replacing it with unsaturated fats, especially polyunsaturated fats, will lower the incidence of CVD.”

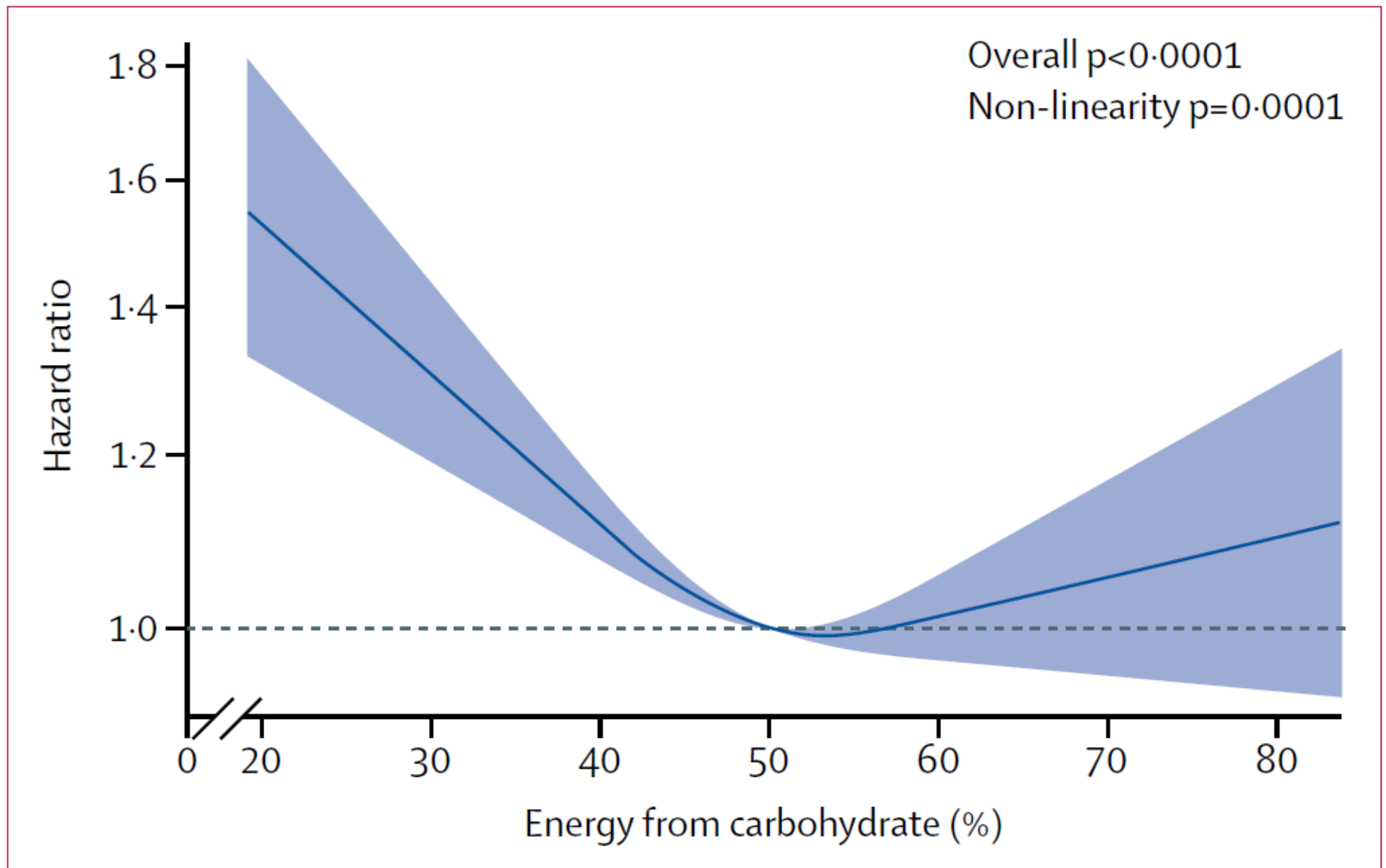
intake of saturated fat and replacing it with unsaturated fats, especially polyunsaturated fats, will lower the incidence of CVD. This recommended shift from saturated to unsaturated fats should occur simultaneously in an overall healthful dietary pattern such as DASH (Dietary Approaches to Stop Hypertension) or the Mediterranean diet as emphasized by the 2013 American Heart Association/American College of Cardiology lifestyle guidelines and the 2015 to 2020 Dietary Guidelines for Americans.

Circulation. 2017;135

High Protein Diet



Dietary carbohydrate intake and mortality: a prospective



consumption ($>70\%$) conferred greater mortality risk than did moderate intake, which was consistent with a U-shaped association (pooled hazard ratio 1.20, 95% CI 1.09–1.32 for low carbohydrate consumption; 1.23, 1.11–1.36 for high carbohydrate consumption). However, results varied by the source of macronutrients: mortality increased when

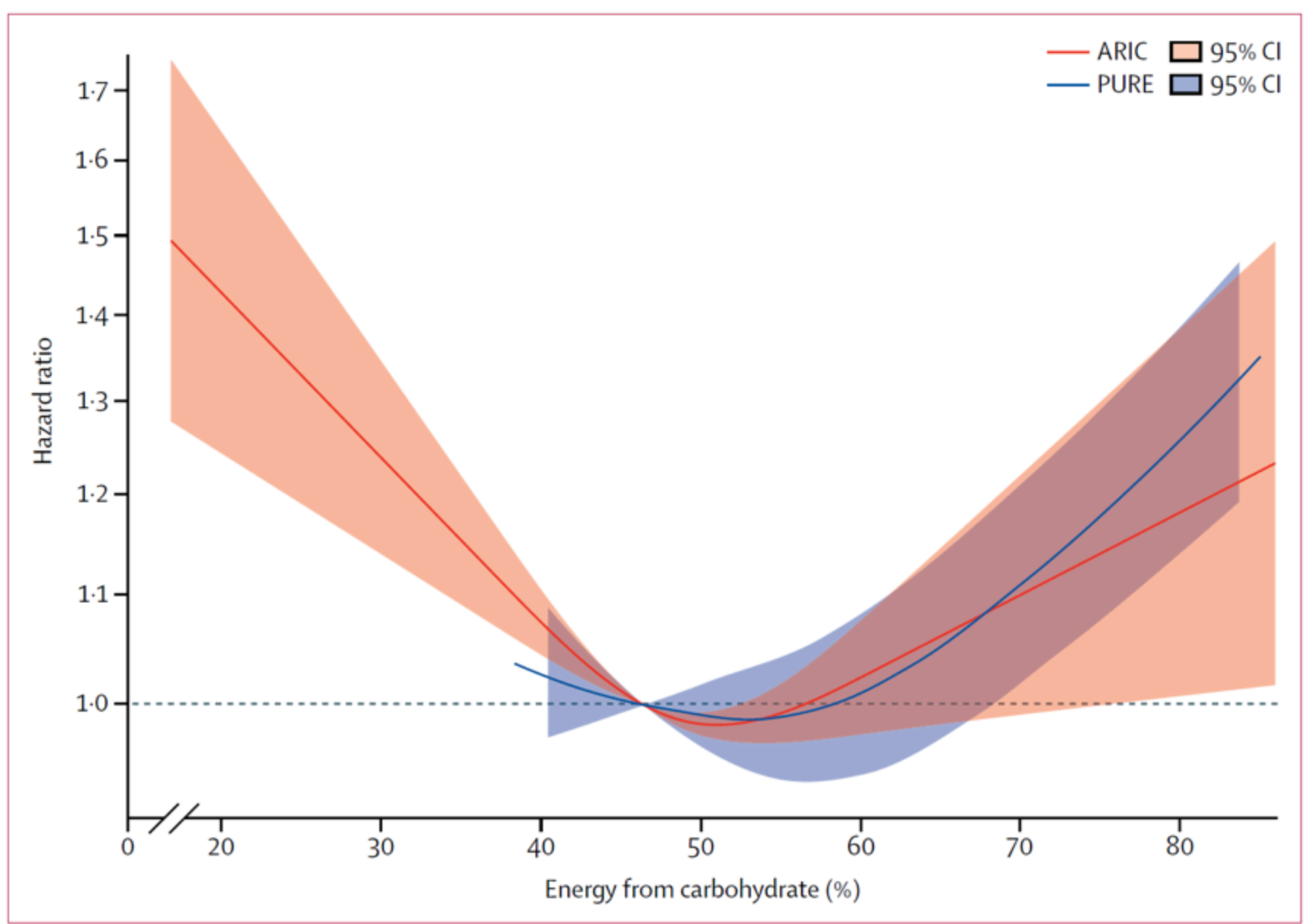
A Mortality in low vs moderate carbohydrate groups

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Energy from carbohydrate (%)

Low-Carbohydrate Systemic Studies

Hiroshi Noto

1 Department of Diabetes Research Center

Abstract

Objective: Low-carbohydrate diet to control weight and prevent disease (CVD)

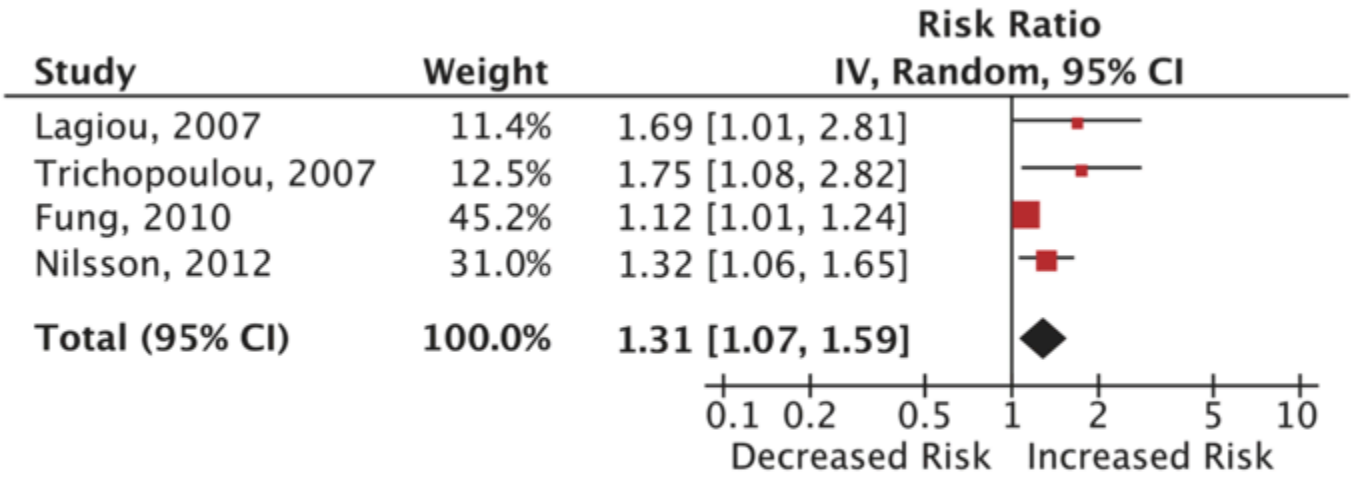
Data sources: PubMed as of September 2012

Review methods: Meta-analysis. Pooled risk ratios were calculated

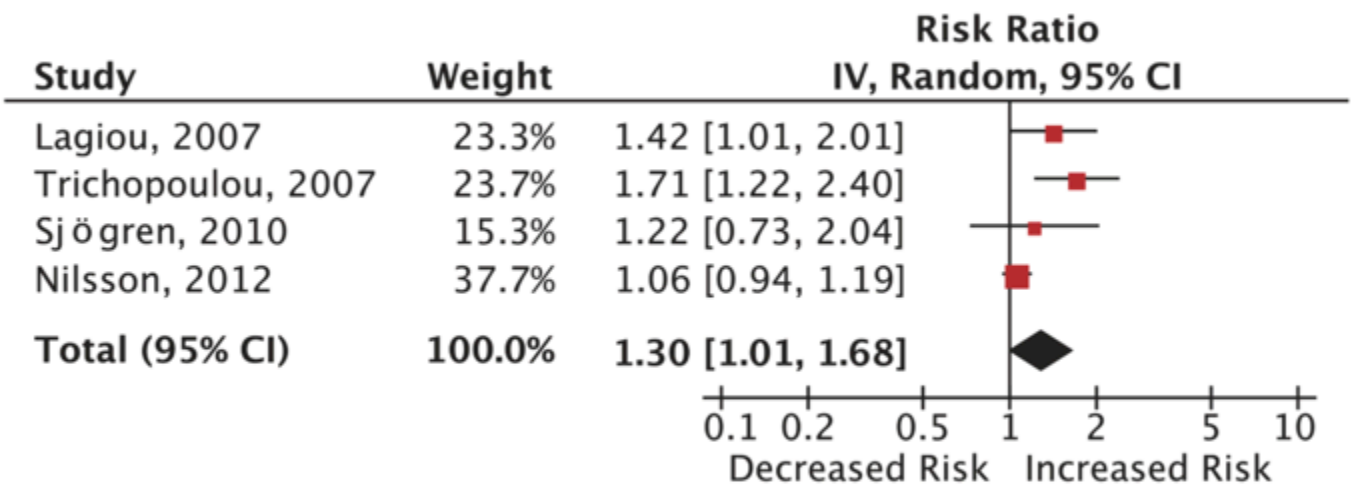
Results: We included 4 studies in 4 countries. The risk of all-cause mortality was 1.31 (1.07, 1.59) for incident CVD incidence. Analyses using

Conclusion: Low-carbohydrate diet significantly reduced mortality and morbidity. Further studies and meta-analyses are needed.

(A) Low-carbohydrate score



(B) Low-carbohydrate / high-protein score



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Low Carbohydrate Diet From Plant or Animal Sources and Mortality

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“An increase in adherence to an animal-based LCD prospectively assessed from the pre- to post-MI period was associated with higher all-cause mortality and cardiovascular mortality (hazard ratios of **1.30** [95% CI: 1.03 to 1.65] for **all-cause mortality** and **1.53** [95% CI: 1.10 to 2.13] for **cardiovascular mortality** comparing extreme quintiles). An increase in adherence to a plant-based LCD was not associated with lower all-cause or cardiovascular mortality”

[95% CI: 1.03 to 1.65] for all-cause mortality and 1.53 [95% CI: 1.10 to 2.13] for cardiovascular mortality comparing extreme quintiles). An increase in adherence to a plant-based LCD was not associated with lower all-cause or cardiovascular mortality.

Conclusions—Greater adherence to an LCD high in animal sources of fat and protein was associated with higher all-cause and cardiovascular mortality post-MI. We did not find a health benefit from greater adherence to an LCD overall after MI. (*J Am Heart Assoc.* 2014;3:e001169 doi: 10.1161/JAHA.114.001169)

Key Words: low-carbohydrate diet • mortality • myocardial infarction • secondary prevention

ONLINE FIRST

Red Meat Consumption and Mortality

Results From 2 Prospective Cohort Studies

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Conclusions: Red meat consumption is associated with an increased risk of total, CVD, and cancer mortality. Substitution of other healthy protein sources for red meat is associated with a lower mortality risk.

Results: We documented 23 926 deaths (including 5910 CVD and 9464 cancer deaths) during 2.96 million person-years of follow-up. After multivariate adjustment for major lifestyle and dietary risk factors, the pooled hazard ratio (HR) (95% CI) of total mortality for a 1-serving-per-day increase was 1.13 (1.07-1.20) for unprocessed red meat and 1.20 (1.15-1.24) for processed red meat. The corresponding HRs (95% CIs) were 1.18 (1.13-

Conclusions: Red meat consumption is associated with an increased risk of total, CVD, and cancer mortality. Substitution of other healthy protein sources for red meat is associated with a lower mortality risk.

Arch Intern Med.

Published online March 12, 2012.

doi:10.1001/archinternmed.2011.2287

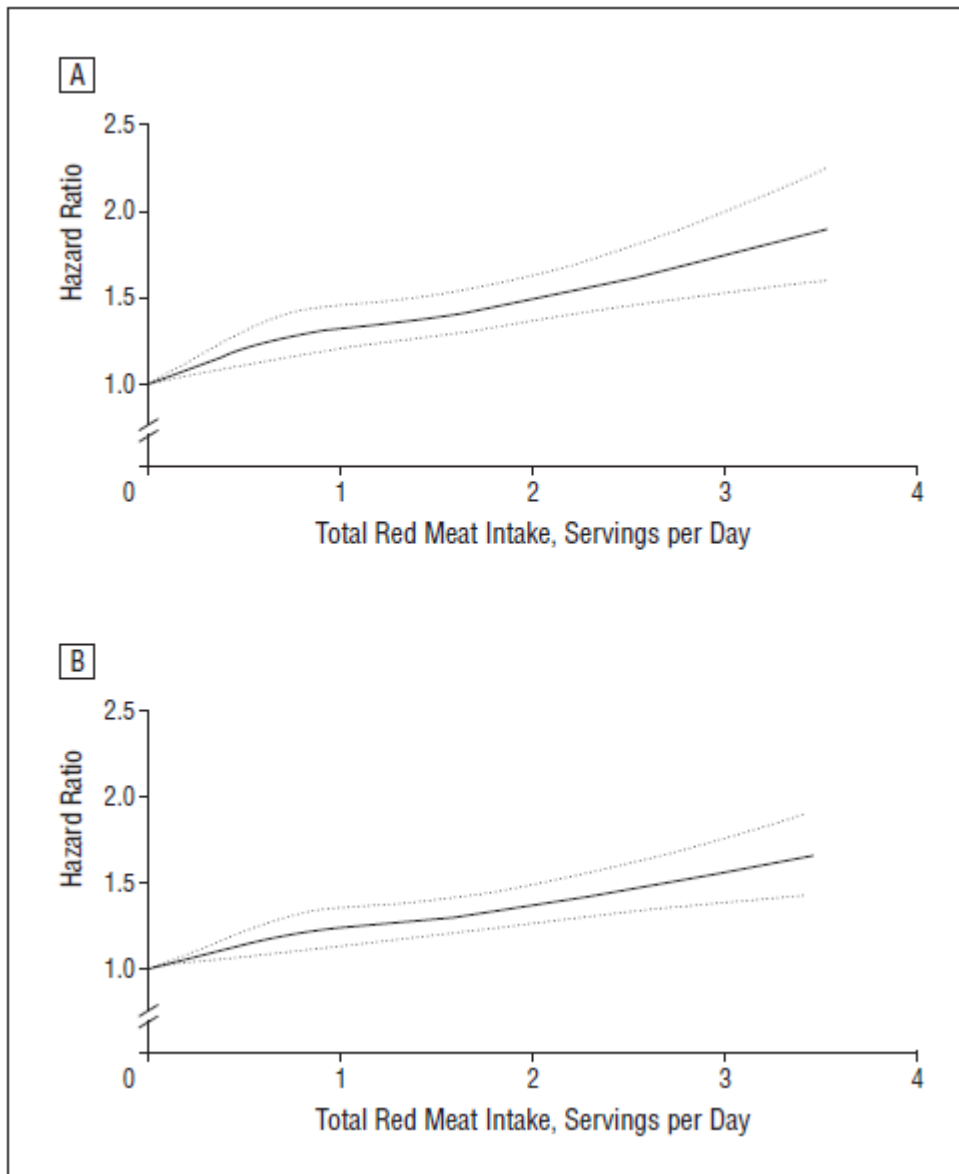
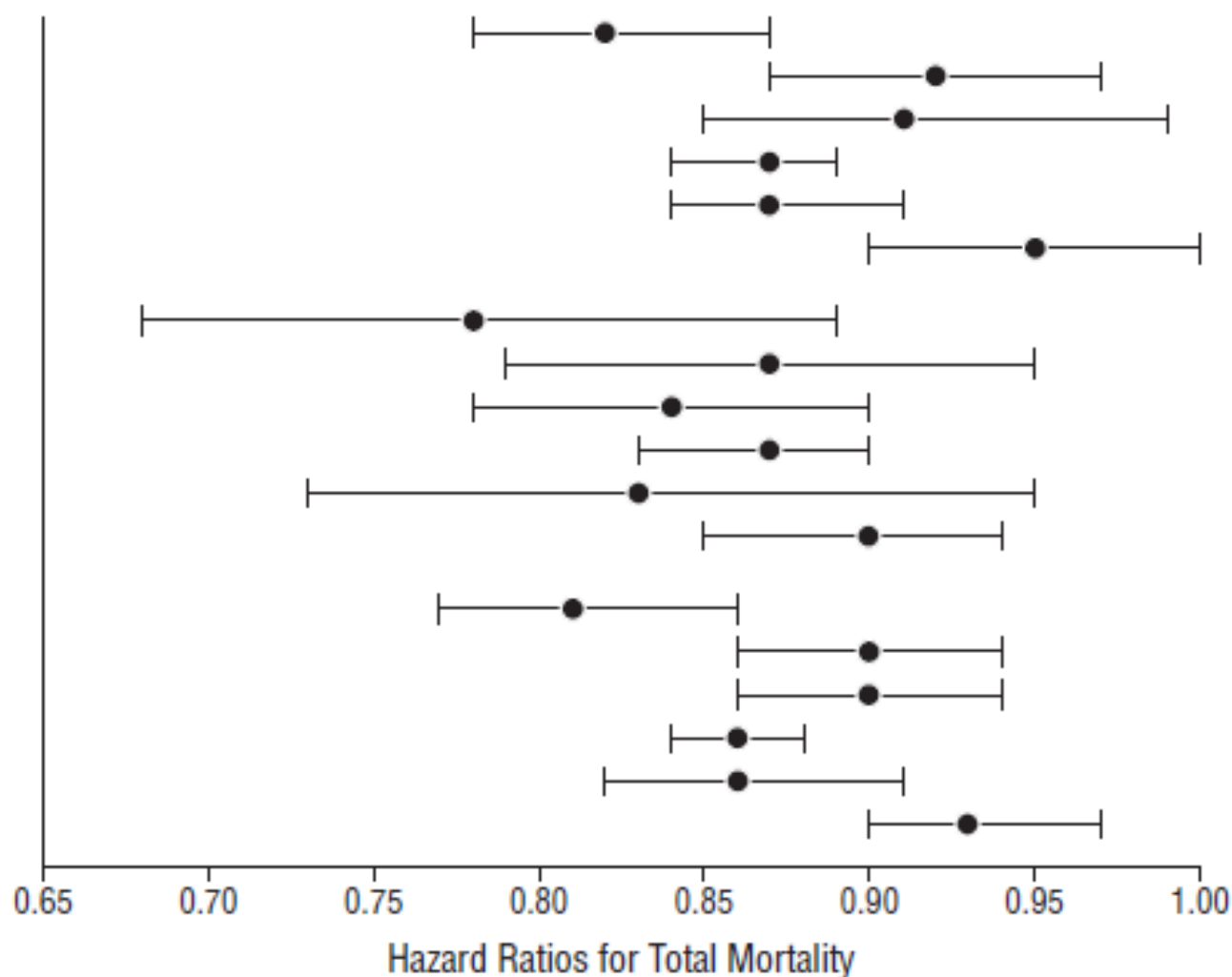


Figure 1. Dose-response relationship between red meat intake and risk of all-cause mortality in the Health Professionals Follow-up Study (A) and the Nurses' Health Study (B). The results were adjusted for age (continuous); body mass index (calculated as weight in kilograms divided by height in meters squared) category (23.0, 23.0-24.9, 25.0-29.9, 30.0-34.9, or 35); alcohol consumption (0, 0.1-4.9, 5.0-29.9, 30.0 g/d in men; 0, 0.1-4.9, 5.0-14.9, or 15.0 g/d in women); physical activity level (3.0, 3.0-8.9, 9.0-17.9, 18.0-26.9, or 27.0 hours of metabolic equivalent tasks per week); smoking status (never, past, or current [1-14, 15-24, or 25 cigarettes per day]); race (white or nonwhite); menopausal status and hormone use in women (premenopausal, postmenopausal never users, postmenopausal past users, or postmenopausal current users); family history of diabetes mellitus, myocardial infarction, or cancer; history of diabetes mellitus, hypertension, or hypercholesterolemia; and intakes of total energy, whole grains, fruits, and vegetables, all in quintiles. Broken lines represent 95% CI.

Nuts for unprocessed red meat
 Legumes for unprocessed red meat
 Low-fat dairy for unprocessed red meat
 Whole grains for unprocessed red meat
 Poultry for unprocessed red meat
 Fish for unprocessed red meat

 Nuts for processed red meat
 Legumes for processed red meat
 Low-fat dairy for processed red meat
 Whole grains for processed red meat
 Poultry for processed red meat
 Fish for processed red meat

 Nuts for total red meat
 Legumes for total red meat
 Low-fat dairy for total red meat
 Whole grains for total red meat
 Poultry for total red meat
 Fish for total red meat



Processed and Unprocessed Red Meat Consumption and Risk of Heart Failure

Prospective Study of Men

“Men who consumed ≥ 75 g/d processed meat compared with those who consumed < 25 g/d had a **1.28** (95% confidence interval, 1.10–1.48, P trend=0.01) higher risk of **HF incidence** and **2.43** (95% confidence interval, 1.52–3.88, P trend <0.001) higher risk of **HF mortality**.”

(95% confidence interval, 1.52–3.88, P trend <0.001) higher risk of HF mortality. The consumption of unprocessed meat was not associated with increased risk of incidence of HF or mortality from HF.

Conclusions—Findings from this prospective study of men with low to moderate red meat consumption indicate that processed red meat consumption, but not unprocessed red meat, is associated with an increased risk of HF. (*Circ Heart Fail.* 2014;7:552-557.)

Key Words: heart failure ■ processed meat ■ prospective cohort study ■ red meat

Association of Animal and Plant Protein Intake With All-Cause and Cause-Specific Mortality

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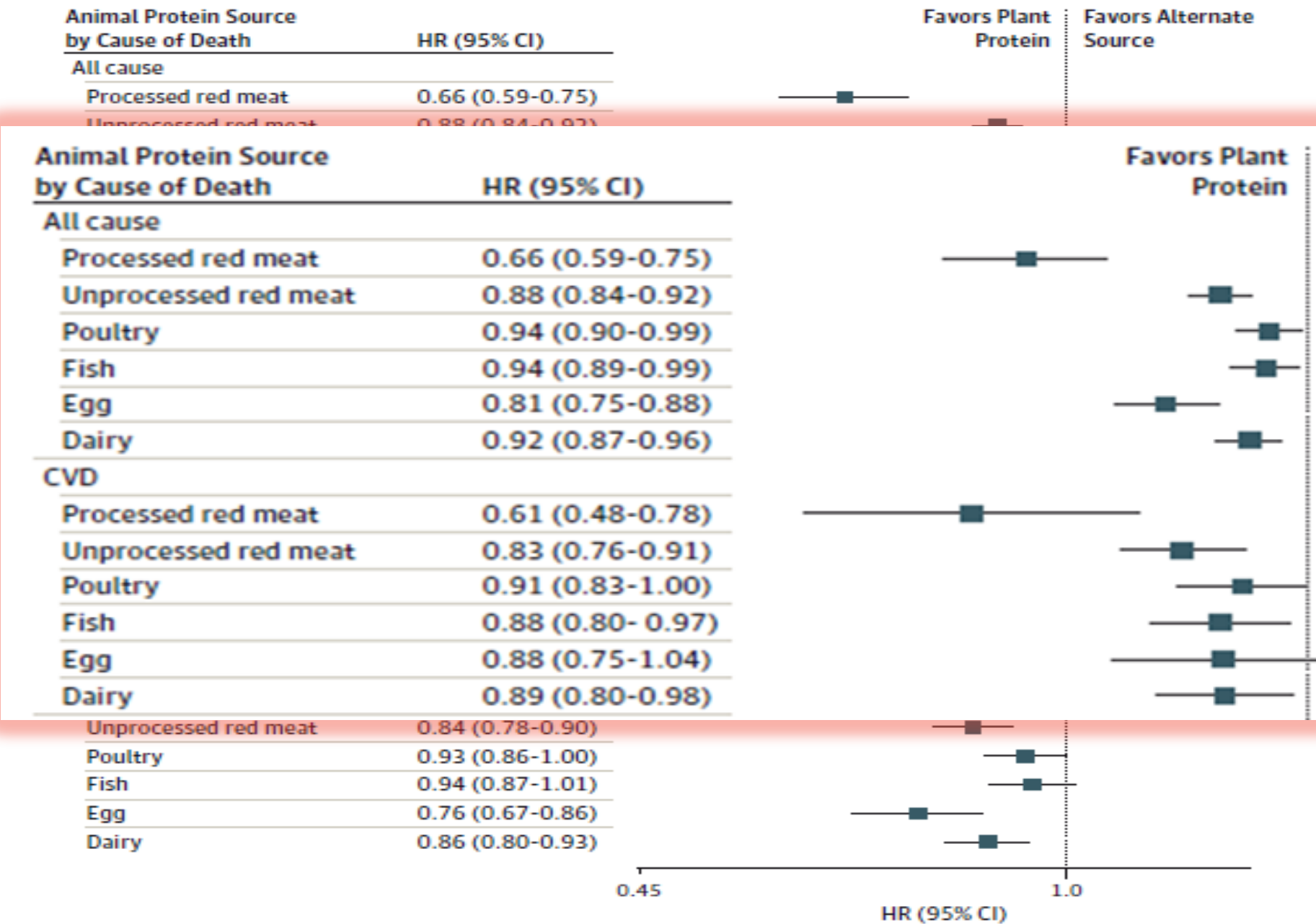
IMPORTANCE Defining what represents a macronutritionally balanced diet remains an open question and a high priority in nutrition research. Although the amount of protein may have specific effects, from a broader dietary perspective, the choice of protein sources will inevitably influence other components of diet and may be a critical determinant for the health outcome.

OBJECTIVE To examine the associations of animal and plant protein intake with the risk for mortality.

DESIGN, SETTING, AND PARTICIPANTS This prospective cohort study of US health care professionals included 131 342 participants from the Nurses' Health Study (1980 to end of follow-up on June 1, 2012) and Health Professionals Follow-up Study (1986 to end of follow-up on January 31, 2012). Animal and plant protein intake was assessed by regularly updated validated food frequency questionnaires. Data were analyzed from June 20, 2014, to January 18, 2016.

MAIN OUTCOMES AND MEASURES Hazard ratios (HRs) for all-cause and cause-specific mortality.

Figure. Risk for Mortality Associated With Replacement of 3% Energy From Various Animal Protein Sources With Plant Protein



Fish?

Ⓢ RUSH

B Total Mortality

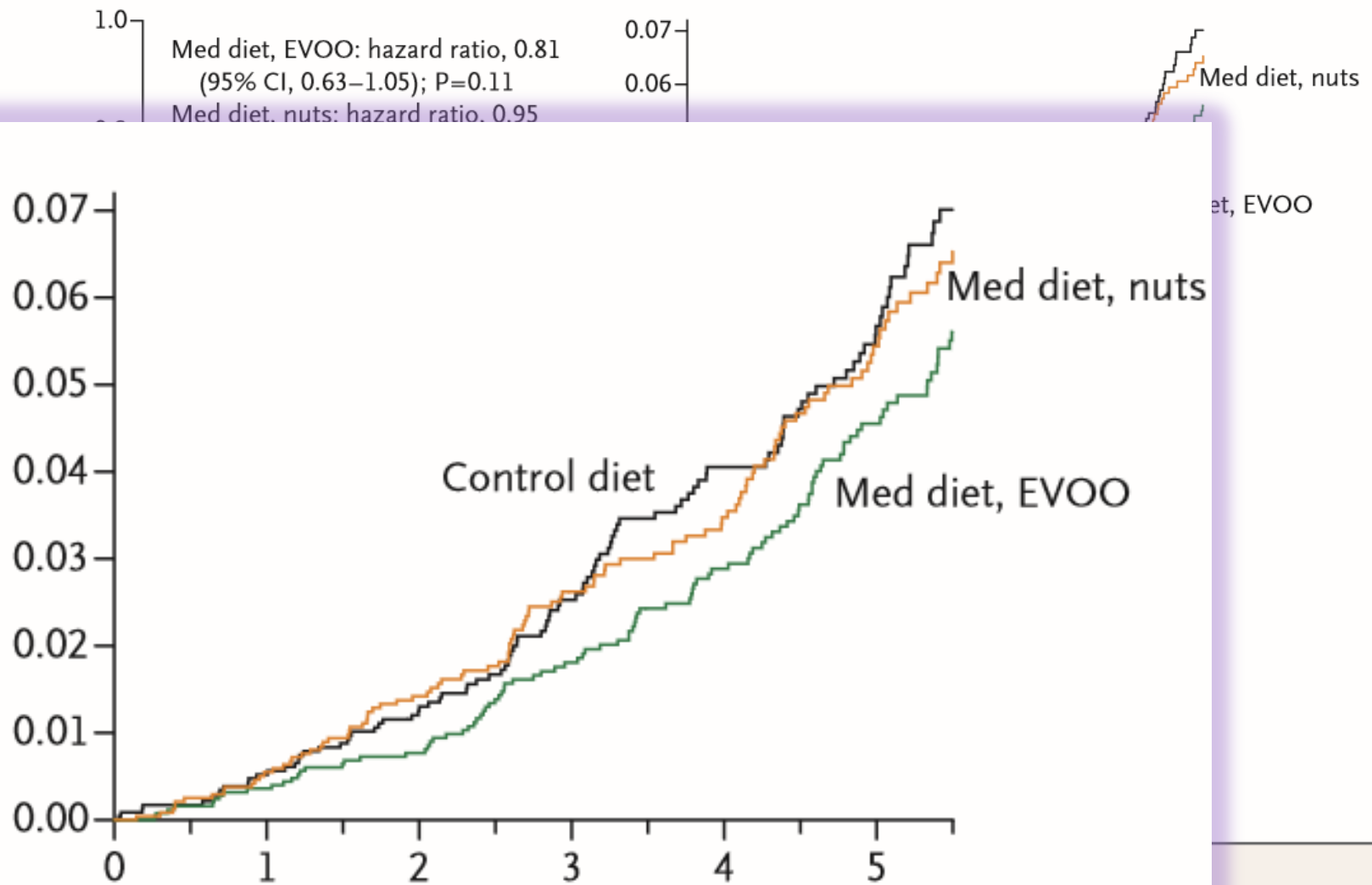


Figure 1.

Panel A shows the incidence of the primary end point (a composite of acute myocardial infarction, stroke, and death from cardiovascular causes), and Panel B shows total mortality. Hazard ratios were stratified according to center (Cox model with robust variance estimators). CI denotes confidence interval, EVOO extra-virgin olive oil, and Med Mediterranean.



A provegetarian food pattern and reduction in total mortality in the Prevención con Dieta Mediterránea (PREDIMED) study¹⁻⁴

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ABSTRACT

Background: Vegetarian diets have been associated with reduced mortality. Because a pure vegetarian diet might not easily be embraced by many individuals, consuming preferentially plant-derived foods would be a more easily understood message. A provegetarian food pattern (FP) emphasizing preference for plant-derived foods might reduce all-cause mortality.

Objective: The objective was to identify the association between an a priori-defined provegetarian FP and all-cause mortality.

Design: We followed 7216 participants (57% women; mean age: 67 y) at high cardiovascular risk for a median of 4.8 y. A validated 137-item semiquantitative food-frequency questionnaire was administered at baseline and yearly thereafter. Fruit, vegetables, nuts, cereals, legumes, olive oil, and potatoes were positively weighted. Added animal fats, eggs, fish, dairy products, and meats or meat products were negatively weighted. Energy-adjusted quintiles were used to assign points to build the provegetarian FP (range: 12–60 points). Deaths were confirmed by review of medical records and the National Death Index.

Results: There were 323 deaths during the follow-up period (76 from cardiovascular causes, 130 from cancer, 117 for noncancer, noncardiovascular causes). Higher baseline conformity with the provegetarian FP was associated with lower mortality (multivariable-adjusted HR for ≥ 40 compared with < 30 points: 0.59; 95% CI: 0.40, 0.88). Similar results were found with the use of updated information on diet (RR: 0.59; 95% CI: 0.39, 0.89).

Conclusions: Among omnivorous subjects at high cardiovascular risk, better conformity with an FP that emphasized plant-derived foods was associated with a reduced risk of all-cause mortality. This trial was registered at www.controlled-trials.com as ISRCTN35739639. *Am J Clin Nutr* 2014;100(suppl):320S–8S.

analysis of 5 prospective studies (10). Subsequently, a meta-analysis of 7 cohort studies confirmed a lower cardiovascular mortality in vegetarians, but inconsistent results for the association between vegetarian diets and death from any cause were found (11). More recently, a 5-y follow-up of the Adventist Health Study 2 cohort showed an overall association of vegetarian dietary patterns with lower mortality (12). Most available comparisons between vegetarians and nonvegetarians relied on a single measurement of diet at baseline, but dietary patterns may change over time and the length of exposure to vegetarianism may account for heterogeneity between results from different cohorts (10, 13, 14). In a pooled analysis of 5 cohort studies, vegetarian diets were inversely associated with CAD mortality, but when vegetarians were subdivided according to whether or not they had followed their current diet for ≥ 5 y, the cardiovascular benefits were confined only to those who had been vegetarian for > 5 y (15).

Given that in most cultures the proportion of true vegetarians is low, it would be interesting to examine whether moderate or intermediate approaches to a predominantly plant-based FP relate

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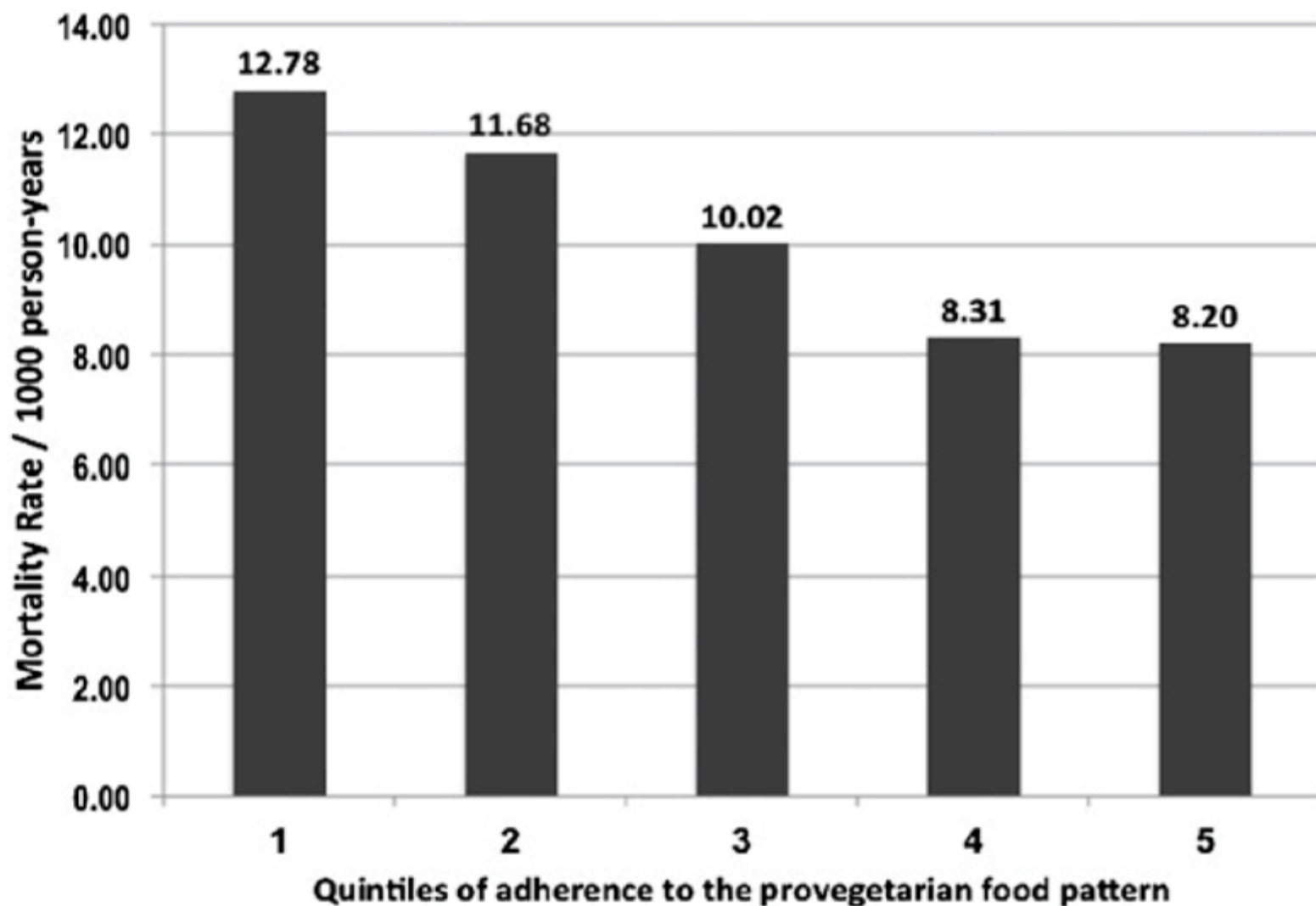


FIGURE 1. Absolute risk of death across baseline quintiles of the pro-vegetarian food pattern: the Prevención con Dieta Mediterránea trial, 2003–2010. Quintile score limits were as follows for quintiles 1–5: <33, 33–35, 36–37, 38–40, >40, respectively.

Dairy?

Ⓢ RUSH

Association of dairy intake with cardiovascular disease and mortality in 21 countries from five continents (PURE): a prospective cohort study

Mahshid Dehghan
Edelweiss Weirath
Khalid F Alhaddad
Lungiswa P Tlale
Karen Yeates
Rural Epidemiology

Summary
Background
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Evidence for
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Interpretation:

Dairy consumption was associated with lower risk of mortality and major cardiovascular disease events in a diverse multinational cohort.

Methods The Prospective Urban Rural Epidemiology (PURE) study is a large multinational cohort study of individuals aged 35–70 years enrolled from 21 countries in five continents. Dietary intakes of dairy products for 136 384 individuals were recorded using country-specific validated food frequency questionnaires. Dairy products comprised milk, yoghurt, and cheese. We further grouped these foods into whole-fat and low-fat dairy. The primary outcome was the composite of mortality or major cardiovascular events (defined as death from cardiovascular causes, non-fatal myocardial infarction, stroke, or heart failure). Hazard ratios (HRs) were calculated using multivariable Cox frailty models with random intercepts to account for clustering of participants by centre.

50140-6736(18)31945-7

*Investigators listed in the appendix

Population Health Research Institute (M Dehghan PhD, A Mente PhD, S Rangarajan MSc, P Sheridan MSc, Prof K Teo MBBCh, Prof S S Anand MD, Prof S Yusuf DPhil) and

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Nuts?

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RESULTS:

There were 2276 cardiovascular deaths during a mean follow-up time of 9.4 years. The HRs for cardiovascular mortality were 1.61 [98.75% confidence interval (CI), 1.12–2.32; P-trend<0.001] for the *‘Meat’* protein factor and 0.60 (98.75% CI, 0.42–0.86; P-trend<0.001) for the *‘Nuts & Seeds’* protein factor (highest vs lowest quintile of factor scores). No significant associations were found for the ‘Grains’, ‘Processed Foods’ and ‘Legumes, Fruits & Vegetables’ protein factors. Additional adjustments for the participants’ vegetarian dietary pattern and nutrients related to cardiovascular disease outcomes did not change the results.

ation with cardiovascular health. We aimed at evaluating the association between specific patterns of protein intake with cardiovascular mortality.

Methods: We selected 81 337 men and women from the Adventist Health Study-2. Diet was assessed between 2002 and 2007, by using a validated food frequency questionnaire. Dietary patterns based on the participants’ protein consumption were derived by factor analysis. Cox regression analysis was used to estimate multivariate-adjusted hazard

Cholesterol?



Cholesterol content per 100 g:

<i>Chicken</i>	<i>85 mg</i>
<i>Pork</i>	<i>86 mg</i>
<i>Beef</i>	<i>90 mg</i>
<i>Salmon</i>	<i>63 mg</i>
<i>Peanuts</i>	<i>0 mg</i>
<i>Almonds</i>	<i>0 mg</i>
<i>Cashews</i>	<i>0 mg</i>
<i>Quinoa</i>	<i>0 mg</i>
<i>Egg whites</i>	<i>0 mg</i>
<i>Egg Yolk</i>	<i>1,085 mg</i>

Effects of a Dietary Portfolio of Cholesterol-Lowering Foods vs Lovastatin on Serum Lipids and C-Reactive Protein

David J. A. Jenkins, MD

Cyril W. C. Kendall, PhD

Augustine Marchie, BSc

Dorothea A. Faulkner, PhD

Julia M. W. Wong, RD

Russell de Souza, RD

Azadeh Emam, BSc

Tina L. Parker, RD

Edward Vidgen, BSc

Karen G. Lapsley, DSc

Elke A. Trautwein, PhD

Context To enhance the effectiveness of diet in lowering cholesterol, recommendations of the Adult Treatment Panel III of the National Cholesterol Education Program emphasize diets low in saturated fat together with plant sterols and viscous fibers, and the American Heart Association supports the use of soy protein and nuts.

Objective To determine whether a diet containing all of these recommended food components leads to cholesterol reduction comparable with that of 3-hydroxy-3-methylglutaryl coenzyme A reductase inhibitors (statins).

Design Randomized controlled trial conducted between October and December 2002.

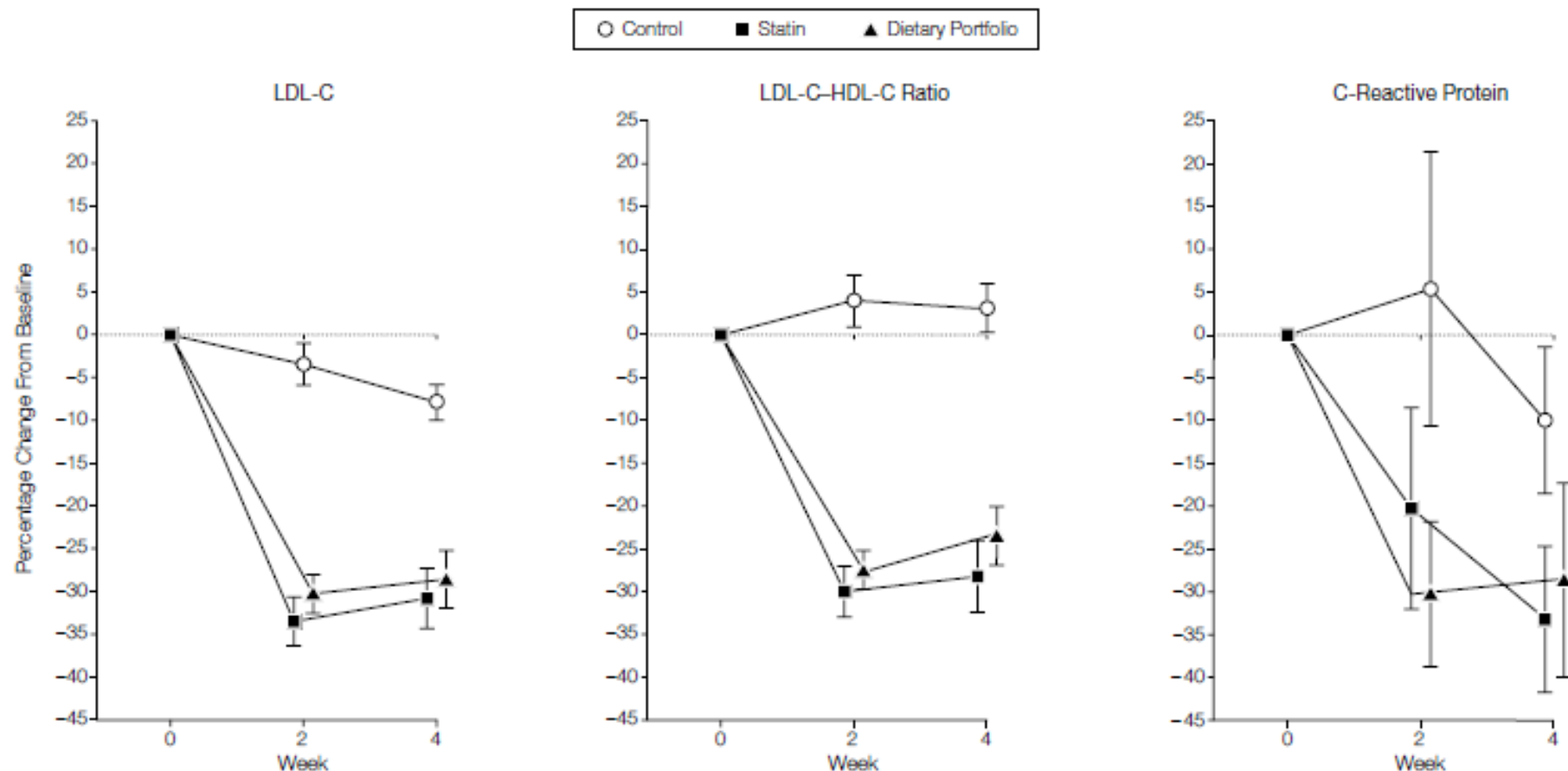
Setting and Participants Forty-six healthy, hyperlipidemic adults (25 men and 21 postmenopausal women) with a mean (SE) age of 59 (1) years and body mass index of 27.6 (0.5), recruited from a Canadian hospital-affiliated nutrition research center and the community.

Interventions Participants were randomly assigned to undergo 1 of 3 interventions

Participants were randomly assigned to undergo 1 of 3 interventions on an outpatient basis for 1 month:

- a diet very low in saturated fat, based on milled whole-wheat cereals and low-fat dairy foods (n = 16; control);
- the same diet plus lovastatin, 20 mg/d (n = 14); or
- a diet high in plant sterols (1.0 g/1000 kcal), soy protein (21.4 g/1000 kcal), viscous fibers (9.8 g/1000 kcal), and almonds (14 g/1000 kcal) (n = 16; dietary portfolio).

Figure 2. Change From Baseline in LDL-C, LDL-C-HDL-C Ratio, and C-Reactive Protein



LDL-C indicates low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol. Values are expressed as mean (SE) because, with the number of participants involved, approximately twice the SE represents a significant difference.

Association between plant-based diets and plasma lipids: a systematic review and meta-analysis

Yoko Yokoyama, Susan M. Levin, and Neal D. Barnard

Context: Although a recent meta-analysis of randomized controlled trials showed that adoption of a vegetarian diet reduces plasma lipids, the association between vegetarian diets and long-term effects on plasma lipids has not been subjected to meta-analysis. **Objective:** The aim was to conduct a systematic review and meta-analysis of observational studies and clinical trials that have examined associations between plant-based diets and plasma lipids. **Data Sources:** MEDLINE, Web of Science, and the Cochrane Central Register of Controlled Trials were searched for articles published in English until June 2015. **Study Selection:** The literature was searched for controlled trials and observational studies that investigated the effects of at least 4 weeks of a vegetarian diet on plasma lipids. **Data Extraction:** Two reviewers independently extracted the study methodology and sample size, the baseline characteristics of the study population, and the concentrations and variance measures of plasma lipids. Mean differences in concentrations of plasma lipids between vegetarian and comparison diet groups were calculated. Data were pooled using a random-effects model. **Results:** Of the 8385 studies identified, 30 observational studies and 19 clinical trials met the inclusion criteria ($N = 1484$; mean age, 48.6 years). Consumption of vegetarian diets was associated with lower mean concentrations of total cholesterol (-29.2 and -12.5 mg/dL,

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Study nameSubgroup within studyDifference in means and 95% CI

Fernandes Dourado et al., 2011 (26)	Lacto-ovo
Burslem et al., 1978 (11), 30-40 yr male	Vegan
Sanders & Roshanai, 1992 (29) , male	Vegan
Lu et al., 2000 (16), female	Vegan/Lacto
Sacks et al., 1975 (10)	Pesco
Teixeira et al., 2007 (14)	Lacto-ovo/ Vegan/ Pesco/ Lacto
Lu et al., 2000, male (16)	Vegan/Lacto
Roshanai & Sanders, 1984 (24), male	Vegan
Burslem et al., 1978 (11), 20-30 yr male	Vegan
Nestel et al., 1981 (37)	Lacto-ovo
Krajcovicova-Kudlackova et al., 1994 (34), female	Lacto-ovo/Lacto
Knuiman & West, 1982 (23)	Vegan
Burslem et al., 1978 (11), 30-40 yr female	Vegan
Burslem et al., 1978 (11), 20-30 yr female	Vegan
Krajcovicova-Kudlackova et al., 1994 (34), male	Lacto-ovo/Lacto
Richter et al., 1999 (28), female	Lacto-ovo
Nieman et al., 1989 (30)	Lacto-ovo
Richter et al., 1999 (28), male	Lacto-ovo
Fu et al., 2008 (17)	Lacto-ovo
Yang et al., 2011 (19)	Lacto-ovo
Harman & Parnell, 1998 (13), female	Lacto/Vegan
Kim et al., 2012 (18)	Vegan/Lacto-ovo
Fisher et al., 1986 (12)	Vegan/Lacto-ovo
Chiang et al., 2013 (22)	Lacto-ovo/lacto/Ovo/Vegan
Gojda et al., 2013 (38)	Vegan
Li et al., 1999 (25)	Lacto-ovo
Sanders & Roshanai, 1992 (29), female	Vegan
Jian et al., 2015 (33)	Vegan
Harman & Parnell, 1998 (13), male	Lacto/Vegan
Liebman & Bazzarre, 1983 (21)	Lacto-ovo
Huijbregts et al., 1980 (39)	Lacto-ovo
Chen et al., 2011 (31)	Lacto-ovo
Huang et al., 2014 (32), postmenopausal	Vegan
Lee et al., 2000 (15)	Lacto-ovo
Karabudak et al., 2008 (36)	Semi/ Lacto-ovo/ Lacto
Roshanai & Sanders, 1984 (24), female	Vegan
Lin et al., 2001 (27)	Lacto-ovo
Goff et al. 2005 (35)	Vegan
Jung et al., 2013 (20)	Vegan/Lacto/Ovo/Lacto-ovo
Huang et al., 2014 (32), premenopausal	Vegan

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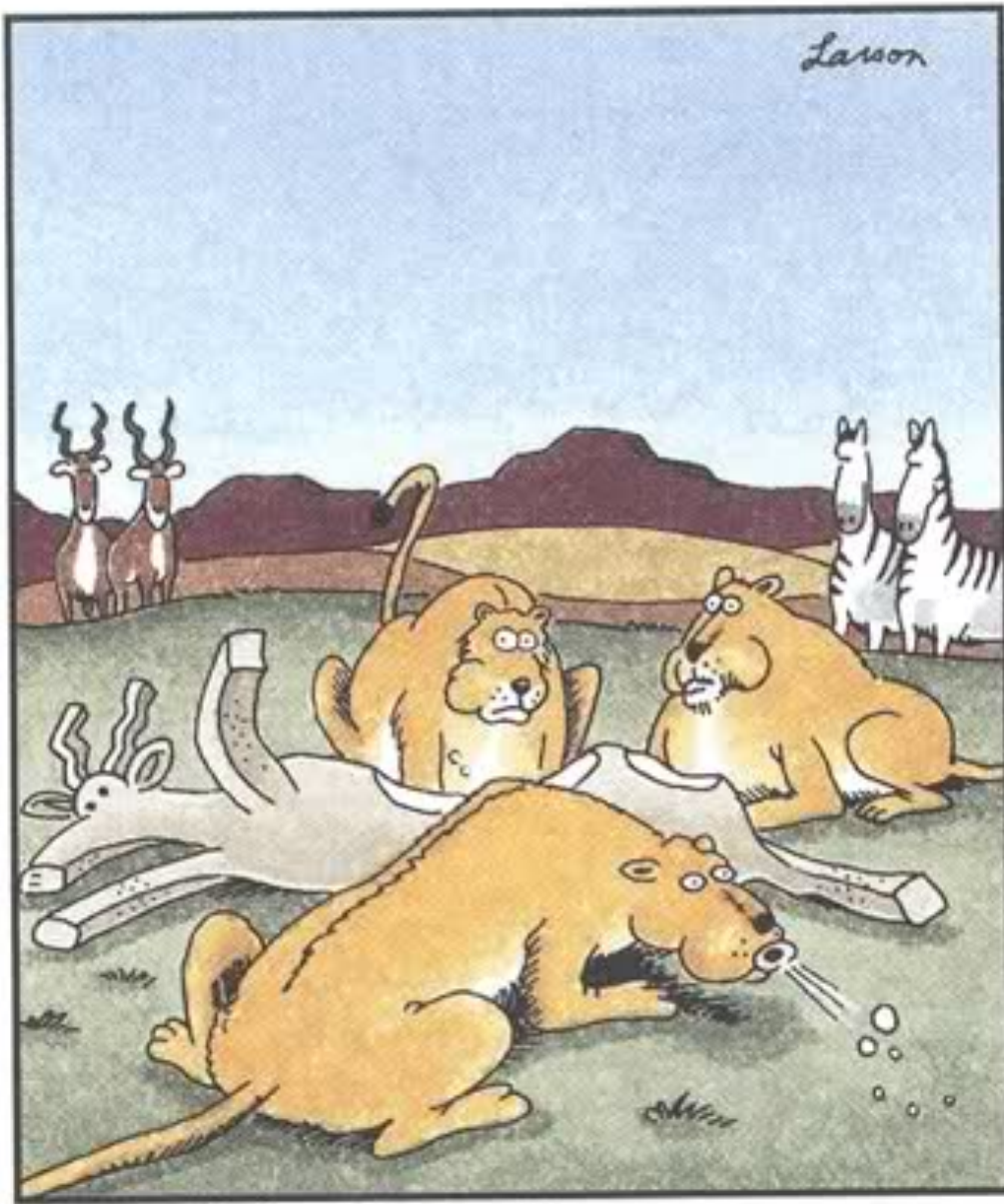
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Where do you get your Protein?



- Do vegetables have any protein?

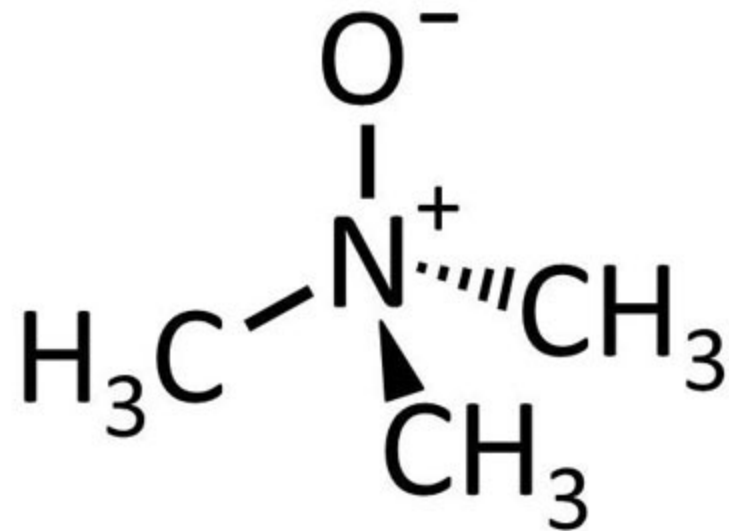
In sudden disgust, the three lionesses realized they had killed a tofudebeest—one of the Serengeti's obnoxious health antelopes.

Protein content per 100 grams:

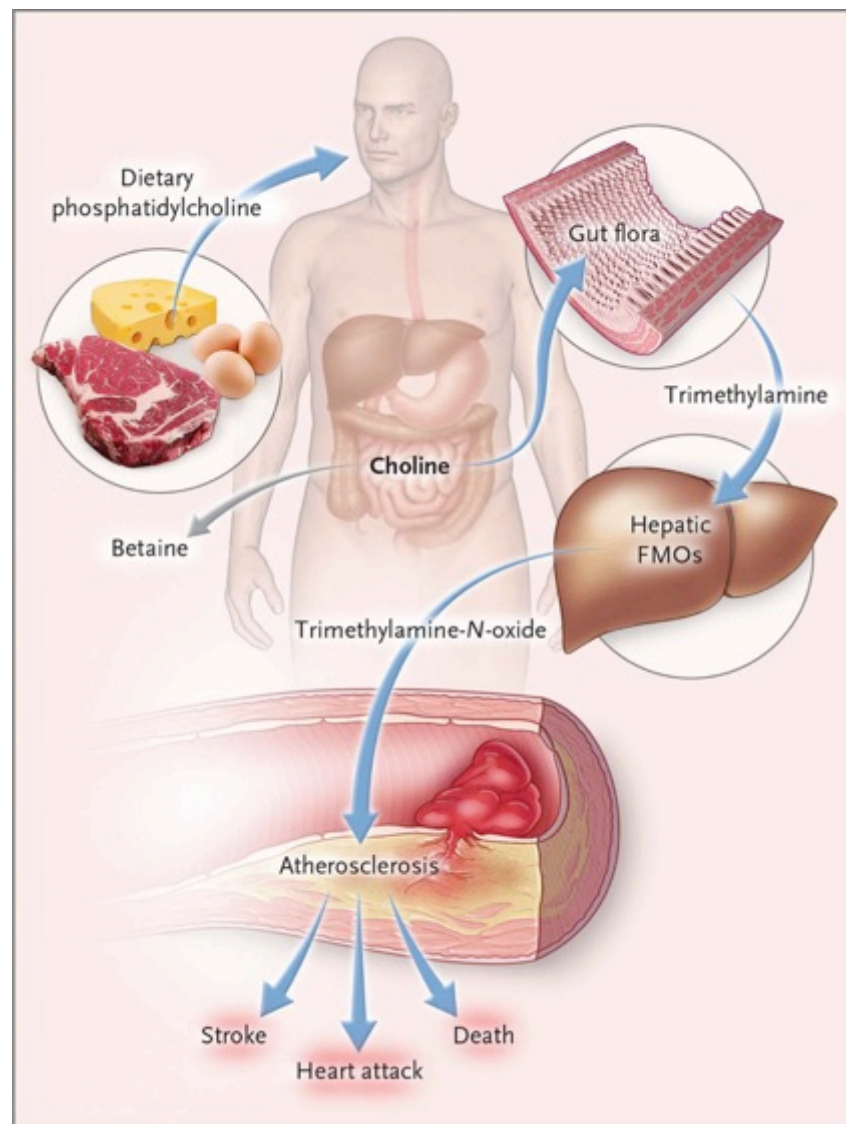
<i>Soy Beans</i>	<i>36 g</i>
<i>Chicken</i>	<i>31 g</i>
<i>Pork</i>	<i>27 g</i>
<i>Beef</i>	<i>26 g</i>
<i>Peanuts</i>	<i>26 g</i>
<i>Almonds</i>	<i>21 g</i>
<i>Cashews</i>	<i>18 g</i>
<i>Quinoa</i>	<i>13 g</i>
<i>Egg whites</i>	<i>11 g</i>

TMAO

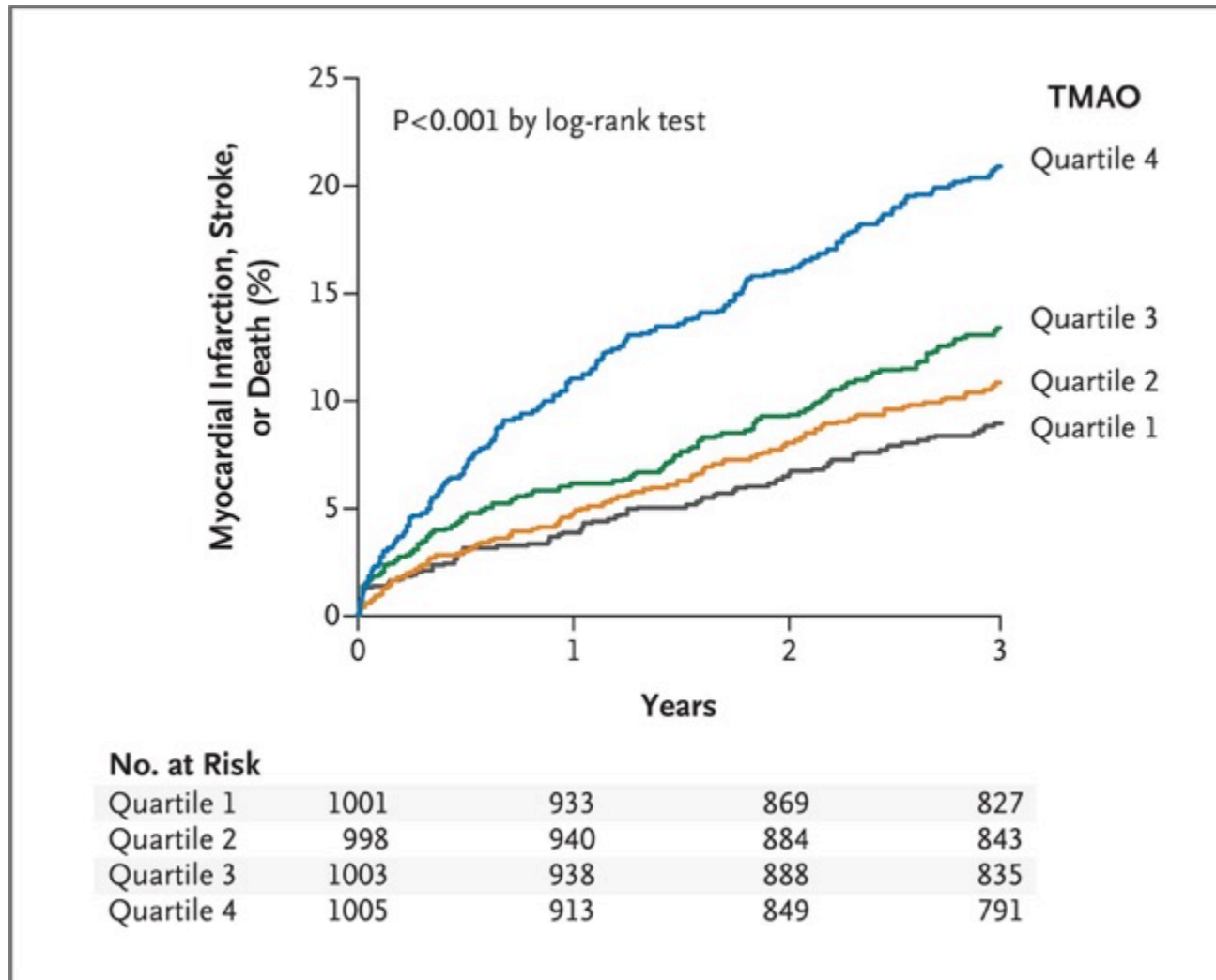
Trimethylamine Oxide



Pathways Linking Dietary Phosphatidylcholine, Intestinal Microbiota, and Incident Adverse Cardiovascular Events.



Kaplan–Meier Estimates of Major Adverse Cardiovascular Events, According to the Quartile of TMAO Level.



Tang WHW et al. N Engl J Med 2013;368:1575-1584

From: Prognostic Value of Elevated Levels of Intestinal Microbe-Generated Metabolite Trimethylamine-N-Oxide in Patients With Heart Failure: Refining the Gut Hypothesis

J Am Coll Cardiol. 2014;64(18):1908-1914. doi:10.1016/j.jacc.2014.02.617

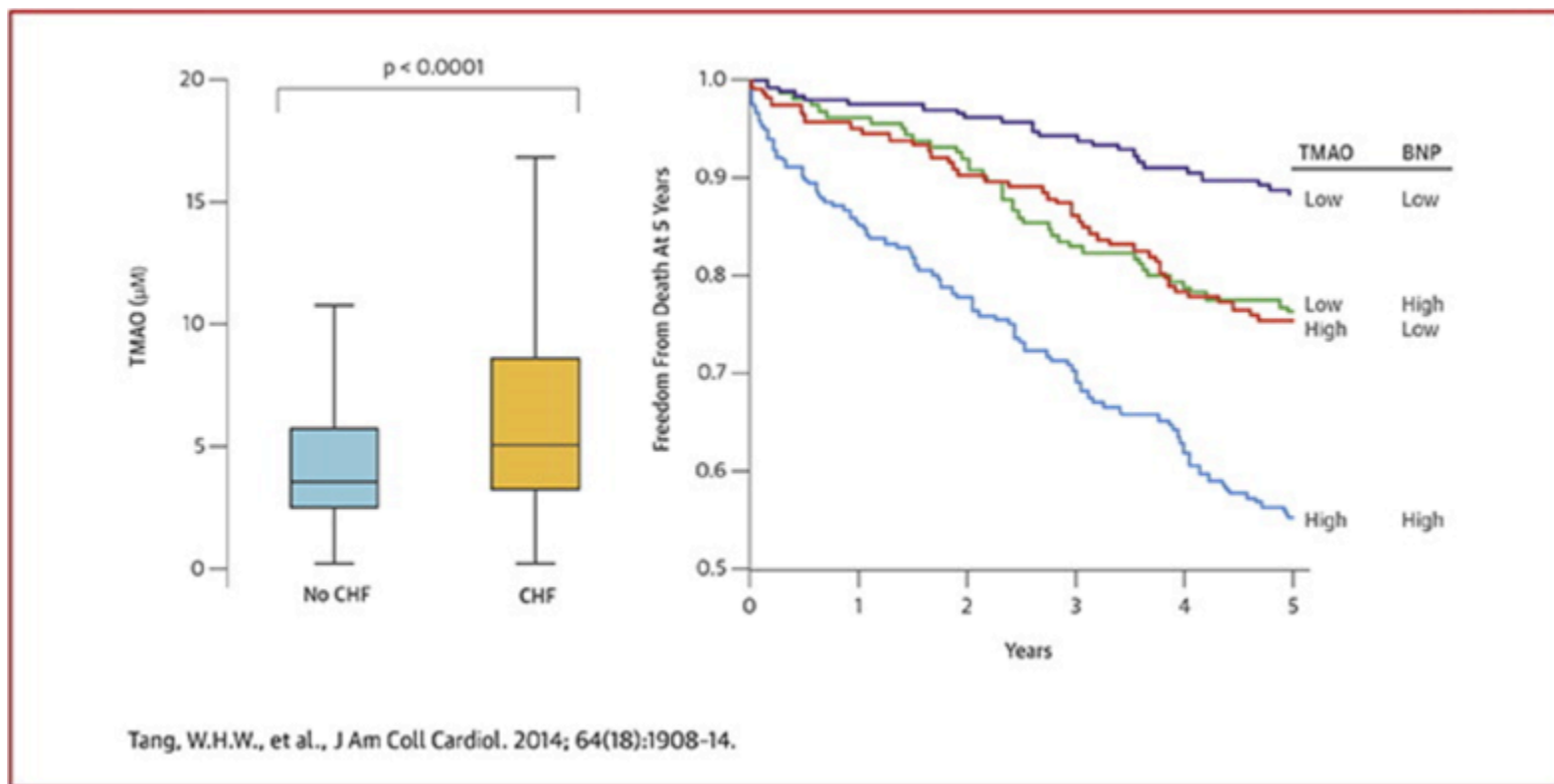


Figure Legend:

Comparison of Fasting TMAO Levels Between Patients With Stable Heart Failure and Apparently Healthy Controls

(Left) Trimethylamine-N-oxide (TMAO) concentration was higher in patients with stable heart failure than healthy controls and (Right) portended poorer survival at higher levels regardless of B-type natriuretic peptide levels. Kaplan-Meier curves for 5-year all-cause mortality with TMAO with TMAO/B-type natriuretic peptide (BNP) stratified at median levels.



ORIGINAL ARTICLE

Trimethylamine N-oxide and prognosis in acute

*“TMAO contributed additional information on patient stratification for in-hospital mortality of AHF admissions using available clinical scores that include renal indices. Furthermore, **elevated levels were associated with poor prognosis at 1 year** and combination of TMAO and NT-proBNP provided additional prognostic information. TMAO was a univariate predictor of death and death/HF, and remained an independent predictor until adjusted for renal confounders.”*

AHA: Plant-Based Diets Tied to Reduced HF Risk

— 28% lower rate of heart failure in secondary analysis of large study

ANAHEIM – People whose dietary patterns include *five or more fruit or vegetable portions a day had less risk of incident heart failure compared to individuals with less plant-based foods in their diet*, researchers said here.

Individuals who most closely followed a mostly plant-based diet had a *28% reduced risk of developing heart failure ($P<0.01$)*, reported Kyla Lara, MD, a resident in internal medicine at the Icahn School of Medicine at Mount Sinai, New York City.

[J Intern Med.](#) 2017 Feb;281(2):106-122.

doi: 10.1111/joim.12543

Potential health hazards of eating red meat

■ A. Wolk

From the Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden

Abstract. Wolk A (Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden). Potential health hazards of eating red meat (Review). *J Intern Med* 2017; **281**: 106–122.

Red meat (beef, veal, pork, lamb and mutton) consumption contributes several important nutrients to the diet, for example essential amino acids, vitamins (including B12) and minerals (including iron and zinc). Processed red meat (ham, sausages, bacon, frankfurters, salami, etc.) undergoes treatment (curing, smoking, salting or the use of chemical preservatives and additives) to improve its shelf life and/or taste. During recent decades, consumption of red meat has been increasing globally, especially in developing countries. At the

cohorts, summary results for the consumption of unprocessed red meat of 100 g day⁻¹ varied from nonsignificant to statistically significantly increased risk (11% for stroke and for breast cancer, 15% for cardiovascular mortality, 17% for colorectal and 19% for advanced prostate cancer); for the consumption of 50 g day⁻¹ processed meat, the risks were statistically significantly increased for most of the studied diseases (4% for total prostate cancer, 8% for cancer mortality, 9% for breast, 18% for colorectal and 19% for pancreatic cancer, 13% for stroke, 22% for total and 24% for cardiovascular mortality and 32% for diabetes). Potential biological mechanisms underlying the observed risks and the environmental impact of red meat production are also discussed. The evidence-based

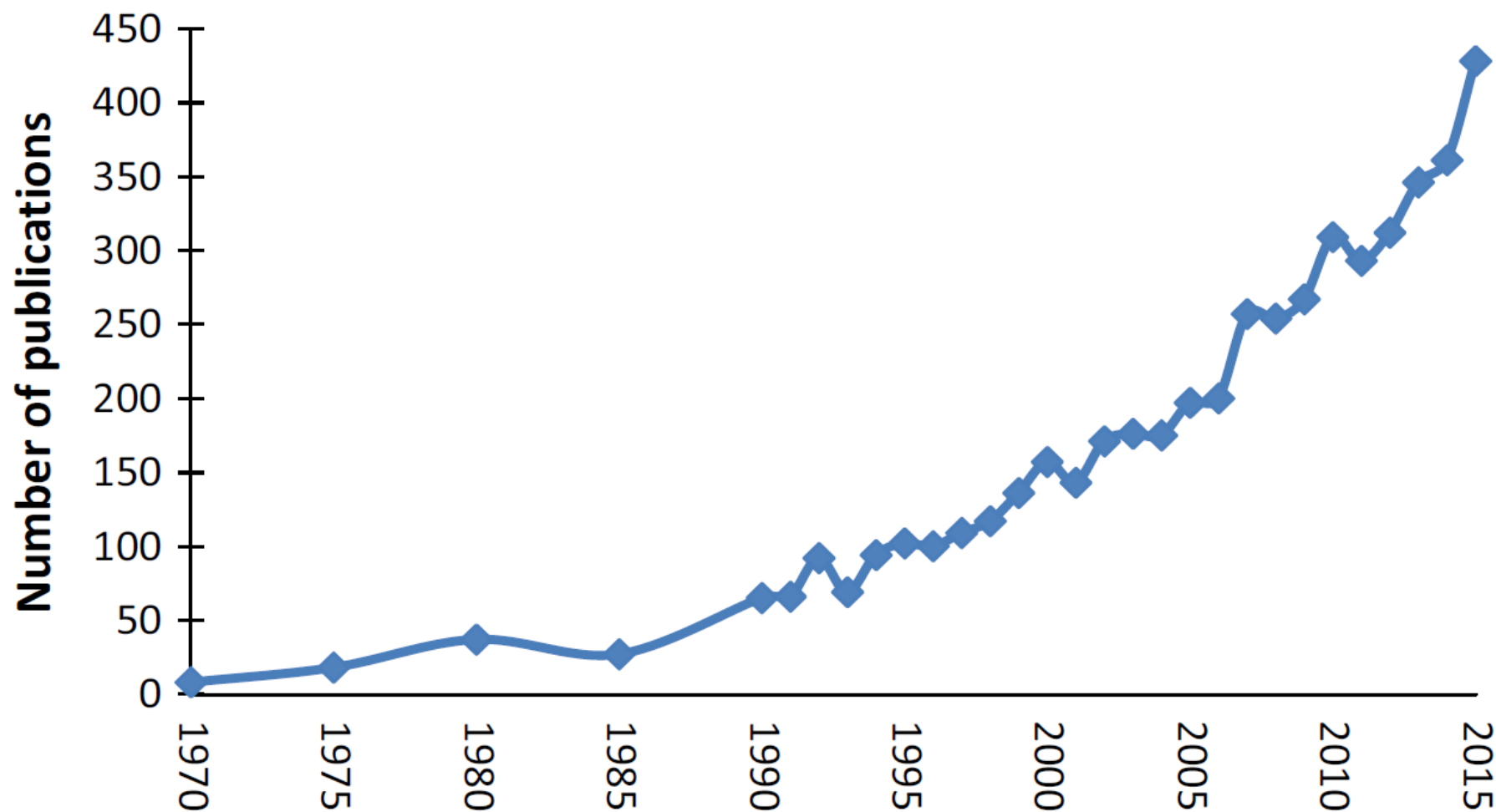
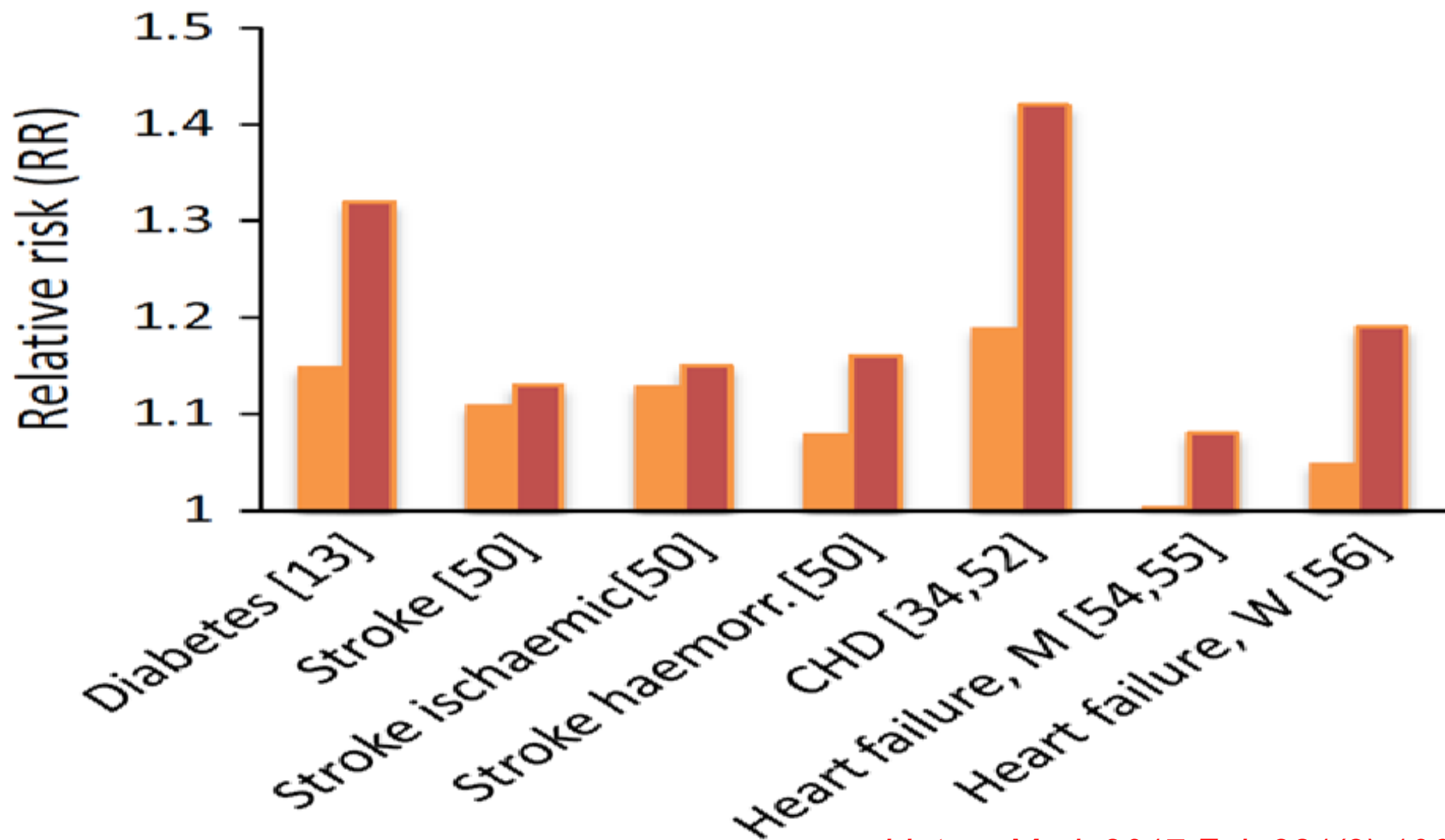


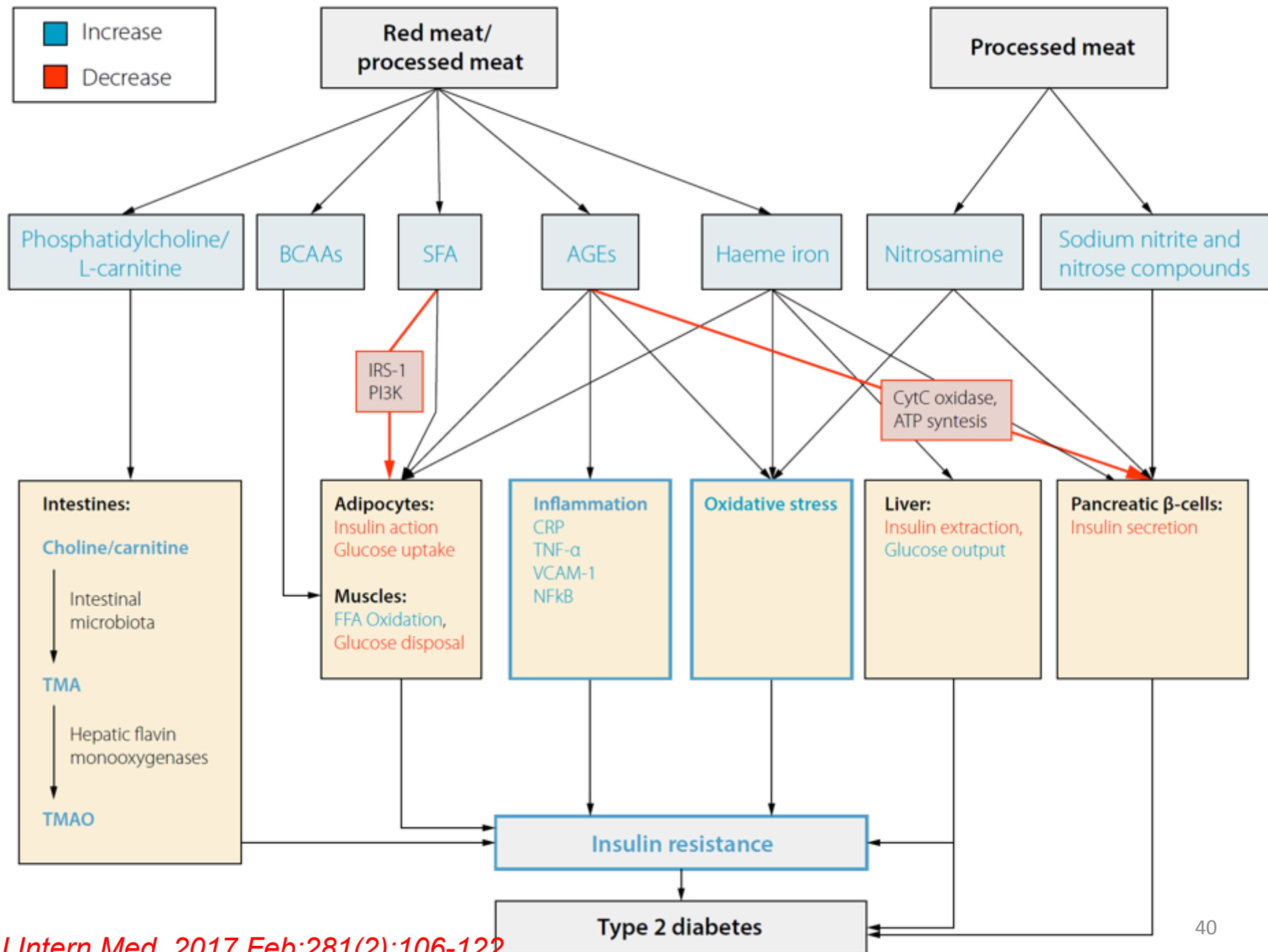
Fig. 1 *Publications on red meat during the period 1970–2015, as identified through PubMed.*

Incidence of diabetes and CVDs

Unprocessed red meat
RR per 100 g per day

Processed red meat
RR per 50 g per day





Mortality from different causes associated with meat, heme iron, nitrates, and nitrites in the NIH-AARP Diet and Health Study: population based cohort study

BMJ 2017;357:j1957

Arash Etemadi, Rashmi Sinha, Mary H Ward, Barry I Graubard, Maki Inoue-Choi, Sanford M Dawsey, Christian C Abnet

ABSTRACT

OBJECTIVE

To determine the association of different types of meat intake and meat associated compounds with overall and cause specific mortality.

DESIGN

Population based cohort study.

SETTING

Baseline dietary data of the NIH-AARP Diet and Health Study (prospective cohort of the general population from six states and two metropolitan areas in the US) and 16 year follow-up data until 31 December 2011.

PARTICIPANTS

536 969 AARP members aged 50-71 at baseline.

mortality. Heme iron and processed meat nitrate/nitrite were independently associated with increased risk of all cause and cause specific mortality. Mediation models estimated that the increased mortality associated with processed red meat was influenced by nitrate intake (37.0-72.0%) and to a lesser degree by heme iron (20.9-24.1%). When the total meat intake was constant, the highest fifth of white meat intake was associated with a 25% reduction in risk of all cause mortality compared with the lowest intake level. Almost all causes of death showed an inverse association with white meat intake.

CONCLUSIONS

The results show increased risks of all cause mortality and death due to nine different causes associated with

Heme Iron

Producing Reactive Oxygen Species



Up to and including: Dates, watermelon, parsley, hemp seeds, beans, spinach, potatoes, nuts, apricots and dried fruits!



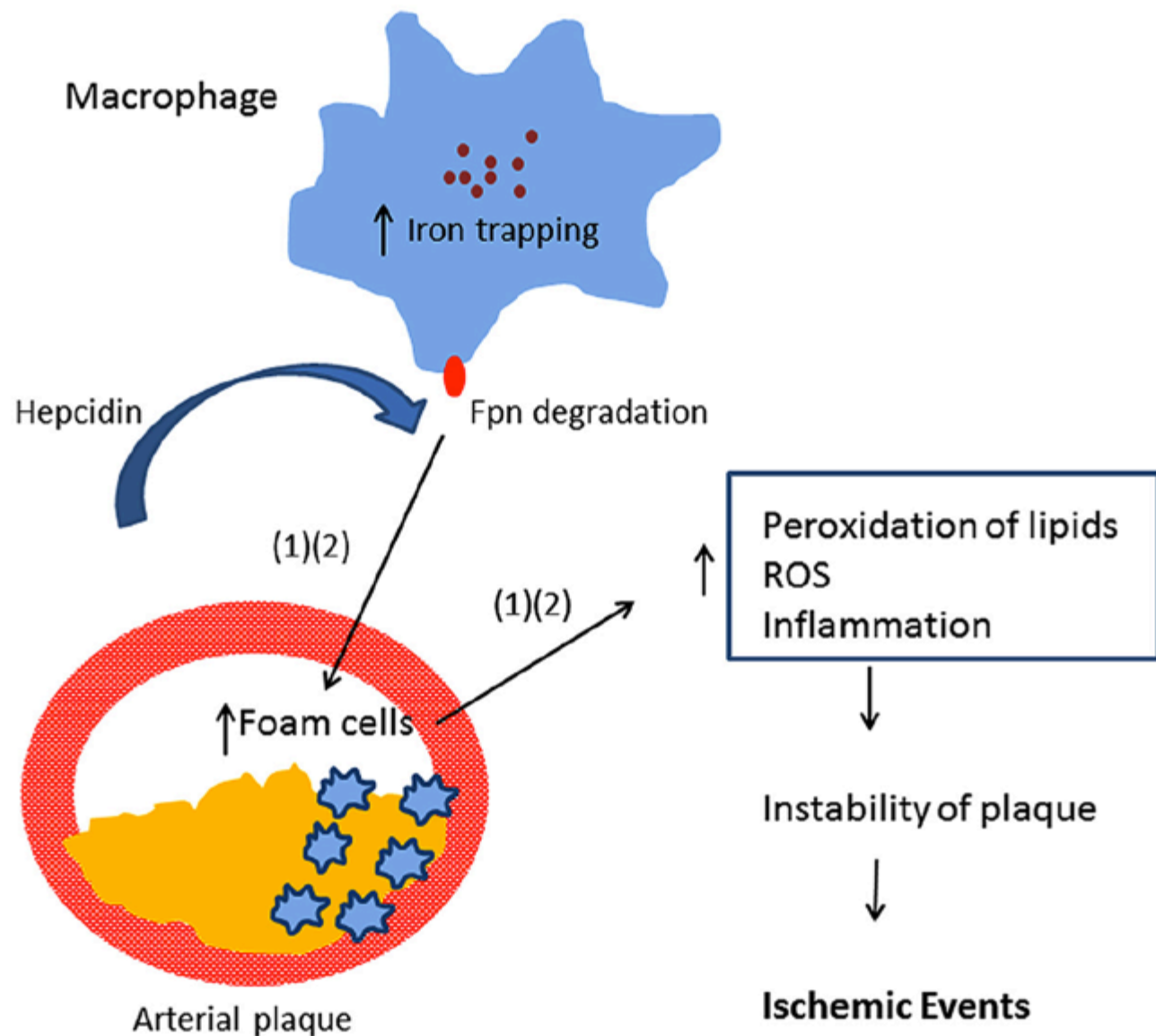


FIGURE 1 | Model showing iron retention in macrophages promotes arterial plaque destabilization (Sullivan, 2007; Theurl et al., 2008).

High Stored Iron Levels Are Associated With Excess Risk of Myocardial Infarction in

On the basis of a Cox proportional hazards model adjusting for age, examination year, cigarette pack-years, ischemic ECG in exercise test, maximal oxygen uptake, systolic blood pressure, blood glucose, serum copper, blood leukocyte count, and serum high density lipoprotein cholesterol, apolipoprotein B, and triglyceride concentrations, men with serum ferritin > 200 mcg/l had a 2.2-fold (95% CI, 1.2-4.0; $p < 0.01$) risk factor-adjusted risk of acute myocardial infarction compared with men with a lower serum ferritin. An elevated serum ferritin was a strong risk factor for acute myocardial infarction in all multivariate models.

strong risk factor for acute myocardial infarction in all multivariate models. This association was stronger in men with serum low density lipoprotein cholesterol concentration of 5.0 mmol/l (193 mg/dl) or more than in others. Also, dietary iron intake had a significant association with the disease risk in a Cox model with the same covariates.

Conclusions. Our data suggest that a high stored iron level, as assessed by elevated serum ferritin concentration, is a risk factor for coronary heart disease. (*Circulation* 1992;86:803-811)

Brief Report

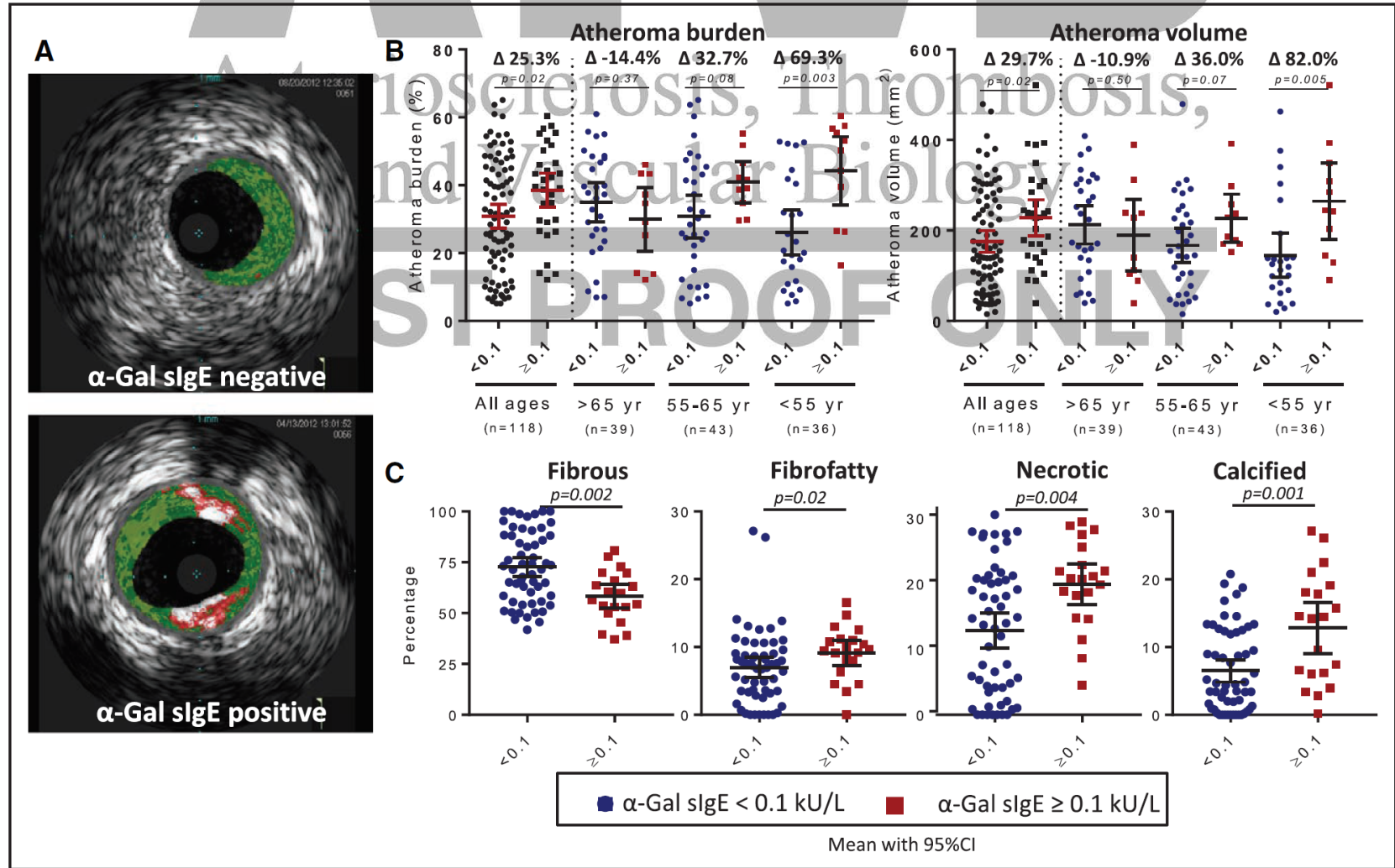


Figure. **A**, Representative examples of intravascular ultrasound (IVUS) with fibrous (dark green), fibrofatty (light green), necrotic (red), and calcified plaques (white) evident. **B**, Results of IVUS in total cohort and when stratified by age. **C**, Results of IVUS virtual histology in subjects ≤65 y of age. Data in **B** and **C** show mean with 95% confidence interval (CI) where each data point represents 1 subject and comparison is with the Mann–Whitney *U* test. Percentage differences in the mean value between galactose- α -1,3-galactose (α -Gal)-positive and α -Gal-negative subjects within an age group are represented in **B** by Δ . sIgE indicates specific IgE.

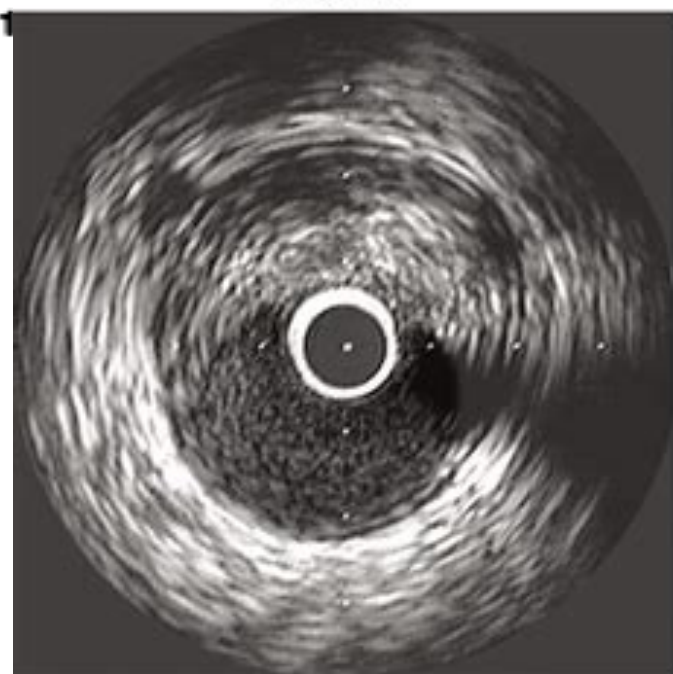
Key words: atherosclerosis ■ galactosyl-(1-3)galactose ■ immunoglobulin E ■ red meat ■ risk factors

Plaque Regression?

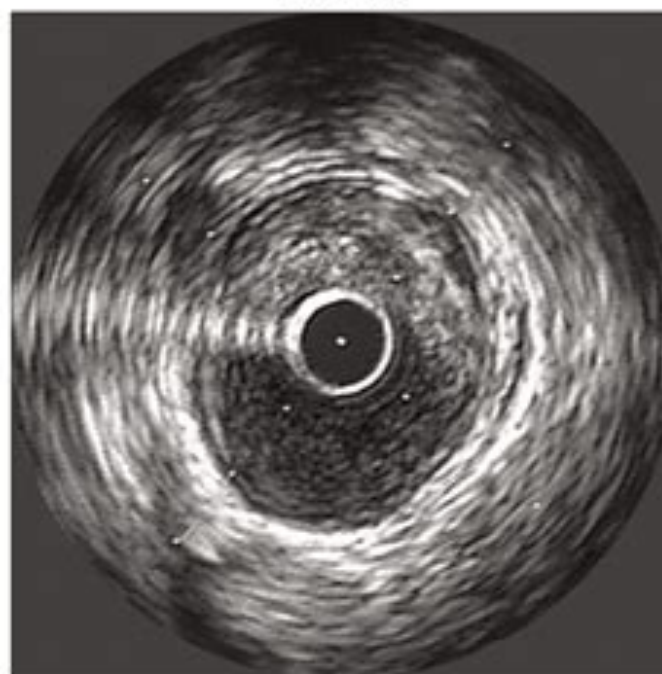
Observed Mean Change in Proximal Stenosis (%)

7

Baseline



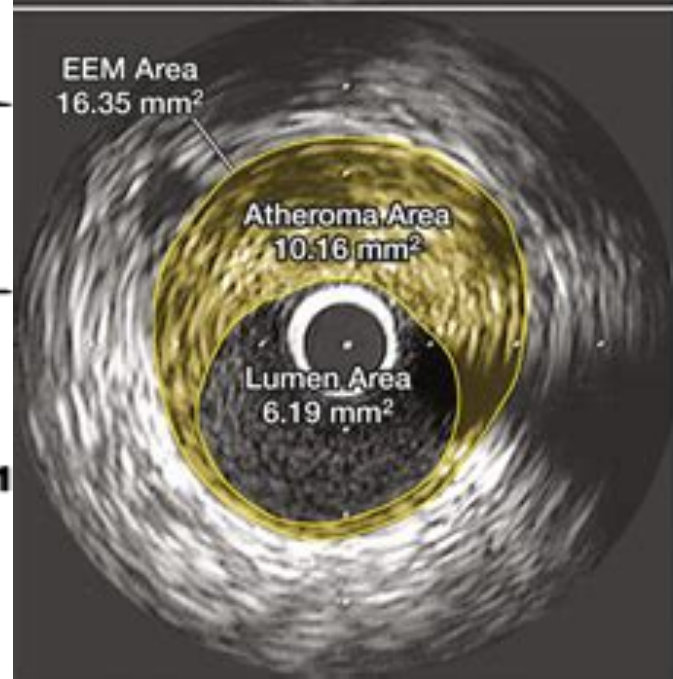
Follow-up



EEM Area
16.35 mm²

Atheroma Area
10.16 mm²

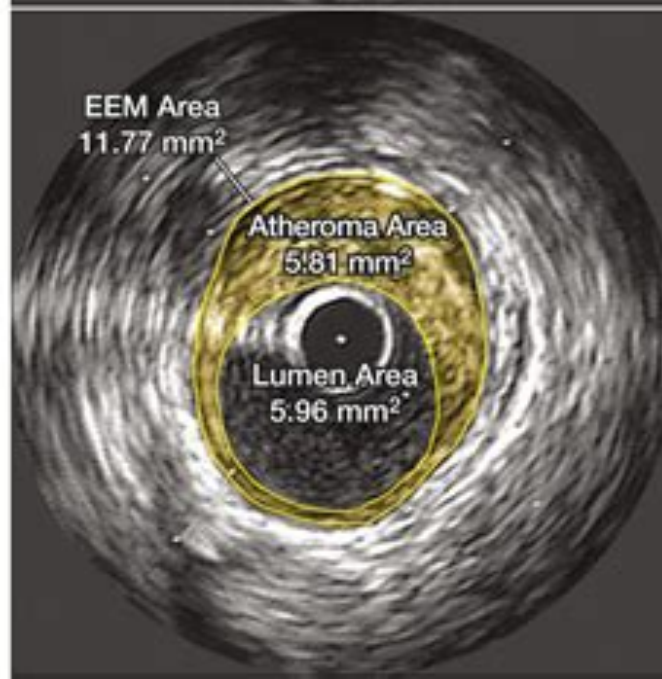
Lumen Area
6.19 mm²



EEM Area
11.77 mm²

Atheroma Area
5.81 mm²

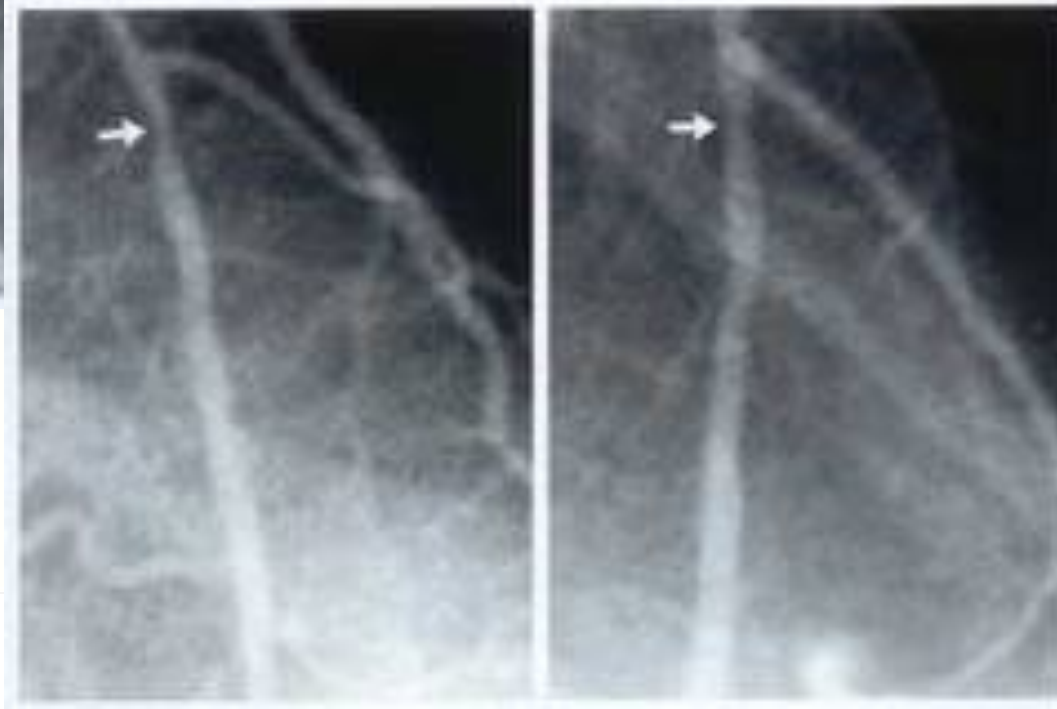
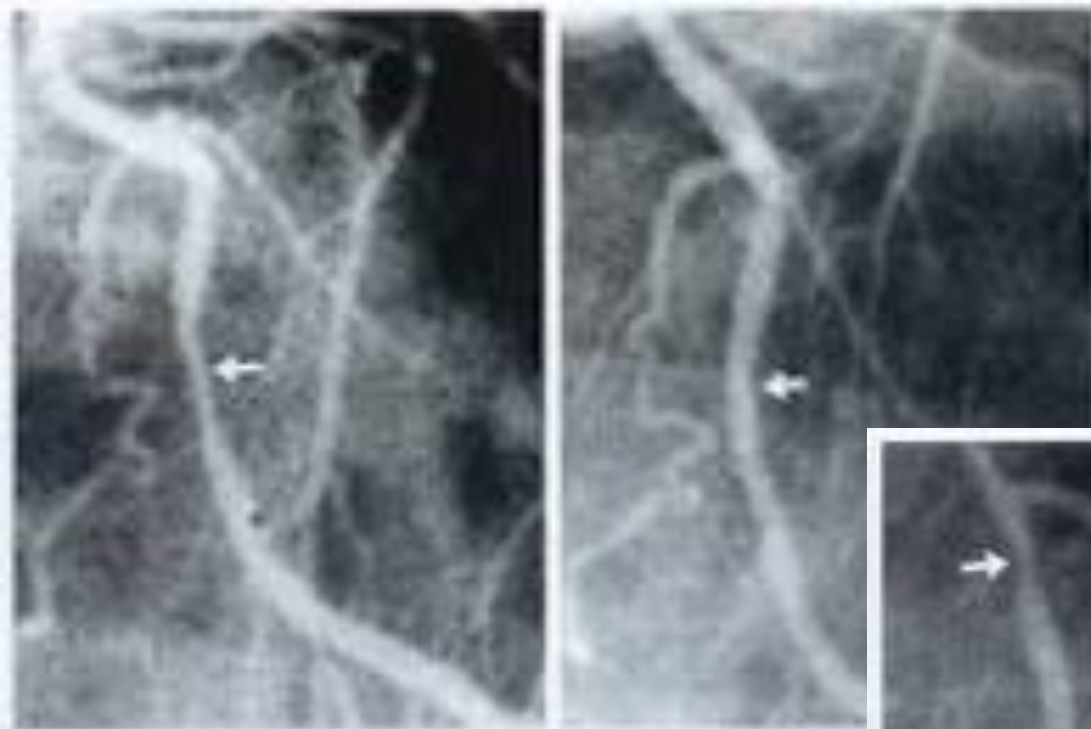
Lumen Area
5.96 mm²



Statistical Analysis.

change in the severity of
against a value estimat-
ression: $\Delta\%S_{prox} = 0.07$
 $\Delta BP_{sys} - 0.7 \Delta ST + 1.5$
egment depression (ΔST)
se test and the percent
($\Delta apoB$), in the HDL cho-
lood pressure ($\% \Delta BP_{sys}$)
accurate estimate of ob-
. Open squares indicate
th lovastatin and colesti-
pol, solid triangles niacin
cles lovastatin

Plaque Regression with Diet





Online article and related content
current as of January 26, 2010.

Intensive Lifestyle Changes for Reversal of Coronary Heart Disease

Dean Ornish; Larry W. Scherwitz; James H. Billings; et al.

JAMA. 1998;280(23):2001-2007 (doi:10.1001/jama.280.23.2001)

Context.—The Lifestyle Heart Trial demonstrated that intensive lifestyle changes may lead to regression of coronary atherosclerosis after 1 year.

Objectives.—To determine the feasibility of patients to sustain intensive lifestyle changes for a total of 5 years and the effects of these lifestyle changes (without lipid-lowering drugs) on coronary heart disease.

Design.—Randomized controlled trial conducted from 1986 to 1992 using a randomized invitational design.

Patients.—Forty-eight patients with moderate to severe coronary heart disease were randomized to an intensive lifestyle change group or to a usual-care control group, and 35 completed the 5-year follow-up quantitative coronary arteriography.

Setting.—Two tertiary care university medical centers.

Intervention.—Intensive lifestyle changes (10% fat whole foods vegetarian diet, aerobic exercise, stress management training, smoking cessation, group psychosocial support) for 5 years.

Main Outcome Measures.—Adherence to intensive lifestyle changes, changes in coronary artery percent diameter stenosis, and cardiac events.

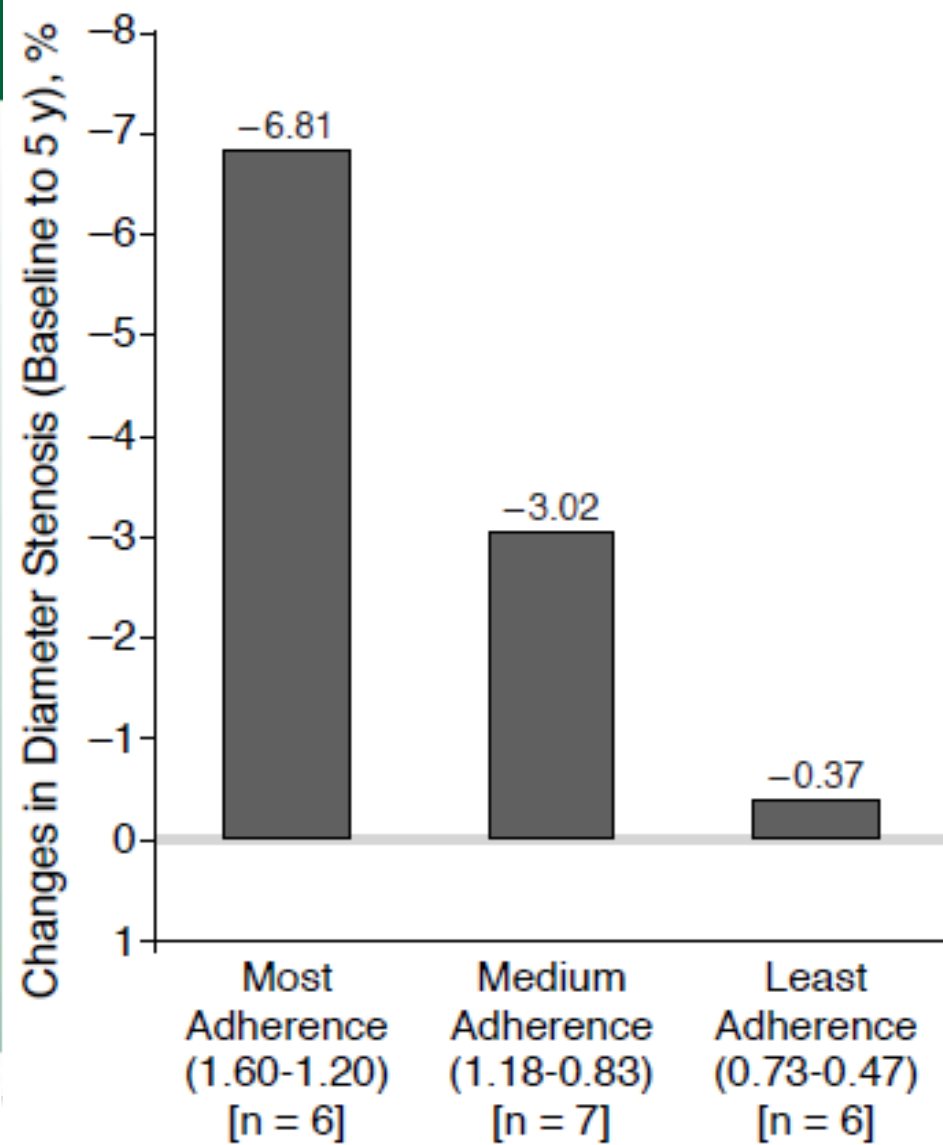


Figure 2.—Changes in percentage diameter stenosis by 5-year adherence tertiles for the experimental group.

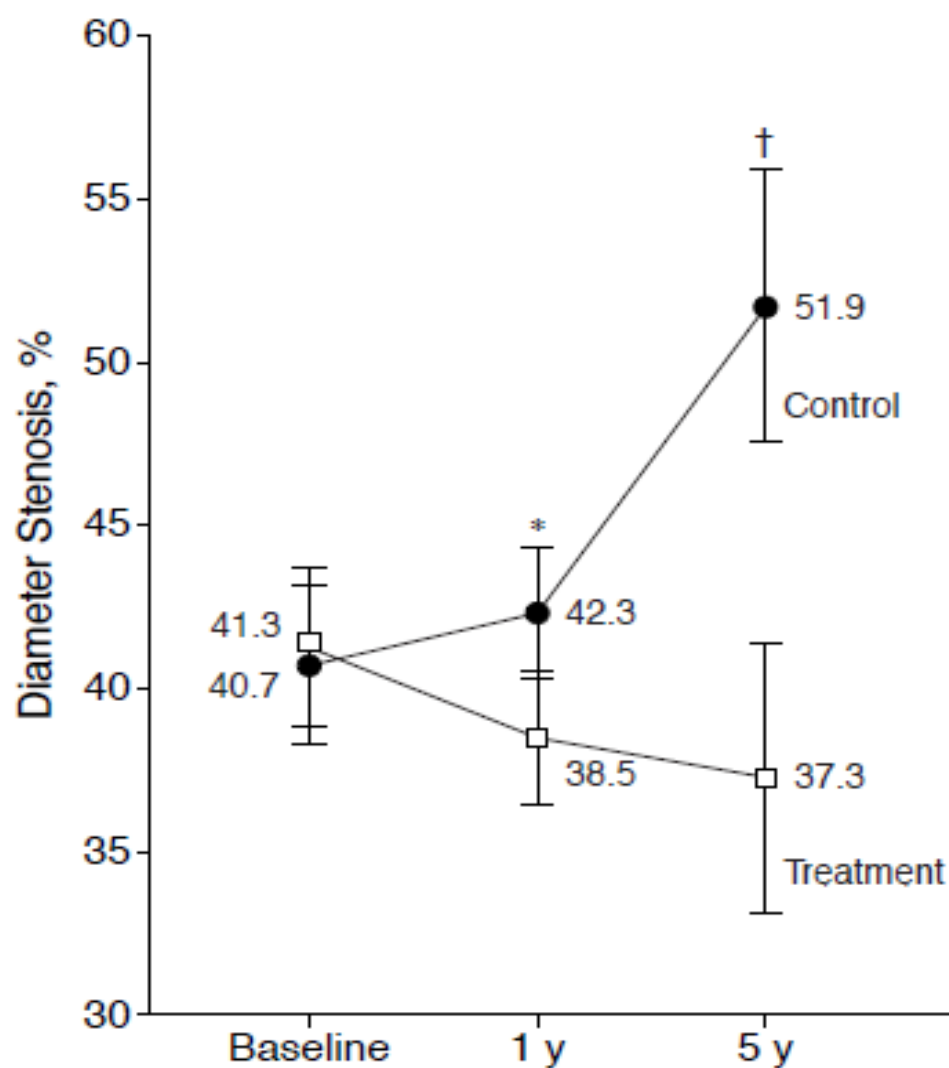


Figure 1.—Mean percentage diameter stenosis in treatment and control groups at baseline, 1 year, and 5 years. Error bars represent SEM; asterisk, $P=.02$ by between-group 2-tailed test; dagger, $P=.001$ by between-group 2-tailed test.

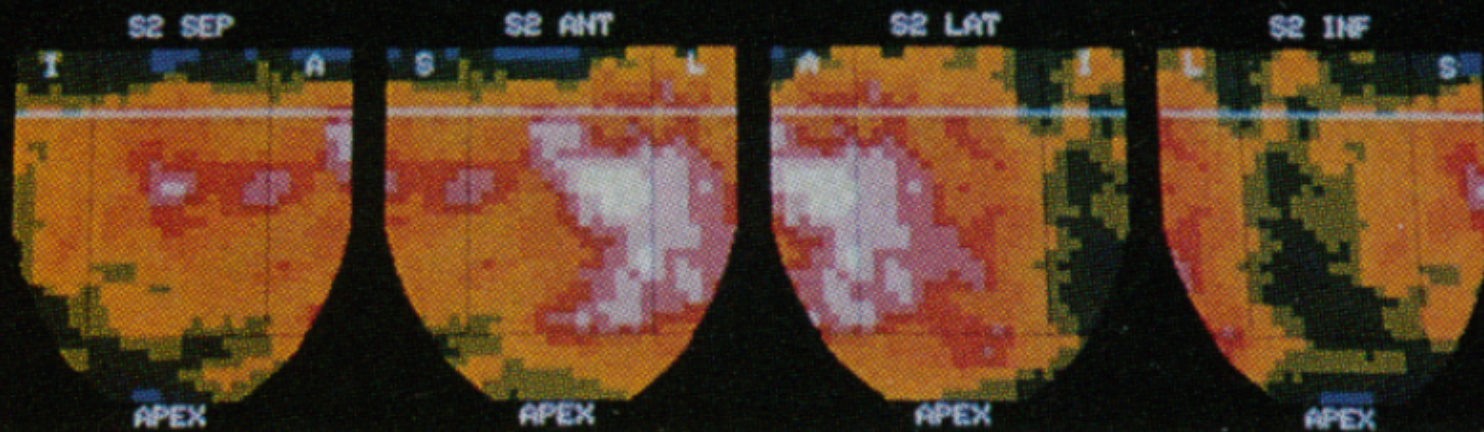
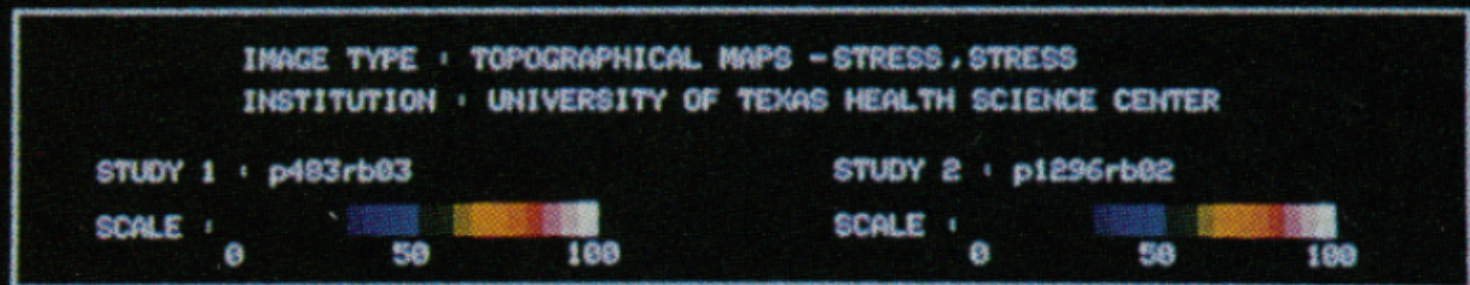
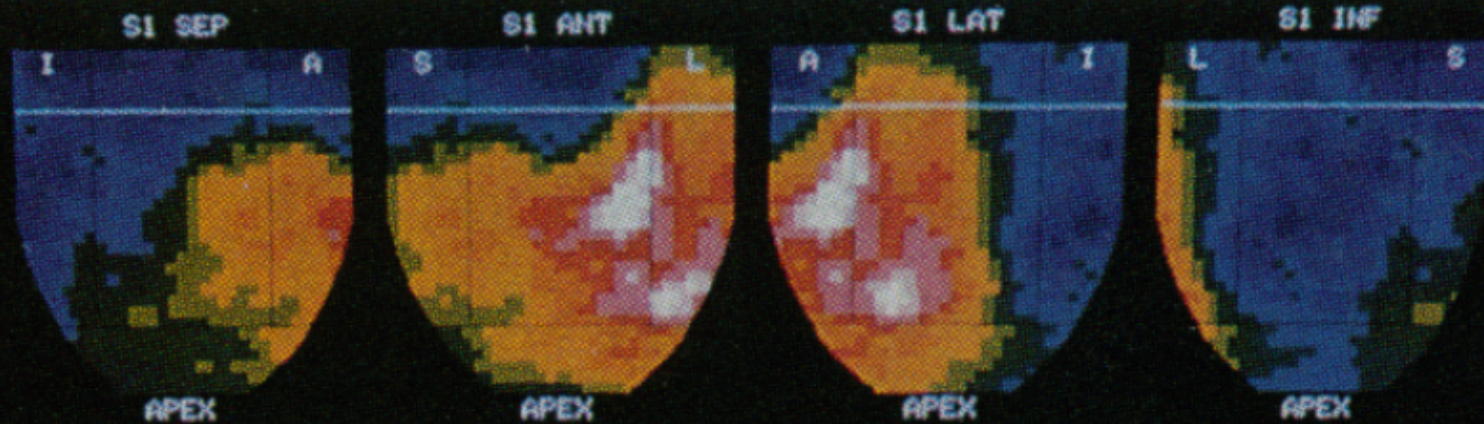
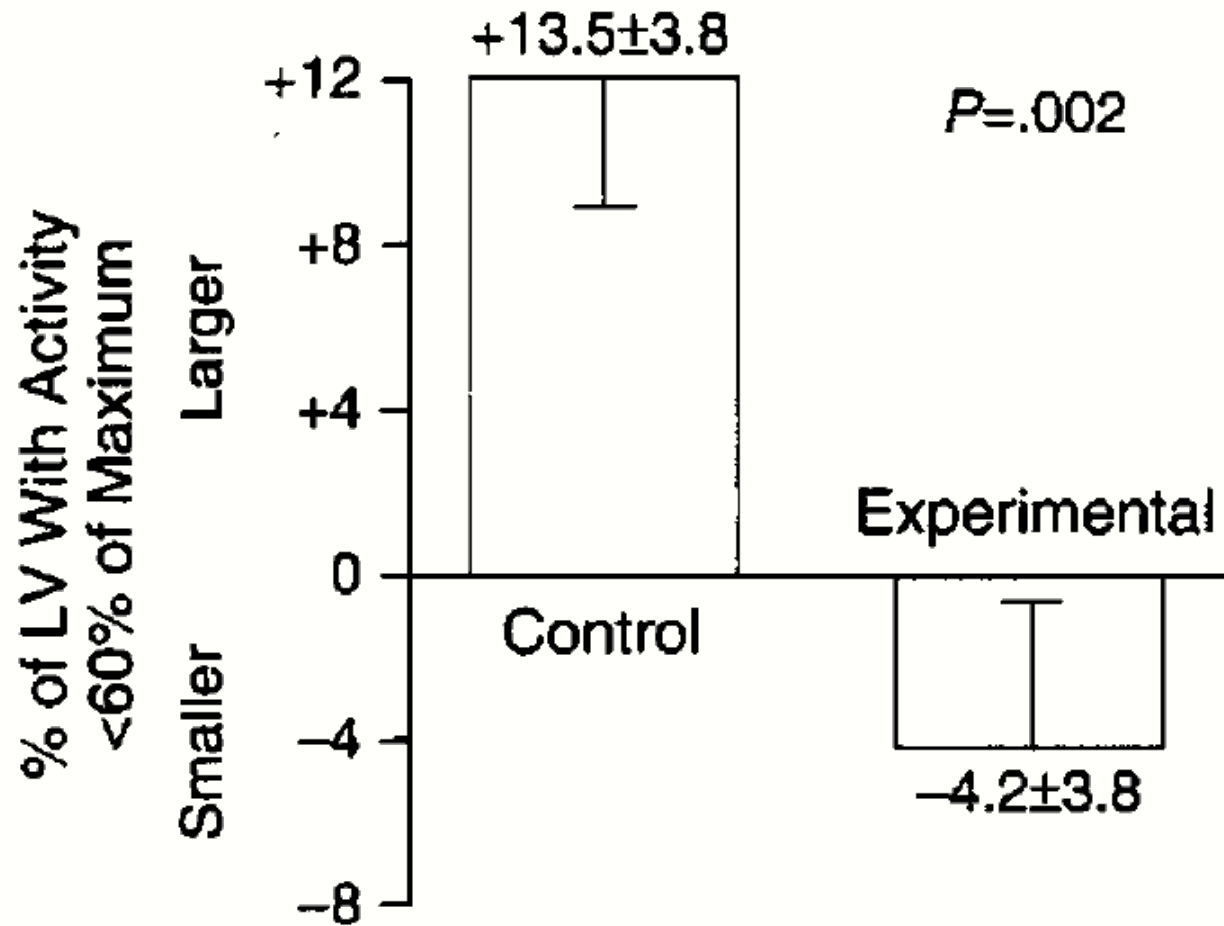


Figure 4



Caldwell B. Esselstyn Jr, MD; Gina Gendy, MD; Jonathan Doyle, MCS; Mladen Golubic, MD, PhD; Michael F. Roizen, MD

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Lyndhurst, Ohio

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*The authors reported no
potential conflict of interest
relevant to this article.*

ORIGINAL RESEARCH

A way to reverse CAD?

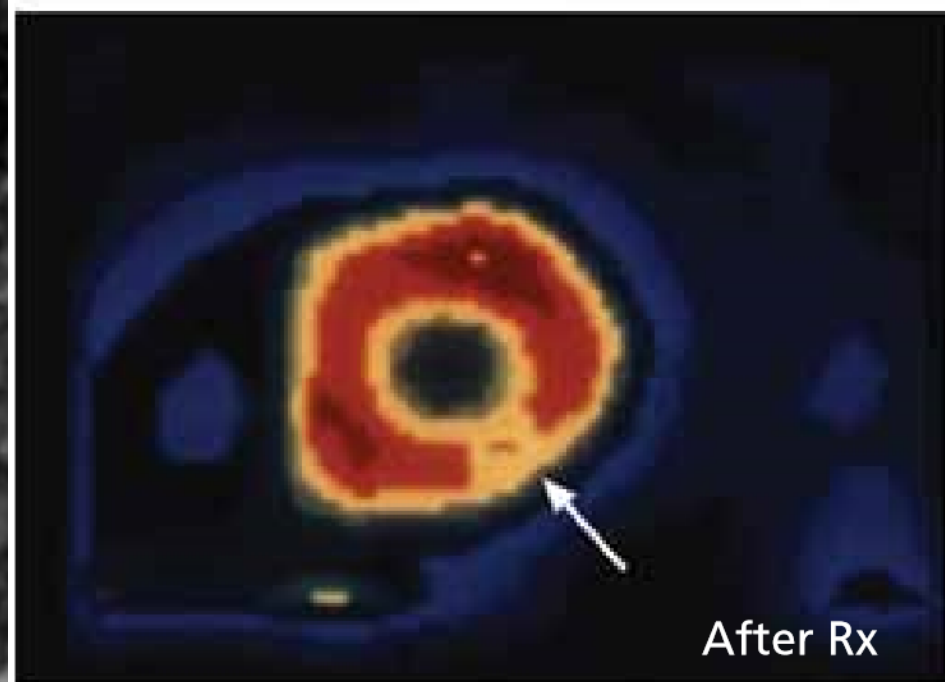
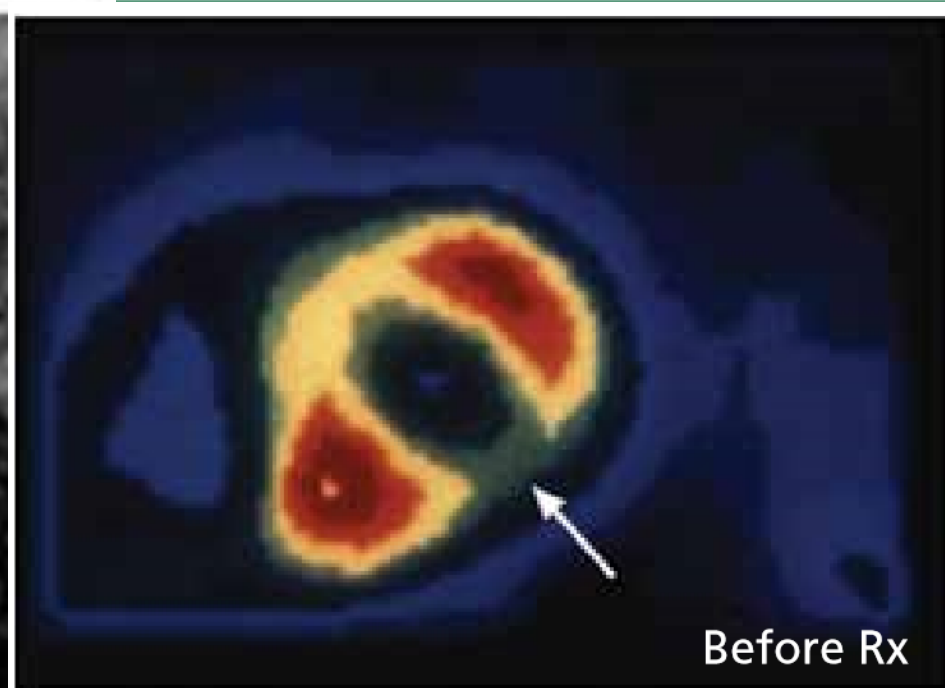
Though current medical and surgical treatments manage coronary artery disease, they do little to prevent or stop it. Nutritional intervention, as shown in our study and others, has halted and even reversed CAD.

ABSTRACT

Purpose ► Plant-based nutrition achieved coronary artery disease (CAD) arrest and reversal in a small study. However, there was skepticism that this approach could succeed in a larger group of patients. The purpose of our follow-up study was to define the degree of adherence and outcomes of 198 consecutive patient volunteers who received counseling to convert from a usual diet to plant-based nutrition.

test to see if adherence can be sustained in broader populations. Plant-based nutrition has the potential for a large effect on the CVD epidemic.

In a 1985 program initiated at the Cleveland Clinic, we examined whether plant-based nutrition could arrest or reverse advanced coronary artery disease (CAD) in 22 patients.¹ One patient with restricted myocardial blood flow documented by positron



	1	Patient stopped clopidogrel on PCP recommendation, resulting in stent closure and MI.		
	1	Patient with atrial fibrillation refused warfarin and suffered a nonfatal stroke.		
	2	Asymptomatic patients with stable CAD persuaded by their PCP to undergo CABG.		
	2	Patients underwent CABG to qualify for valvular repair surgery.		
	1	Patient underwent PCI with stenting to qualify for valvular repair surgery.		
	2	Patients underwent PCI with stenting for occluded grafted LIMA.		
Disease progression		4	11	
	1	Stroke	2	Stroke
	2	CABG [†]	4	PCI with stent
	1	Restenting [#]	3	CABG
			1	Endarterectomy for PAD
			1	Heart transplant
Death		5	2	
Noncardiac**		5	0	
Cardiac		0	2	

Heart disease mortality is increasing in the US and the world, driven by diet, exercise and lifestyle choices, mediated by an increase in obesity and type II diabetes mellitus.

There are no generally safe animal products for those with cardiac risk factors. **Processed red meat (but all animal products in varying degrees), trans- and saturated fats, sugar and other refined carbohydrates** promote cardiac risk: *hypertension, diabetes, dyslipidemia, peripheral artery disease, coronary disease, myocardial infarction, erectile dysfunction, heart failure, stroke and death.*

These consequences (except death) can be treated with drugs and devices. *Or we can change our lifestyles and prevent them in the first place.*

21.75



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SURGEON GENERAL'S WARNING:
Smoking Causes Lung Cancer,
Heart Disease, Emphysema, And
May Complicate Pregnancy.



Nutrition Education From Medical School to Fellowship

Receive a formal, practical lecture, series, or discussion on the role of nutrition and diet in overall health

During Medical / Professional School

During Residency

During Fellowship Training...

FIT

MD

I recall receiving a high level of nutrition education that gave me excellent skills for counseling patients.

0%

1%

I recall receiving a solid nutrition education during my fellowship training that adequately prepared me for counseling patients.

9%

8%

I recall receiving minimal nutrition education during my fellowship training that did not adequately prepare me for counseling patients.

35%

33%

I do not recall receiving any nutrition education during my fellowship training.

56%

57%

I recall receiving a solid nutrition education during my fellowship training that adequately prepared me for counseling patients.

9%

8%

I recall receiving minimal nutrition education during my fellowship training that did not adequately prepare me for counseling patients.

35%

33%

I do not recall receiving any nutrition education during my fellowship training.

56%

57%

MD n= 646
FIT n= 75

Meeting Coverage > AHA

Heart Attack Fells AHA President During Annual Meeting

— The AHA reports that he received a stent and is doing well

by Larry Husten, CardioBrief

November 13, 2017

ANAHEIM -- The president of the American Heart Association, John Warner, MD, 52, had a "mild heart attack" on Monday morning, according to the AHA. Warner received a stent at an undisclosed hospital. The AHA said he is "doing well."

The attack occurred during the AHA's annual scientific sessions meeting here. The first indication of problems occurred early today when the AHA announced that Warner would not be available to moderate a press briefing on new hypertension guidelines.

Take Home Message: *Change Your Lifestyle*

Three Phases of Truth

"All truth passes through three stages. First, it is *ridiculed*. Second, it is *violently opposed*. Third, it is accepted as being *self-evident*."



Arthur Schopenhauer
German Philosopher
(1788-1866)