CARDIOVASCULAR DISEASE AND NUTRITION:

CLOSING THE GAP

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Cardiovascular Disease and Nutrition: Closing the Gap

Cole Adam, RD

Diet can have a positive or negative impact on cardiovascular disease risk

Poor diet is the leading cause of death and disability in the U.S. and worldwide.[1]

Poor diet accounts for roughly half of U.S. cardiometabolic deaths.[2]

Only 0.6% of children and 1.5% of adults meet the criteria for an "ideal" American Heart Association (AHA) diet score.[3]

AHA: “Poor diet quality is strongly associated with elevated risk of cardiovascular disease morbidity and mortality.”

It’s estimated that 69% of ischemic heart disease deaths could be prevented if healthier diets were adopted.[1]

The Basics of a Heart Healthy Diet

- A diet that emphasizes whole, plant-based foods
  - Whole grains
  - Legumes
  - Fruit
  - Vegetables
  - Nuts/seeds
- Modest amounts of fish and non-fat dairy
- Replace saturated and trans fat with monounsaturated and unsaturated fats
- Limit red and processed meat, alcohol, salt, added sugar, and ultra-processed foods

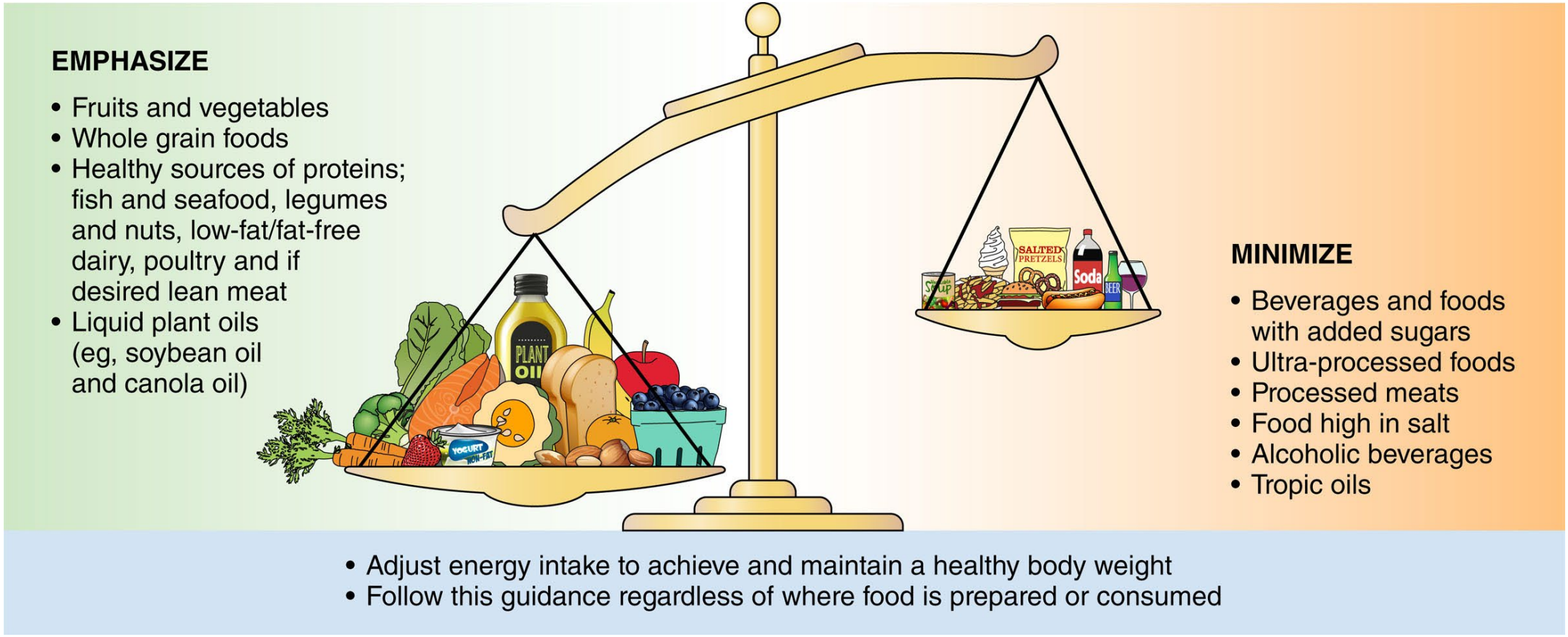
2019 ACC/AHA Guidelines for Primary Prevention of Cardiovascular Disease[4]

Recommendations for Nutrition and Diet

Referenced studies that support recommendations are summarized in Online Data Supplements 4 and 5.

COR	LOE	Recommendations
I	B-R	1. A diet emphasizing intake of vegetables, fruits, legumes, nuts, whole grains, and fish is recommended to decrease ASCVD risk factors.[S3.1-1–S3.1-11]
IIa	B-NR	2. Replacement of saturated fat with dietary monounsaturated and polyunsaturated fats can be beneficial to reduce ASCVD risk.[S3.1-12,S3.1-13]
IIa	B-NR	3. A diet containing reduced amounts of cholesterol and sodium can be beneficial to decrease ASCVD risk.[S3.1-9,S3.1-14–S3.1-16]
IIa	B-NR	4. As a part of a healthy diet, it is reasonable to minimize the intake of processed meats, refined carbohydrates, and sweetened beverages to reduce ASCVD risk.[S3.1-17–S3.1-24]
III: Harm	B-NR	5. As a part of a healthy diet, the intake of *trans* fats should be avoided to reduce ASCVD risk.[S3.1-12,S3.1-17,S3.1-25–S3.1-27]

2021 Dietary Guidance to Improve Cardiovascular Health: A Scientific Statement from the AHA[5]



2021 European Society of Cardiology Guidelines on Cardiovascular Disease Prevention[6]

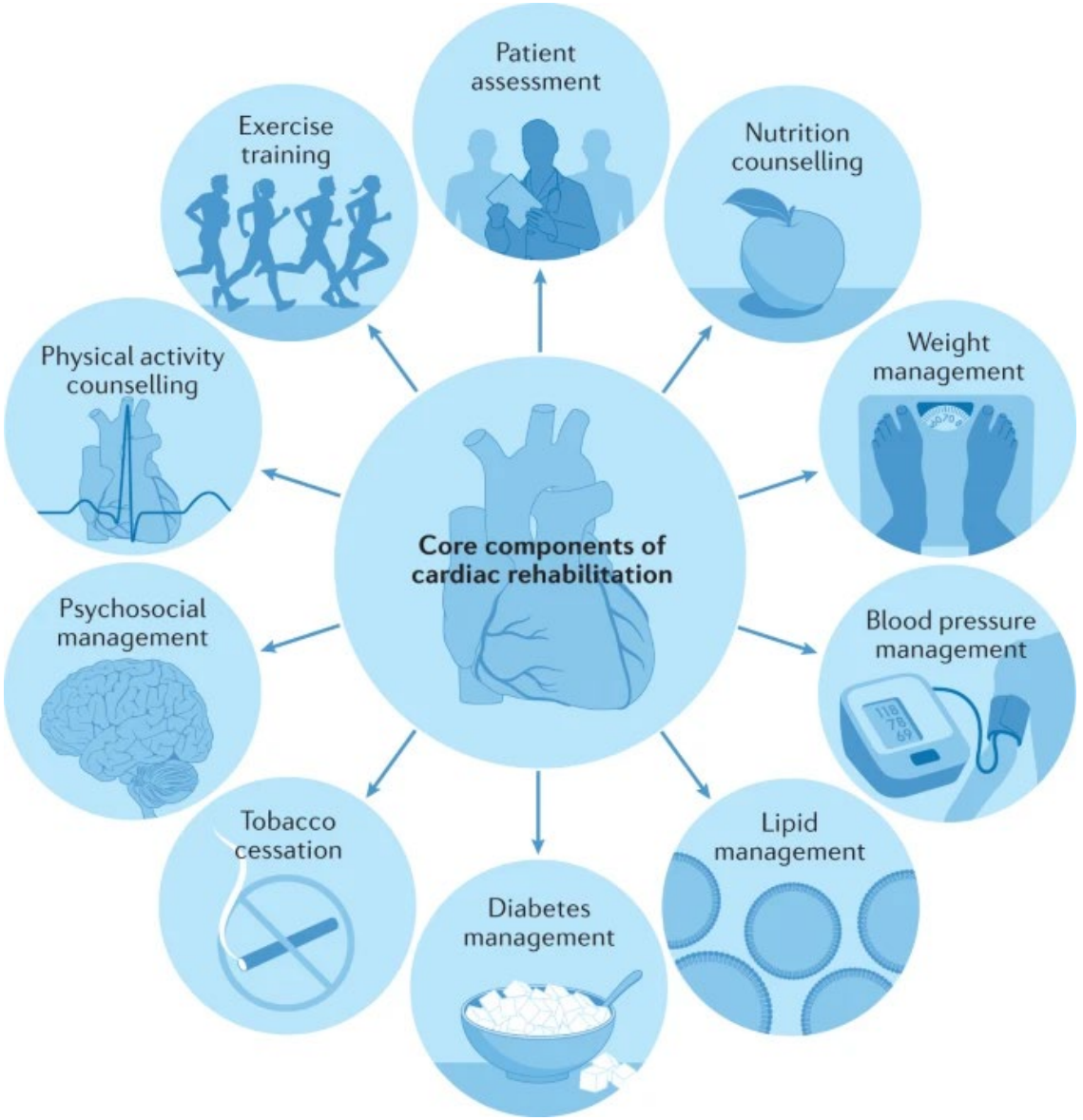
It is recommended to adopt a Mediterranean or similar diet to lower risk of CVD.[403,404]	I	A
It is recommended to replace saturated with unsaturated fats to lower the risk of CVD.[405–409]	I	A
It is recommended to reduce salt intake to lower BP and risk of CVD.[410]	I	A
It is recommended to choose a more plant-based food pattern, rich in fibre, that includes whole grains, fruits, vegetables, pulses, and nuts.[411,412]	I	B
It is recommended to restrict alcohol consumption to a maximum of 100 g per week.[413–415]	I	B
It is recommended to eat fish, preferably fatty, at least once a week and restrict (processed) meat.[406,416–418]	I	B
It is recommended to restrict free sugar consumption, in particular sugar-sweetened beverages, to a maximum of 10% of energy intake.[419,420]	I	B

The Role of a Dietitian on the Healthcare Team

- Dietitian credentials require:
  - A minimum of a bachelor degree in nutrition
  - Completion of an accredited supervised practice internship
  - Passing of the dietetic registration exam
  - Gaining licensure in applicable states
  - Maintaining continuing education
- Serve as nutrition expert
- Designated time to exclusively discuss nutrition
- Reviews of randomized controlled trials found that compared to no nutrition intervention or usual care provided by physician and/or nurse, dietitian consultation resulted in[7-8]:
  - Improved diet quality
  - Improved diabetes management (hgA1c)
  - Greater weight loss outcomes
  - Greater triglyceride reduction

Role of Cardiac Rehab

- A 2021 Cochrane review[9] of randomized controlled trials found that attending cardiac rehab led to:
  - Reduced risk of MI
  - Small reduction in all-cause mortality
  - Large reduction in all-cause hospitalization
  - Reduced healthcare costs
  - Improved health-related quality of life



Ornish-Based Intensive Cardiac Rehab

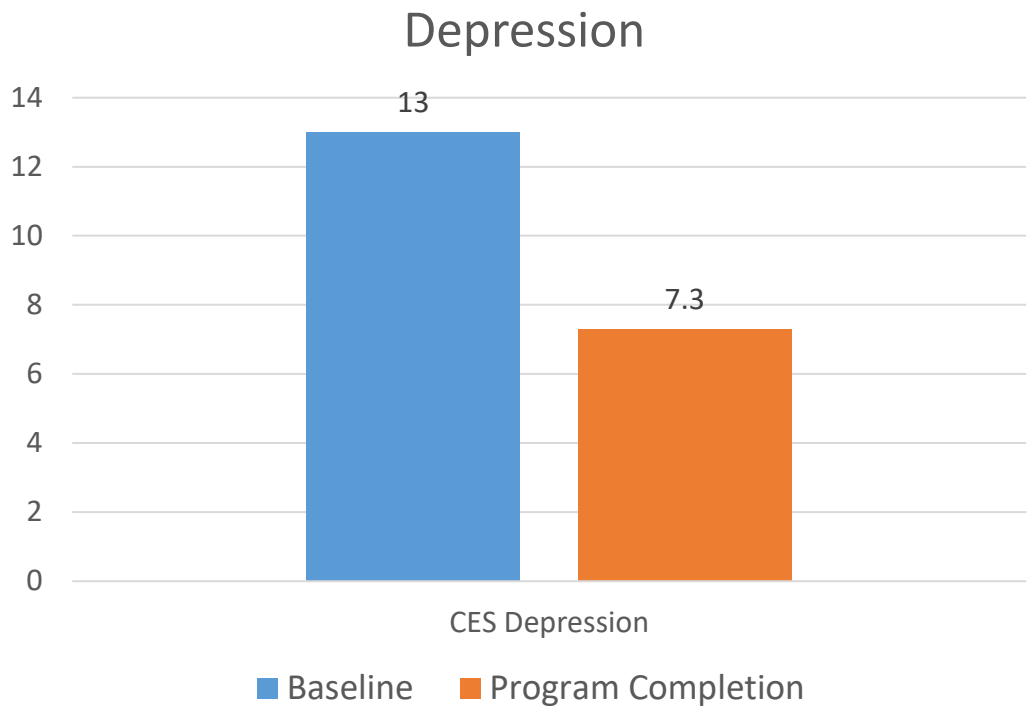
- This Medicare-approved program includes 18 classes over nine weeks.
- Participants attend two, four-hour classes per week with one hour dedicated to each of the following:
  - Exercise
  - Plant-based nutrition
  - Stress management
  - Group support

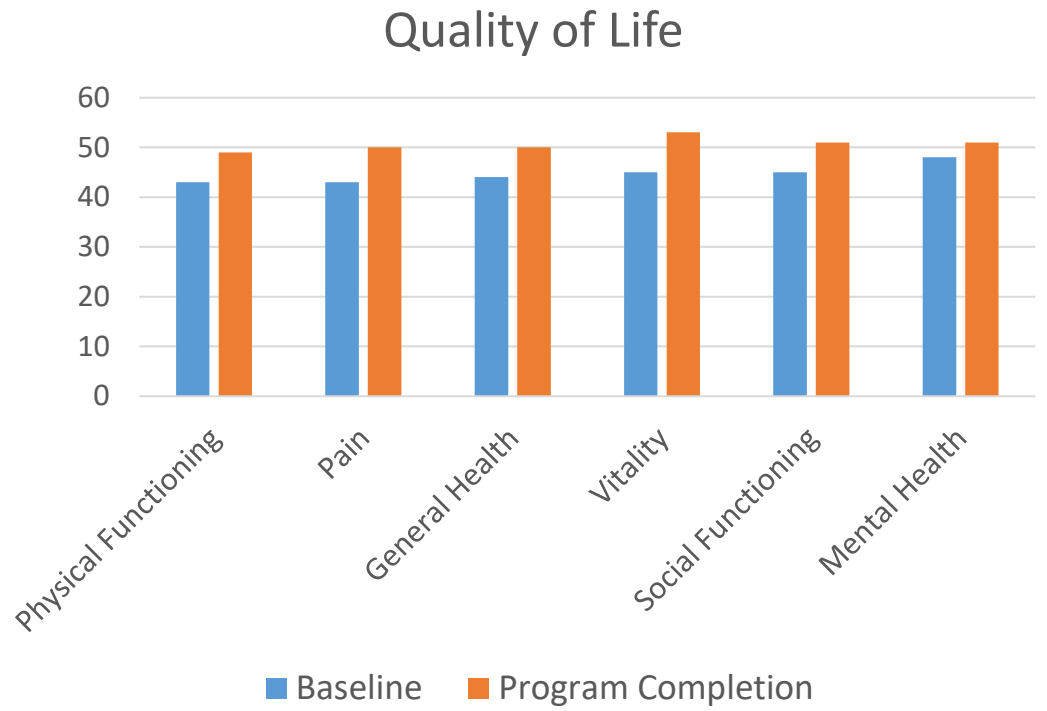
Metabolic Improvements

Health Measure	Baseline Average	Completion Average	Percent Change
Body weight	195 lbs	188 lbs	-3.6%
Systolic BP	113 mmHg	109 mmHg	-3.5%
Diastolic BP	67 mmHg	64 mmHg	-4.5%
Total Cholesterol	156 mg/dL	123 mg/dL	-21%
LDL	85 mg/dL	59 mg/dL	-30%
HDL	44 mg/dL	42 mg/dL	-4.5%
Triglycerides	136 mg/dL	117 mg/dL	-14%
Hemoglobin A1c	6.3%	6.1%	-3%
C-Reactive Protein	4.2 mg/L	2.2 mg/L	-47%
Exercise Capacity	4.1 METs	7.0 METs	+71%

*Based on participants who completed the program and obtained post-program labs

Psychosocial Improvements





Summary

- Diet can have a major positive or negative impact on CVD risk
- There is general consensus that a heart healthy diet is a diet centered on whole, plant foods
- Dietitians serve as the nutrition expert with designated time to educate patients
- Patients see health improvements when working a dietitian and/or when attending cardiac rehab
- This translates to healthier and happier patients

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Gaps in Cardiology & Prevention of CVD

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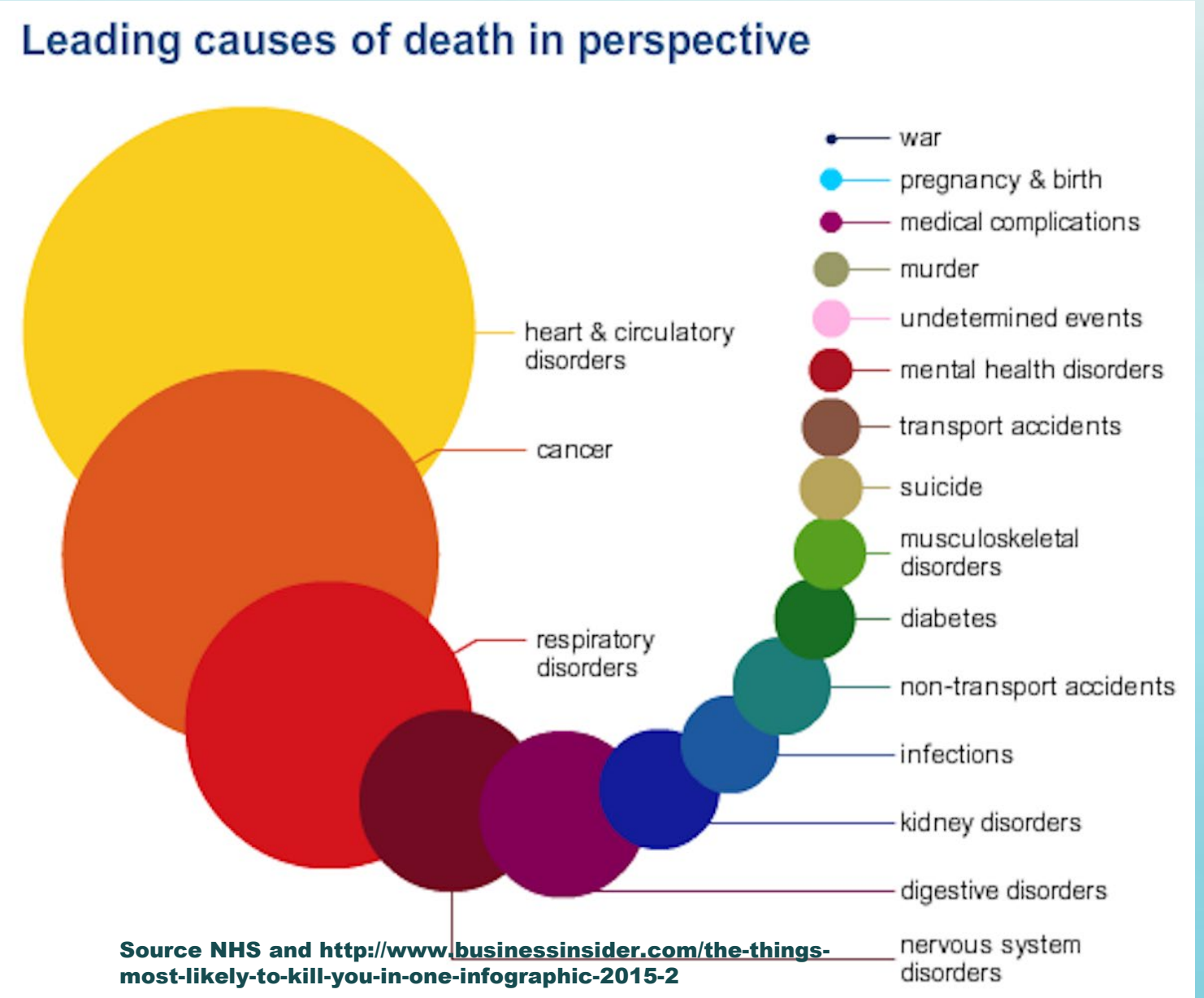
Leading Causes of Death



Source NHS and http://www.businessinsider.com/the-things-most-likely-to-kill-you-in-one-infographic-2015-2

Lifestyle Interventions to Lower LDL

Dietary Modification	Recommendation	~LDL-C Reduction
Saturated fat	<7% calories	8%-10%
Dietary cholesterol	<200 mg/d	3%-5%
Plant stanols/sterols	Up to 2 g/d	6%-10%
Viscous dietary fiber	5-10 g/d	3%-5%
Soy protein	20-30 g/d	5%-7%
Almonds	>10 g/d	1%/10 g
Weight reduction	Lose 10 lb (4.5 kg)	5%-8%
Total		30%-45%

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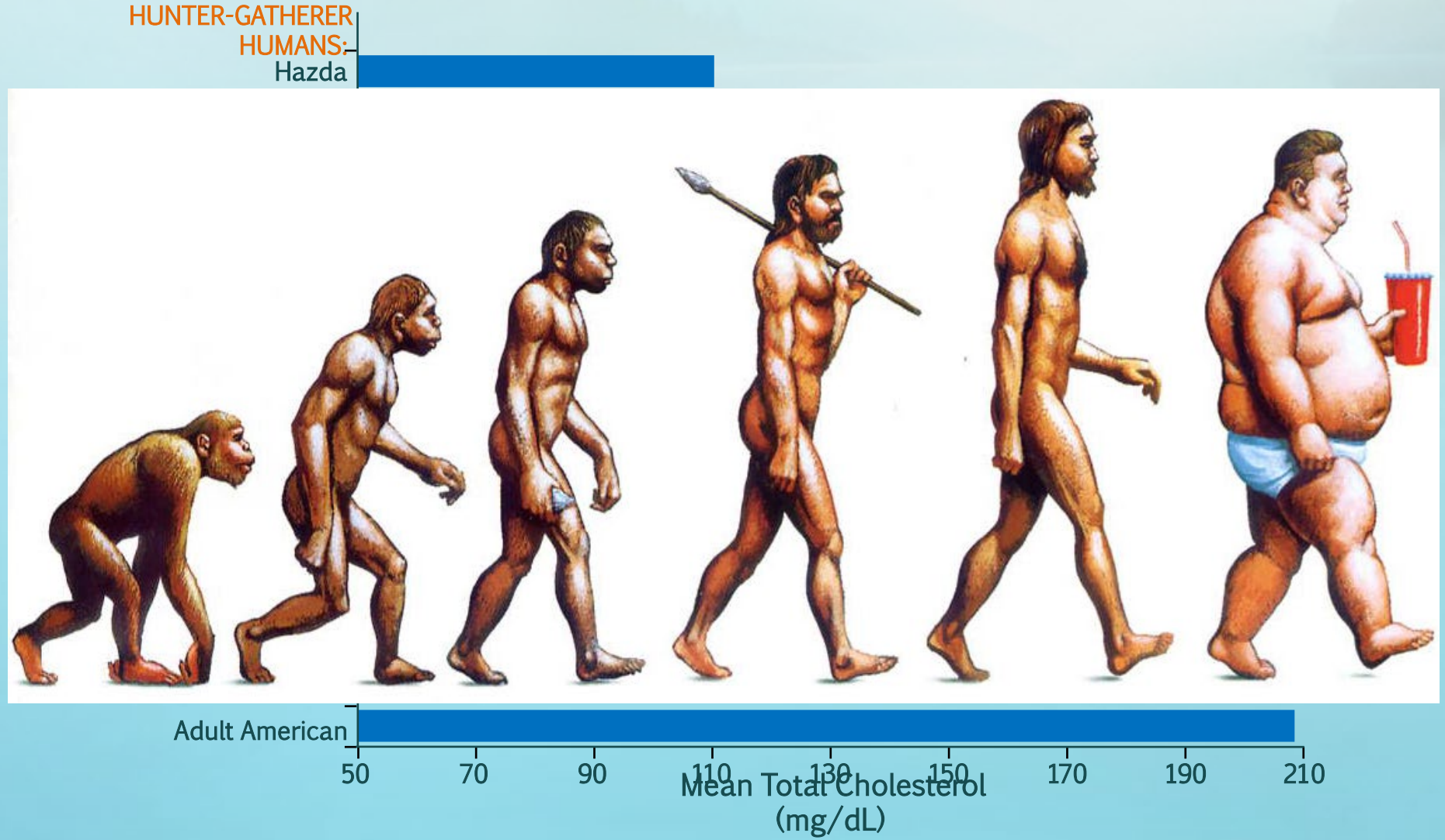
Cholesterol and Environment Worsening



Cover illustration, *The Economist*. December 13, 2003.

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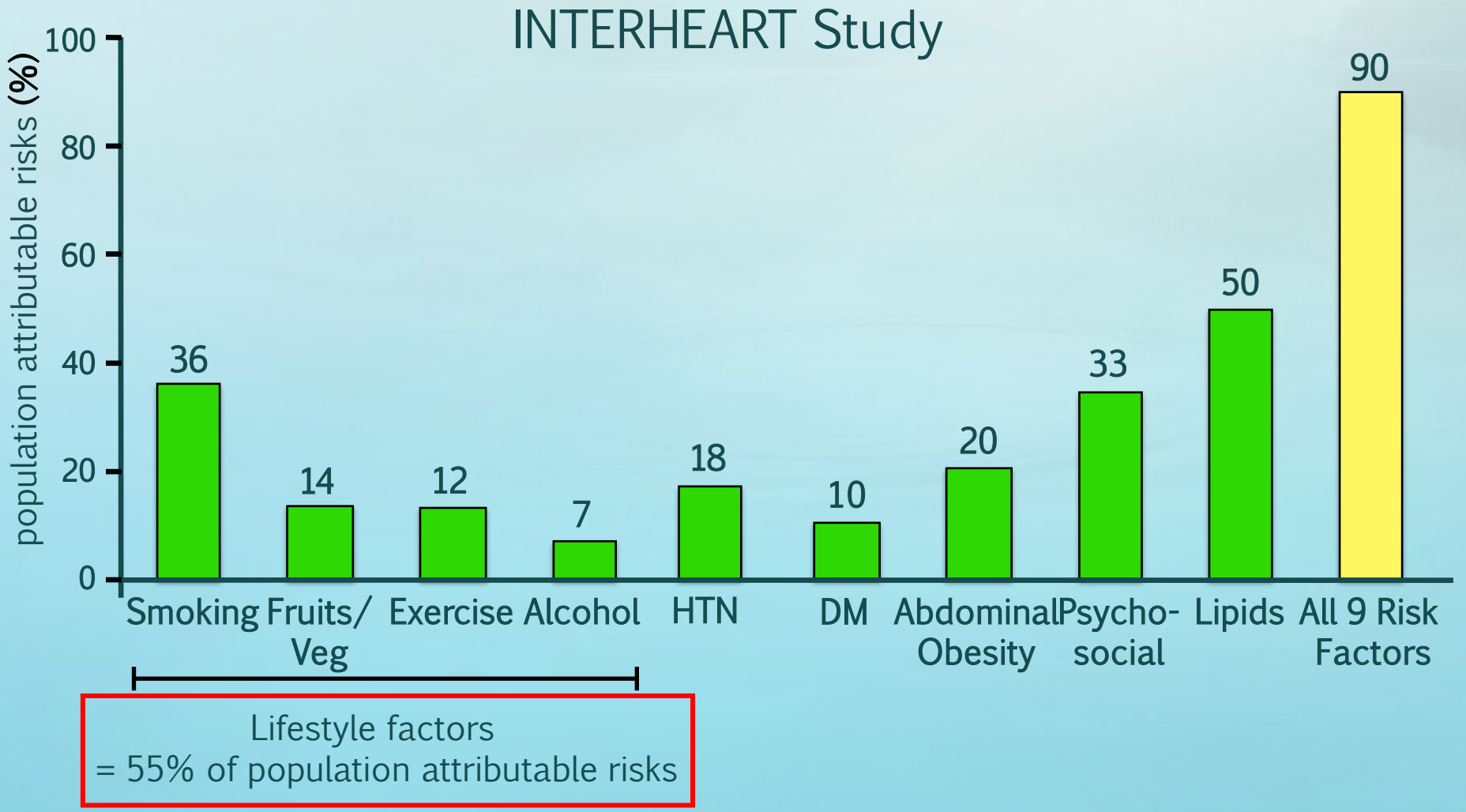
Importance of Addressing Lifestyle



N = 15,152 patients and 14,820 controls in 52 countries.

DM, diabetes mellitus, HTN, hypertension; PAR, population attributable risk (adjusted for all risk factors).

Yusuf S, et al. *Lancet*. 2004;364:937-952.

CLINICAL RESEARCH STUDY

THE AMERICAN JOURNAL of MEDICINE®

A Deficiency of Nutrition Education and Practice in Cardiology

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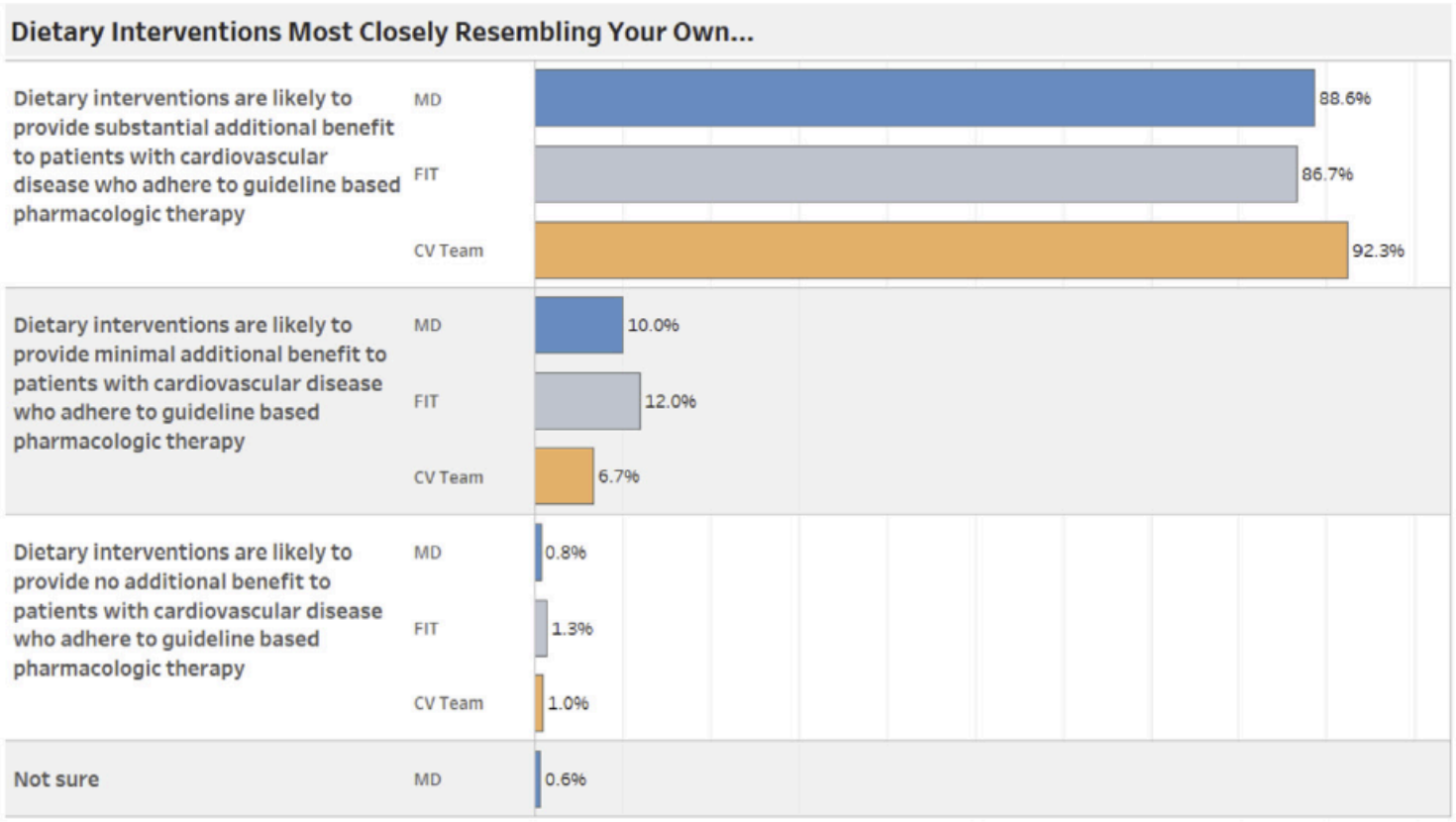
ABSTRACT

BACKGROUND: Nutrition is one of the foundations of cardiovascular guidelines for risk reduction and treatment. However, little is known about whether cardiologists, cardiology fellows-in-training, and cardiovascular team members have the nutrition education and knowledge necessary to implement these guidelines. The aim of this study was to describe the educational experiences, attitudes, and practices relating to nutrition among cardiovascular professionals.

METHODS: Surveys completed by cardiologists, fellows-in-training, and cardiovascular team members inquired about their personal dietary habits, history of nutrition education, and attitudes regarding nutrition interventions.

RESULTS: A total of 930 surveys were completed. Among cardiologists, 90% reported receiving no or minimal nutrition education during fellowship training, 59% reported no nutrition education during internal medicine training, and 31% reported receiving no nutrition education in medical school. Among cardiologists, 8% described themselves as having "expert" nutrition knowledge. Nevertheless, fully 95% of cardiologists believe that their role includes personally providing patients with at least basic nutrition information. The percentage of respondents who ate ≥5 servings of vegetables and fruits per day was: 20%

Attitudes Regarding Dietary Interventions



MD n= 642
FIT n= 75
CV Team n= 209

Devries S, Agatston A, Aggarwal M, Aspry KE, Esselstyn CB, Kris-Etherton P, Miller M, O'Keefe JH, Ros E, Rzeszut AK, White BA, Williams KA, **Freeman AM**. A Deficiency of Nutrition Education and Practice in Cardiology. Am J Med. 2017 May 24.

Figure 2 Attitudes regarding dietary interventions. Q: Which of the following perspectives on dietary interventions most closely resembles your own? CV = cardiovascular; FIT = fellow-in-training.

Surprising Trends From the Front Lines

- 90% of cardiologists had no or minimal nutrition education during fellowship training
- Only 8% had a “solid nutrition education” that they considered “adequate”

Devries S, Agatston A, Aggarwal M, Aspry KE, Esselstyn CB, Kris-Etherton P, Miller M, O'Keefe JH, Ros E, Rzeszut AK, White BA, Williams KA, **Freeman AM**. A Deficiency of Nutrition Education and Practice in Cardiology. Am J Med. 2017 May 24.

Self Assessments

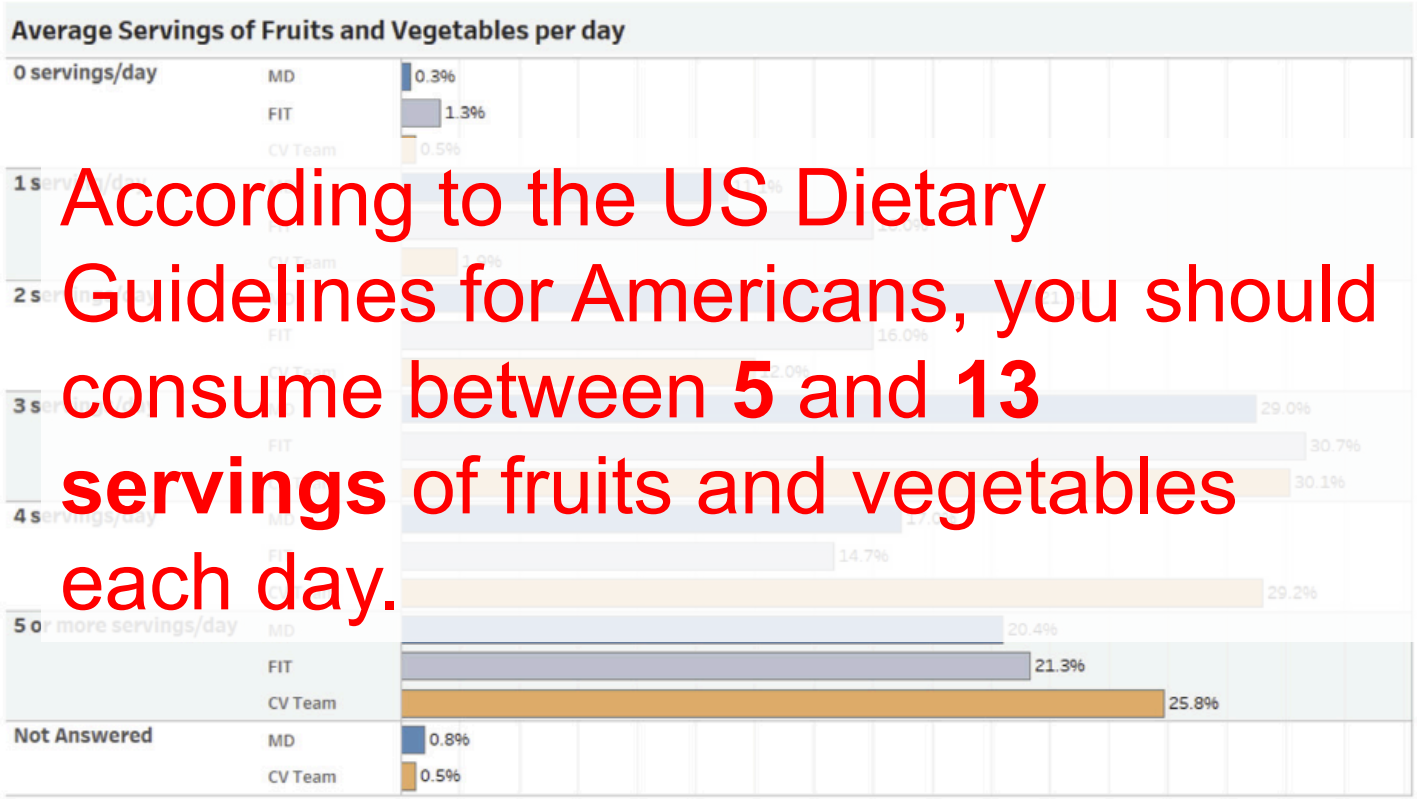
- Just 8% cardiologists have expert knowledge in nutrition

Knowledge was self assessed

- 22% - better than average
- 23% - average
- 27% - adequate
- 18% described “feeling uncomfortable teaching patients on this topic.”

Devries S, Agatston A, Aggarwal M, Aspry KE, Esselstyn CB, Kris-Etherton P, Miller M, O'Keefe JH, Ros E, Rzeszut AK, White BA, Williams KA, **Freeman AM**. A Deficiency of Nutrition Education and Practice in Cardiology. Am J Med. 2017 May 24.

Dietary Habits of Cardiovascular Professionals



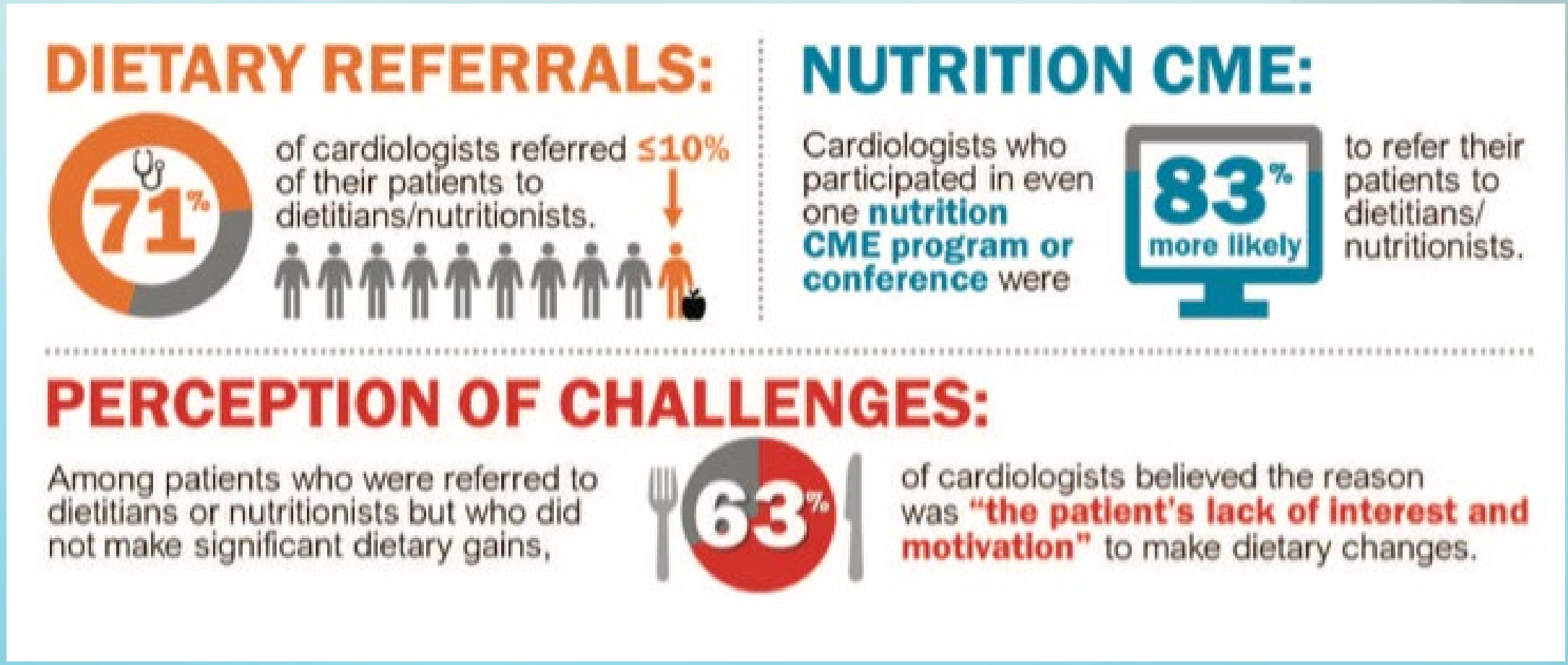
According to the US Dietary Guidelines for Americans, you should consume between **5** and **13** **servings** of fruits and vegetables each day.

MD n= 642
FIT n= 75
CV Team n= 209

Devries S, Agatston A, Aggarwal M, Aspry KE, Esselstyn CB, Kris-Etherton P, Miller M, O'Keefe JH, Ros E, Rzeszut AK, White BA, Williams KA, **Freeman AM**. A Deficiency of Nutrition Education and Practice in Cardiology. Am J Med. 2017 May 24.

Figure 4 Dietary habits of cardiovascular professionals. On average, how many servings of fruits and vegetables do you eat every day? (1 cup of uncooked green leafy vegetables = 1 serving; ½ cup of other cooked vegetables = 1 serving). CV = cardiovascular; FIT = fellow-in-training.

New Work – RD Referrals



Devries, S., Aggarwal, M., Allen, K., Kris-Etherton, P., Theriot, P., & Freeman, A. M. (2021). Assessment of the Low Referral Rate of Cardiologists to Dietitians/Nutritionists. *International Journal of Disease Reversal and Prevention*, *4*(1), 8 pp. https://doi.org/10.22230/ijdrp.2021v3n2a303

RD Referrals

- Surveys were sent to 409 clinically active cardiologists (ACC Cardiosurv) and completed by 123 (30%). Their experience level was: 28% early career (1–10 years post-training), 25% in mid-career (11–20 years), and 43% late career (> 20 years); 4% did not provide tenure information (see Table 1).

Devries, S., Aggarwal, M., Allen, K., Kris-Etherton, P., Theriot, P., & Freeman, A. M. (2021). Assessment of the Low Referral Rate of Cardiologists to Dietitians/Nutritionists. *International Journal of Disease Reversal and Prevention*, *4*(1), 8 pp. https://doi.org/10.22230/ijdrp.2021v3n2a303

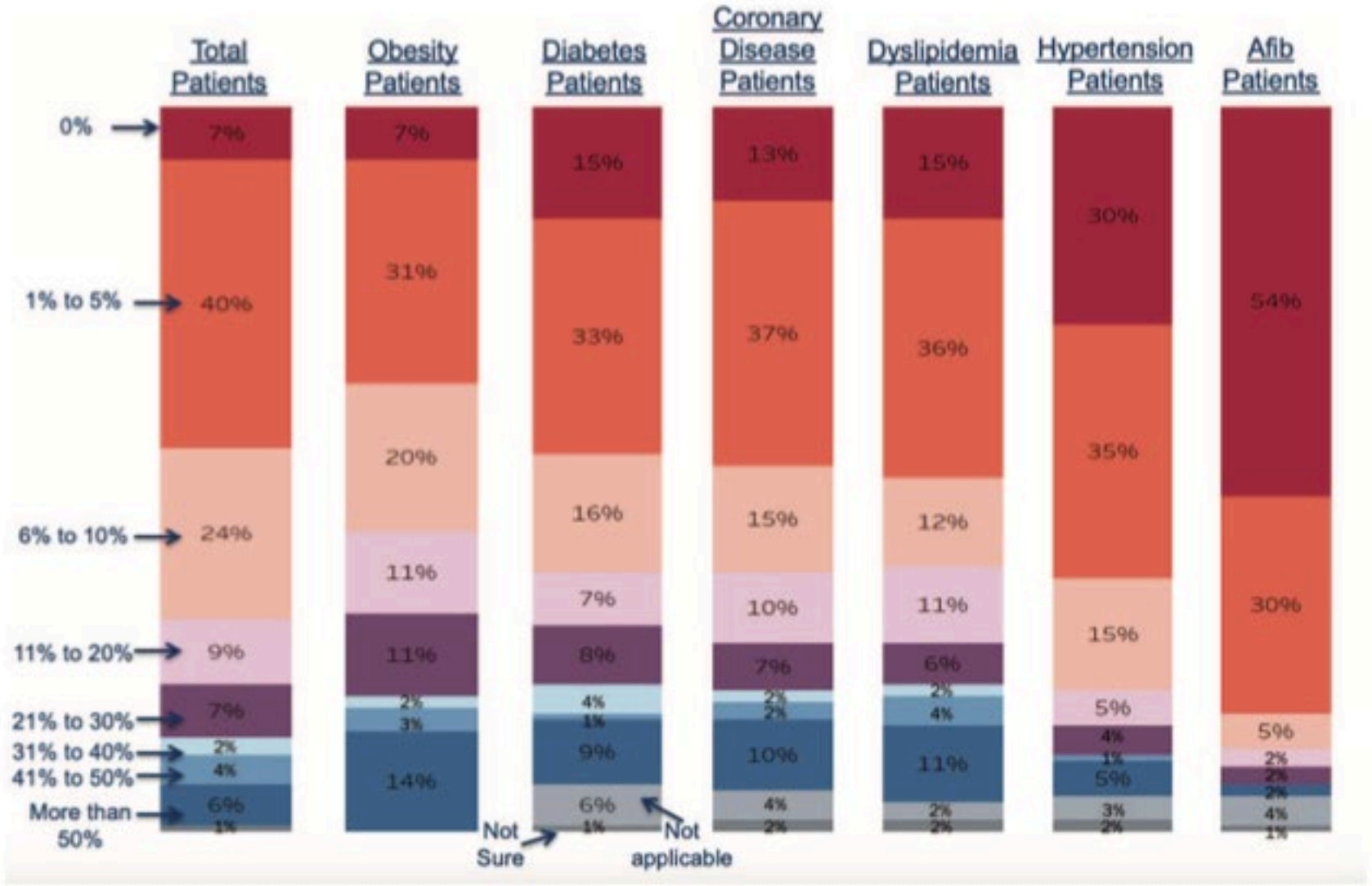


Figure 1. Percentage of patients referred to dietitians/nutritionists

Notes: Percentage of cardiologists (value noted on bars) who refer patients to a dietitian/nutritionist at frequencies noted adjacent to y-axis ($n = 123$). Afib, atrial fibrillation

Devries, S., Aggarwal, M., Allen, K., Kris-Etherton, P., Theriot, P., & Freeman, A. M. (2021). Assessment of the Low Referral Rate of Cardiologists to Dietitians/Nutritionists. *International Journal of Disease Reversal and Prevention*, *4*(1), 8 pp. https://doi.org/10.22230/ijdrp.2021v3n2a303

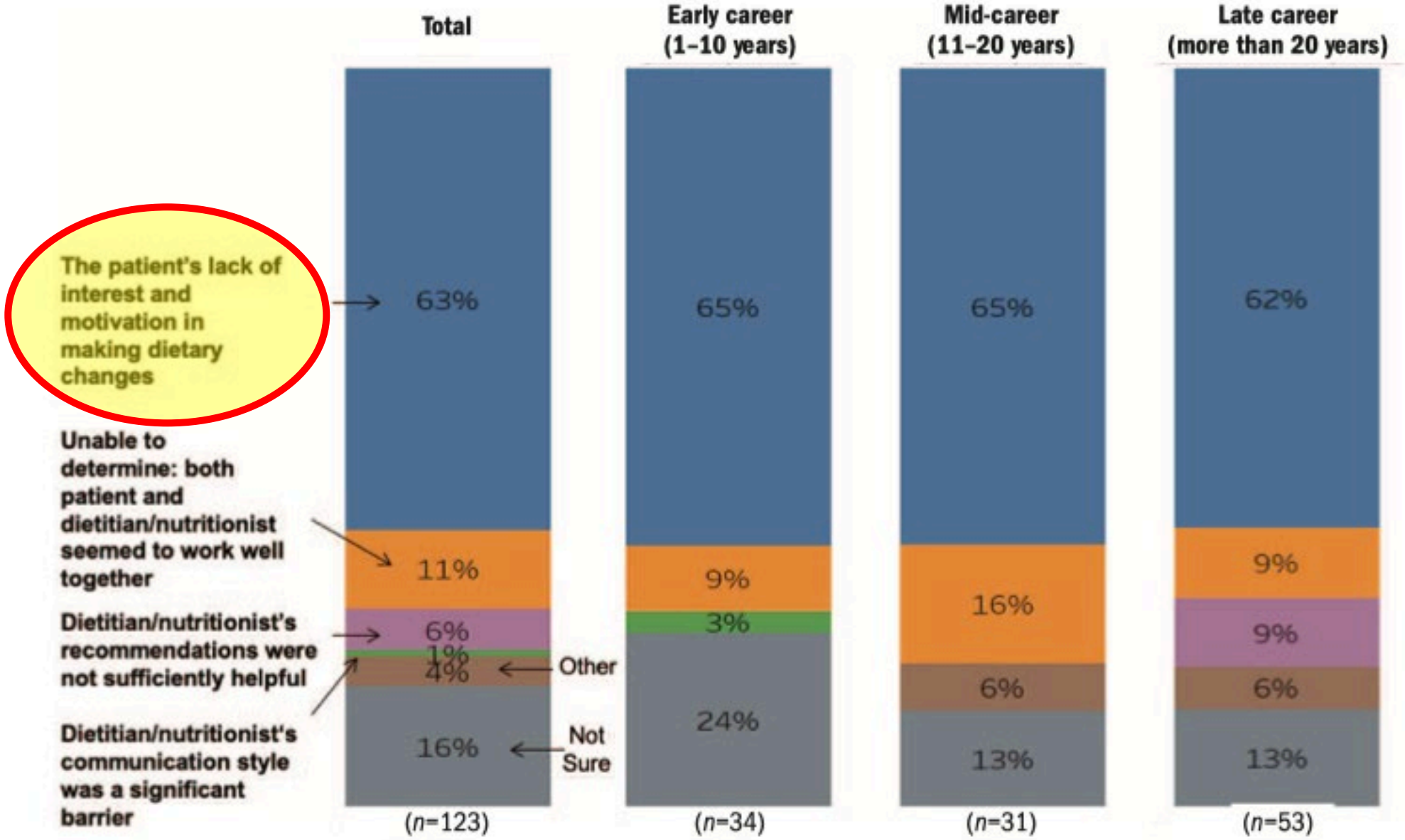


Figure 3. Most frequent reason dietary goal not achieved

Devries, S., Aggarwal, M., Allen, K., Kris-Etherton, P., Theriot, P., & Freeman, A. M. (2021). Assessment of the Low Referral Rate of Cardiologists to Dietitians/Nutritionists. *International Journal of Disease Reversal and Prevention*, *4*(1), 8 pp. https://doi.org/10.22230/ijdrp.2021v3n2a303

RD Referrals

- Participation in at least one focused nutrition CME program since completing fellowship = significantly more likely to refer patients to a dietitian/nutritionist 10% of the time than those who did not do so
- Nearly double (44% from 24%) the referral rates among cardiologists who participated in nutrition CME.
- 78% of cardiologists reported not having participated in a nutrition-focused CME course or conference since fellowship.

Devries, S., Aggarwal, M., Allen, K., Kris-Etherton, P., Theriot, P., & Freeman, A. M. (2021). Assessment of the Low Referral Rate of Cardiologists to Dietitians/Nutritionists. *International Journal of Disease Reversal and Prevention*, *4*(1), 8 pp. https://doi.org/10.22230/ijdrp.2021v3n2a303

RD Referrals

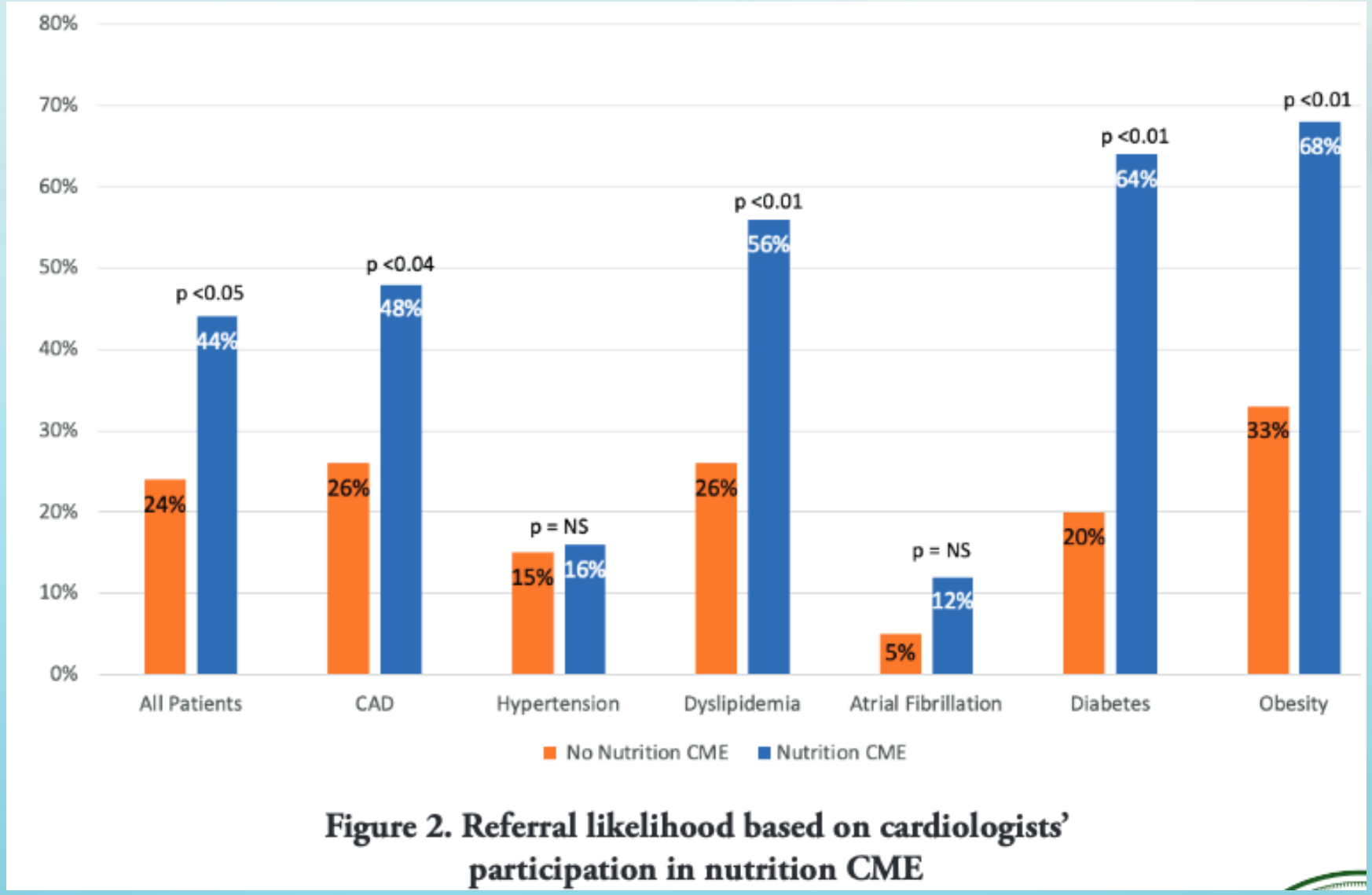


Figure 2. Referral likelihood based on cardiologists' participation in nutrition CME

Devries, S., Aggarwal, M., Allen, K., Kris-Etherton, P., Theriot, P., & Freeman, A. M. (2021). Assessment of the Low Referral Rate of Cardiologists to Dietitians/Nutritionists. *International Journal of Disease Reversal and Prevention*, *4*(1), 8 pp. https://doi.org/10.22230/ijdrp.2021v3n2a303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Your body often has a remarkable capacity to heal…
if you give it a chance to do so - and quickly.

Adding Prevention

- Use motivational interviewing, direct questions, patient surveys
- Ask about diet, exercise, stress, and connection/support at every visit
- When patients are their sickest i.e. MI, CABG etc. use this as an opportunity to inspire wellness
- Discuss cardiac prevention and secondary prevention
- Incorporate ICR referrals into your clinical workflow and discharge pathways

Key Data Points

Why am I so passionate about this?

Replace Animal with Plant Protein

- Diets of 131,342 participants from the Nurses' Health Study and Health Professionals Follow-up Study.
- Animal protein intake was associated with an increased risk for death from diseases, especially cardiovascular disease, and plant protein intake was associated with a lower risk for mortality.
- Replacing animal protein of various origins with plant protein was associated with lower mortality.
- **HRs for all-cause mortality** were 0.66 (95% CI, 0.59-0.75) when 3% of energy from plant protein was substituted for an equivalent amount of protein from **processed red meat**, 0.88 (95%CI, 0.84-0.92) from **unprocessed red meat**, and 0.81 (95%CI, 0.75-0.88) from **egg**.
- **This is a 44% reduction, 12% reduction, and 19% reduction!**

Hu FB, et al. Association of animal and plant protein intake with all-cause and cause-specific mortality. *JAMA Intern Med*. Published online August 1, 2016.

Plant vs. Animal Protein Intake in CV Mortality Risk

Animal protein intake may be associated with a higher risk for cardiovascular mortality, as compared to plant protein intake in patients with at least one lifestyle risk factor, according to a study published Aug. 1 in *JAMA Internal Medicine*.

The prospective cohort study, by **Mingyang Song, MD, ScD**, et al., looked at 131,342 participants in the Nurses' Health Study and the Health Professionals Follow-up Study. The median protein intake was 14% for animal protein and 4% for plant protein.

After adjusting for major lifestyle and dietary risk factors, results showed that animal protein intake was "weakly associated" with higher mortality, particularly cardiovascular mortality since "every 10% increment of animal protein from total calories was associated with a 2% higher risk" for all-cause mortality, and an 8% increased risk for cardiovascular mortality. In comparison, plant protein intake "was associated with a 10% lower risk" of all-cause mortality "for every 3% increment of total calories and a 12% lower risk" for cardiovascular mortality.

The authors add that these associations "were confined to participants with at least one unhealthy lifestyle factor based on smoking, heavy alcohol intake, overweight or obesity, and physical inactivity," but not seen in patients without any of these risk factors.

"Substitution of plant protein for animal protein, especially from processed red meat, may confer substantial health benefit. Therefore, public health recommendations should focus on improvement of protein sources," the authors conclude.

"The findings are very consistent with prior research, but with some new statistically significant elements that further support the benefits of substituting plant protein for animal protein," said **Kim Allan Williams Sr., MD**, immediate past president of the ACC. "Consider the lives that could be saved by changing dietary protein intake from animals to vegetables!"

"Consider the lives that could be saved by changing dietary protein intake from animals to vegetables!"

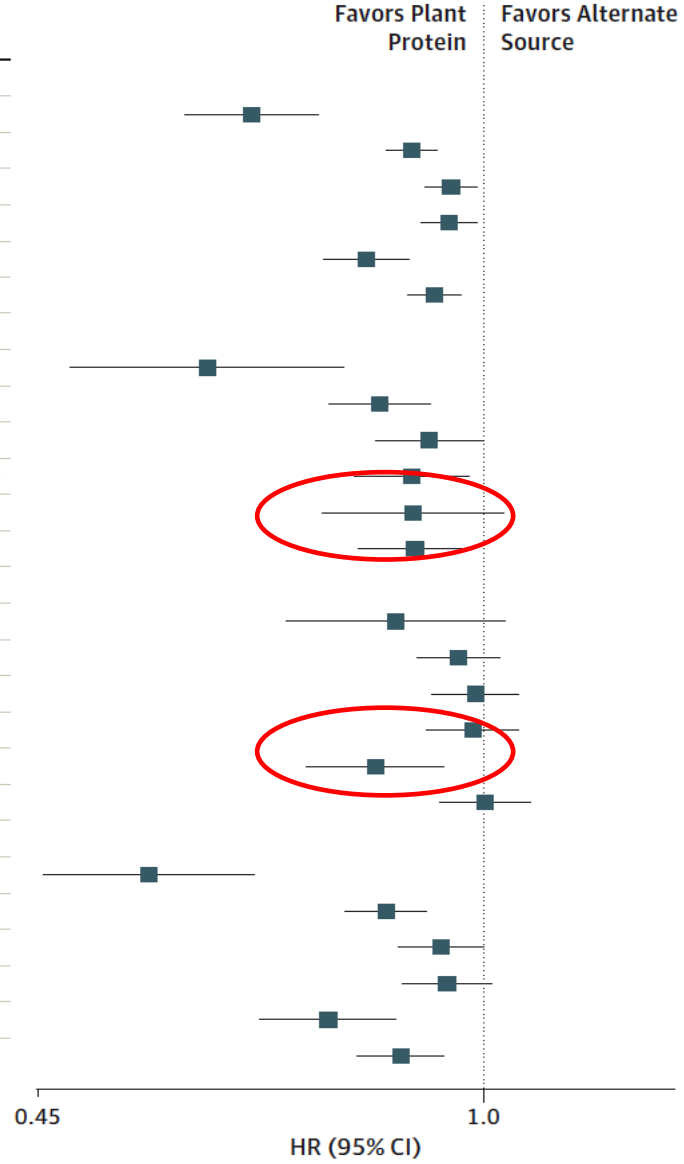
—Kim Allan Williams, MD

Song M, Fung TT, Hu FB, et al. *JAMA Intern Med*. 2016doi:10.1001/jamainternmed.2016.4182

Data From the Study

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

Animal Protein Source by Cause of Death	HR (95% CI)
All cause	
Processed red meat	0.66 (0.59-0.75)
Unprocessed red meat	0.88 (0.84-0.92)
Poultry	0.94 (0.90-0.99)
Fish	0.94 (0.89-0.99)
Egg	0.81 (0.75-0.88)
Dairy	0.92 (0.87-0.96)
CVD	
Processed red meat	0.61 (0.48-0.78)
Unprocessed red meat	0.83 (0.76-0.91)
Poultry	0.91 (0.83-1.00)
Fish	0.88 (0.80- 0.97)
Egg	0.88 (0.75-1.04)
Dairy	0.89 (0.80-0.98)
Cancer	
Processed red meat	0.86 (0.71-1.04)
Unprocessed red meat	0.96 (0.89-1.03)
Poultry	0.99 (0.91-1.06)
Fish	0.98 (0.91-1.06)
Egg	0.83 (0.73-0.93)
Dairy	1.00 (0.93-1.09)
Other	
Processed red meat	0.55 (0.46-0.67)
Unprocessed red meat	0.84 (0.78-0.90)
Poultry	0.93 (0.86-1.00)
Fish	0.94 (0.87-1.01)
Egg	0.76 (0.67-0.86)
Dairy	0.86 (0.80-0.93)



The Lyon Heart Study

A randomized secondary prevention trial with Mediterranean Diet

Lyon results cause the AHA to release a science advisory:

"The unprecedented reduction in coronary recurrence rates, *despite* the fact that lipid/lipoprotein risk factors were comparable, clearly points to other important risk factor modifications as major influences in the development of CVD."

"The public health benefits that now seem to be achievable by dietary intervention, using emerging evidence, clearly warrant an investment of significant research funding by the AHA and its partners."

Kris-Etherton P, et al. AHA Science Advisory: Lyon Diet Heart Study Circulation. 2001; 103: 1823-1825

… As Powerful As Statins

- 4,098 women and men from both the Nurses' Health Study and the Health Professionals Follow-up Study.
- 9 Years: Diets lowest in red and processed meat products and sugar and highest in whole grains, fruits, and vegetables lowered the risk of death from heart disease by 40%, compared with no dietary changes.
- And a 29% overall risk reduction in death of all causes
- Effect seems to be strongest in women

That's an effect "as powerful as the effect of statins, without the adverse effects or costs," noted an accompanying invited commentary by Ramón Estruch (Mediterranean Diet Study)

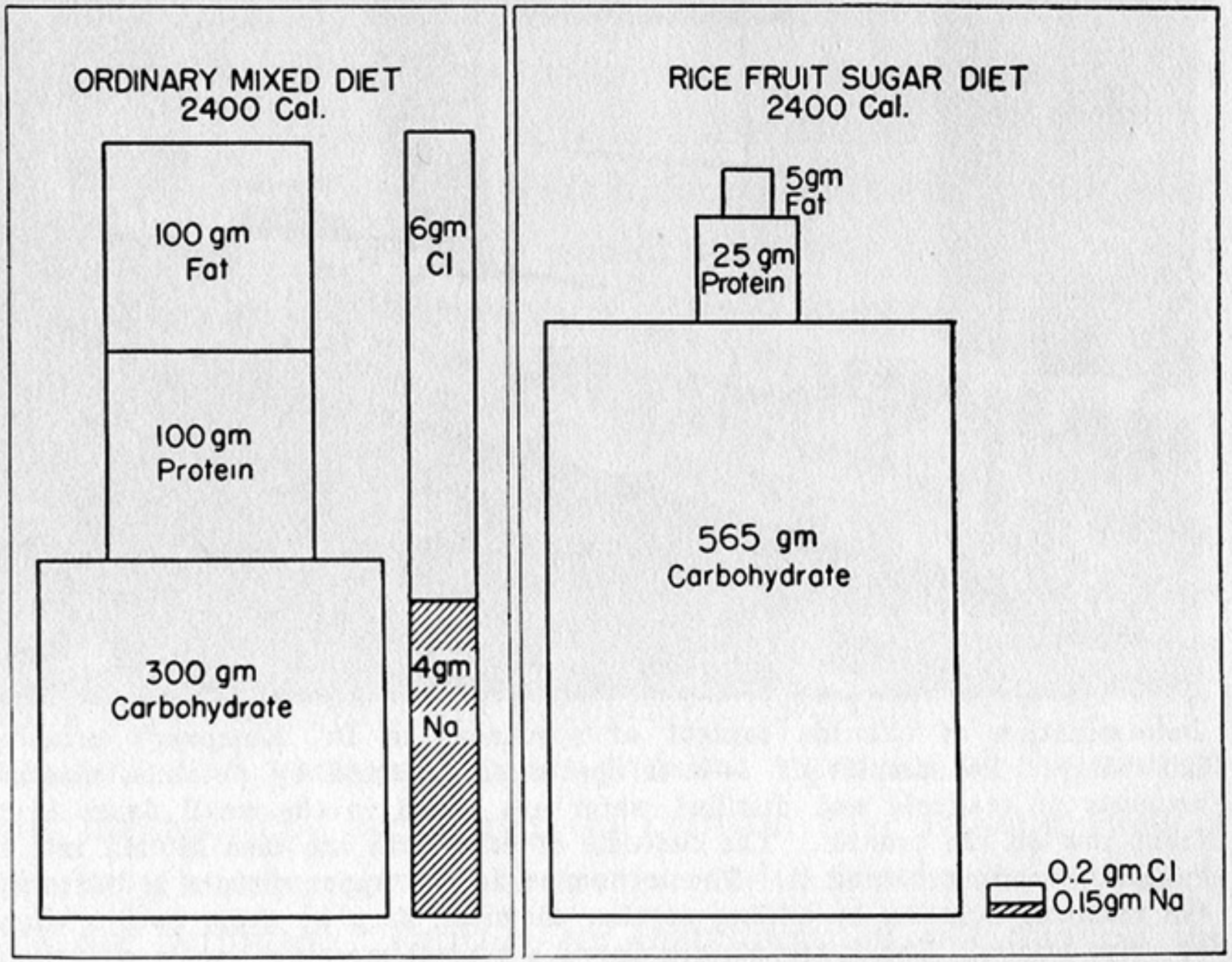
Li S, Chiuve SE, Flint A, et al. Better diet quality and decreased mortality among myocardial infarction survivors. *JAMA Intern Med*. Published online September 2, 2013.
Estruch R, Ros E "Eat a healthy diet and drink wisely to postpone dying if you survived a myocardial infarction? Yes, but randomized clinical trials are needed" JAMA Intern Med 2013; DOI: 10.1001/jamainternmed.2013.7667.

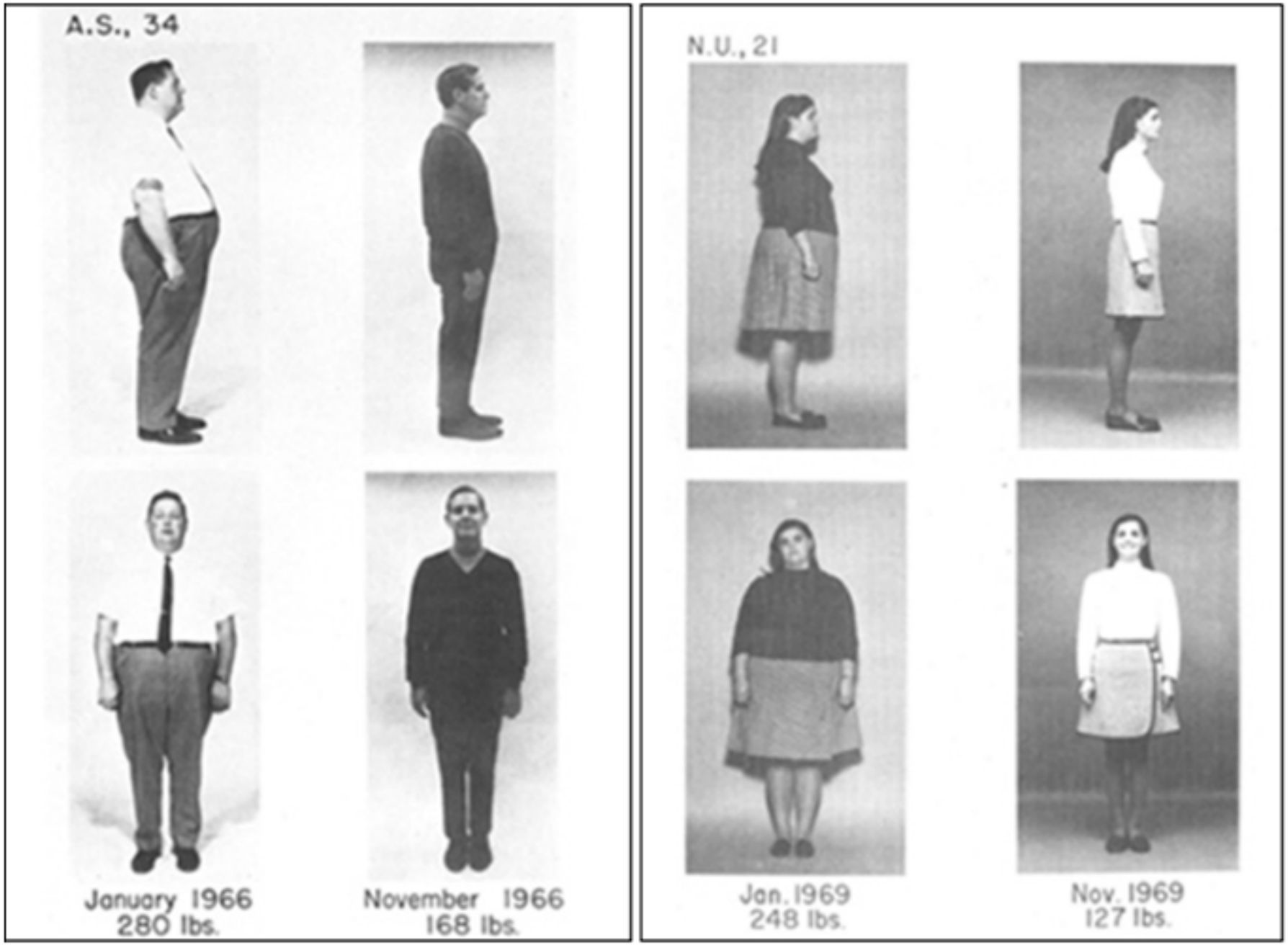
Dr. Walter Kempner

- Duke University in the 1940s
- Fed patients a diet of white rice and fruit (i.e. sugar)
- Marked improvements in weight, blood pressure, and diabetes

Kempner W. Treatment of heart and kidney disease and of hypertensive and arteriosclerotic vascular disease with the rice diet. Ann Intern Med.
1949;31:821–856, illust.

COMPOSITION OF DIETS





From the Bulletin of the Walter Kempner Foundation (June 1972)

Kempner Continued

B Newborg, W Kempner. Analysis of 177 cases of hypertensive vascular disease with papilledema; one hundred twenty-six patients treated with rice diet. Am J Med. 1955 Jul;19(1):33-47.

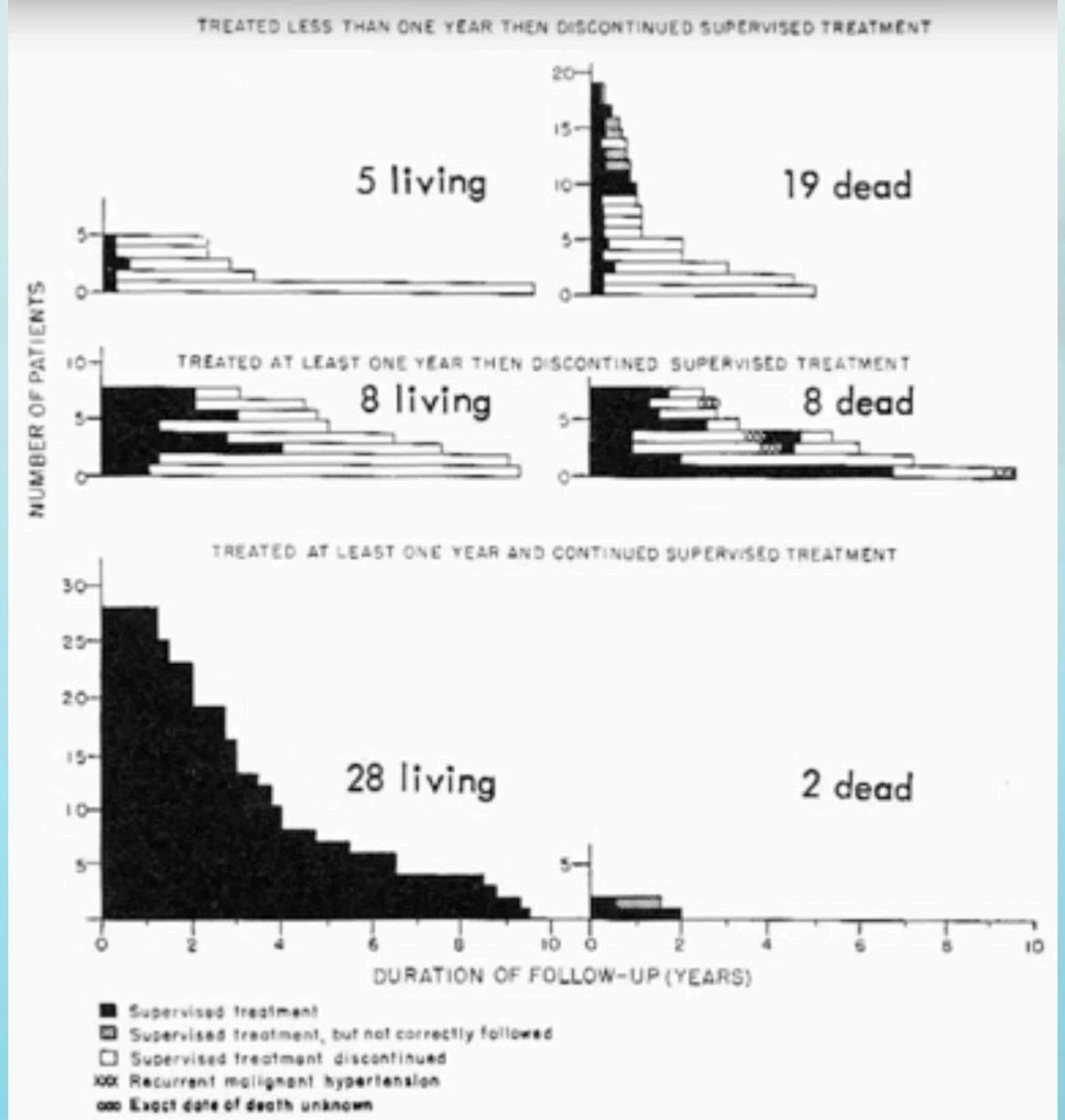


FIG. 2. Survival time and period of treatment (seventy patients, total PSP excretion in two hours, 36 per cent or more). Living, forty-one patients; dead, twenty-nine patients.

CV Disease – Ornish Intervention

- Study of 48 patients, all of whom had atherosclerotic plaques that were clearly visible on angiograms.
- Half control / Half experimental

- Experimental Group:
  - Low-fat, vegetarian diet
  - Brisk walking for one-half hour per day or one hour three times per week
  - Avoidance of tobacco
  - Stress management exercises
  - The prescribed diet excluded red meat, poultry, and fish, virtually eliminating cholesterol and animal fat. It also minimized vegetable oils, because all oils contain at least some traces of saturated fats.
- All patients had a second angiogram one year later.
- Control group: 100% had disease progression and symptoms
- Experimental group: chest pain diminished within weeks. Cholesterol levels dropped dramatically without cholesterol-lowering drugs.
  - 82% of the patients showed measurable reversal of their coronary artery blockages.
  - 400% improvement in myocardial perfusion after five years as compared to the randomized control group as measured by cardiac PET scan.

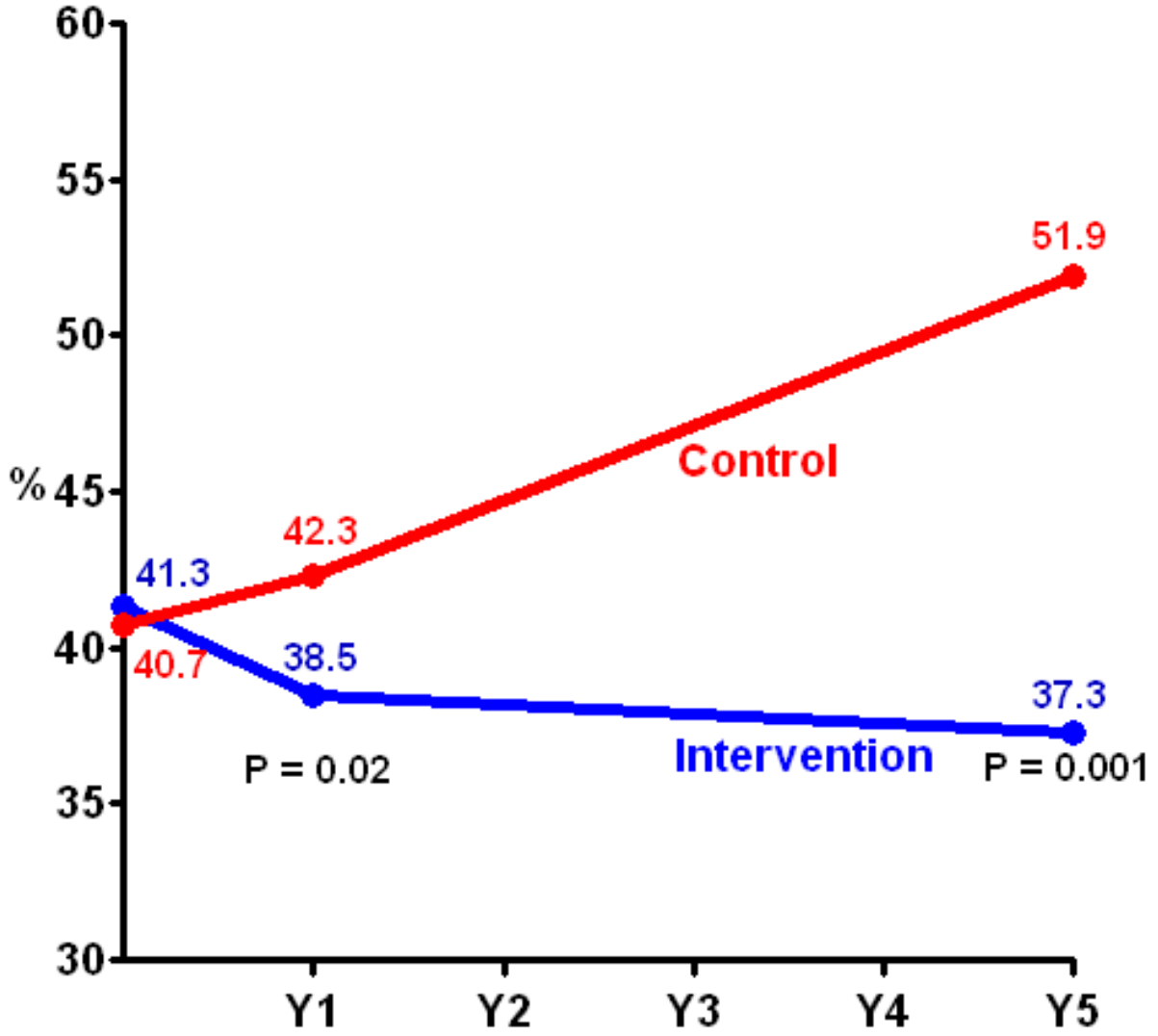
Ornish D, Brown SE, Scherwitz LW, et al. Can lifestyle changes reverse coronary heart disease? Lancet 1990;336:129-33.

Lifestyle Heart Trial

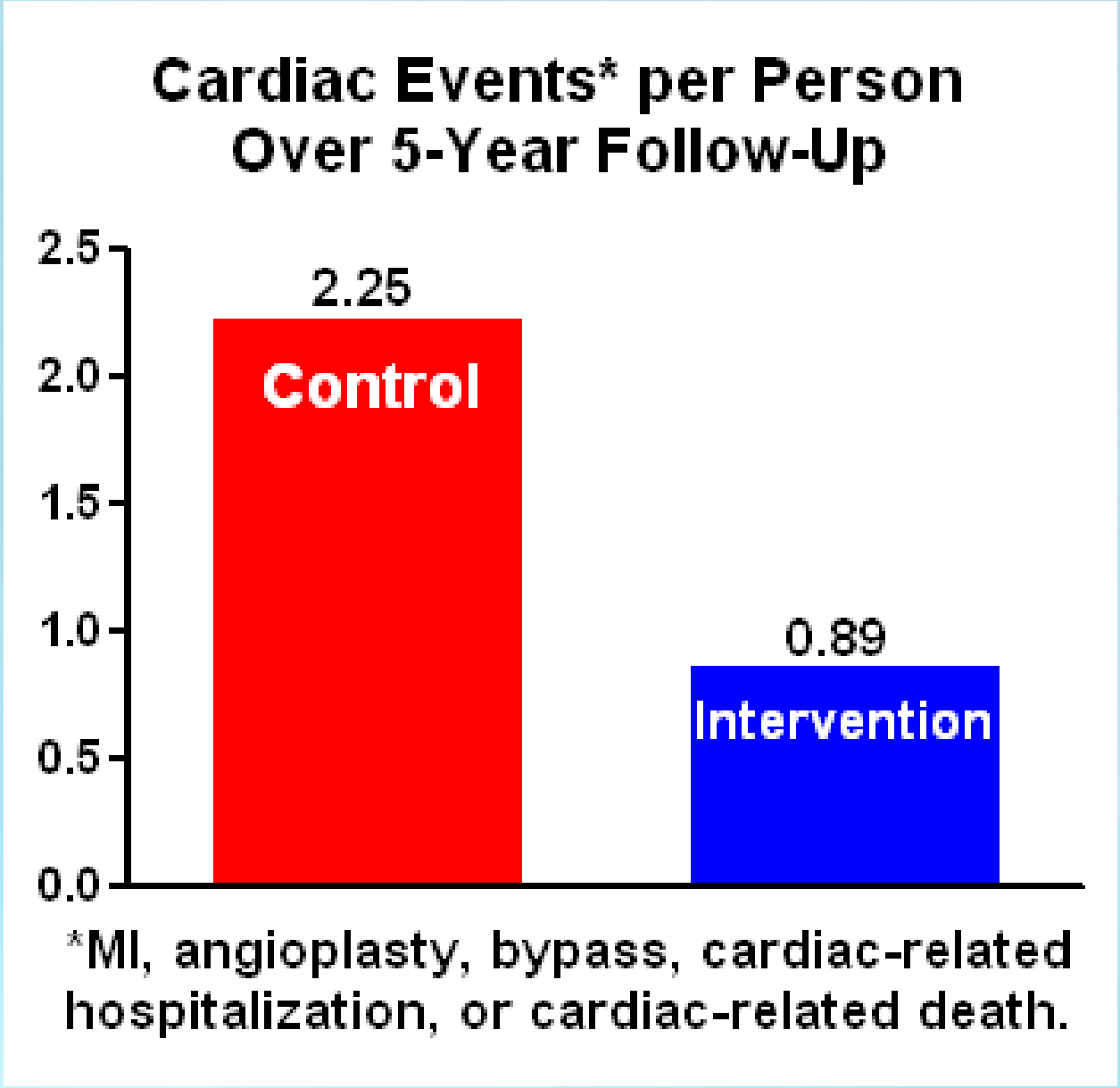
Total Cholesterol	↓ 24%
LDL	↓ 37%
Weight	↓ 22 lbs
Reversal	82% of participants

Ornish D. Lancet 1990;336:129-33.

Mean % Diameter Stenosis at 1 and 5 Years



Ornish D. JAMA 1998:280:2001-7.



Ornish D. JAMA 1998;280:2001-7.

99% of patients stopped or reversed their heart disease as measured by cardiac PET scans after 5 years.
In contrast, 45% of controls got worse, 50% showed no change, and only 5% improved (p = 0.03).

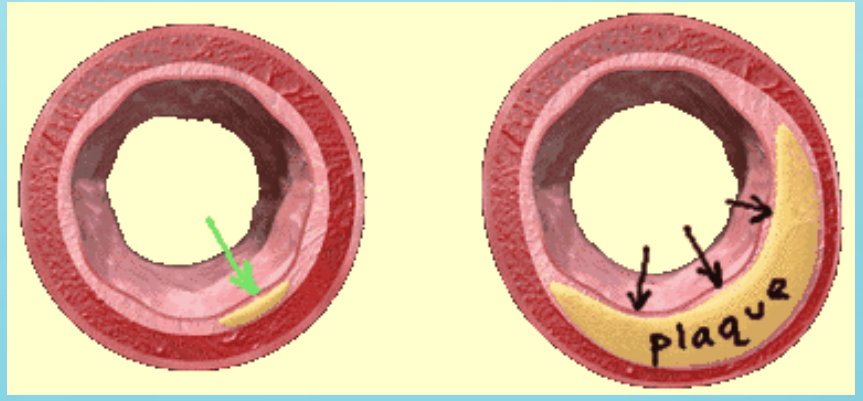
--Gould KL, Ornish D, et al. *JAMA*. 1995;274:894-901.

Further On Halting Coronary Disease

New work in 2014:

- 198 patients followed for nearly 4 years– counseled on going vegan; 98% with pre-existing CAD
- 177 complied
- 112/177 reported angina before starting; 93% - 104/112 had resolution of angina
- Of the compliant, new CV event rate of 0.6%, 10% with any event
- Of the noncompliant, 62% event rate (13/21)

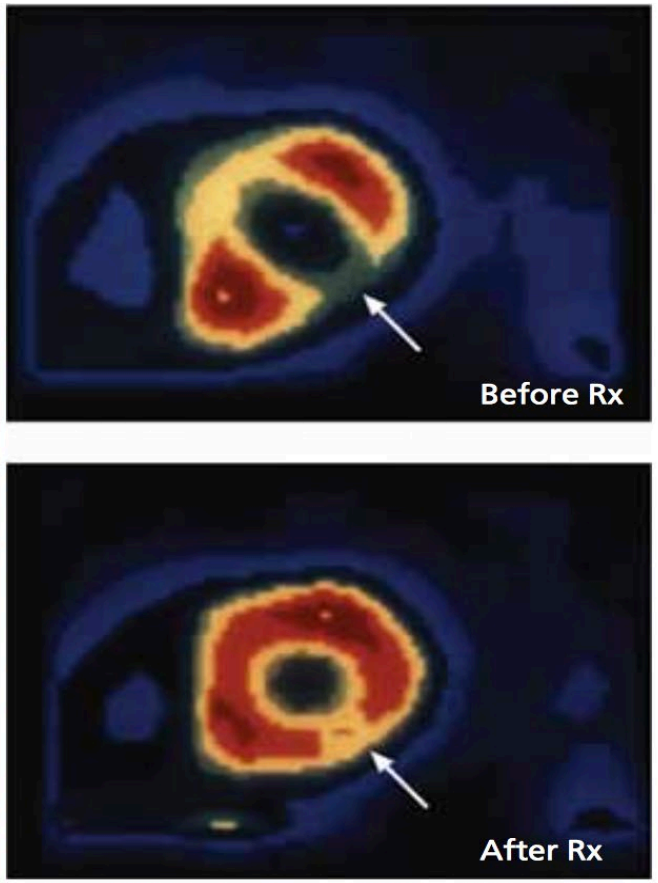
Esselstyn CB, et al. J Fam Pract. 2014 Jul;63(7):356-364b.



Halting Coronary Disease

FIGURE 1

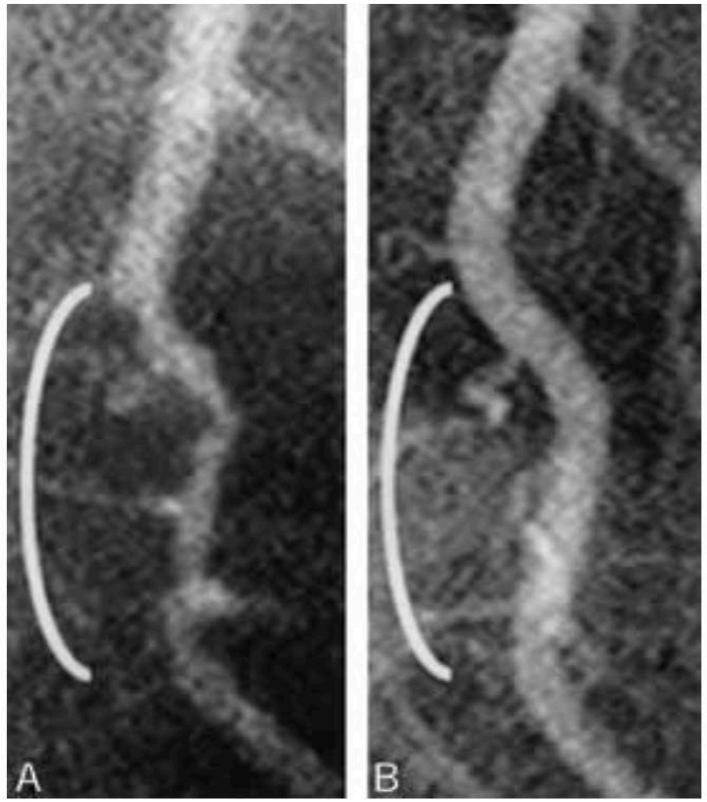
Restoration of myocardial perfusion[2]



Positron emission tomography performed on a patient with coronary artery disease shows an area of myocardium with insufficient blood flow (top). Following only 3 weeks of plant-based nutritional intervention, normal blood flow was restored (bottom).

FIGURE 2

Reversal of coronary artery disease[4]



Coronary angiography reveals a diseased distal left anterior descending artery (A). Following 32 months of a plant-based nutritional intervention without cholesterol-lowering medication, the artery regained its normal configuration (B).

Esselstyn CB Jr. Resolving the coronary artery disease epidemic through plant-based nutrition. Prev Cardiol. 2001;4:171-177.

The Bottom Line

- We as professionals are not the best at utilizing proven medications or approaches be they medicines or lifestyle
- We need to better as CVD is starting to increase again
- Our knowledge gaps and actions (referring) are poor
- The data is strong
- Befriend the plants!

drmaggarwal

drmonicaaggarwal

Strategies to Building an Integrative Model in Medicine

Monica Aggarwal, MD

Adjunct Associate Professor, Division of Cardiology

University of Florida

Telemedicine: drmonicaaggarwal.com

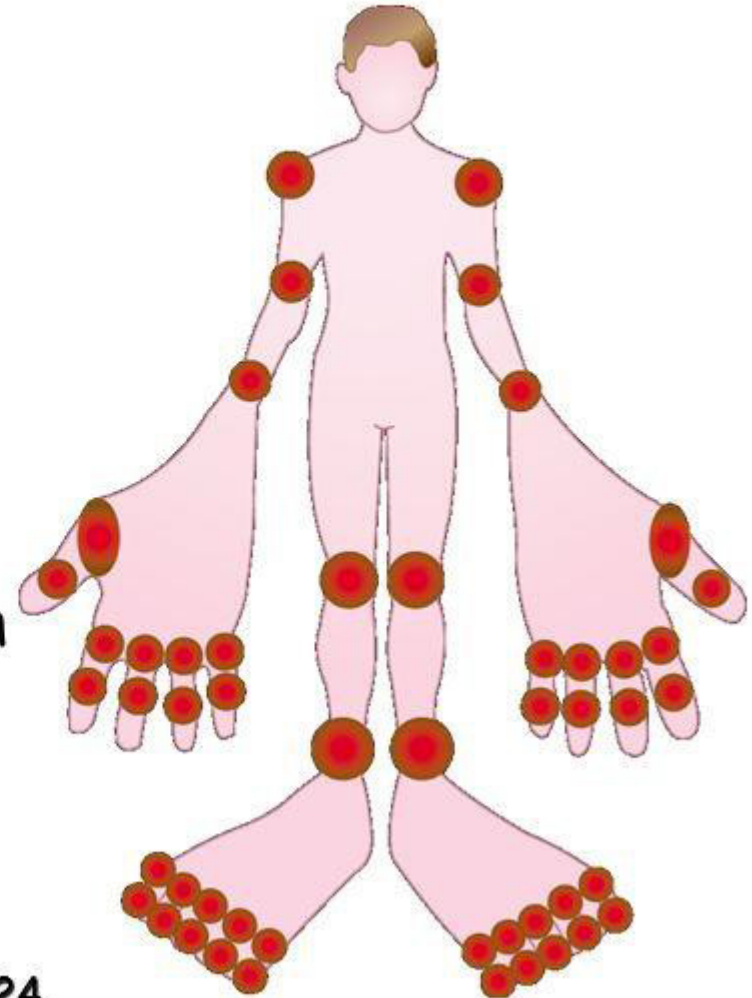
Why I am here?

- I am a PREVENTIVE CARDIOLOGIST
- I am a RESEARCHER
- I am a MOTHER
- I am an ATHLETE
- I am a PATIENT

RHEUMATOID ARTHRITIS

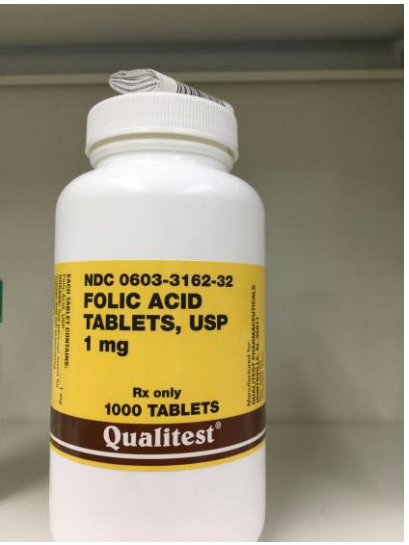
Presenting Signs and Symptoms

- Symmetric joint pain
- Swelling of small peripheral joints
- Morning joint stiffness of variable duration
- Other diffuse aching
- Fatigue, malaise, and depression may precede other symptoms by weeks or months



Grassi W et al. *Eur J Radiol.* 1998;27(suppl 1):S18-S24.


NDC 0591-5052-01
Prednisone
Tablets USP
5 mg


NDC 0603-3162-32
FOLIC ACID
TABLETS, USP
1 mg
Rx only
1000 TABLETS
Qualitest


NDC 0555-0572-02
METHOTREXATE
Tablets USP
2.5 mg
Warning: Discontinue or reduce dosage immediately at first sign of ulceration or bleeding in mouth, gastrointestinal ulceration or bleeding, diarrhea or marked depression of bone marrow.
℞ only
100 TABLETS
TEVA


NDC 0093-0174-56
LEFLUNOMIDE
Tablets USP
20 mg
℞ only
30 TABLETS
TEVA
NDC 0093-0173-56
LEFLUNOMIDE
Tablets USP
10 mg
℞ only
30 TABLETS
TEVA

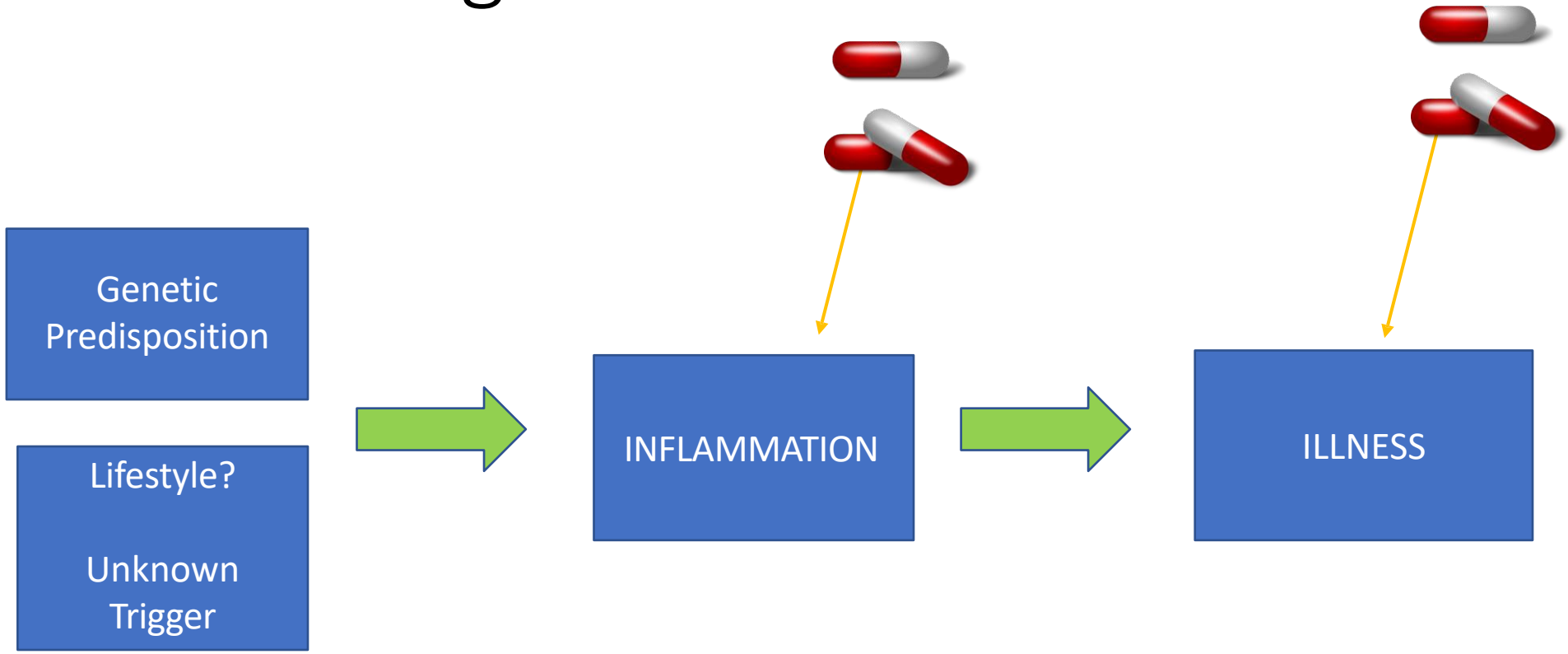
How I felt

- Scared all of the time
- Emotional
- Fragile
- Unable to understand how this had happened
- Not in control
- Angry at my daughter

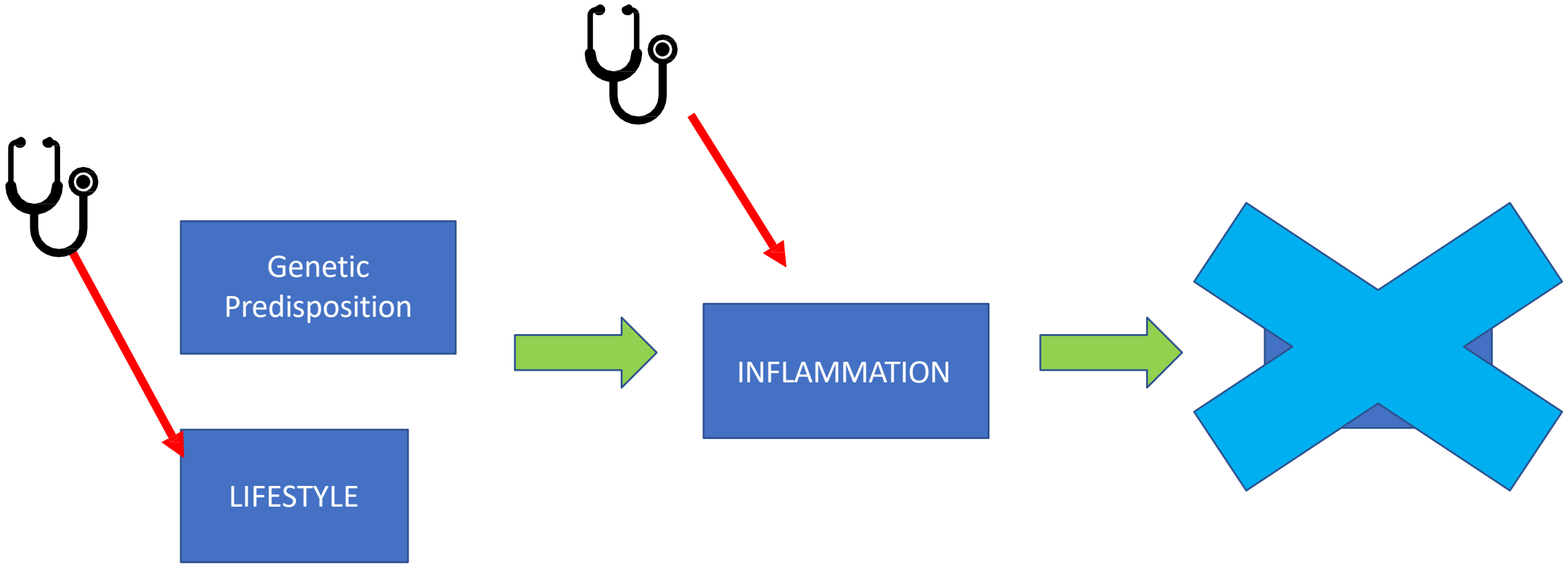
Why Did I Get Sick?
Inflammation


OSTEOPOROSIS
HEART DISEASE
RHEUMATISM
ARTHRITIS
HEARTBURN
DIABETES
OBESITY
CANCER
IBS
GOUT

Traditional thought



Another way to look at it



Lifestyle factors Imbalance=inflammation

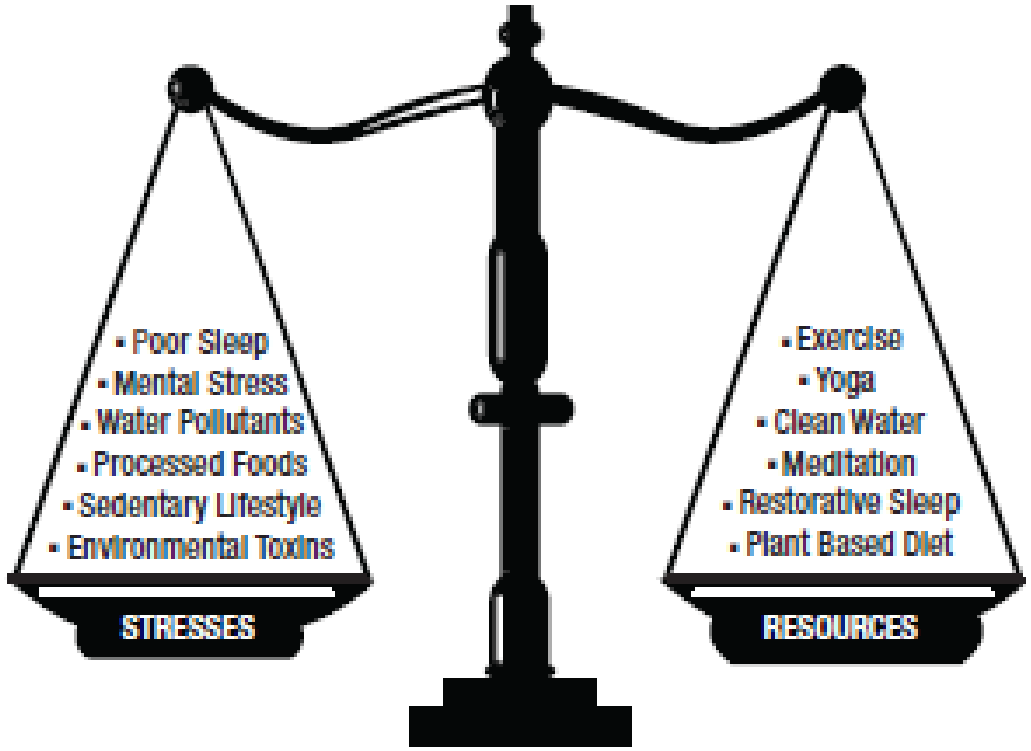


FIGURE 1. **STRESSES vs. RESOURCES**

Aggarwal M, Rao J. Body on Fire

Why did I get RA?

- GENES>>INFLAMMATION>>ILLNESS
- GENES always there
- Poor lifestyle caused inflammation, activated genes expression and triggered illness
- My lifestyle triggers:
  - Lack of sleep
  - Stress
  - Dairy
- So much of chronic illness is identifying those triggers and calming your inflammation

Plan of attack

- **Nutrition**
- Exercise
- Slow Down
- Yoga
- Meditation
- Sleep


348

My Story is Not a New One

Heart Disease is an Inflammatory Condition

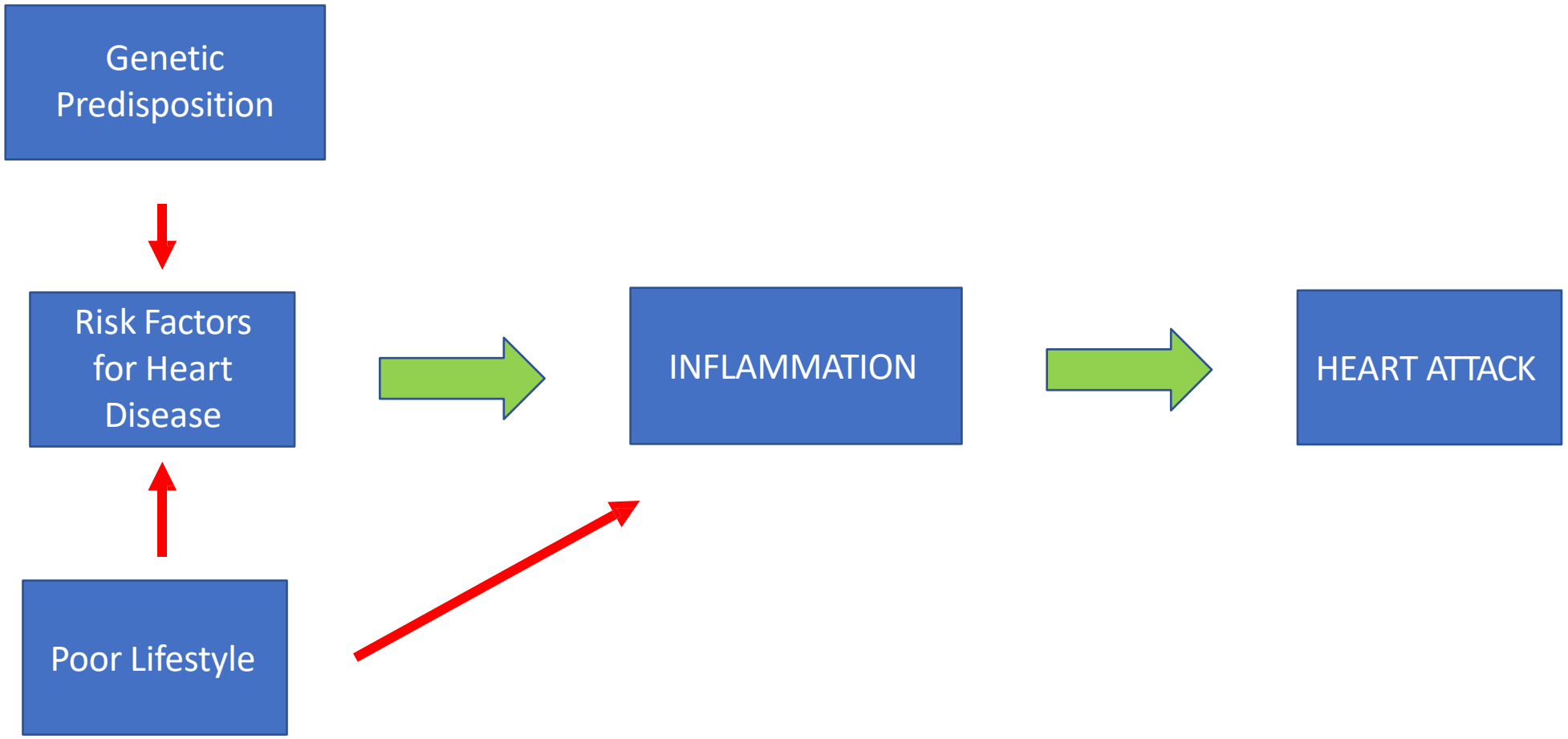
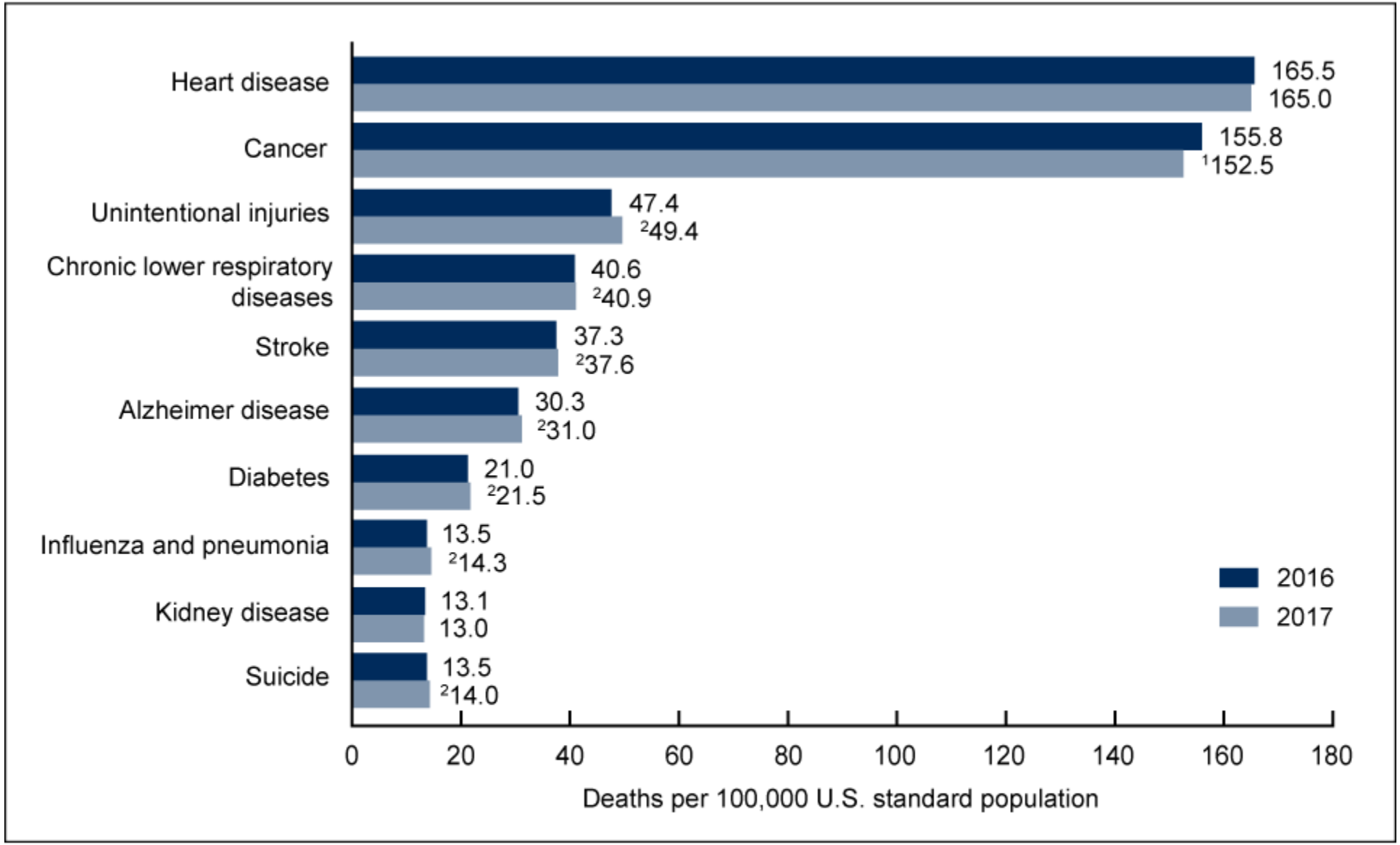


Figure 4. Age-adjusted death rates for the 10 leading causes of death: United States, 2016 and 2017

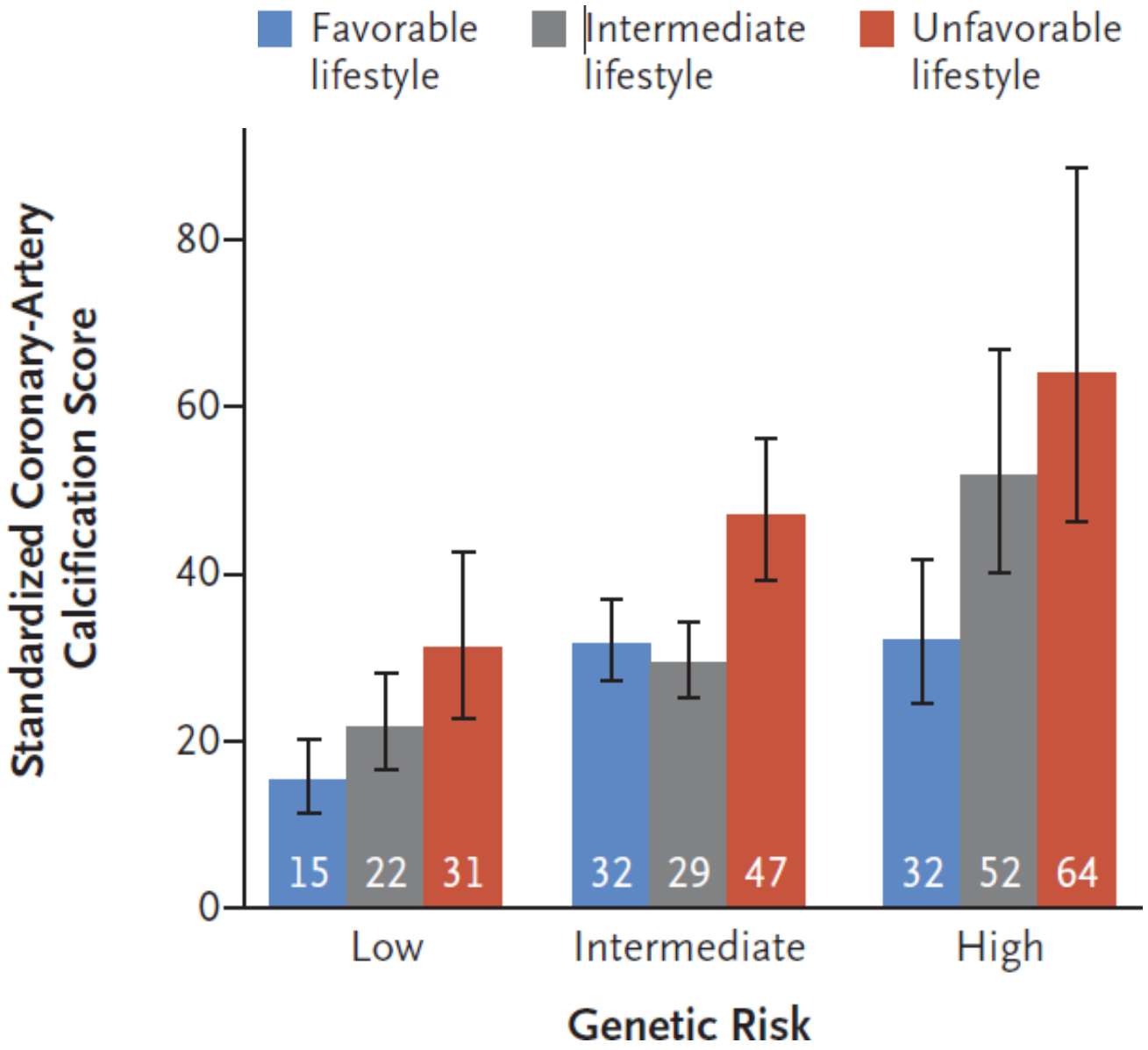


[1]Statistically significant decrease in age-adjusted death rate from 2016 to 2017 ($p < 0.05$).
[2]Statistically significant increase in age-adjusted death rate from 2016 to 2017 ($p < 0.05$).
NOTES: A total of 2,813,503 resident deaths were registered in the United States in 2017. The 10 leading causes accounted for 74.0% of all deaths in the United States in 2017. Causes of death are ranked according to number of deaths. Rankings for 2016 data are not shown. Data table for Figure 4 includes the number of deaths for leading causes. Access data table for Figure 4 at: https://www.cdc.gov/nchs/data/databriefs/db328_tables-508.pdf#4.
SOURCE: NCHS, National Vital Statistics System, Mortality.

	WOMEN		MEN		p value
	Prevalence per 10^5	95% C.I.	Prevalence per 10^5	95% C.I.	
Autoimmune thyroiditis	4376	4039–4735	495	376–640	<0.001
Psoriasis/psoriatic arthritis	776	638–936	1135	950–1345	0.003
rheumatoid arthritis	741	606–897	324	229–445	<0.001
Type 1 diabetes	424	323–545	512	391–659	0.31
Multiple sclerosis	296	214–401	137	78–222	0.008
Ulcerative colitis	127	75–201	119	65–200	>0.99
Celiac disease	212	143–302	17	22678	<0.001
Systemic lupus erythematosus	148	92–227	0	0–31	<0.005
Myasthenia gravis	42	16–92	26	5–75	0.53
Systemic sclerosis	56	24–111	9	0–48	0.05
Sjogren's syndrome	42	16–92	17	22–62	0.31
Crohn's disease	14	2–51	17	2–62	>0.99

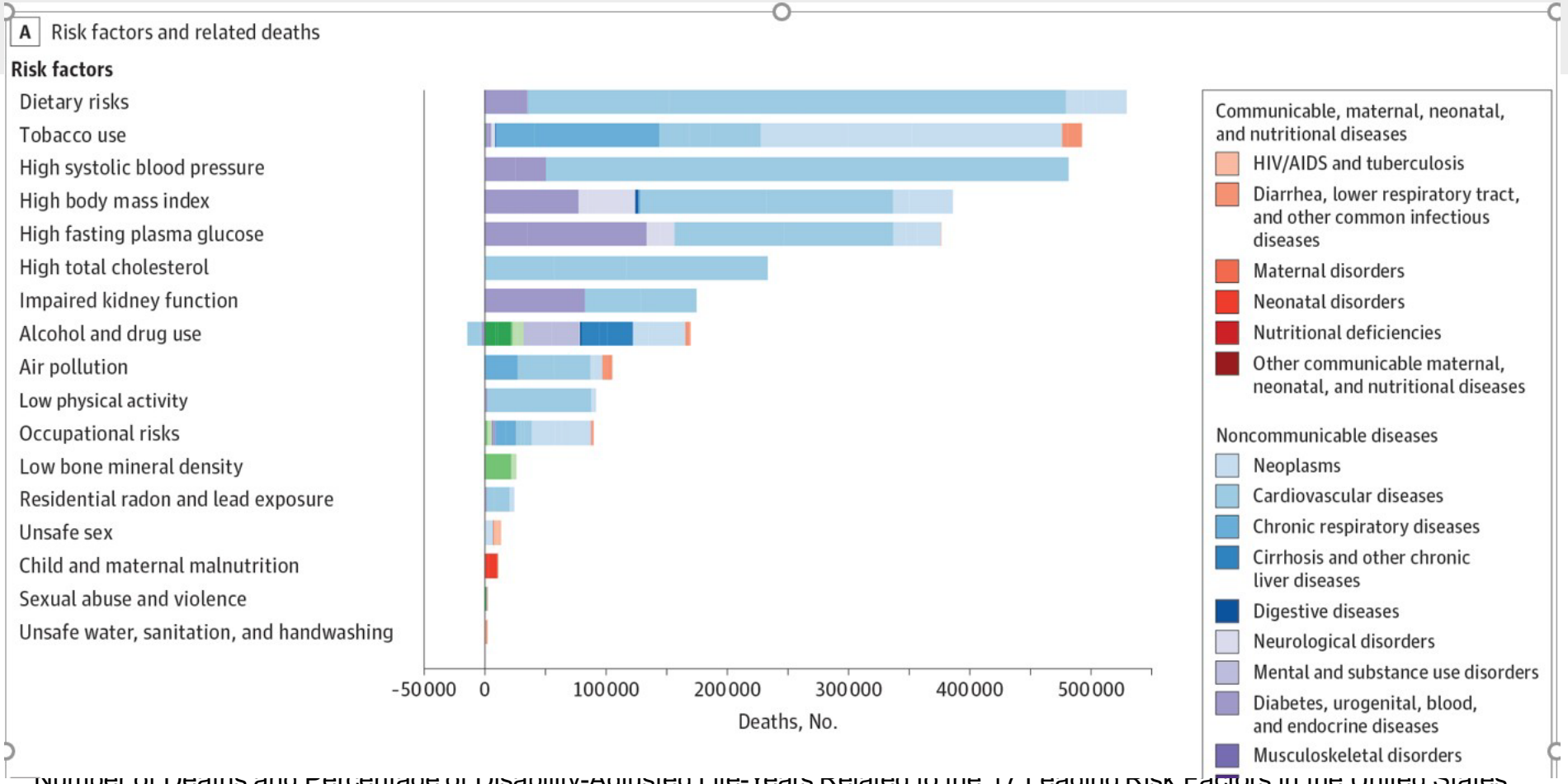
doi:10.1371/journal.pone.0032487.t003

Genetic Predisposition



Khera, AV et al NEJM 2016;375:2349-2358

From: **The State of US Health, 1990-2016: Burden of Diseases, Injuries, and Risk Factors Among US States**



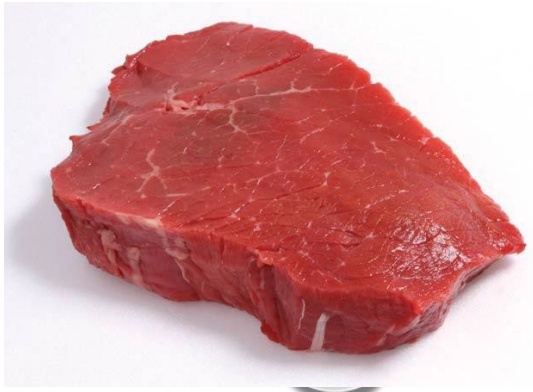
Number of Deaths and Percentage of Disability-Adjusted Life-Years Related to the 17 Leading Risk Factors in the United States, 2016Negative values (where bars extend left of zero) indicate a protective effect.

Dietary risks? Whats wrong with our foods?
the Standard American diet (SAD)

Sad diet

- This dietary pattern is characterized by a high consumption of
  - Red meat
  - Refined grains
  - Processed foods
  - High-fat dairy products
  - Desserts
  - Non-nutritious calories :
    - High-sugar drinks
  - 0.9% of adolescence and only 2-3 % of adults

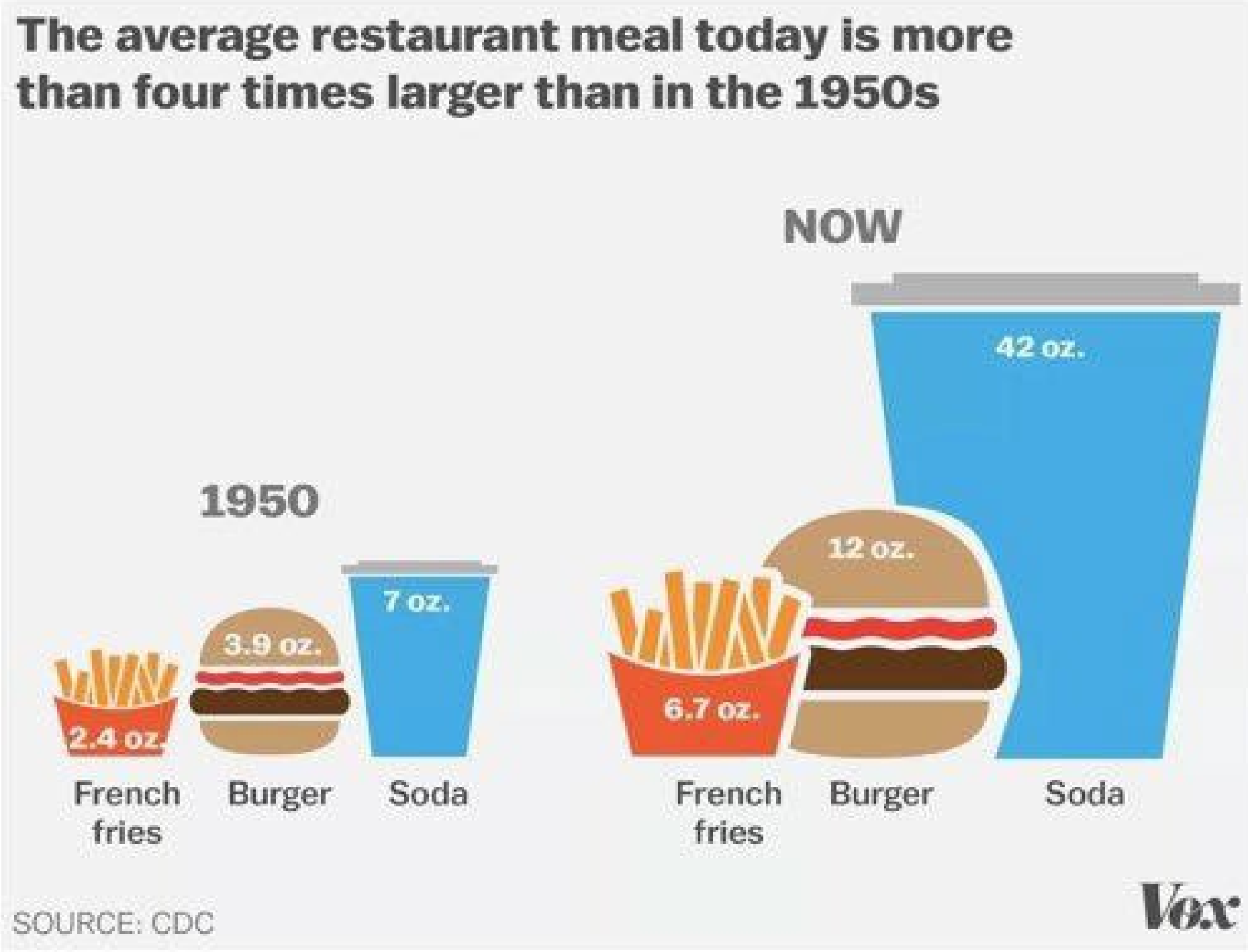
obtaining their daily recommended fruit and vegetable intake

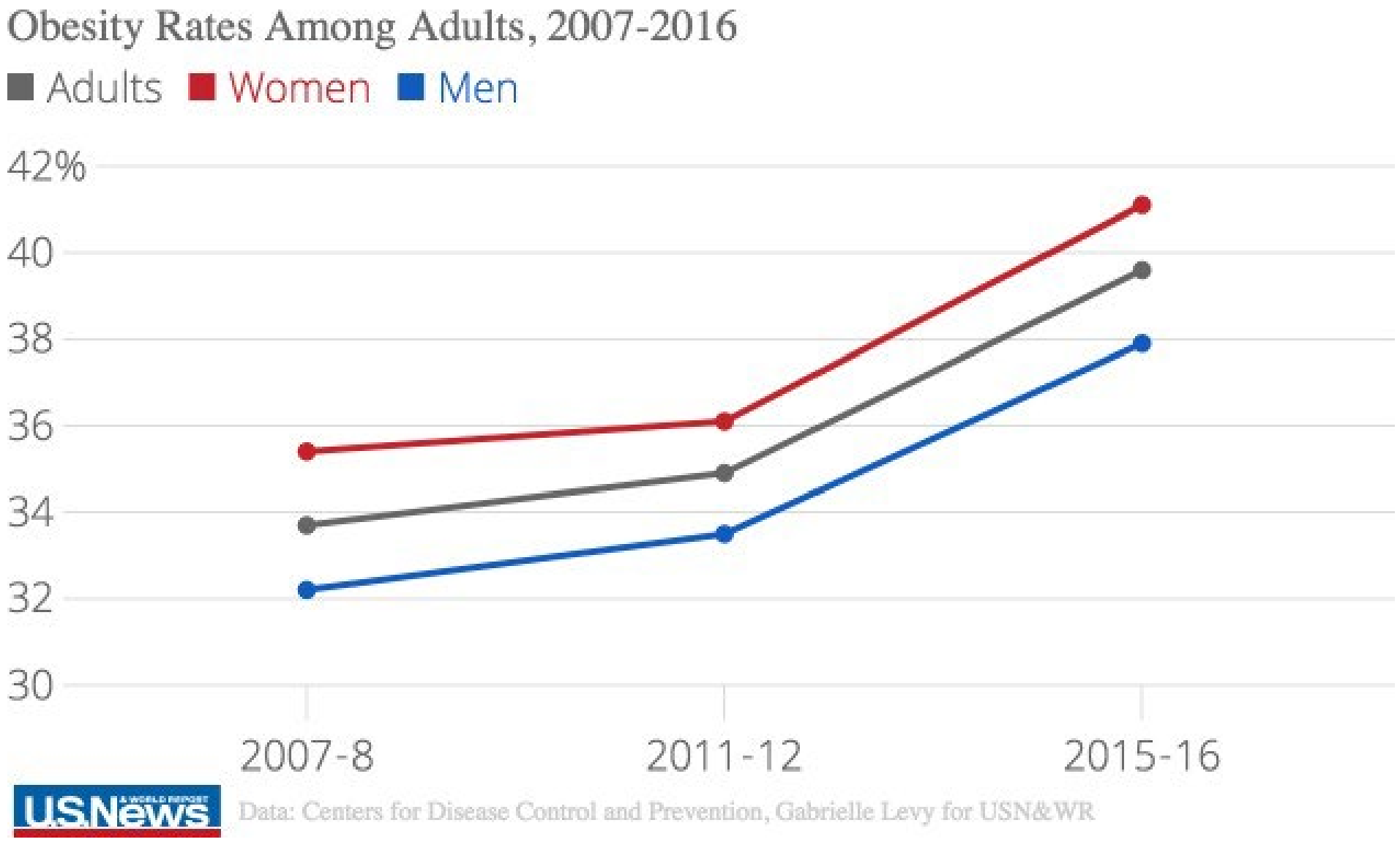


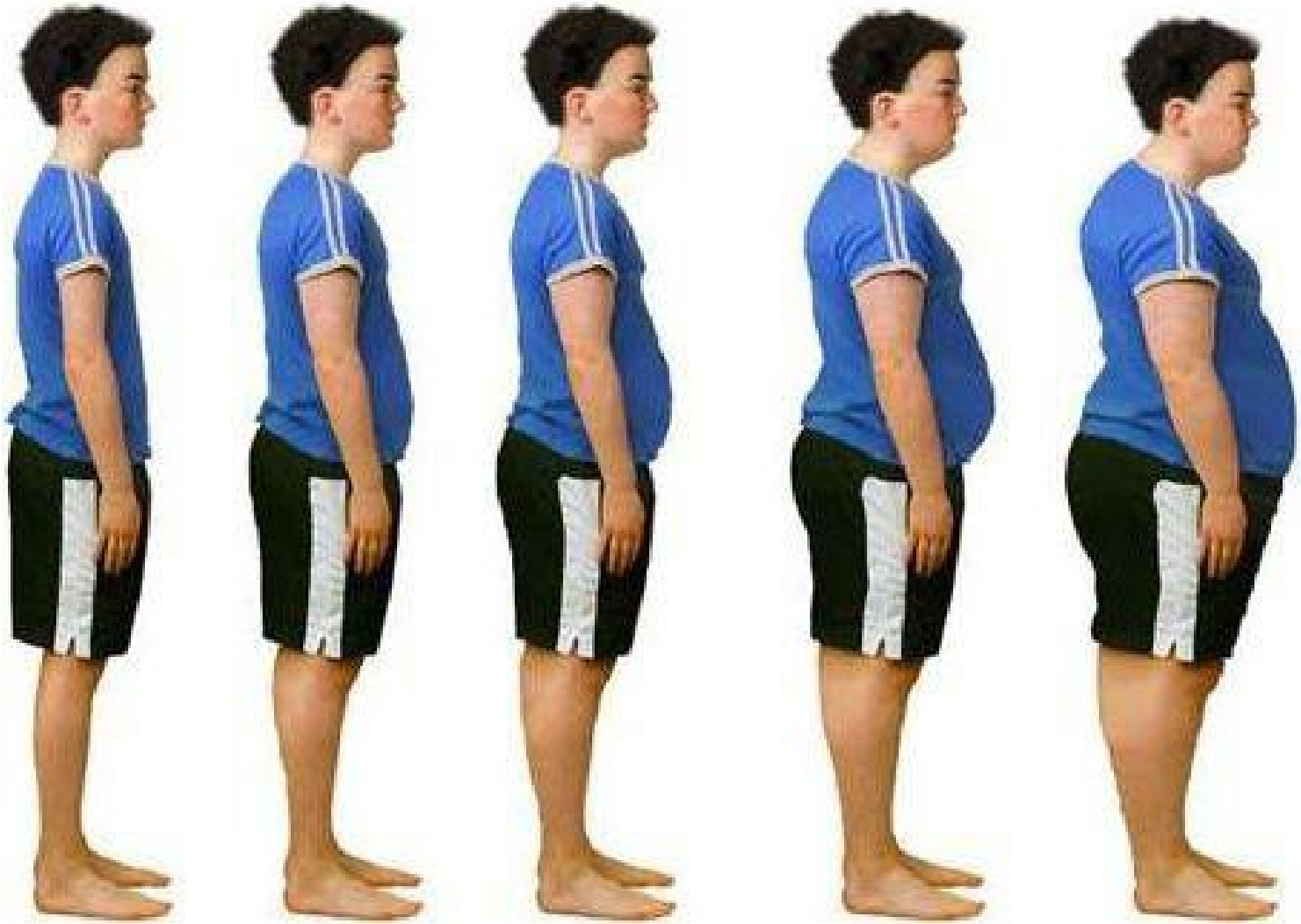
Halton et al. Am J Clin Nutr **February 2006,** vol. 83 no. 2 **284-290**

- Almost 75% of packaged foods in the U.S. now contain added sugars, and much also comes from consumption of sugar-sweetened beverage (SSBs)

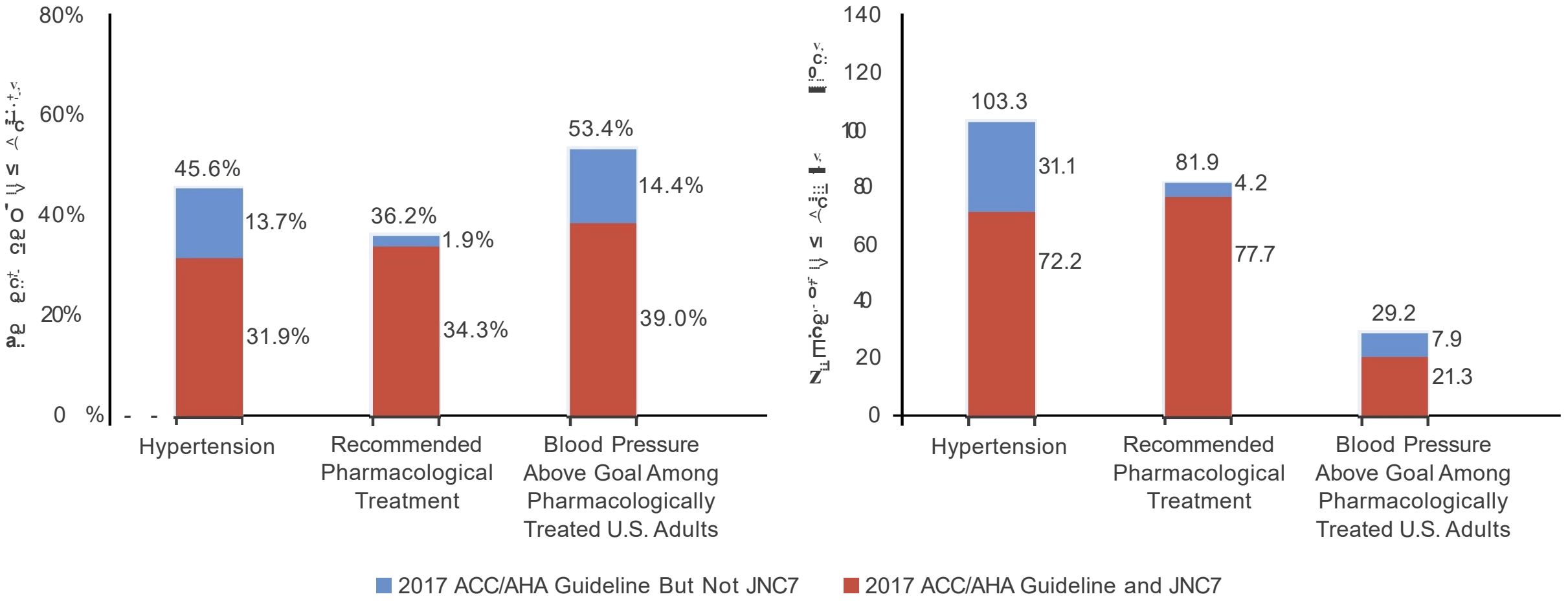
Bray, GA and Popkin, BM (2014) Dietary sugars and body weight: Have we reached a crisis in the epidemic of obesity and diabetes. Diabetes Care **37**:950-56.


The average restaurant meal today is more than four times larger than in the 1950s
1950
2.4 oz.
3.9 oz.
7 oz.
French fries
Burger
Soda
NOW
6.7 oz.
12 oz.
42 oz.
French fries
Burger
Soda
SOURCE: CDC
Vox


Obesity Rates Among Adults, 2007-2016
Adults
Women
Men
42%
40
38
36
34
32
30
2007-8
2011-12
2015-16
U.S.News
Data: Centers for Disease Control and Prevention, Gabrielle Levy for USN&WR



CENTRAL ILLUSTRATION: Prevalence of Hypertension, Recommendation for Pharmacological Antihypertensive Treatment, and Blood Pressure Above Goal Among U.S. Adults According to the 2017 ACC/AHA and the JNC7 Guidelines



Muntner, P. et al. J Am Coll Cardiol. 2018:71(2):109-18.

3.1. Nutrition and Diet

Recommendations for Nutrition and Diet Referenced studies that support recommendations are summarized in Online Data Supplements 4 and 5.		
COR	**LOE**	**Recommendations**
I	B-R	1. A diet emphasizing intake of vegetables, fruits, legumes, nuts, whole grains, and fish is recommended to decrease ASCVD risk factors.[S3.1-1–S3.1-11]
IIa	B-NR	2. Replacement of saturated fat with dietary monounsaturated and polyunsaturated fats can be beneficial to reduce ASCVD risk.[S3.1-12,S3.1-13]
IIa	B-NR	3. A diet containing reduced amounts of cholesterol and sodium can be beneficial to decrease ASCVD risk.[S3.1-9,S3.1-14–S3.1-16]
IIa	B-NR	4. As a part of a healthy diet, it is reasonable to minimize the intake of processed meats, refined carbohydrates, and sweetened beverages to reduce ASCVD risk.[S3.1-17–S3.1-23]
III-Harm	B-NR	5. As a part of a healthy diet, the intake of *trans* fats should be avoided to reduce ASCVD risk.[S3.1-12,S3.1-17,S3.1-25–S3.1-27]

Circulation

ACC/AHA CLINICAL PRACTICE GUIDELINE

2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease

A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines

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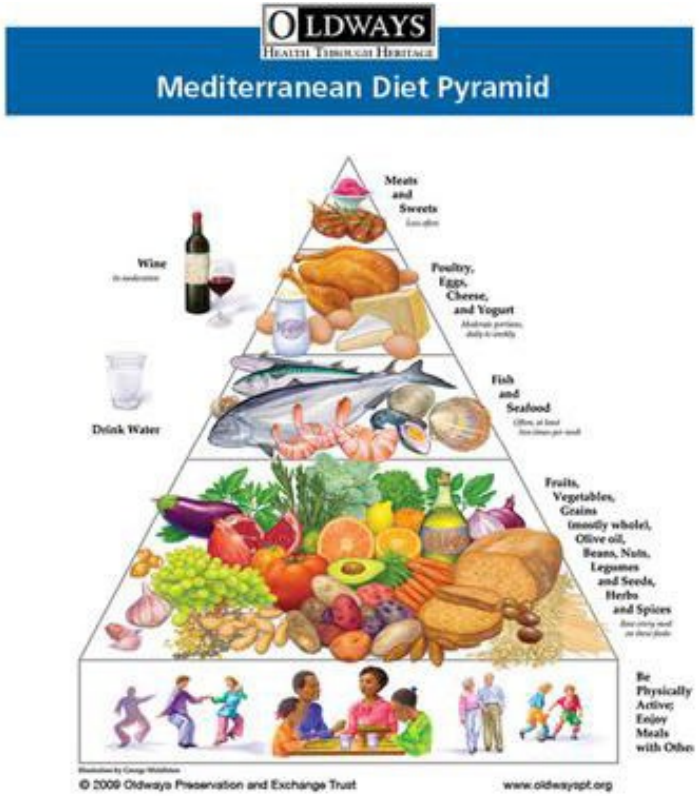
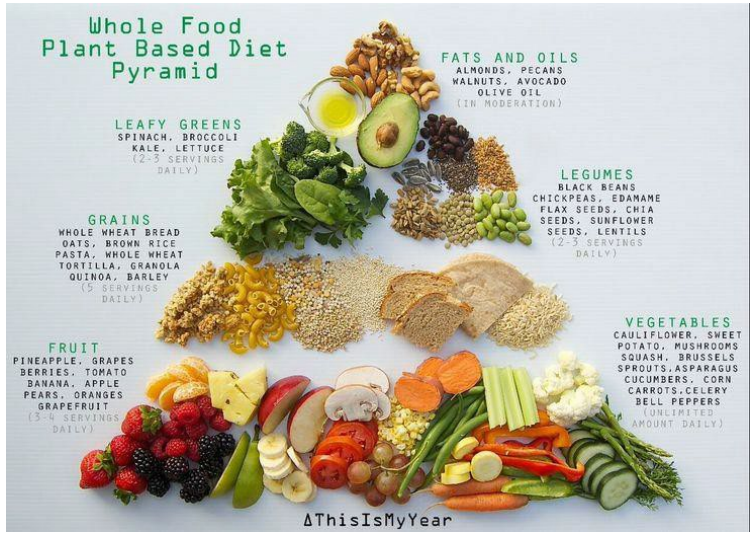
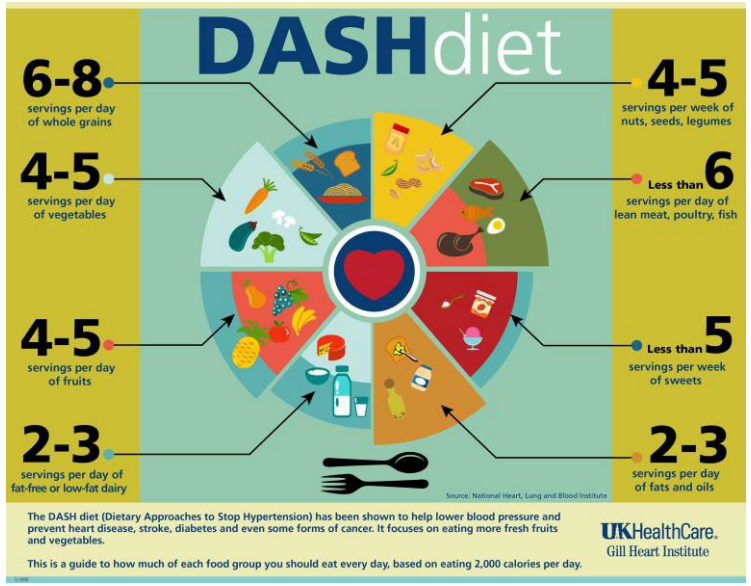
Endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation, the American Geriatrics Society, the American Society of Preventive Cardiology, and the Preventive Cardiovascular Nurses Association

ACC/AHA Task Force Members, see page e623

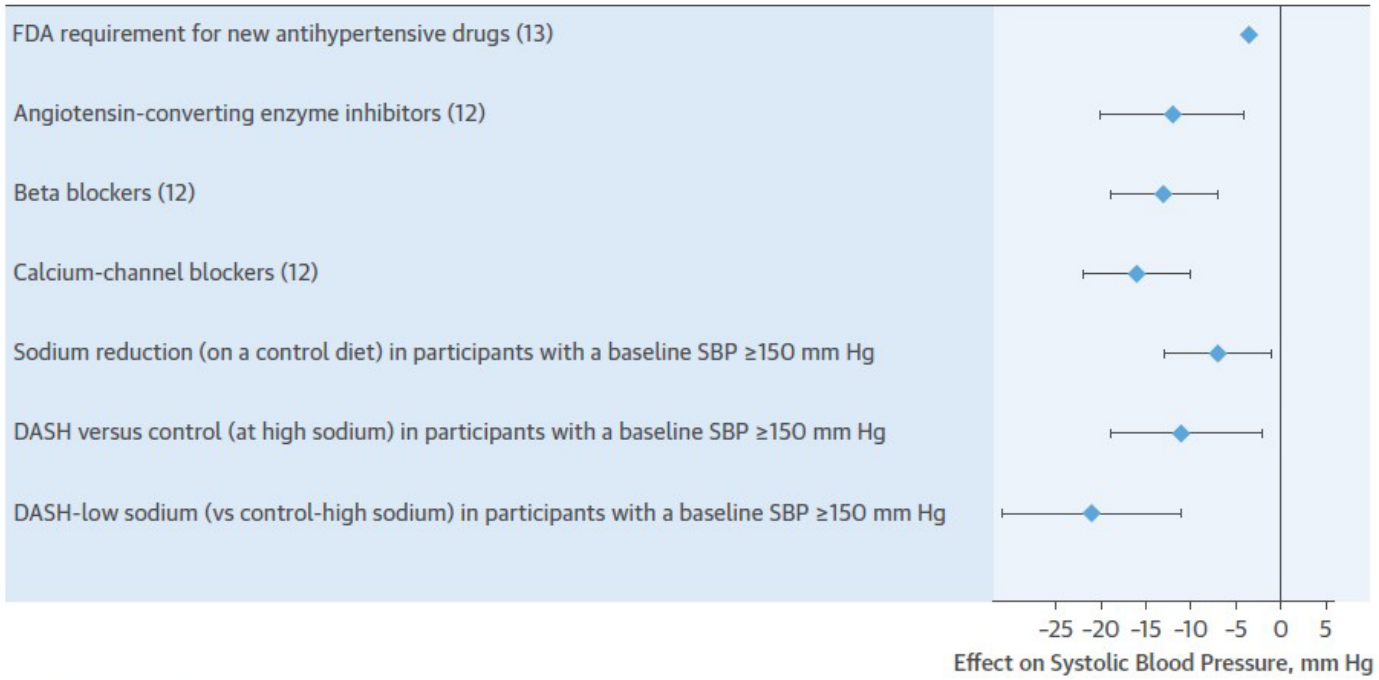
Key Words: AHA Scientific Statements ■ guidelines ■ antihypertensive agents ■ aspirin ■ atherosclerosis ■ atherosclerotic cardiovascular disease ■ atrial fibrillation ■ behavior modification ■ behavior therapy ■ blood cholesterol ■ blood pressure ■ body mass index ■ cardiovascular team-based care ■ cardiovascular ■ cardiovascular disease ■ cholesterol ■ chronic kidney disease ■ coronary artery calcium score ■ coronary disease ■ coronary heart disease ■ cost ■ diet ■ dietary patterns ■ dietary


OLDWAYS
Mediterranean Diet Pyramid
Meats and Sweets
Wine
Poultry, Eggs, Cheese, and Yogurt
Drink Water
Fish and Seafood
Fruits, Vegetables, Grains (mostly whole), Olive oil, Beans, Nuts, Legumes and Seeds, Herbs and Spices
Be Physically Active; Enjoy Meals with Others
© 2009 Oldways Preservation and Exchange Trust
www.oldwayspt.org


Whole Food Plant Based Diet Pyramid
FATS AND OILS
ALMONDS, PECANS WALNUTS, AVOCADO OLIVE OIL (IN MODERATION)
LEAFY GREENS
SPINACH, BROCCOLI KALE, LETTUCE (2-5 SERVINGS DAILY)
LEGUMES
BLACK BEANS CHICKPEAS, EDAMAME FLAX SEEDS, CHIA SEEDS, SUNFLOWER SEEDS, LENTILS (2-3 SERVINGS DAILY)
GRAINS
WHOLE WHEAT BREAD OATS, BROWN RICE PASTA, WHOLE WHEAT TORTILLA, GRANOLA QUINOA, BARLEY (5 SERVINGS DAILY)
VEGETABLES
CAULIFLOWER, SWEET POTATO, MUSHROOMS SQUASH, BRUSSELS SPROUTS, ASPARAGUS CUCUMBERS, CORN CARROTS, CELERY BELL PEPPERS (UNLIMITED AMOUNT DAILY)
FRUIT
PINEAPPLE, GRAPES BERRIES, TOMATO BANANA, APPLE PEARS, ORANGES GRAPEFRUIT (5-4 SERVINGS DAILY)
ΔThisIsMyYear


DASHdiet
6-8 servings per day of whole grains
4-5 servings per day of vegetables
4-5 servings per day of fruits
2-3 servings per day of fat-free or low-fat dairy
4-5 servings per week of nuts, seeds, legumes
Less than 6 servings per day of lean meat, poultry, fish
Less than 5 servings per week of sweets
2-3 servings per day of fats and oils
Source: National Heart, Lung and Blood Institute
The DASH diet (Dietary Approaches to Stop Hypertension) has been shown to help lower blood pressure and prevent heart disease, stroke, diabetes and even some forms of cancer. It focuses on eating more fresh fruits and vegetables.
This is a guide to how much of each food group you should eat every day, based on eating 2,000 calories per day.
UKHealthCare
Gill Heart Institute

CENTRAL ILLUSTRATION The BP Effects of the DASH Diet



Juraschek, S.P. et al. J Am Coll Cardiol. 2017;70(23):2841-8.

Sodium reduction, alone or combined, compared with average BP effects of antihypertensive drug therapies and the FDA requirement for new antihypertensive drugs. Estimates for antihypertensive drug classes are taken from Manisty et al. (12). The FDA requirement for new antihypertensive drugs is taken from a committee meeting of the Center for Drug Evaluation and Research (2014) (13). BP = blood pressure; DASH = Dietary Approaches to Stopping Hypertension; FDA = Food and Drug Administration; SBP = systolic blood pressure.

- FDA requirement
  - 3-4 mm Hg
- ACE inhibitors
  - 12 mm Hg
- Beta-blockers
  - 13 mm Hg
- Calcium channel blockers
  - 16 mm Hg
- Sodium reduction
  - 7 mm Hg
- DASH diet
  - 11.4 mm Hg
- DASH + low Na diet
  - 20.8 mm Hg

Juraschek, Stephen P., et al. "Effects of sodium reduction and the DASH diet in relation to baseline blood pressure." Journal of the American College of Cardiology 70.23 (2017): 2841-2848.

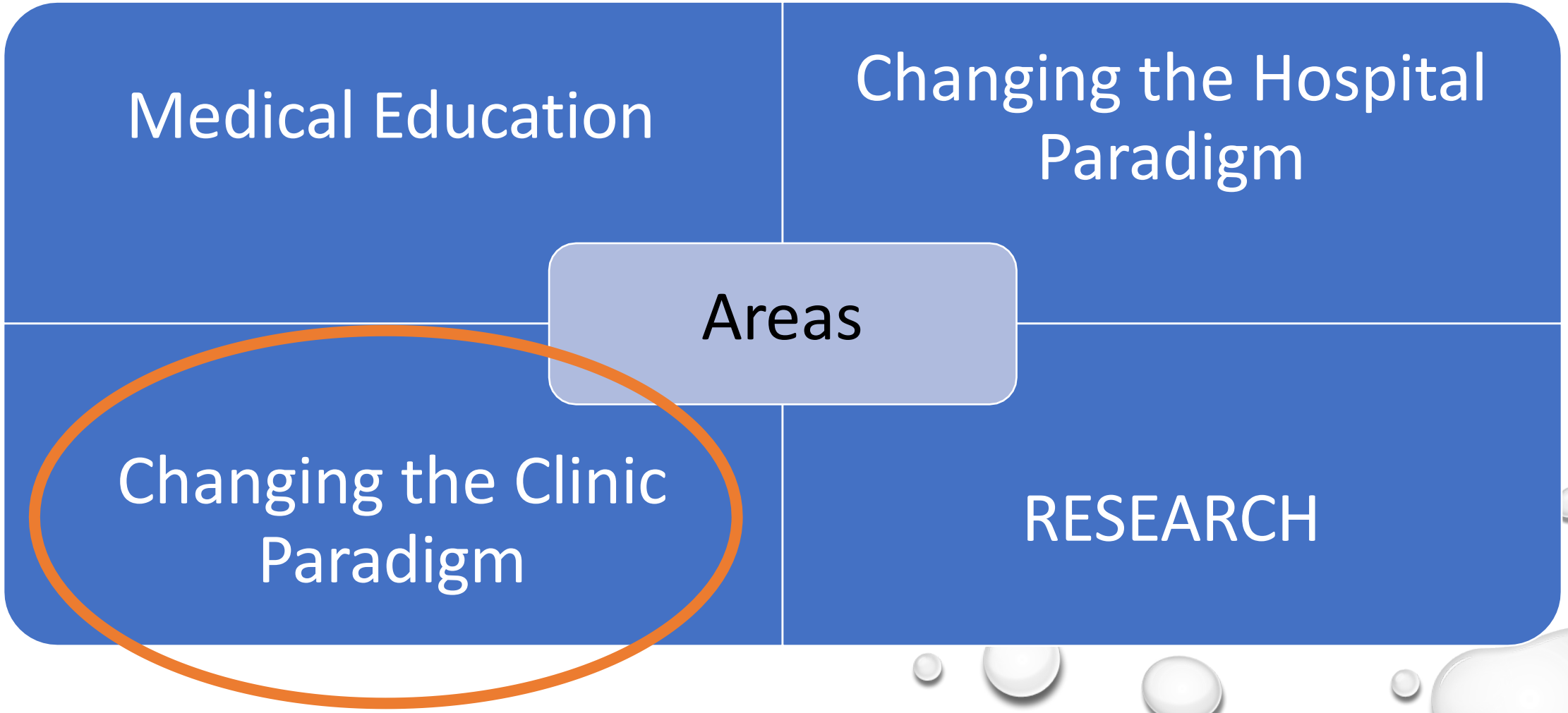
Nutrition Education From Medical School to Fellowship

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%

MD n= 646
FIT n= 75

What we are doing at University of Florida



Prevention Clinic

Build a prevention clinic and empower patients to take control of their health using lifestyle and diet tools

Integrative and preventative model

Prevention Clinic with one-hour long visits.

A Yoga Room

Meditation

Extensive nutrition education.

RESULTS:

Improved Quality of life

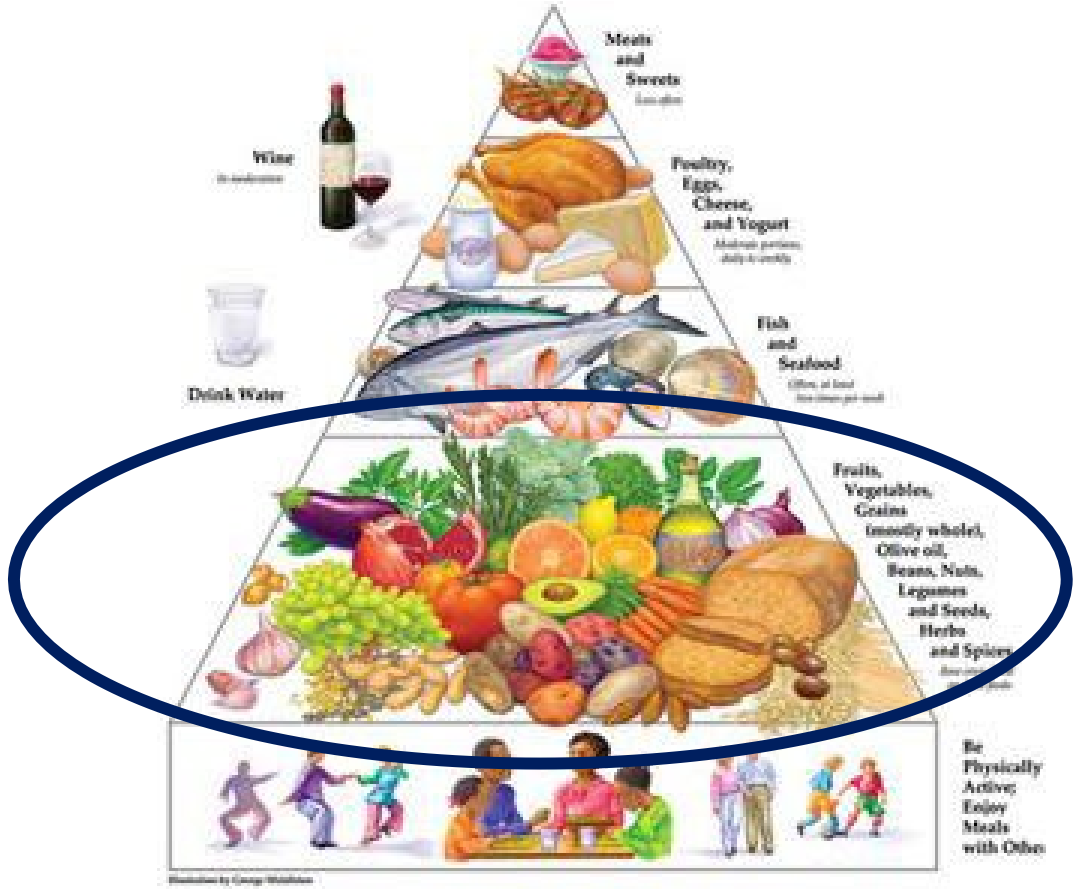
Decrease in Anthropomorphic measurements

Reduction in medications

Reduction in serum lipid profiles

OLDWAYS
HEALTH THROUGH HERITAGE

Mediterranean Diet Pyramid



www.oldwayspt.org


Whole Food
Plant Based Diet
Pyramid
FATS AND OILS
ALMONDS, PECANS
WALNUTS, AVOCADO
OLIVE OIL
(IN MODERATION)
LEAFY GREENS
SPINACH, BROCCOLI
KALE, LETTUCE
(2-3 SERVINGS
DAILY)
LEGUMES
BLACK BEANS
CHICKPEAS, EDAMAME
FLAX SEEDS, CHIA
SEEDS, SUNFLOWER
SEEDS, LENTILS
(2-3 SERVINGS
DAILY)
GRAINS
WHOLE WHEAT BREAD
OATS, BROWN RICE
PASTA, WHOLE WHEAT
TORTILLA, GRANOLA
QUINOA, BARLEY
(5 SERVINGS
DAILY)
VEGETABLES
CAULIFLOWER, SWEET
POTATO, MUSHROOMS
SQUASH, BRUSSELS
SPROUTS,ASPARAGUS
CUCUMBERS, CORN
CARROTS,CELERY
BELL PEPPERS
(UNLIMITED
AMOUNT DAILY)
FRUIT
PINEAPPLE, GRAPES
BERRIES, TOMATO
BANANA, APPLE
PEARS, ORANGES
GRAPEFRUIT
(3-4 SERVINGS
DAILY)
ΔThisIsMyYear


Domino's
Pizza

DOES THE CLINIC WORK?

Contents lists available at ScienceDirect

American Heart Journal Plus: Cardiology Research and Practice

journal homepage: www.sciencedirect.com/journal/american-heart-journal-plus-cardiology-research-and-practice

Research paper

Impact of a preventive cardiology clinic focusing on lifestyle and nutrition counseling: A pilot analysis

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ARTICLE INFO

Keywords:
Diet
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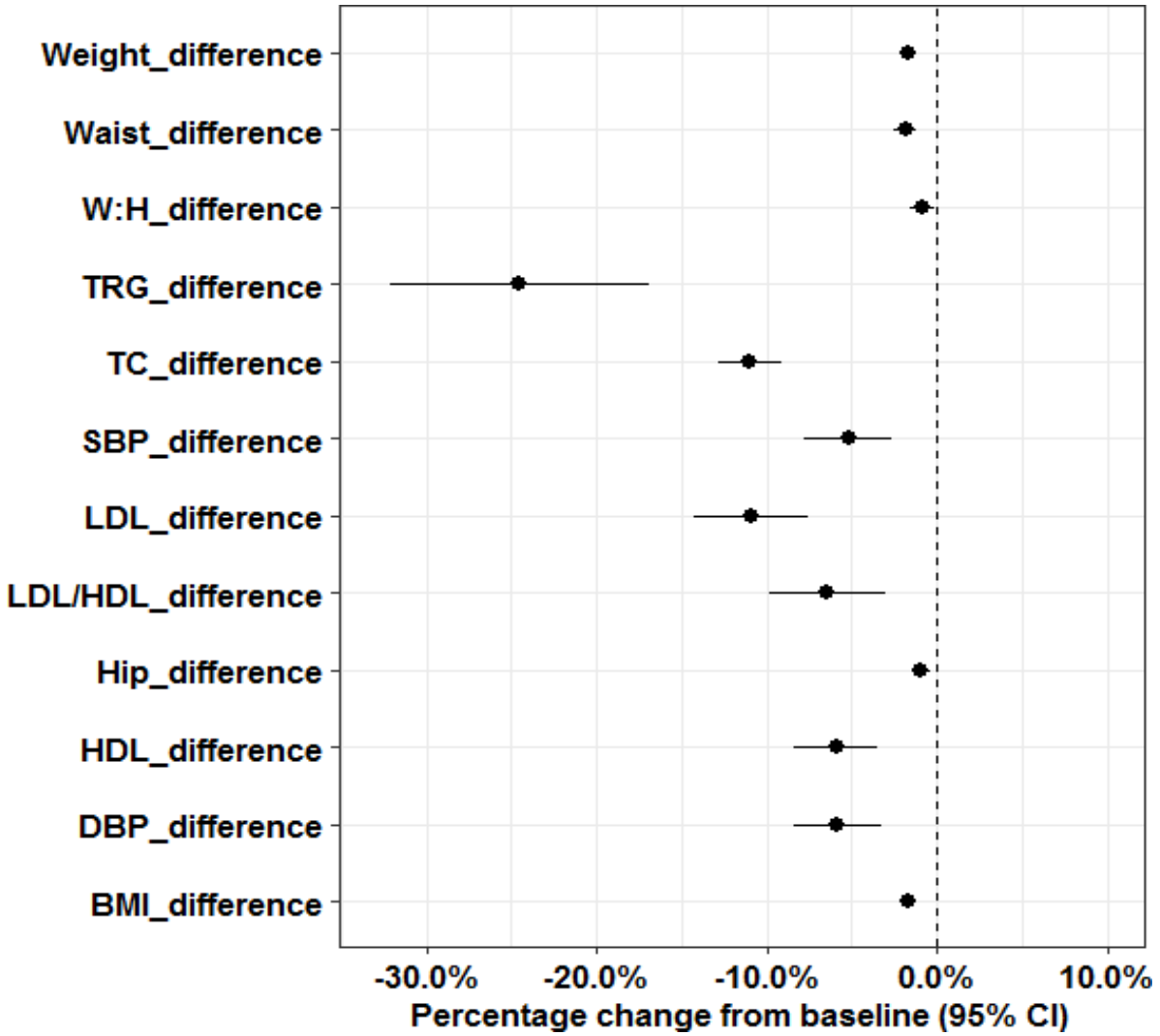
Lifestyle
Prevention

ABSTRACT

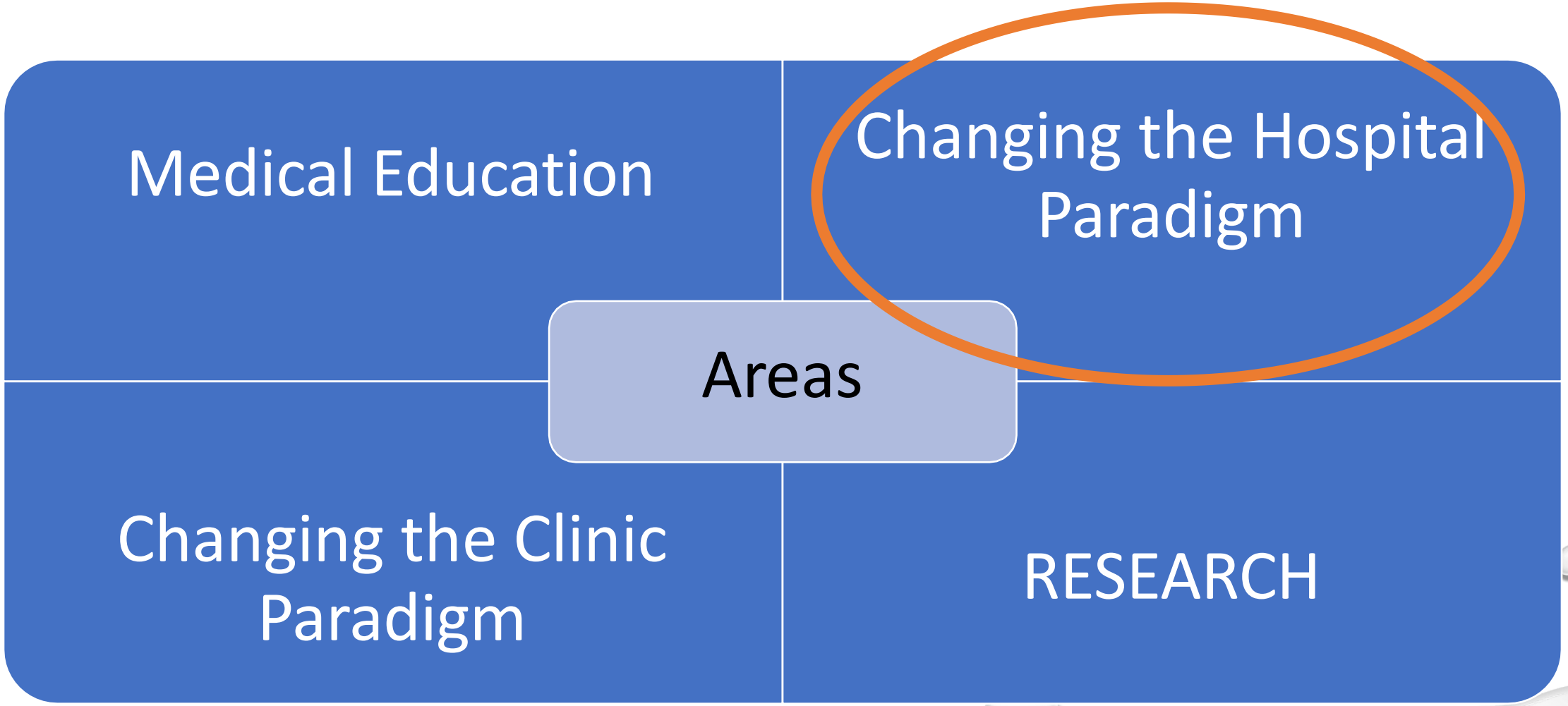
Standard cardiology practice often defers preventive strategies to primary care providers. We aimed to evaluate the effectiveness of a preventive cardiology clinic focused on lifestyle and nutrition counseling combined with guideline-directed medical therapy on reducing cardiovascular disease (CVD) risk. We queried the University of Florida-Health database for patients enrolled in the preventive cardiology clinic, and a general and interventional cardiology clinic from January 2016 to October 2019. Mean change in weight and blood cholesterol including LDL cholesterol (LDL-C), total cholesterol (TC) and triglycerides (TG) were compared in the three clinics in the initial cohort and stratified into primary and secondary prevention. A propensity score-matched analysis was done to adjust for CVD risk factors and statin use. Among a cohort of 239 patients, enrollment in the preventive clinic (n = 99) was associated with greater weight loss at 6 months compared to other clinics (n = 140) (mean −1.7 vs +0.1 kg, p 0.007). Preventive clinic was also associated with greater mean reduction in LDL-C (−24.8 vs −7.1 mg/dl, p 0.021), TC (−29.3 vs −2.0, p 0.003) and TG (−19.7 vs +13.3, p 0.002) at both initial and last follow-up (median time 6 and 16 months). The association with reduction in TG was observed in both primary and secondary prevention, but reduction in LDL-C and TC was only significant in secondary prevention. In a propensity-matched linear regression analysis, preventive clinic was independently associated with LDL-C reduction (b −14.7, r −0.3, p 0.038). A preventive cardiology clinic focused on patient education can be effective in reducing CVD risk.

	difference between day 1 and day 6 data	
	Mean	Std
BMI	-0.50	0.38
Height (inches)	0.00	0.00
Weight (pounds)	-3.28	2.62
Waist (cm)	-1.85	3.05
Hip (cm)	-1.07	2.82
W:H	-0.01	0.03
SBP (mmHg)	-6.76	15.17
DBP (mmHg)	-5.00	9.82
TC (mg/dL)	-20.40	15.44
TRG (mg/dL)	-31.78	44.06
HDL (mg/dL)	-3.13	5.83
LDL (mg/dL)	-11.71	15.92
LDL/HDL	-0.14	0.33



Primary prevention cohort			
	Preventive clinic	**Conventional clinics**	**p-value**
TC, mg/dl	-ve 22.5 ± 59.3	0.8 ± 47.7	0.068
LDL-C, mg/dl	-ve 18.2 ± 51.9	-ve 9.9 ± 32.7	0.401
TG, mg/dl	-ve 16.9 ± 49.8	8.7 ± 39.2	0.016
Secondary prevention cohort			
	Preventive clinic	**Conventional clinics**	**p-value**
TC, mg/dl	-ve 41.8 ± 62.4	-ve 4.1 ± 36.2	0.010
LDL-C, mg/dl	-ve 37.0 ± 57.7	-ve 5.0 ± 29.8	0.015
TG, mg/dl	-ve 24.8 ± 73.9	16.8 ± 76.3	0.035

What we are doing at University of Florida



Hospital Initiatives

- Discharge Education packet
- Nursing involvement in education
- Required Dietician visit pre discharge
- Required documentaries to be watched on television
- Plant based menu

Successful Implementation of Healthful Nutrition Initiatives into Hospitals

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[a]Division of Cardiology, University of Florida, Gainesville, Florida; [b]Department of Medicine, University of Florida, Gainesville, Florida; [c]University of Florida, Gainesville, Florida; [d]Lenox Hill Hospital, Northwell Health, New York, NY; [e]Department of Medicine, NYC Health + Hospitals/Bellevue, New York; [f]Division of Cardiology, Montefiore Health System, Bronx, NY; [g]Division of Cardiology, Department of Medicine, National Jewish Health, Denver, Colo; [h]Division of Cardiology, Lenox Hill Hospital, Northwell Health, New York, NY; [i]Division of Cardiology, James A. Haley VA Medical Center, Tampa, Fla; [j]Division of Cardiology, Kaiser Permanente Riverside Medical Center, Riverside, Calif; [k]Division of Preventative Cardiology, Lancaster General Hospital/Penn Medicine, Lancaster, Pa; [l]Division of Cardiology, Brigham and Women's Hospital, Boston, Mass; [m]Division of Cardiology, Rush University Medical Center, Chicago, Ill; [n]Geisel School of Medicine, Dartmouth Medical School, Hanover, NH; [o]Division of Cardiology, Walter Reed National Military Medical Center, Bethesda, Md; [p]Brown University, Warren Alperty Medical School, Providence, RI; [q]George Washington University School of Medicine, and Physicians Committee for Responsible Medicine, Washington, DC.

How is an inpatient menu created?

- Inpatient meals are created by a hospital's food and nutrition department using a diet manual
  - Many facilities set their standard adult caloric needs between 2,000 and 2,400 kcal per day and protein, carbohydrate, and fat ranges are set as 10-20%, 45-65%, and 20-35% of total daily energy needs respectively for a standard diet.

- A registered dietitian is often involved in menu planning and determining which therapeutic diets are needed based on patient acuity and services provided at the facility.

- The Joint Commission Hospital Accreditation Standard simply advocates that healthy food for patients is "consistent with each patient's care, treatment, and services" but does not have any strict guidelines on how to uphold this tenet.

Problems

- Special diets vary in their restricted macronutrient, sodium or cholesterol content per hospital.
  - For example, the ‘Consistent Carbohydrate Diet’, varies in its carbohydrate composition at each hospital, but typically limits foods that are high in refined sugars.
- Cardiac diets usually limit the amount of both sodium and cholesterol in each meal, but often still include lean red meats, reduced fat dairy and small portions of vegetables.

DATA

- There are few data available about what is actually being done.
- One study looked at a large consortium of academic hospitals and surveyed food service directors and noted that
  - While hospitals meet one or some of the dietary recommendations, only 4/59 hospitals surveyed met all of the dietary objectives advised by the Healthy People 2000 guidelines.
  - Most hospitals met the minimum recommended numbers of fruits, vegetables and grains, yet not of fiber content.
  - More than half of the hospitals surveyed used fruit juice as a fruit serving.
  - For specialized low sodium diets, studies found that the meals were often above the sodium restriction by up to 1,000 mg/day.

Another Study

- In a study which looked at eight New York City (NYC) hospitals to assess if they were upholding NYC's Healthy Hospital Food Initiative (HHFI), none of the hospitals met all of HHFI standards and most did not meet the limit for sodium and percent of calories from fat and saturated fat.
- Most did not meet the fiber standard.
- Sodium content varied from 1,991 mg to 3,248 mg.
- Of significance, when HHFI standards were initiated, the hospitals were able to significantly improve those standards

Standards

- In 2010, the American Dietetic Association, now the Academy of Nutrition and Dietetics, issued a statement regarding therapeutic diets and the approval process stating that upon completion of this process, the NCM, formulary of diets, menus, and patient/client education materials must be approved by the hospital's medical staff and appropriate hospital committee

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%
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I do not recall receiving any nutrition education during my fellowship training.	56%	57%

MD n= 646
FIT n= 75

Over a Year

- Lots of Discussions with
  - Dietary
  - Nursing

What were the Concerns?

- Customer Service Ratings
  - Poor ratings bad for the hospital
  - No one will like the foods
- Cost
  - Plant based foods are more expensive
- Viability of plant-based foods
  - Foods has to sit for hours before arriving to patient rooms
- Lack of nutritional content in plant-based foods
- Lack of standardization of protocols
  - Lack of awareness from physicians and from administrators of what is being served
  - Lack of awareness from physicians and administrators on how to improve the menu
- Ordering protocols

Customer Satisfaction

- Customer Service ratings concerns
  - “You are from the North…”
- Looked at foods that were successful at Montefiore, the only other hospital with a plant-based menu at that time
- Food tastings with all of the nurses
- We received loads of positive feedback
- Highlights: rice and black beans, Boca burger, tofu stir fry, sweet potato and kale hash, hummus vegetable wrap, lentil bolognaise, black bean burger

Viability

- We focused on providing food that were quick to assemble (fruit plant, whole wheat toast) or could be made and frozen
- Batch cooking and freezing was common and foods were later reheated.

Lack of Nutritional Content

- Education, education, education
- Work with the dietary services and RD
- Understand each others' perspectives
- Incorporated legumes, whole grains, soy to make the protein requirements
- The average plant-based meal is lower in calories, fat and carbohydrates and offers more fiber.
- The plant-based meals offered less protein that the traditional cardiac diet and sometimes, augmentation was required.

Lack of Standardization

- Collaboration
- Working with the RD staff
- Focus on the AMA, ACC initiatives to offering healthier options

Ordering Protocols

PLANT-BASED MENU

The healthiest diets are those that are high in lentils, fruits and vegetables, beans, and whole grains. Eating these foods puts you on a path to lowering your risk of heart disease. We hope you enjoy this plant-based menu: ***for your health, for your future.***

How many fruits and vegetables do I need to eat?

The American Heart Association recommends eight or more servings of fruits and/or vegetables per day. Eating more fruits and vegetables may help keep you at a healthy weight, live longer, and help lower your cholesterol and blood pressure.

What is a serving size?

FRUITS:

4-5 servings per day
- **1 medium fruit** *(about the size of a baseball)*
- **1/4 cup dried fruit**
- **1/2 cup fresh, frozen or canned fruit**

VEGETABLES:

4-5 servings per day
- **1 cup raw leafy vegetables** *(about the size of a small fist)*
- **1/2 cup cut-up raw or cooked vegetables**
- **1/2 cup vegetable juice**

Breakfast

- ( ) **STEAMING OATMEAL**
  With raisins, almonds and brown sugar
- ( ) **OVERNIGHT OATS**
  Oatmeal rolled oats, chia seeds and fruit
- ( ) **CHEERIOS**
  With soy milk
- ( ) **WHOLE WHEAT TOAST**
  With peanut butter or avocado spread
- ( ) **FRESH FRUIT PLATE**
  With bran muffin

Lunch

- ( ) **BLACK BEAN BURGER**
  Hearty black bean patty over a warm bun with option of lettuce, tomato and onion
- ( ) **HUMMUS TOMATO SANDWICH**
  Fresh hummus over whole grain sandwich thins topped with tomato and spinach
- ( ) **FRESH VEGETABLE WRAP**
  Tomatoes, carrots, cucumbers, olives and lettuce wrapped in an avocado spread whole grain wrap

Dinner

- ( ) **VEGETABLE PASTA PRIMA VERA**
  A mix of sautéed fresh vegetables in a light sauce over penne pasta
- ( ) **TOFU VEGETABLE STIR FRY**
  Seasoned grilled tofu with sautéed green & red peppers, onions and broccoli
- ( ) **BLACK BEANS & YELLOW RICE**
  Seasoned black beans over fluffy yellow rice

Chef Specials

- ( ) **SWEET POTATO & KALE OVER BARLEY**
- ( ) **LENTIL BOLOGNESE OVER PASTA**
- ( ) **CHICKPEA POTATO COCONUT CURRY**

Beverages

- ( ) **HOT TEA**
- ( ) **ORANGE JUICE**
- ( ) **APPLE JUICE**
- ( ) **GRAPE JUICE**
- ( ) **CRANBERRY JUICE**
- ( ) **SOY MILK**

For more information on heart healthy nutrition, prevention and more, visit UFHealth.org/IntegrativeCardio.

UFHealth
Shands

Cost

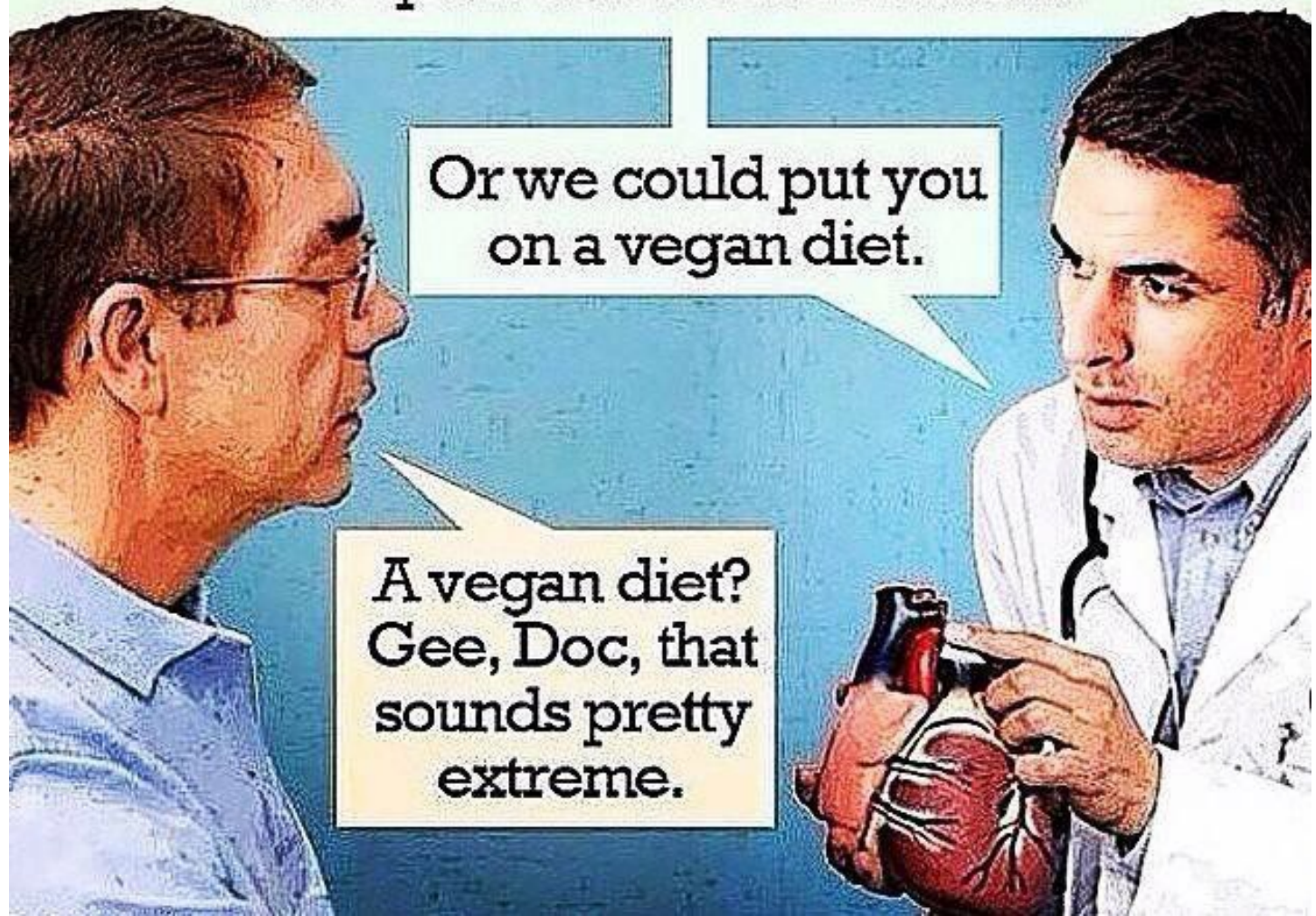
- Costs for plant-based meals ranged from $0.12 (rice and black beans)-$2.30 (overnight oats)
- Cost of regular cardiac diet or carb consistent diet tray is $2.20 and the plant-based meal tray was $2.87
- Over 7-month period, there were about 25 plant-based meals ordered per day

INTEGRATIVE AND PREVENTIVE CARDIOLOGY

LIVING WITH HEART DISEASE
GUIDELINES FOR A HEALTHIER LIFE

UFHealth
HEART AND VASCULAR CARE

So you have two choices. We could perform triple bypass surgery, where we take a vein out of your thigh, and open up your chest so we can sew the vein onto your coronary artery. This costs more than $100,000 and will keep you laid up for at least two months.



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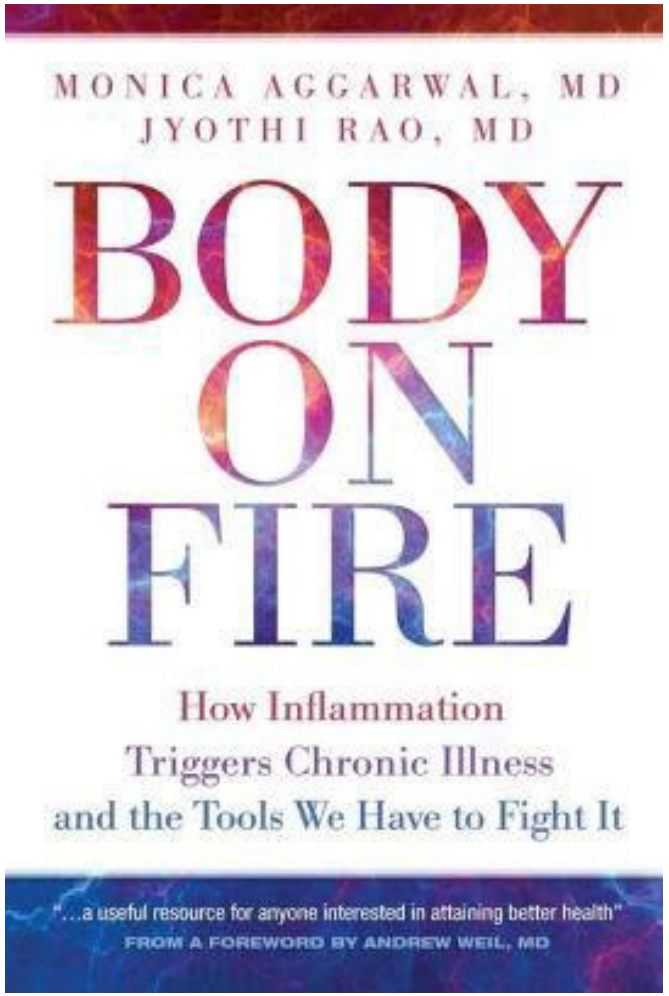

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Thank you!

drmaggarwal

drmonicaaggarwal

Q & A

Please use the QA feature in Zoom

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