



Addressing Cardiac Health Disparities for Better Patient Outcomes

Learning objectives

- Provide examples of how health disparities in cardiac care can adversely impact health outcomes and quality of care.
- Identify the role of implicit bias in contributing to health disparities.
- Evaluate strategies for reducing the occurrence of health disparities in your cardiac care practice.

This presentation and a link to the recording will be emailed to you within five (5) business days.

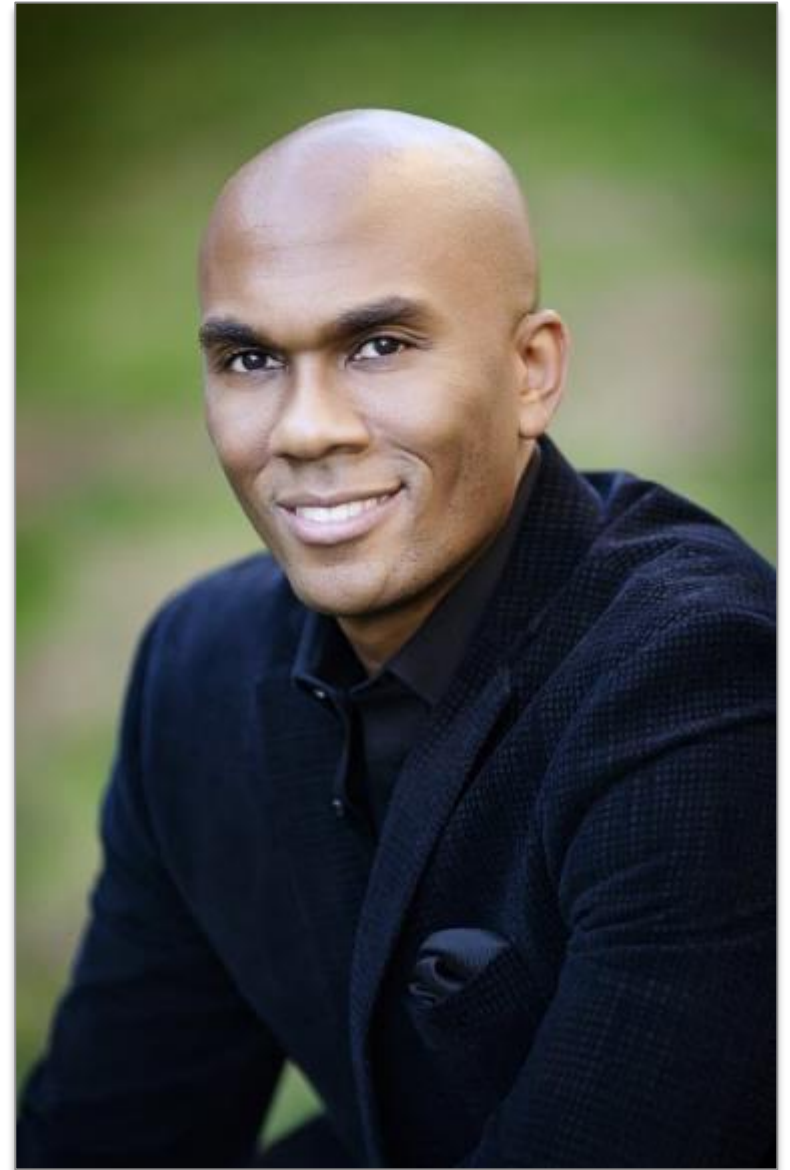
Why we are here today

- While management of cardiovascular disease has led to improved mortality over the years, disparities in outcomes have continued to increase among racial and ethnic groups.
- Disparities manifest by race and ethnicity, socioeconomic status, gender and geography.
- In this webinar, Dr. Batiste will address key health disparities in cardiac care and the principles and practices cardiac providers can use to recognize and reduce their occurrence.



Columbus D. Batiste II, MD FACC FSCAI

- ❖ *Board-certified Interventional Cardiologist*
- ❖ *Regional Chief of Cardiology,
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- ❖ *Co-founder, Healthy Heart Nation*





Bridging the Gap: Addressing Cardiac Health Disparities for Better Patient Outcomes

Columbus Batiste, MD, FACC, FSCAI

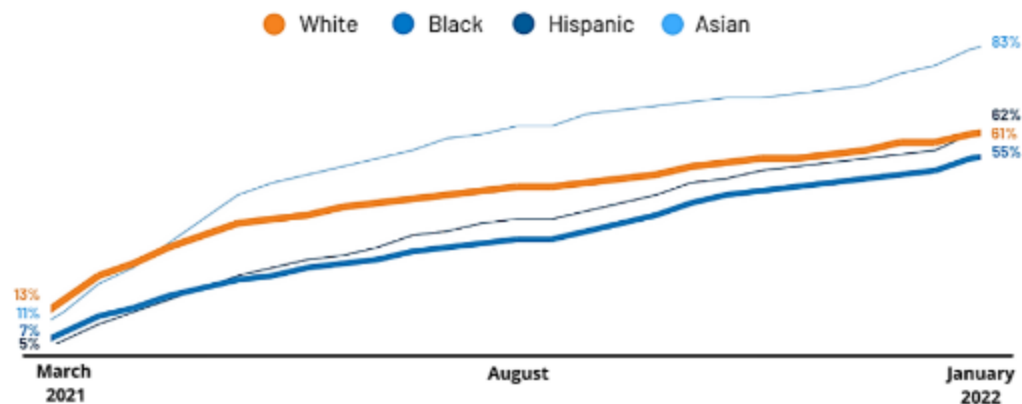
Black people face increased health risks from COVID-19.

2.5x Black people are 2.5 times as likely as White people to be hospitalized after infection.

1.7x Black people are 1.7 times as likely as White people to die.

Despite increased health risks, Black people are also less likely than White people to have received a COVID-19 vaccine.

Percent of Population That Has Received at Least One Vaccine Dose





" One thing we must of course expect to find, and that is a much higher death rate at present among Negroes than among whites...They have in the past lived under very different conditions and they still live under different conditions..." 1899 The Philadelphia Negro, Chapter X page 148



SICKER & SOONER



HYPERTENSION DISPARITIES

African American adults are **40 percent** more likely to have high blood pressure, and they are less likely than non-Hispanic whites to have their blood pressure under control.

African American women are nearly **60 percent** more likely to have high blood pressure, as compared to non-Hispanic white women.

STROKE DISPARITIES

African Americans are **50 percent more likely to have a stroke** (cerebrovascular disease), as compared to their white adult counterparts.

Black men are **70 percent more likely to die** from a stroke as compared to non-Hispanic whites.

African American women are **twice as likely** to have a stroke as compared to non-Hispanic white women.



Cardiovascular Disparities

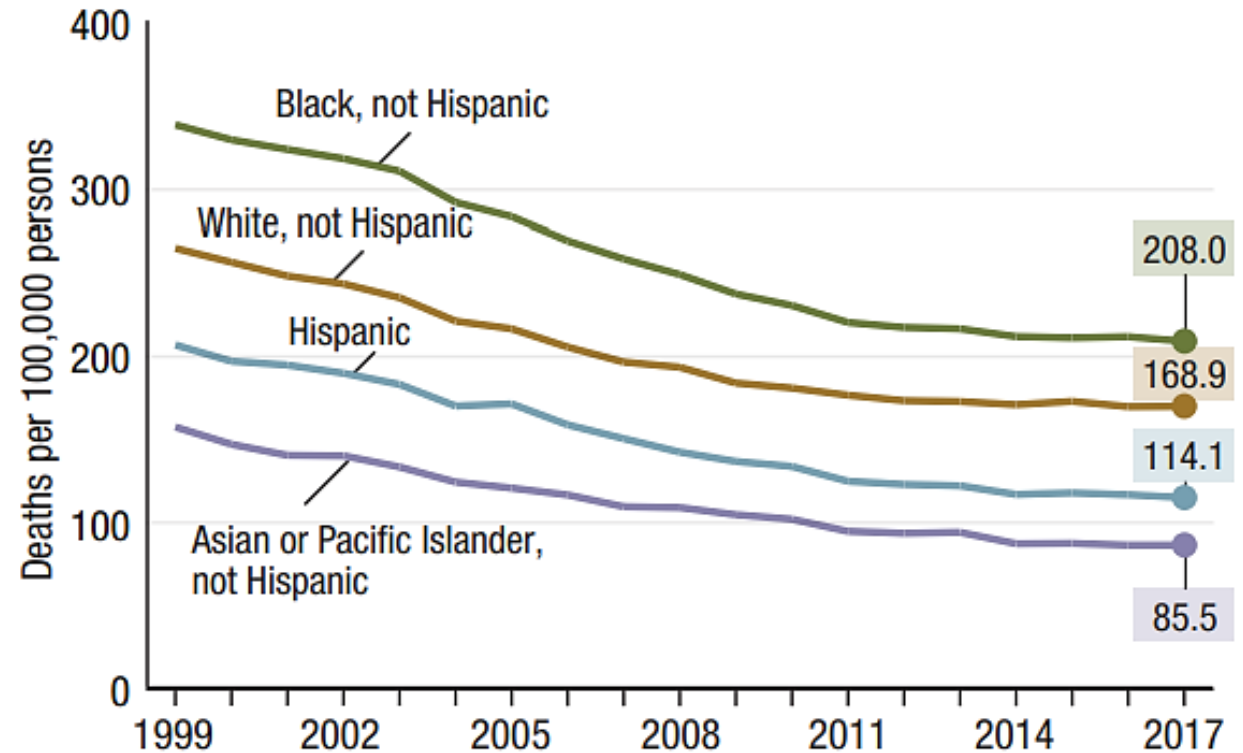
Coronary Artery Disease

Prevalence, death rate vary by race

Difference exists in rates of angiogram, timeliness of angiograms, and treatment given post-MI

Treatment includes PCI, CABG, medications, and lifestyle referrals/ counseling such as cardiac rehab

Age-adjusted death rates for heart disease, by race and Hispanic origin: 1999–2017



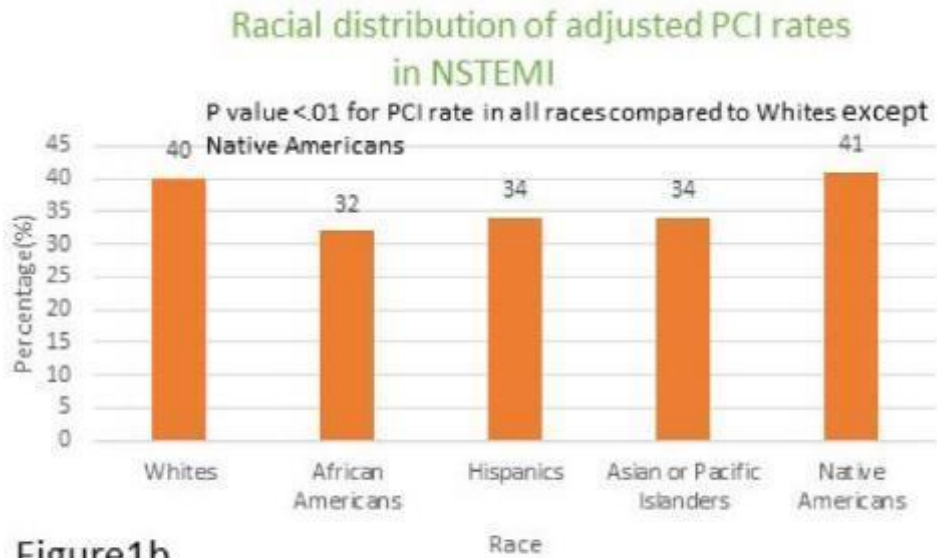


Figure1b

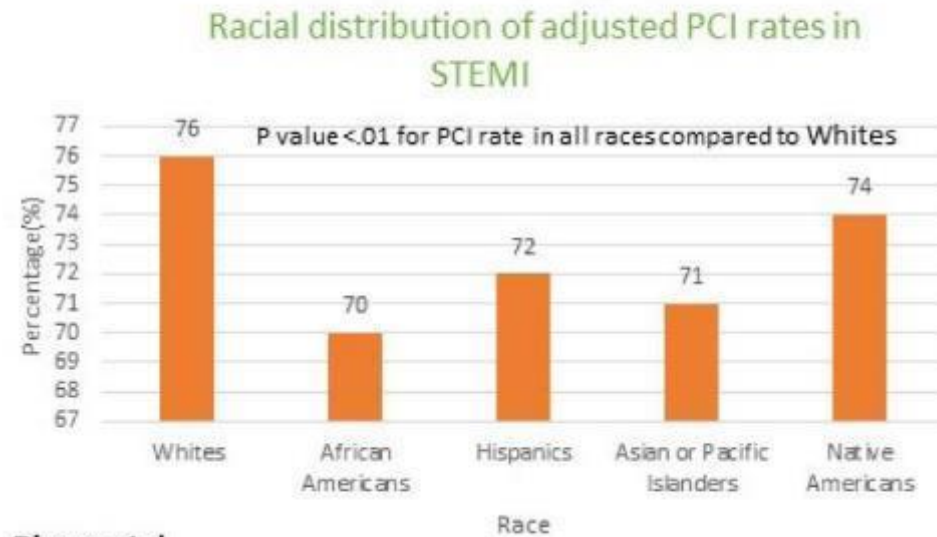
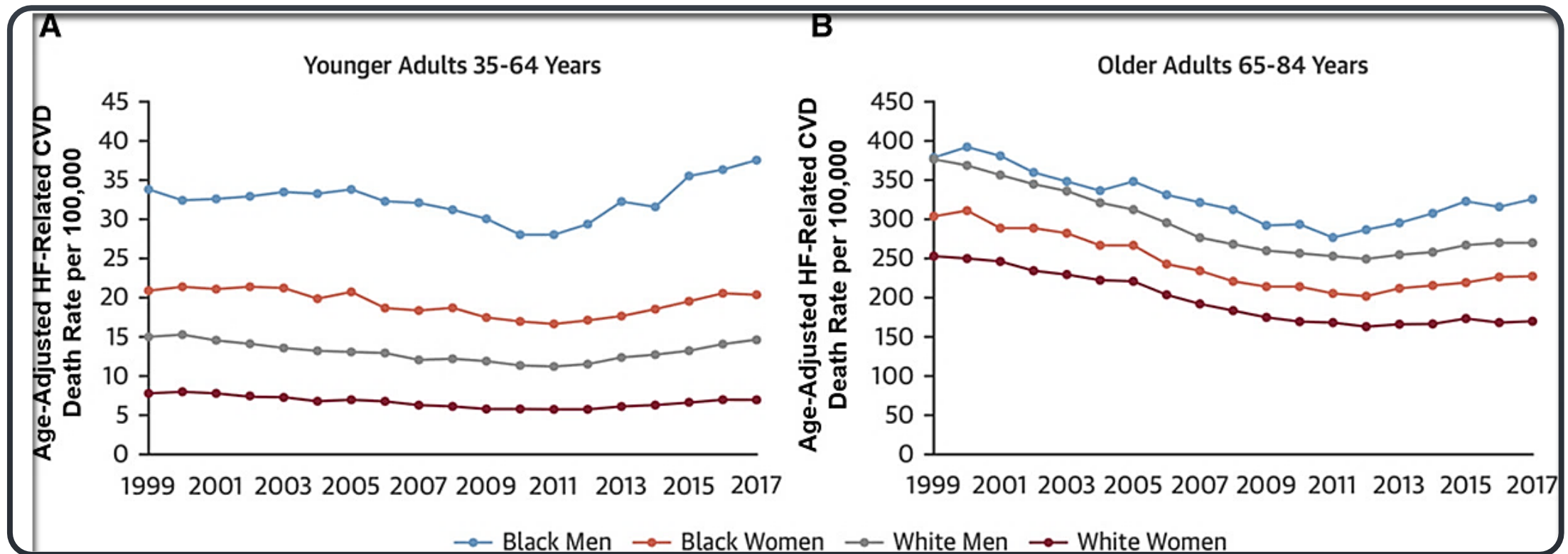


Figure1d

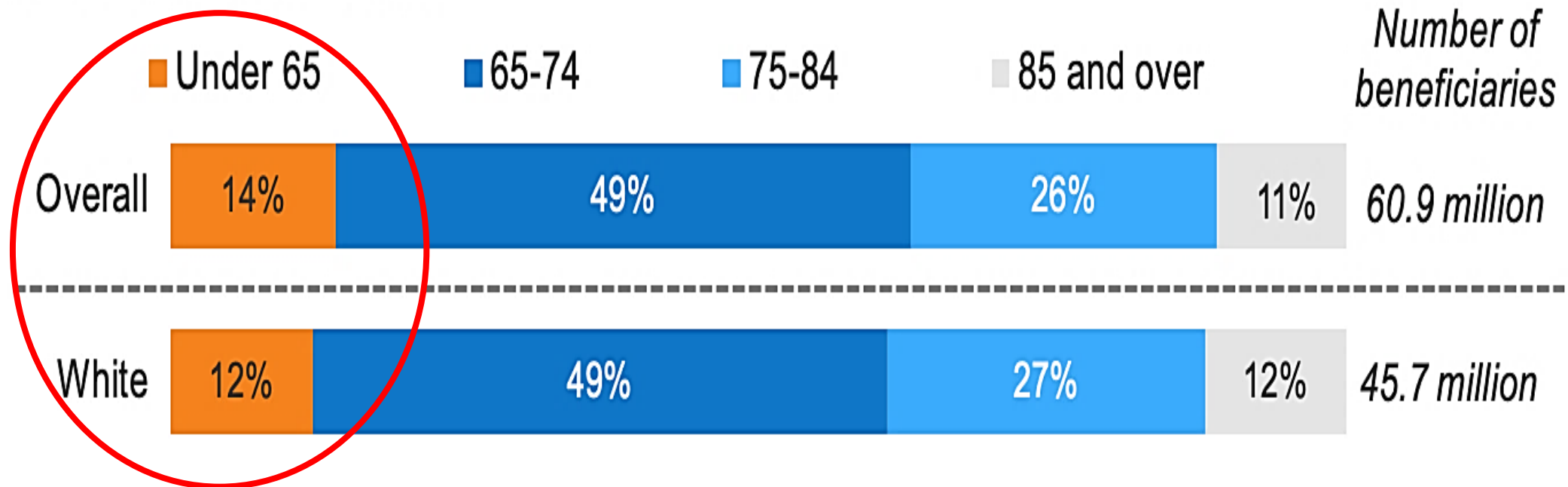
Racial disparities in PCI utilization still exist with lower PCI rates in most races compared to White patients with AMI



Cardiovascular Disparities Heart Failure

- Black persons diagnosed with heart failure at younger age
- Death rate for heart failure is highest in Black men
- Rate of hospitalization is 2.5x higher than that compared to White patients with longer length of stay as well as higher readmission rate

Larger Shares of Black and Hispanic Medicare Beneficiaries Are Under Age 65 and Living With a Long-Term Disability Compared to White Beneficiaries



“Among White individuals, the prevalence of CV risk factors and disease is projected to decrease whereas significant increases are projected in racial and ethnic minorities”

CENTRAL ILLUSTRATION: Projected Future of Cardiovascular Risk Factors and Cardiovascular Diseases by 2060



Projections of Future Cardiovascular Risk Factors and Cardiovascular Disease in the United States From 2025 to 2060

Cardiovascular Risk Factors

Diabetes: ↑ of 39.3% to 55 million persons
Hypertension: ↑ of 27.1% to 162 million persons
Dyslipidemia: ↑ of 27.6% to 126 million persons
Obesity: ↑ of 18.3% to 126 million persons

Cardiovascular Diseases

Ischemic heart disease: ↑ of 30.7% to 29 million persons
Heart failure: ↑ of 33.4% to 13 million persons
Myocardial infarction: ↑ of 16.9% to 16 million persons
Stroke: ↑ of 33.8% to 15 million persons

Key points

- Projections for future cardiovascular risk factors and cardiovascular disease were based on NHANES data combined with 2020 U.S. Census projections for future population distributions
- Although steep rise in cardiovascular risk factors and cardiovascular diseases are expected in upcoming years, differences between women and men will largely remain stable over time
- Disproportionate increase in cardiovascular risk factors and cardiovascular disease are projected to impact racial and ethnic minority populations
- The results from this study have important implications for motivating policy decisions regarding equitable delivery of quality health care to all Americans

Mohebi R, et al. *J Am Coll Cardiol.* 2022;80(6):565-578.

What do Racial Disparities in Health Really Mean?



Massive
Unnecessary
Loss of Lives

265 Deaths Every Day

Levine et al., 2001



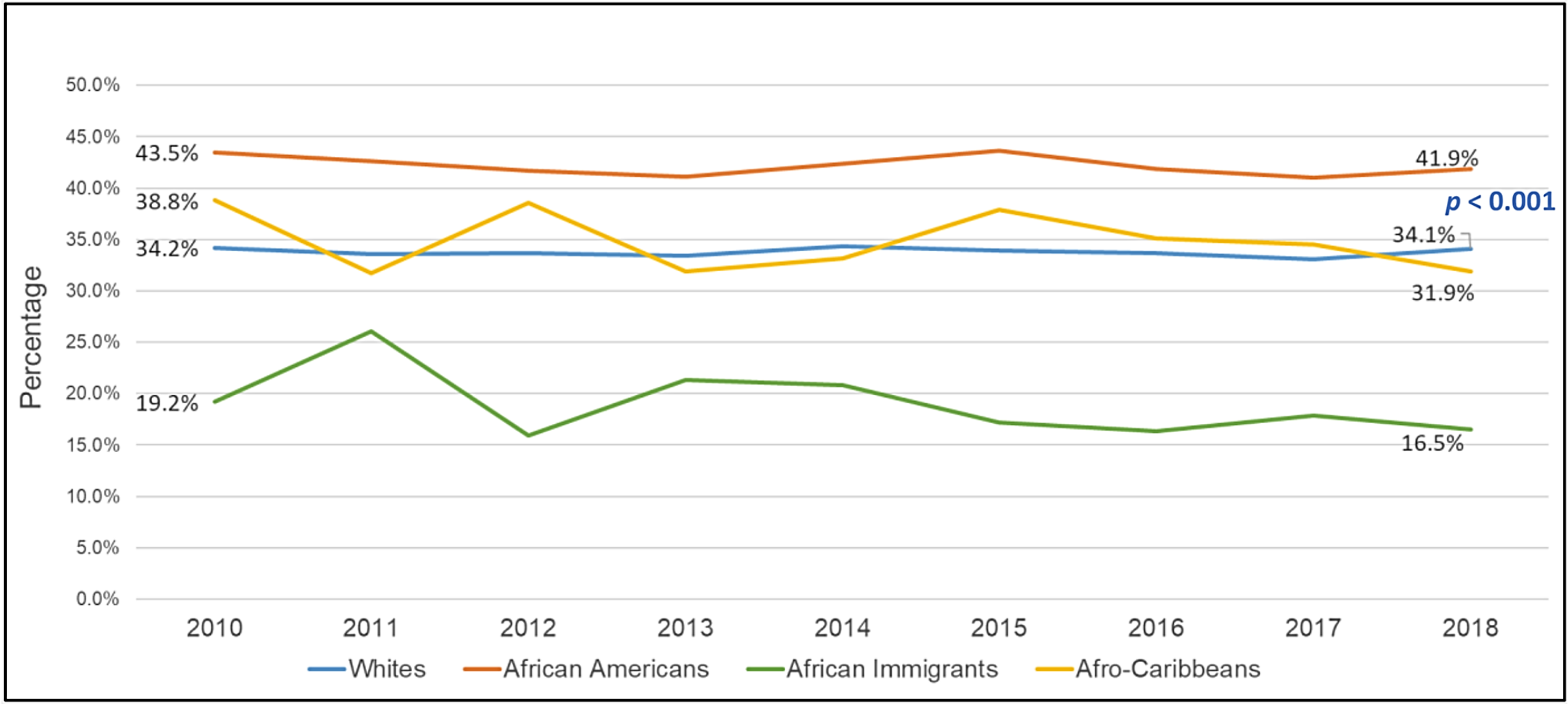
Harvard Business Review

Racial health disparities are associated with substantial annual economic losses nationally, including an estimated **\$35 billion** in excess health care expenditures, **\$10 billion** in illness-related lost productivity, and nearly **\$200 billion** in premature deaths. Concerted efforts to reduce health disparities could thus have immense economic and social value.

Why Do Black People *Die Sicker*
and *Sooner* Than Other People ?

IT'S NOT
GENETIC



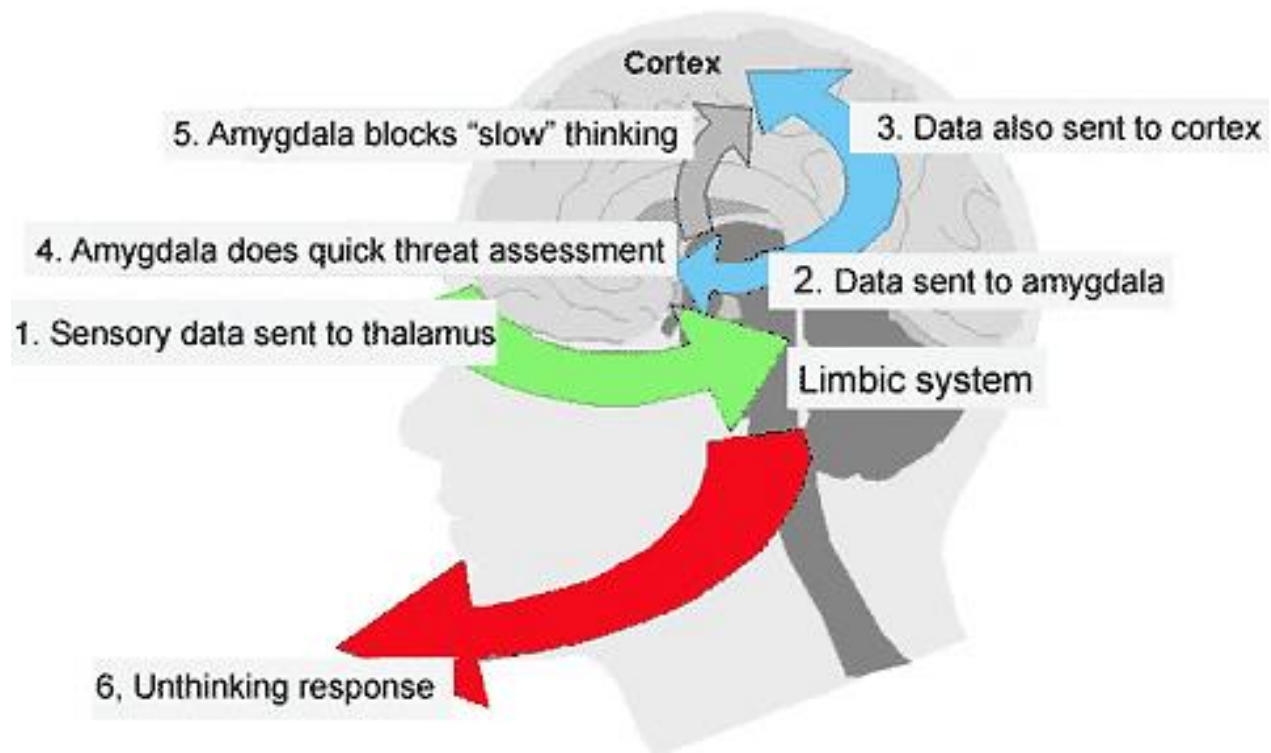




Defining Stress

Stress is a condition or feeling experienced when a person perceives that **demands exceed** the personal and social **resources** the individual is able to mobilize.



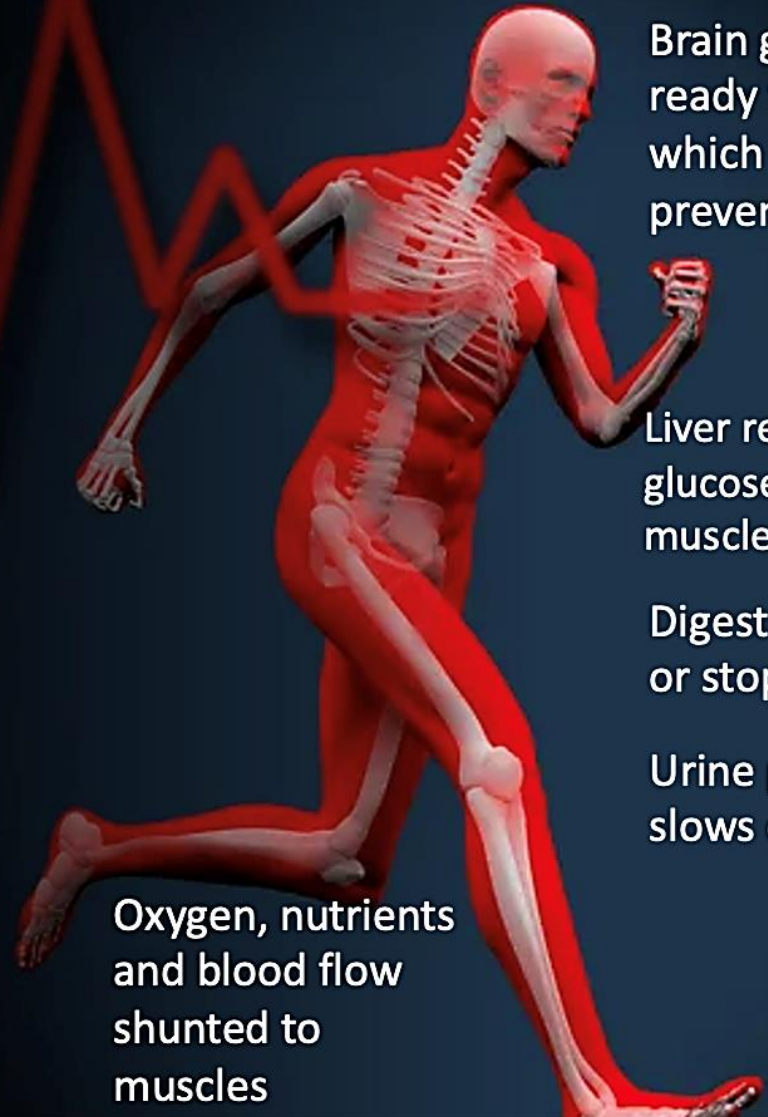


The amygdala notes the emotion and feelings caused by the stimuli, and the unthinkable response that resulted from them. In the future, if similar emotion and feelings are evoked, the *amygdala hijacks the rational brain, producing the noted unthinkable response.*

— Fight or Flight Hidden Effects

Cortisol released increasing blood pressure and blood sugar while depressing the immune system

Adrenaline released
To Increase strength for
fight or flight



Brain gets body ready for action which in turn prevents sleep

Liver releases glucose for muscle fuel

Digestion slows or stops

Urine production slows or stops

Oxygen, nutrients and blood flow shunted to muscles

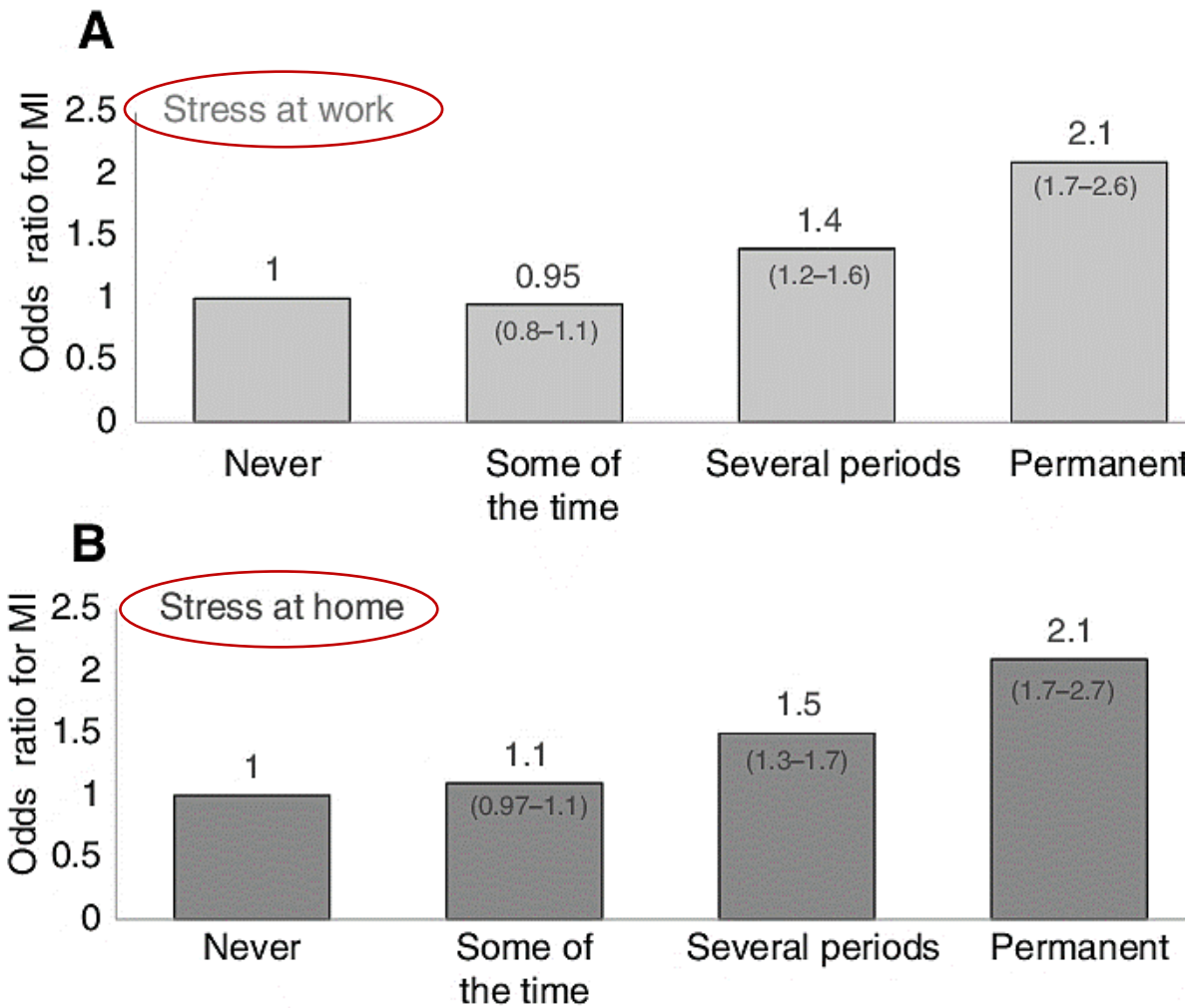
“Too much of a good thing can be a bad thing”

The Stress Factor

Chronic exposure to stress, poor social supports and limited social networks have been shown to ***increase disease risk***

Perceived Stress & Heart Disease

Meta-analysis suggests ***that high perceived stress is*** associated with a moderately ***increased risk of incident CHD.***



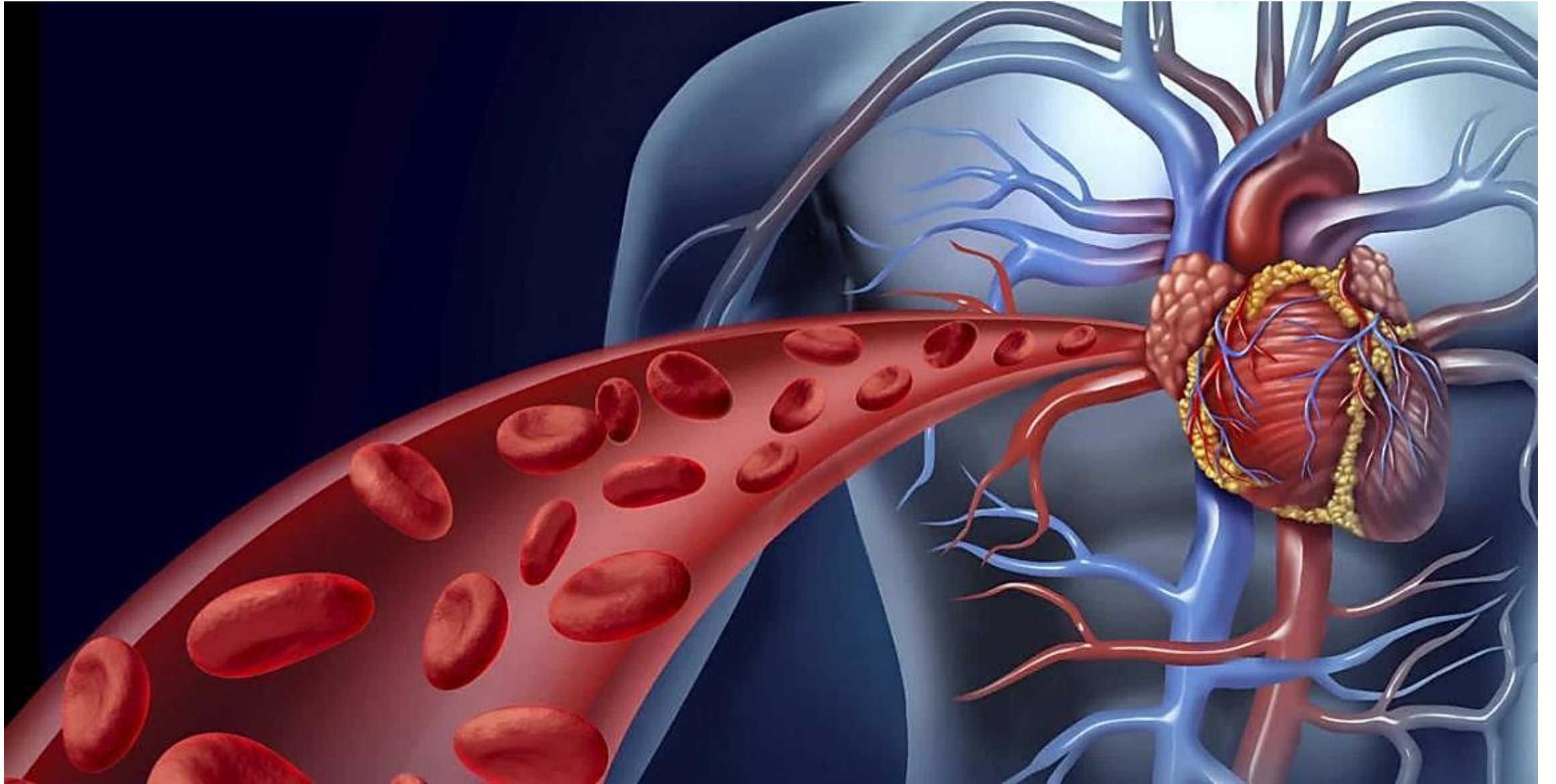
The Interheart study showed that *psychological stress is an independent risk factor for heart attacks*, similar in heart-damaging effects to the more commonly measured cardiovascular risks

STRESSORS



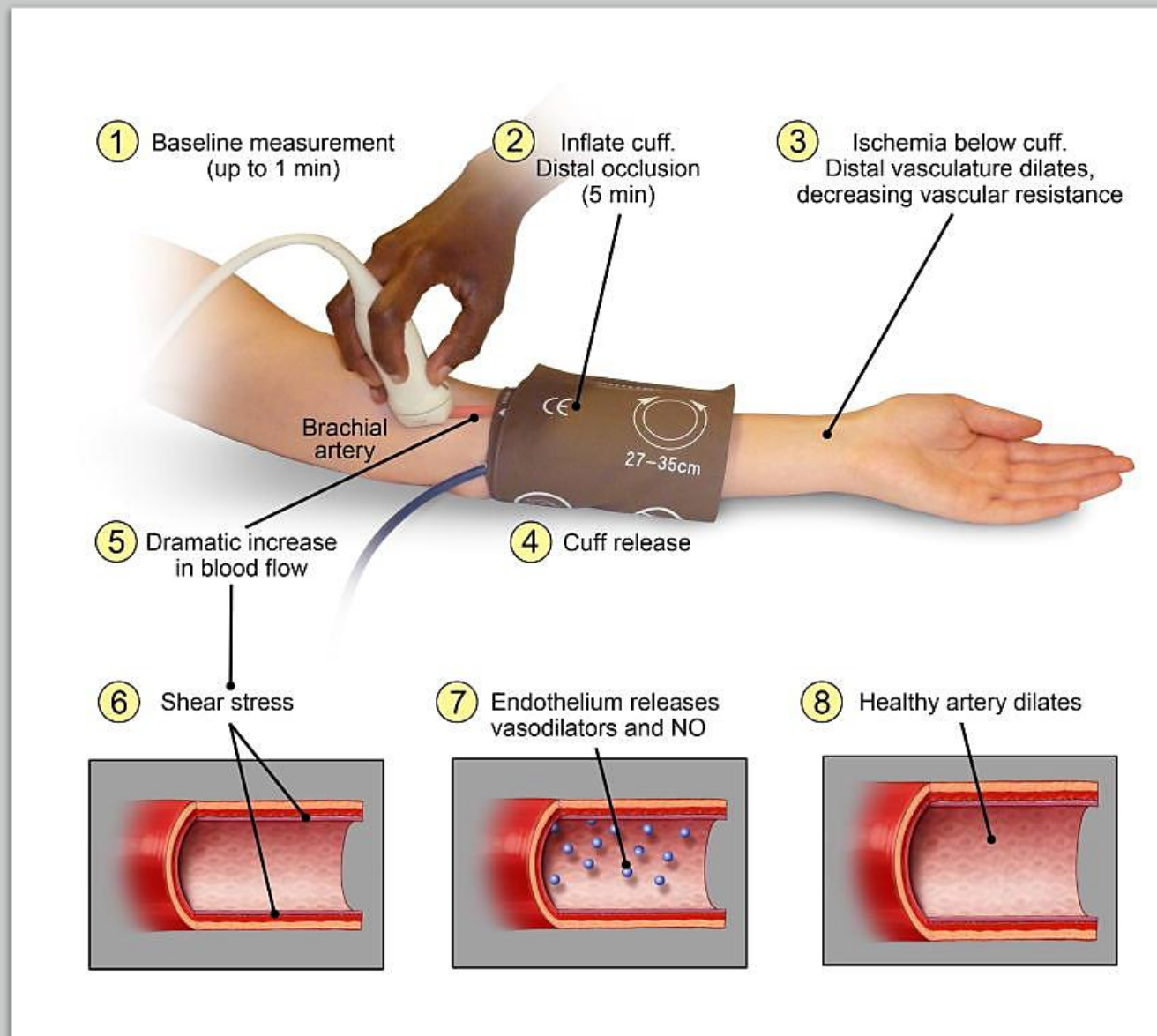
Perceived Stress and Stroke

14 studies were included in A meta-analysis indicates that ***perceived psychosocial stress is independently associated with increased risk of stroke.***



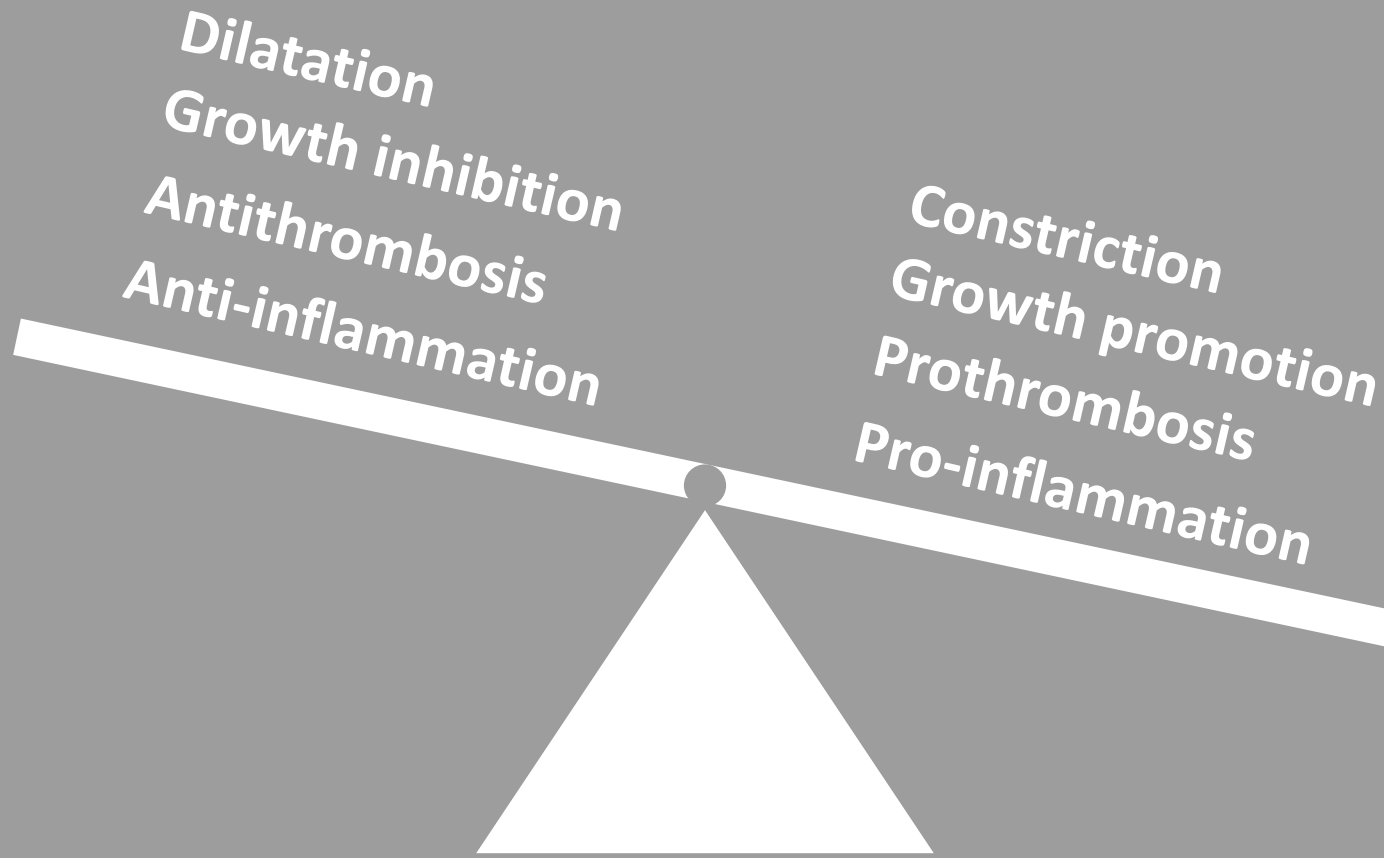


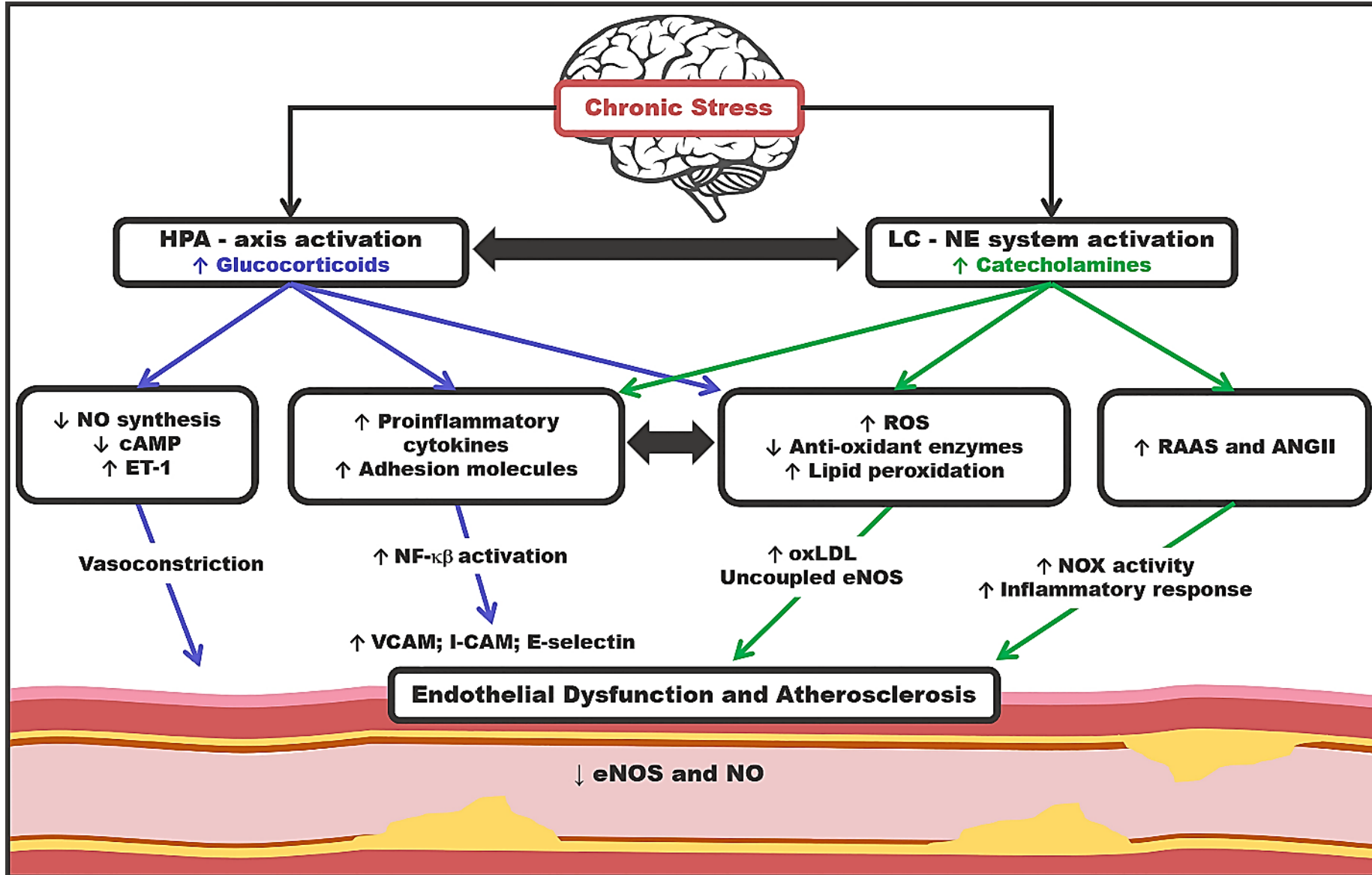
Flow-mediated Dilatation



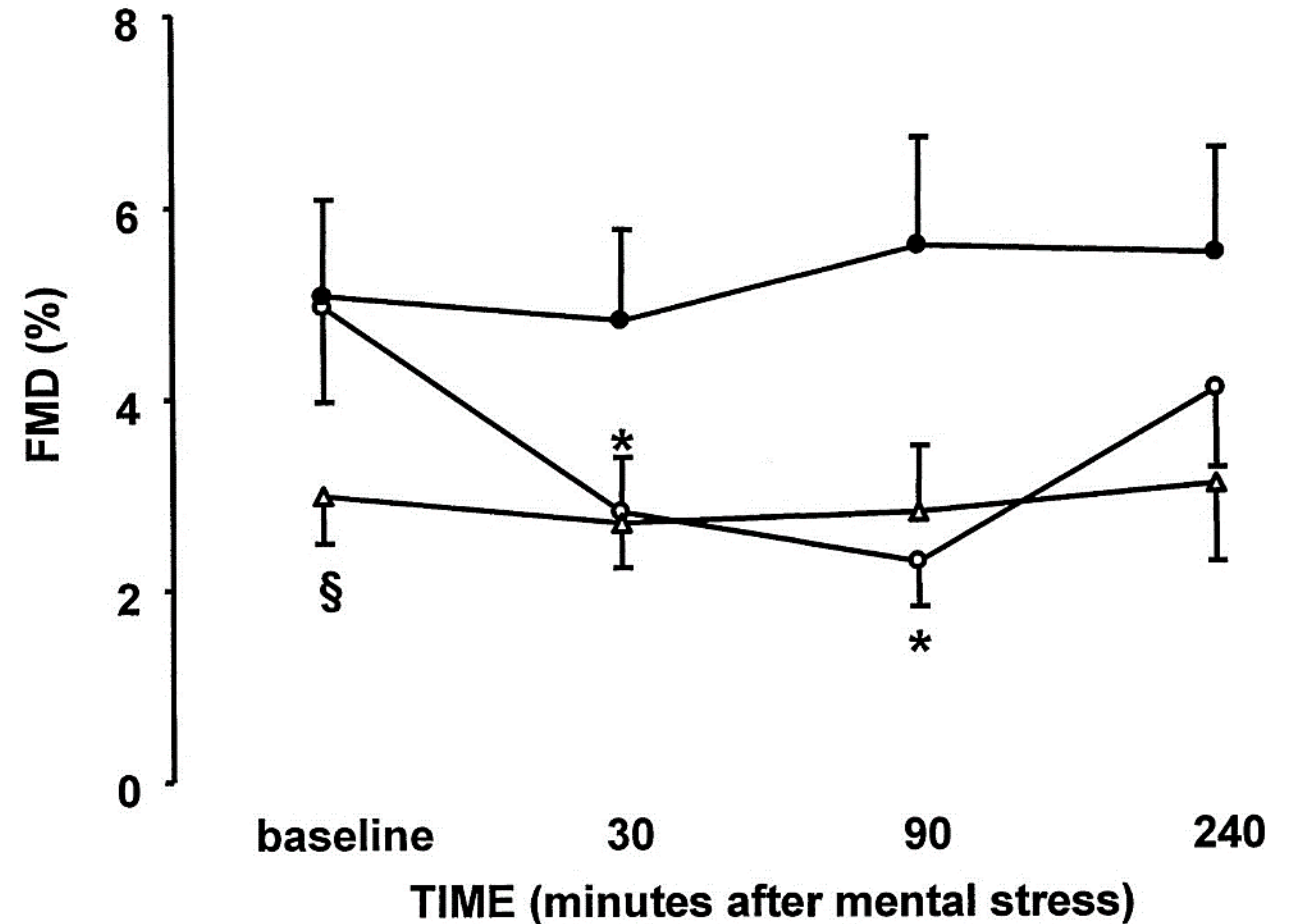


Endothelial Dysfunction

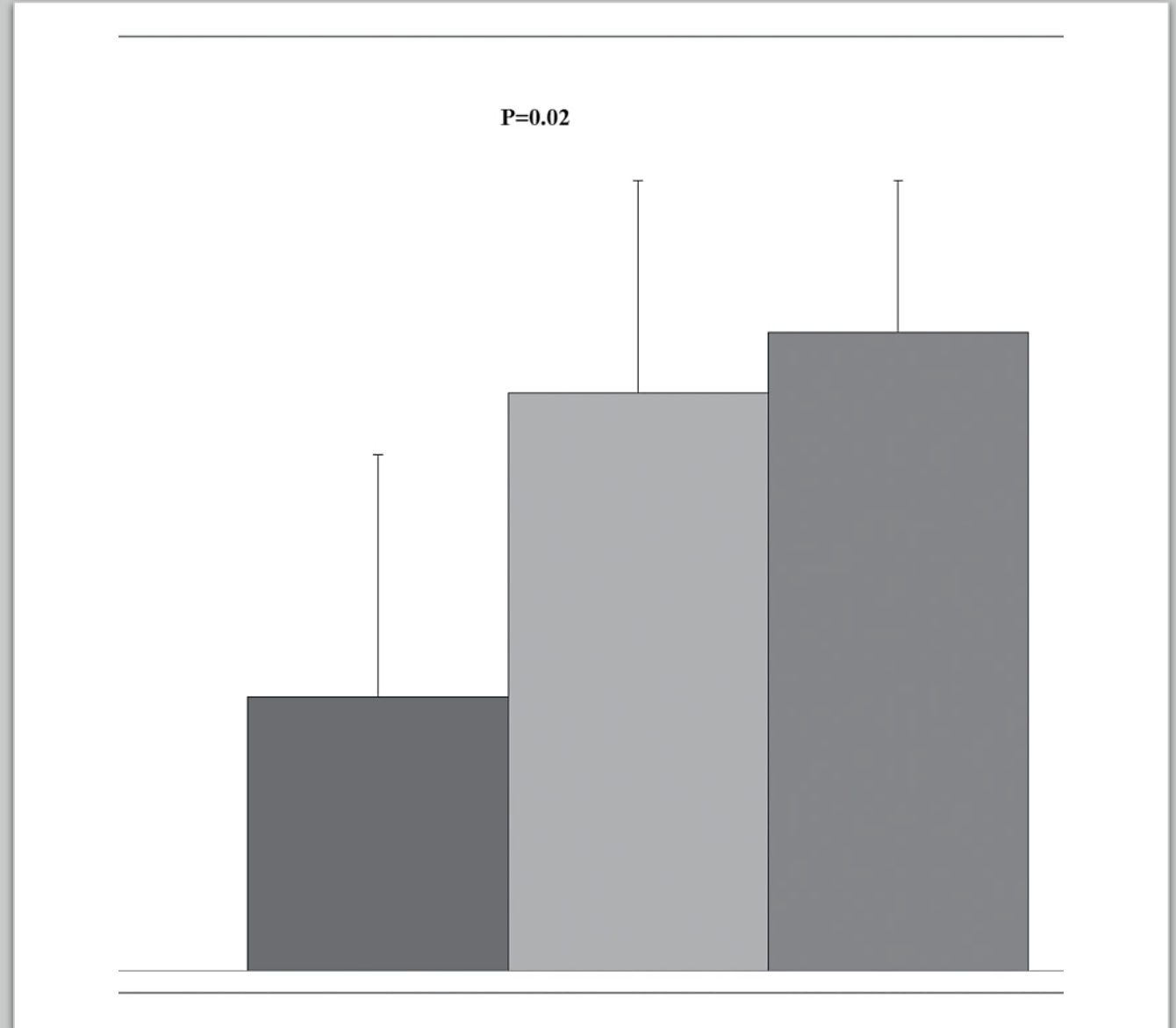




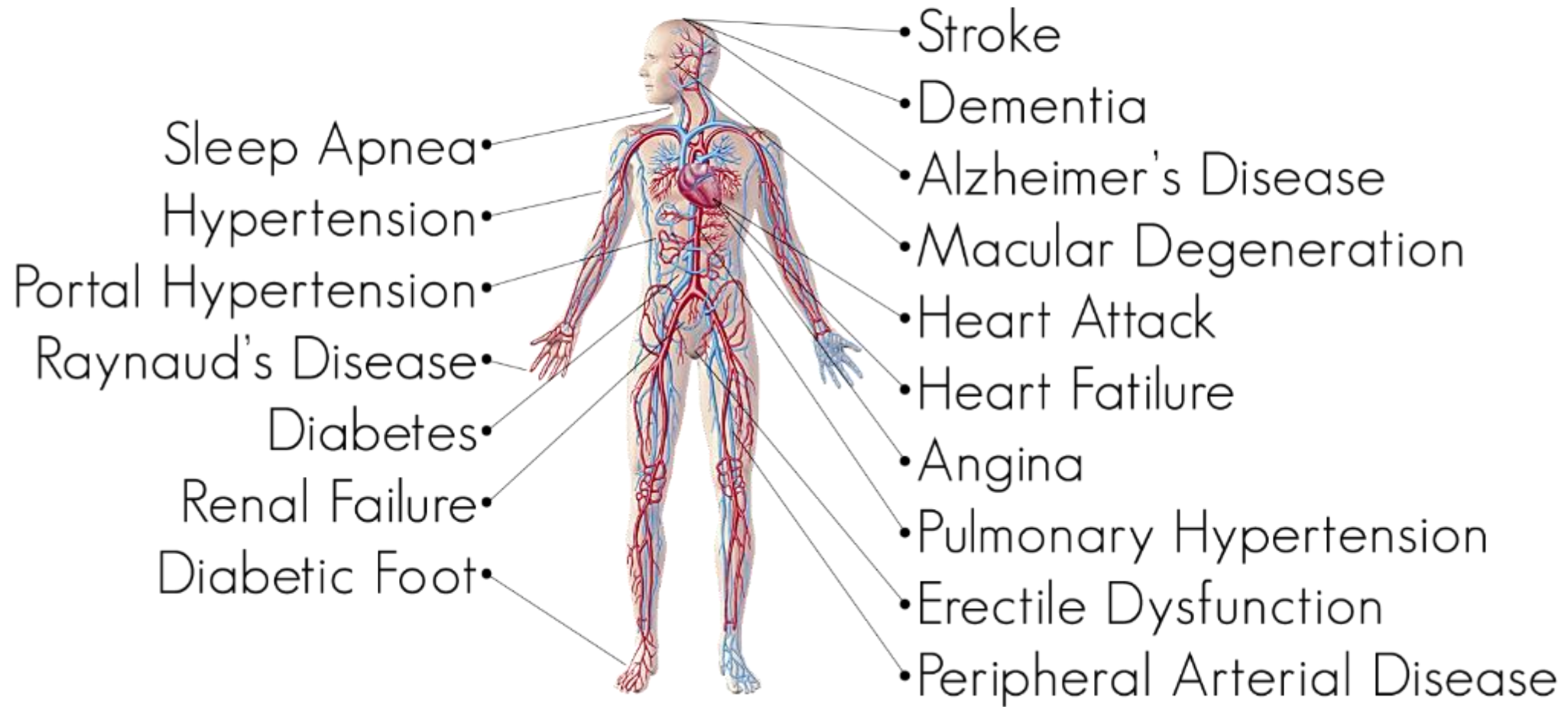
Mental Stress Induces Transient Endothelial Dysfunction in Humans



Chronic Stress and Endothelial Dysfunction: MESA STUDY



Vascular Dysfunction is the precursor of:



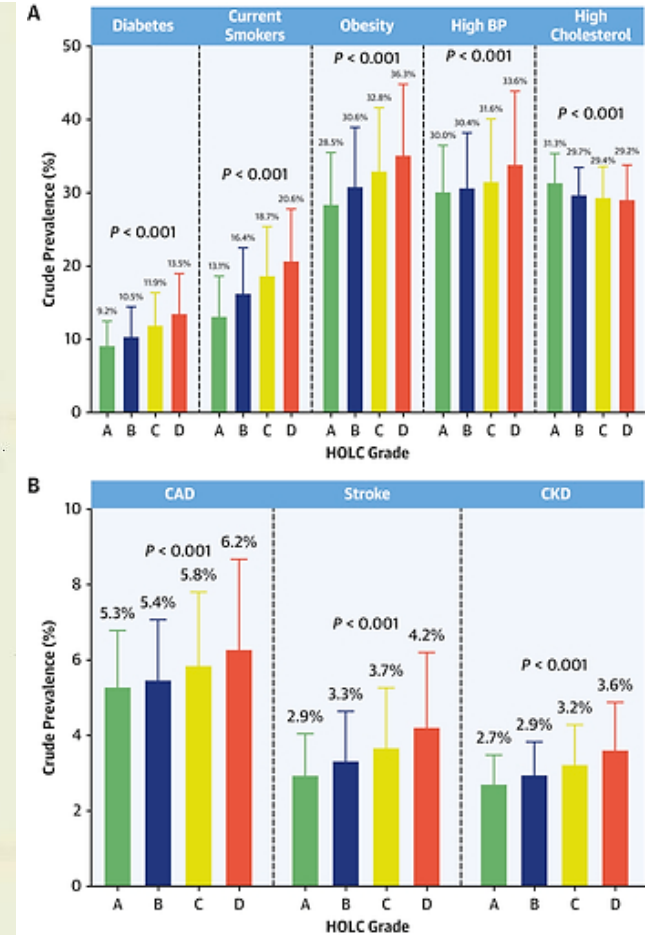
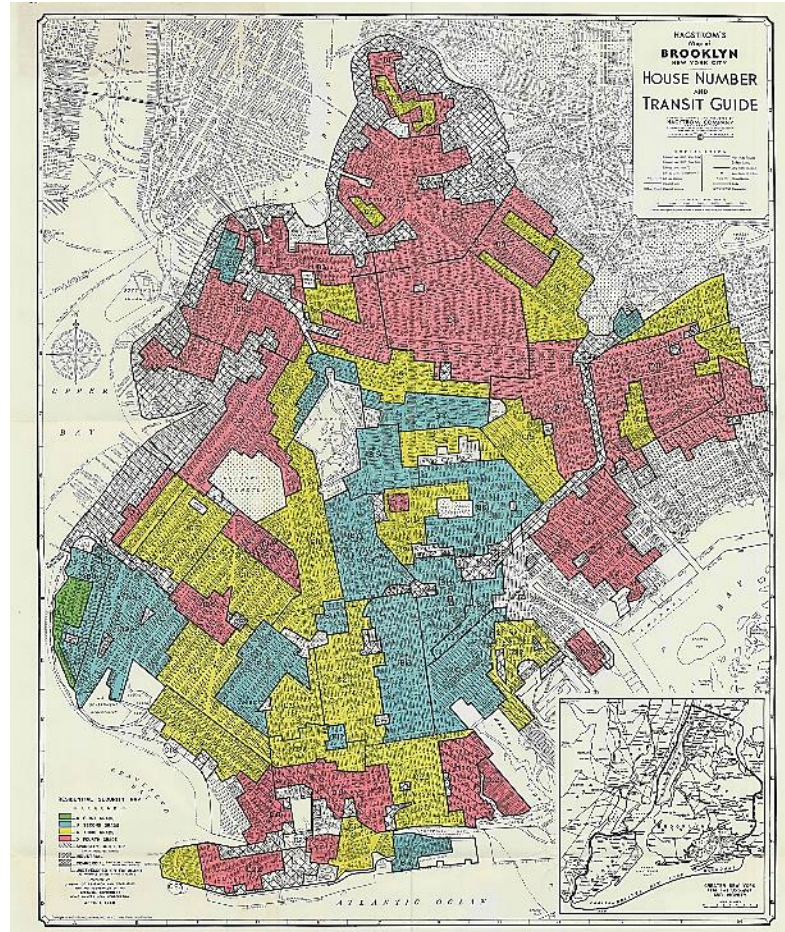
Unique Stressor

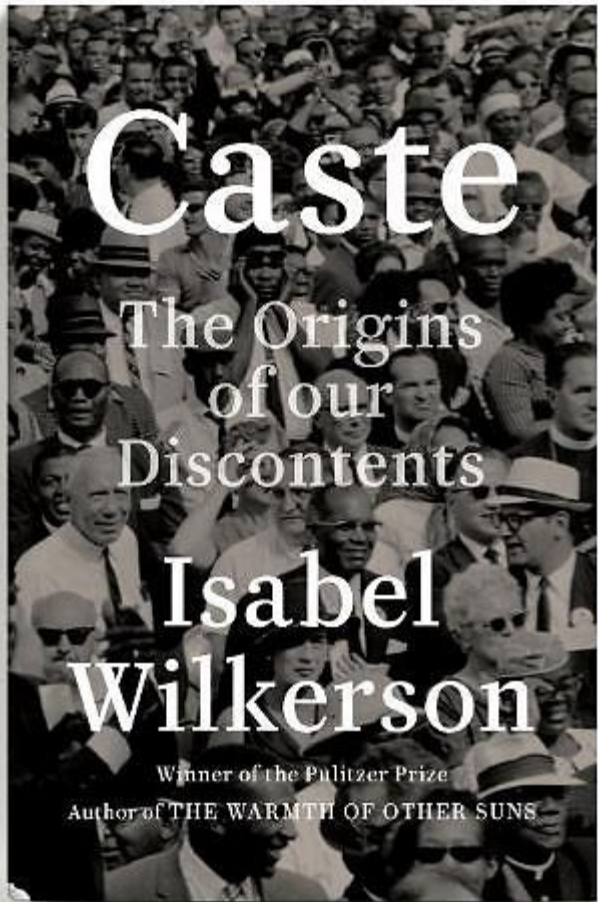
Is a thread that connects all other stressors and disproportionately impacts a segment of the population



Racism is a statement about a person's valueResources most often go where value is perceived.

More than 60 years after redlining was banned, the historical discriminatory housing practice was still associated with cardiovascular disease and its risk factors in a cross-sectional study.





What is caste? According to Wilkerson, "caste is the granting or withholding of respect, status, honor, attention, privileges, resources, benefit of the doubt, and human kindness to someone on the basis of their perceived rank or standing in the hierarchy."

Everyday discrimination scale

Frequently treated with **less courtesy** than others

Frequently treated with **less respect** than others

Frequently received **poorer service** than others

Frequently people think you're **not smart**

Frequently people are **afraid** of you

Frequently people act like you are **dishonest**

Frequently people **act better than you**





Racism as Stress

A study of African-American women found that those who ***reported chronic emotional stress due to their experience of racism*** had more severely ***blocked carotid arteries***.





When considering underrepresented groups defined by factors other than race and ethnicity, *persons with income <35k dollars were more likely to both have CAS and undergo revascularization.*

THE ROLE OF RACISM AS STRESS IN HEALTHCARE

RESEARCH ARTICLE | HEALTH EQUITY

[HEALTH AFFAIRS](#) > [VOL. 41, NO. 2](#): RACISM & HEALTH

Negative Patient Descriptors: Documenting Racial Bias In The Electronic Health Record

[Michael Sun](#), [Tomasz Oliwa](#), [Monica E. Peek](#), and [Elizabeth L. Tung](#)

[AFFILIATIONS](#) ▾

PUBLISHED: JANUARY 19, 2022  **Open Access**

<https://doi.org/10.1377/hlthaff.2021.01423>

Compared with White patients, ***Black patients had 2.54 times the odds of having at least one negative descriptor in the history and physical notes***.....potential to exacerbate racial and ethnic health care disparities.

Etiology of Racial Disparities

Implicit Bias

Logistic-regression analysis indicated that **women** (odds ratio, 0.60; 95 percent confidence interval, 0.4 to 0.9; P=0.02) **and blacks** (odds ratio, 0.60; 95 percent confidence interval, 0.4 to 0.9; P=0.02) **were less likely to be referred for cardiac catheterization than men and whites, respectively.**



A



B



C



D



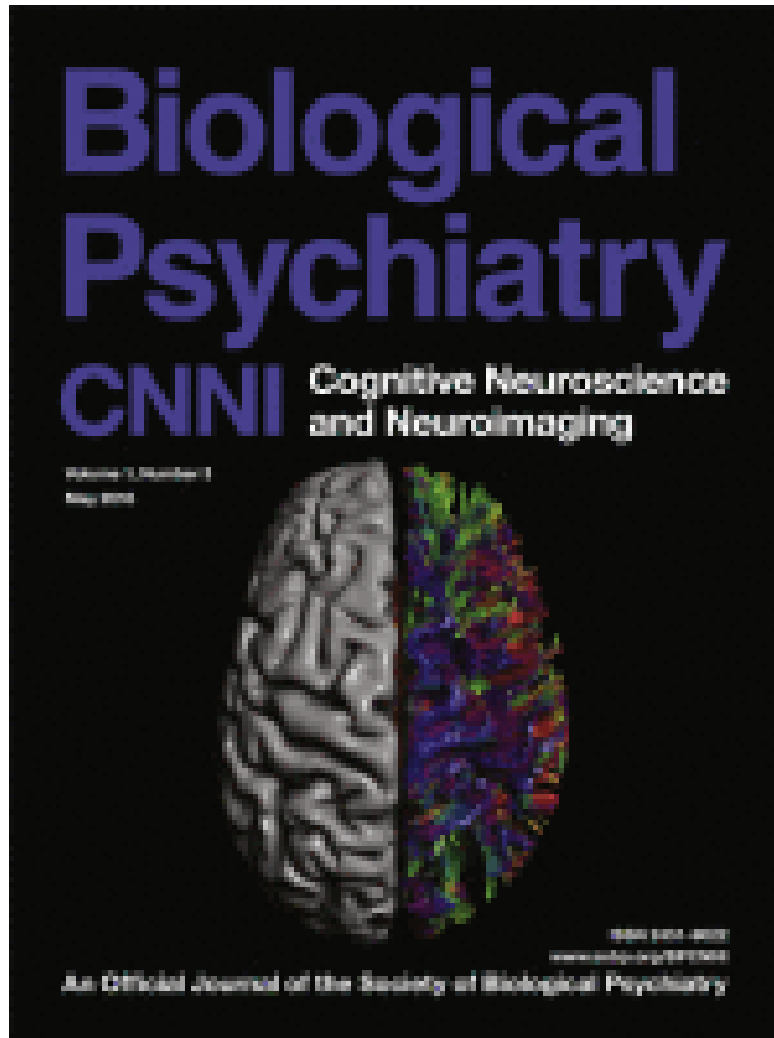
E



F



Biological Proof of Racism as Stress



Collectively, our findings provide the first evidence that *social discrimination is independently associated with elevations in intrinsic amygdala activity* and functional connectivity, thus revealing clear parallels between the Neural substrates of discrimination and psychological stressors of other origins

Discrimination causes nearly instantaneous spikes in stress hormones

The study of real-time cortisol levels opens the door to understanding how daily life events influence health

14-007 2012 · 4:25 PM · BY [ROBERTO INFANTE-ORTEGA](#)



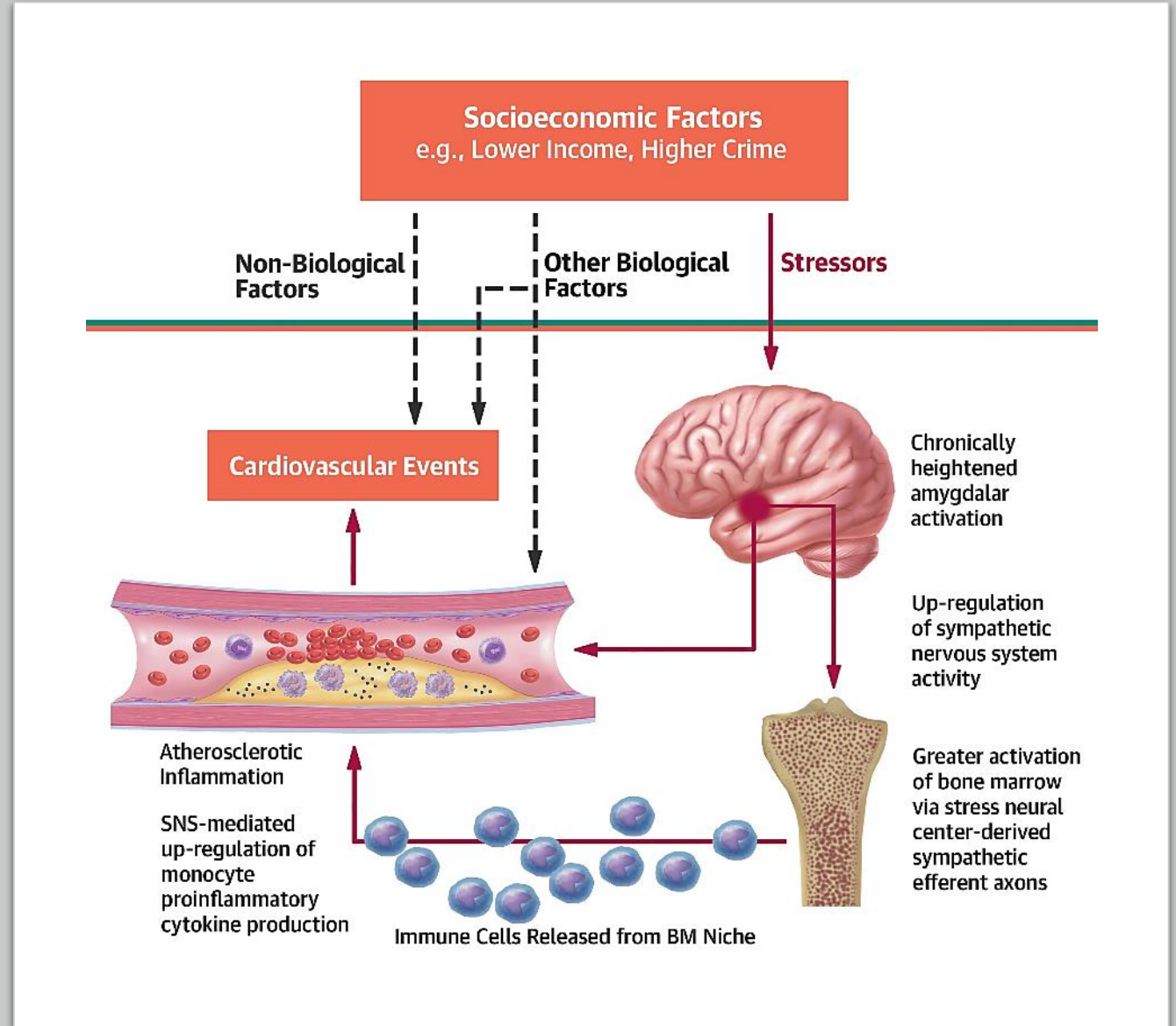
High levels of interpersonal *racial discrimination* determine low-grade *inflammation* levels that have been found to forecast chronic diseases of aging, such as coronary disease and stroke.

Lower Socioeconomic Status:

Associated with higher Amygdalar activity

Independently predicts MACE

These findings illuminate a stress-associated neurobiological mechanism by which SES disparities may potentiate adverse health outcomes.



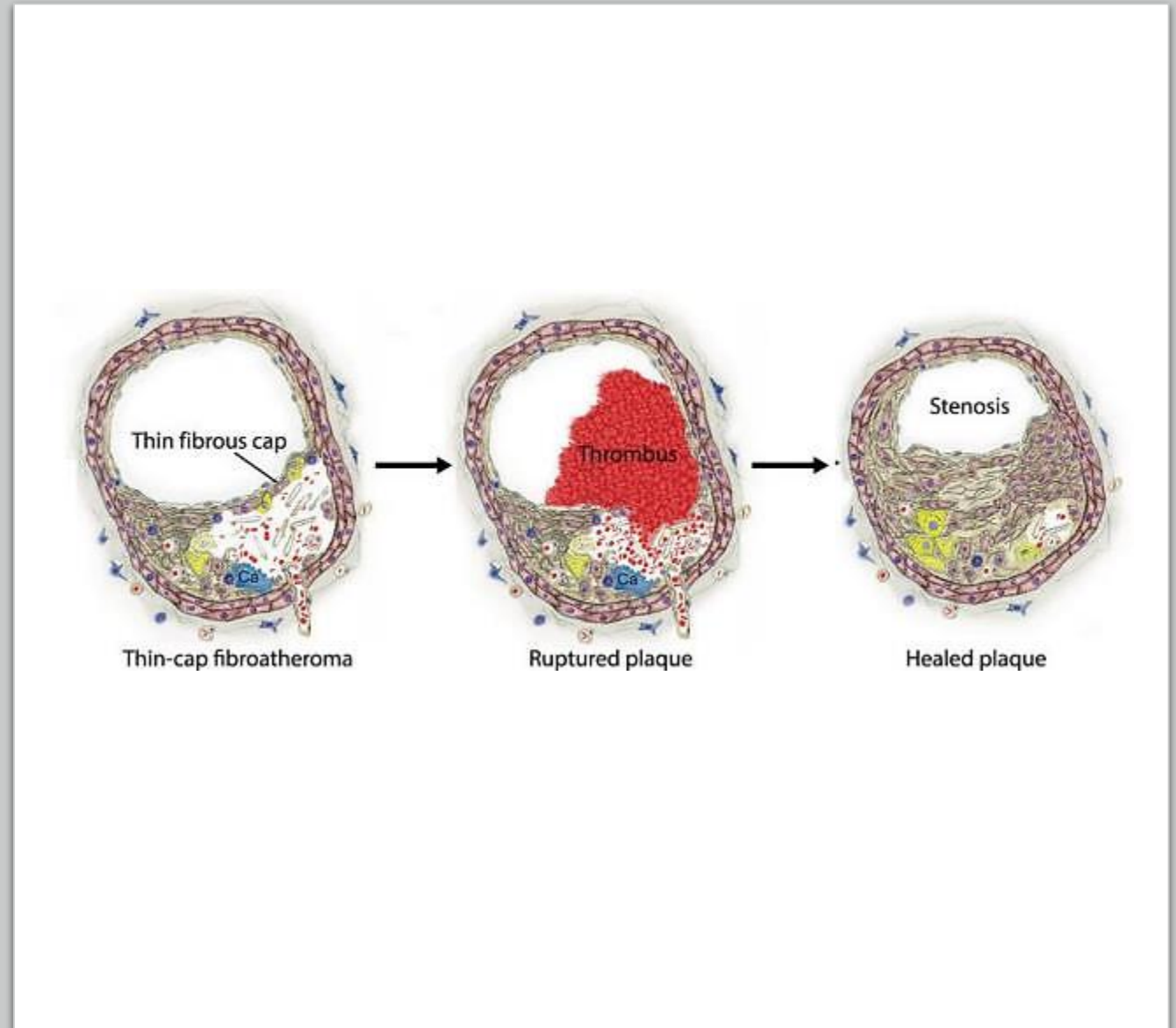
Endothelial Function: The Impact of Objective and Subjective Socioeconomic Status on Flow- Mediated Dilation

Lower subjective social status in one's community may be linked to CVD via impaired vasodilation.



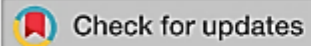
Acute mental stress drives vascular inflammation and promotes plaque destabilization in mouse atherosclerosis

Our data show that acute mental stress rapidly amplifies inflammatory leucocyte expansion inside mouse atherosclerotic lesions and promotes plaque vulnerability.





In communities with a high level of frisking, Sewell et al found increased levels of PTSD, nervousness, and mental stress **not only by those touched directly by the law system but also others within the community.**



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Published: 25 January 2022

Racism as a leading cause of death in the United States

Harlan M. Krumholz,^{1,2,3} Daisy S. Massey,¹ Karen B. Dorsey^{1,4}

During the past year, the dual crises of the covid-19 pandemic and police violence have opened many people's eyes to the ways in which the political construct of race—and anti-Black racism in particular—continue to determine who lives and who dies in the United States. Moreover, research is showing how little progress we are making in eliminating inequalities.¹ Within medicine, physicians and other healthcare professionals are reckoning with the ways in which research has falsely looked at race as a biological attribute rather than a social construct over centuries, contributing to systems of racism in healthcare delivery. At long last, medical science is declaring that race is not biological, but that racism has profound consequences for health.²

To address racism, understand its impact on health, and identify and assess potential remedies, a national set of metrics is needed to galvanise action and promote accountability. During the pandemic, excess

potential pathways. This reality derives from the historical and present manifestation of racial politics in the United States, such as laws and policies that curtail individual freedoms, obstruct access to economic opportunities, and limit social mobility. For many racial and ethnic minority groups, and particularly for the descendants of enslaved Africans, equality in health and longevity remain beyond reach.

Excess deaths among Black people represent the difference over a discrete time between the number of deaths that occurred and the number of deaths that would have occurred had the mortality rate been the same as that among White people. The excess deaths associated with race can be understood as a toll that is in large part a result of racism in the United States. There is no biological reason, independent of social context, that Black people should die younger than White people. The excess premature deaths are the cumulative difference in death between Black and White people across every specific cause of death.

Stress=Demands-Resources

The higher our *stress* the poorer our health

When you get stressed what do you turn to?



Turn to fake
resources



The Motivational Triad



HABIT PROBLEM
 DISEASE ENDING PROHIBITION
 BREAK ABUSE PERSON
 ADDICTED QUITTING TOBACCO
 ISSUES HEALTH PRESSURE
 ADDICT QUIT MEDICINE
 SMOKER UNHEALTHY
 BAD LIFESTYLE
 SMOKE DANGER
 NICOTINE ILLNESS
 BAN
 HARMFUL
 ALCOHOL
 STRESS
 ADDICTION CIGARETTE RISK
 NARCOTIC
 STOP CANCER
 HEALTHY
 HAND WARNING
 DRUG
 FORBIDDEN
 HARMFUL
 ALCOHOL
 STRESS



STRESSED

SPELLED BACKWARDS IS

DESSERTS

The New York Times

'I Just Need the Comfort': Processed Foods Make a Pandemic Comeback

Shoppers, moved by nostalgia and hunting for longer shelf lives, are returning to old standbys like Chef Boyardee and Campbell's soup.



Study found that the ***consumption of fast food and levels of stress were directly proportional to each other.***

Food Deserts

According to a survey done in 2016 by McKinsey & Company, “**one out of every five** African American households is situated in a food desert

Researchers have revealed **that for every 1% increase in the percentage of the white population, there was a 17% decrease** in the density of fast-food outlets in low-income neighborhoods.



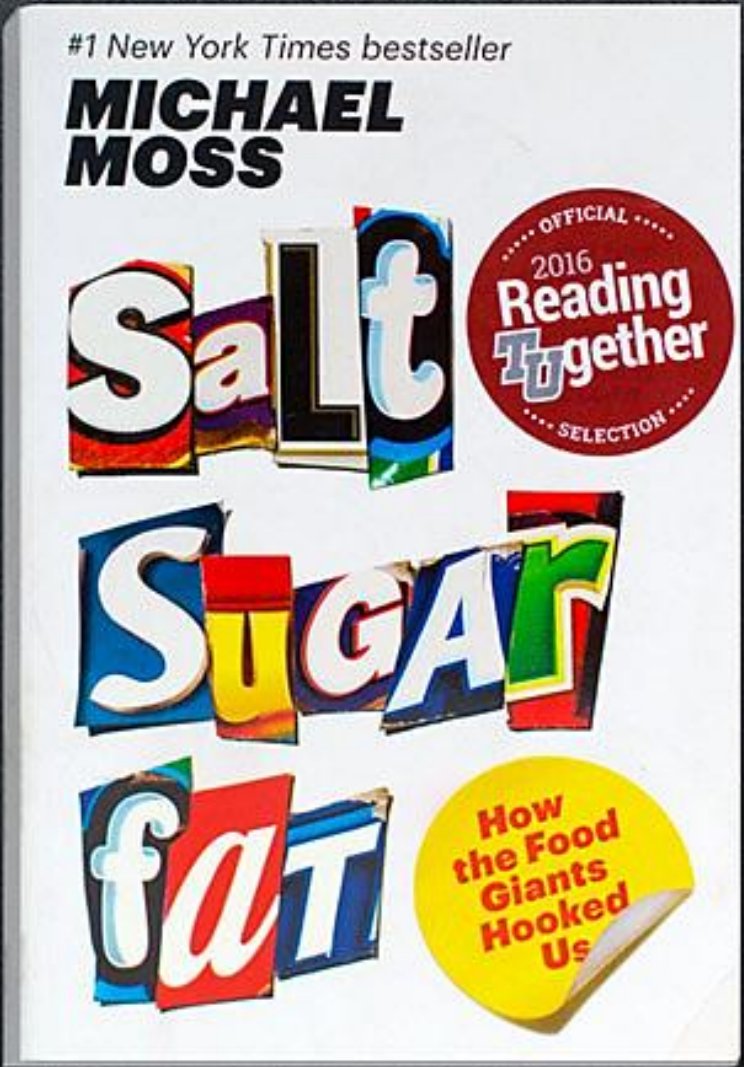
Nutritional stress

Eating the *disease-*
forming foods

not eating the *health-*
promoting foods

**The Behavioral Risk Factor Surveillance Survey,
only 21.3% of African Americans consume fruits
and vegetables ≥ 5 times per day, the lowest of
any U.S. racial or ethnic group**

Food we eat *creates*
stress in our bodies



Nutritional stress damages
our endothelium

Plant-based diets



e.g., Mediterranean diet/ DASH diet

Fruits, vegetables, whole grains, legumes, nuts, fish, olive oil

Lipid peroxidation

↓ F2-isoprostane; ↓ ox-LDL; ↓ MDA; ↓ TBARS

Oxidative DNA damage

↓ 8-OH-dG

Antioxidant defense

↑ SOD activity; ↑ SOD protein level;
↑ catalase activity

Inflammation

↓ hs-CRP; ↓ IL-6; ↓ TNF- α

Western diet



e.g., Fast-food diet

Red and processed meat, high-energy foods, refined carbohydrates, added

Lipid peroxidation

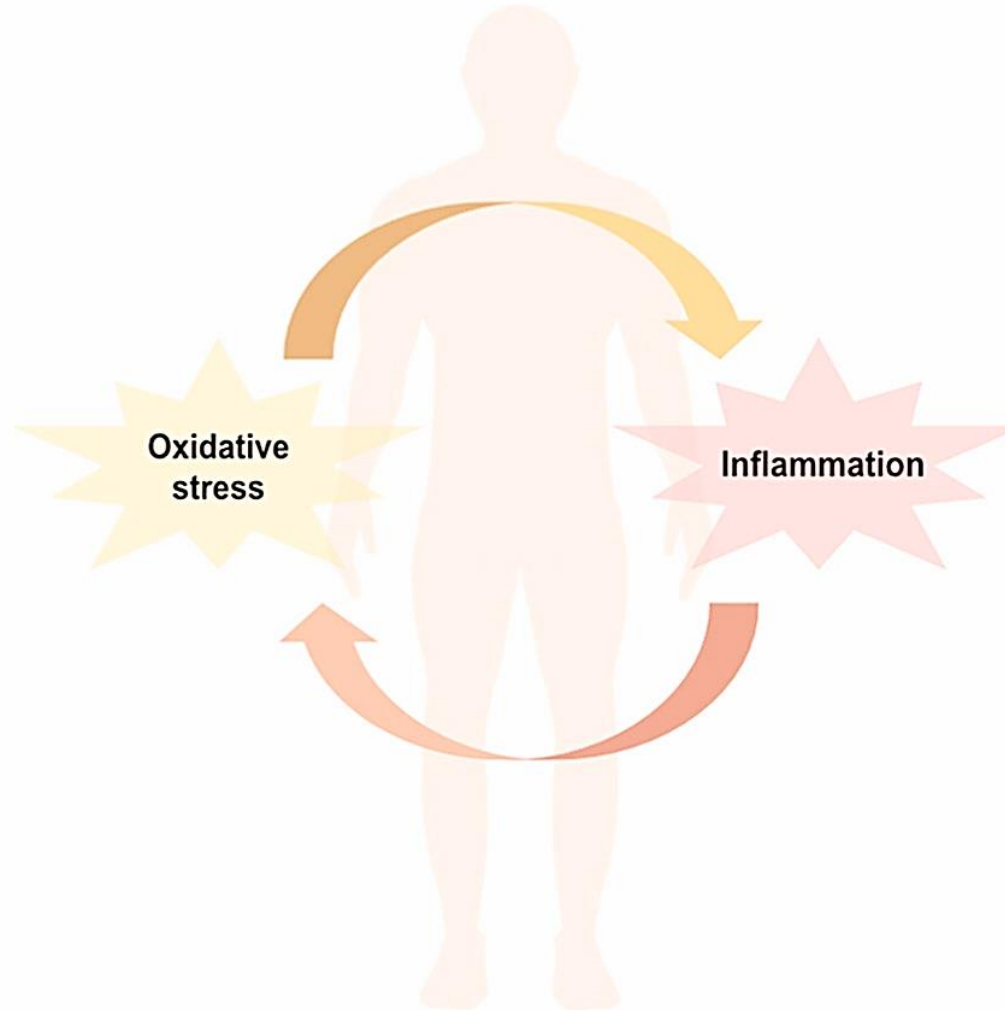
↑ MDA;
↑ Lipoprotein-associated phospholipase

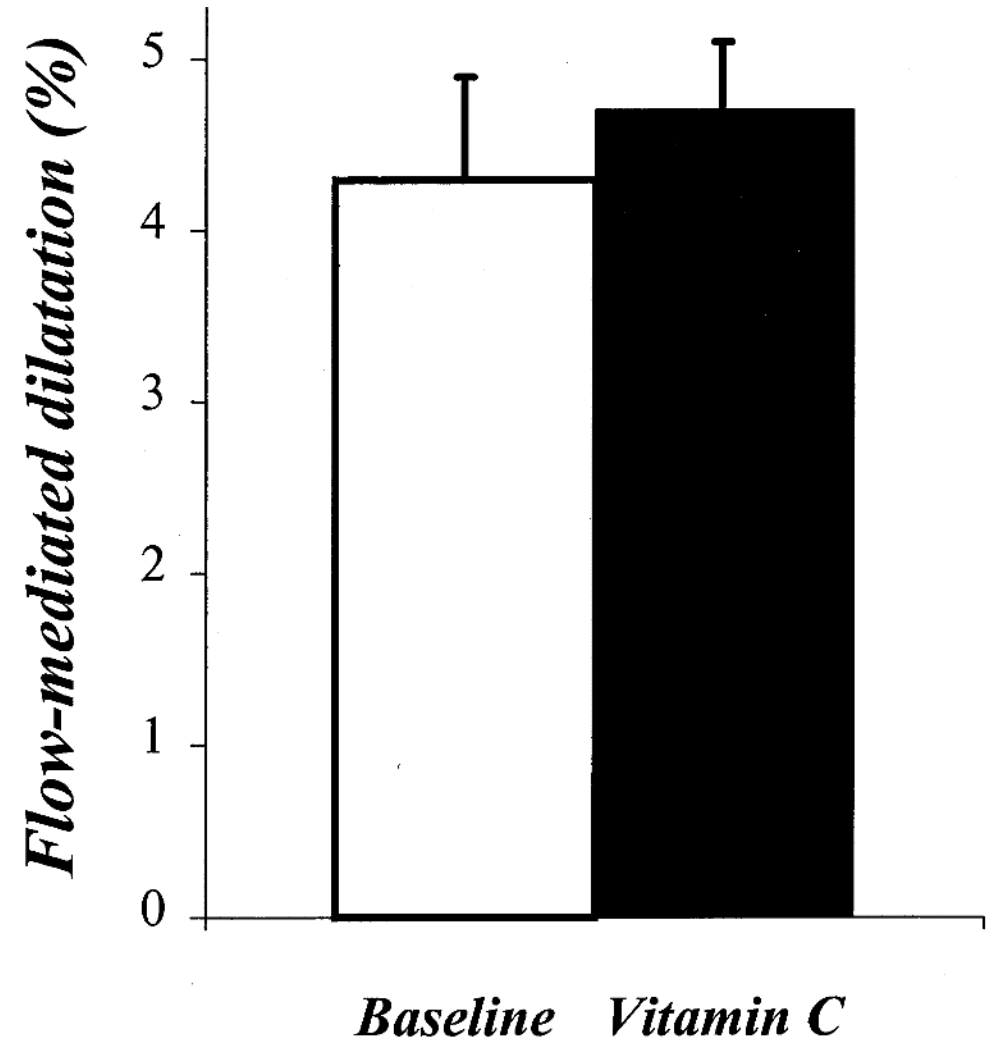
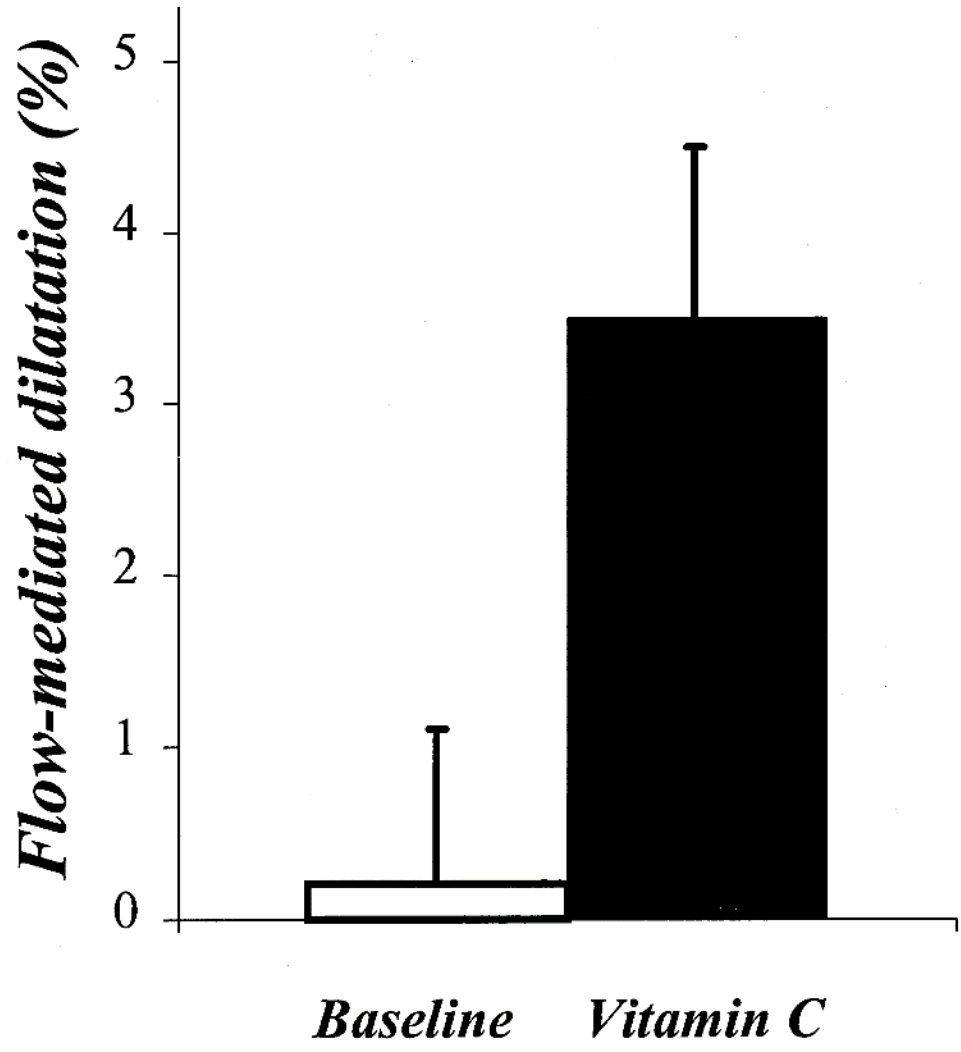
Antioxidant defense

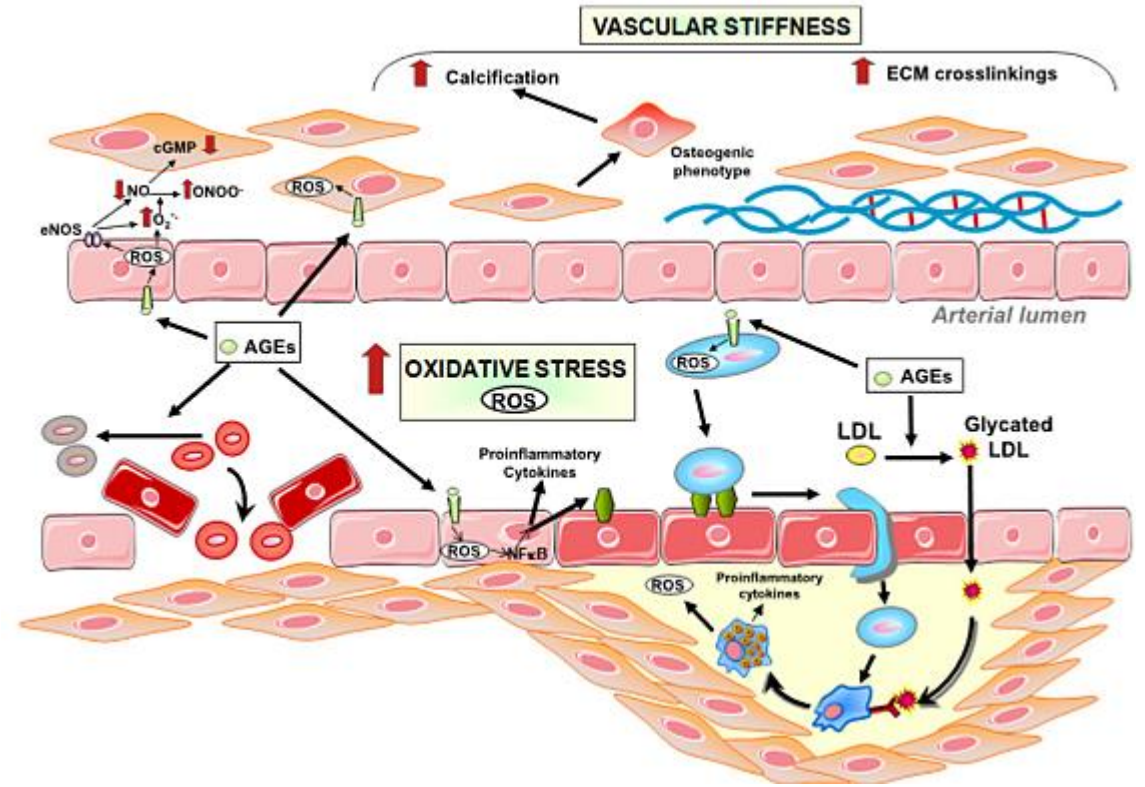
↓ MPO protein level;
↓ TAC; ↓ Ceruloplasmin

Inflammation

↑ IL1RT1; ↑ IL2RA; ↑ TRAIL-

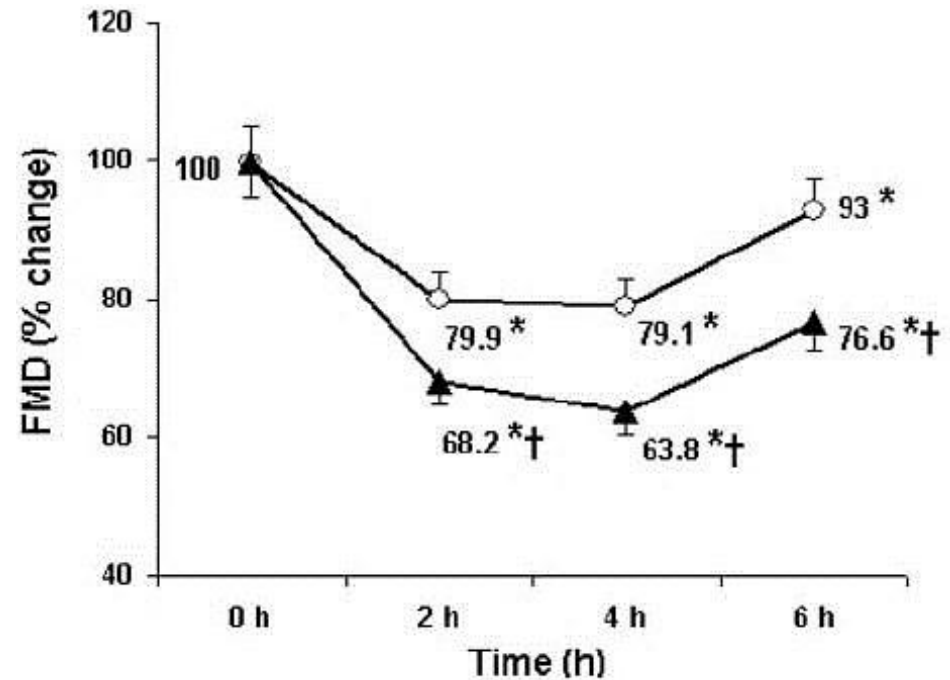






ADVANCED GLYCATED END PRODUCTS

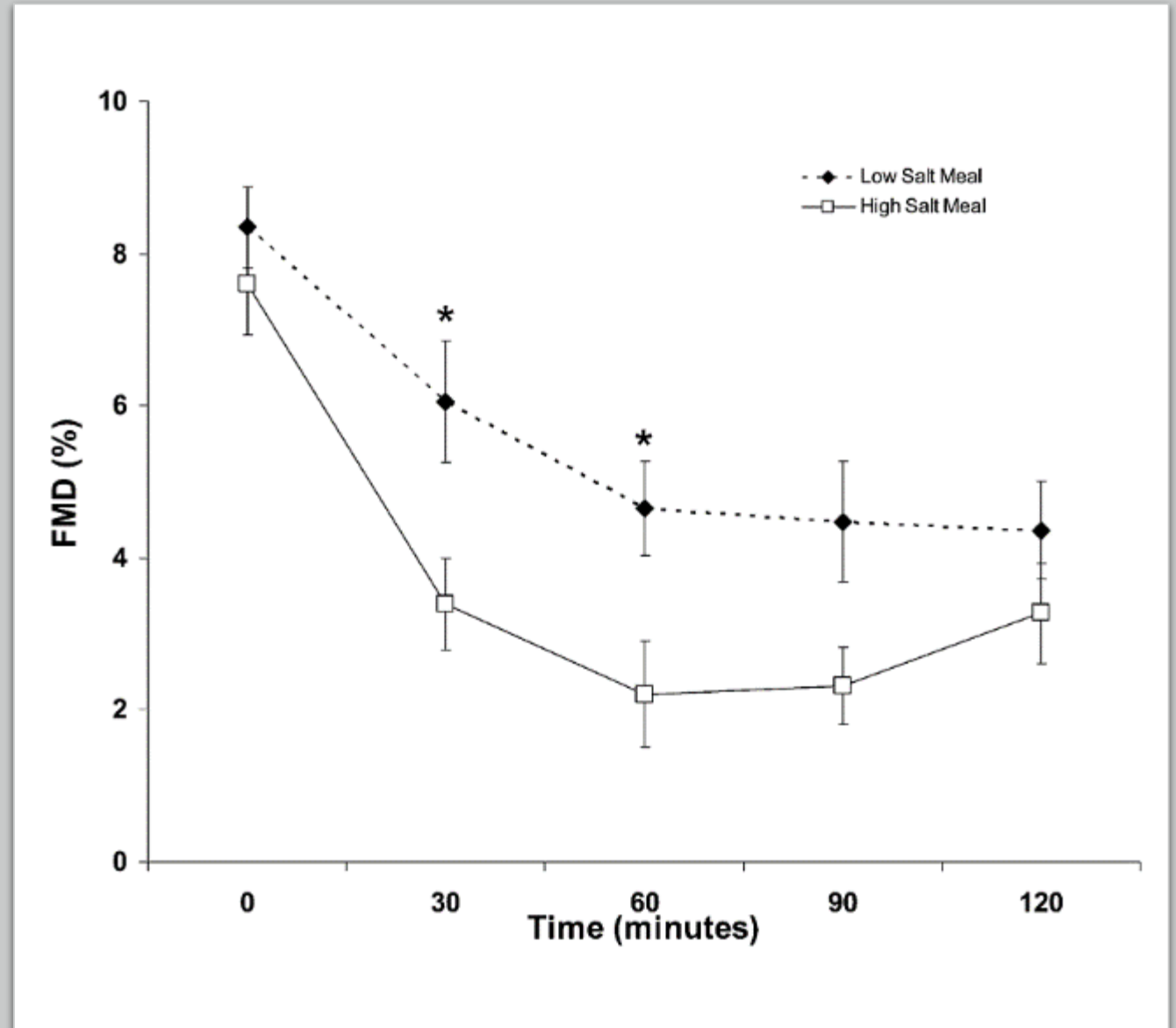
Effects of low- and high-AGE meals on macro- and microvascular endothelial function and oxidative stress in patients with type 2 diabetes mellitus



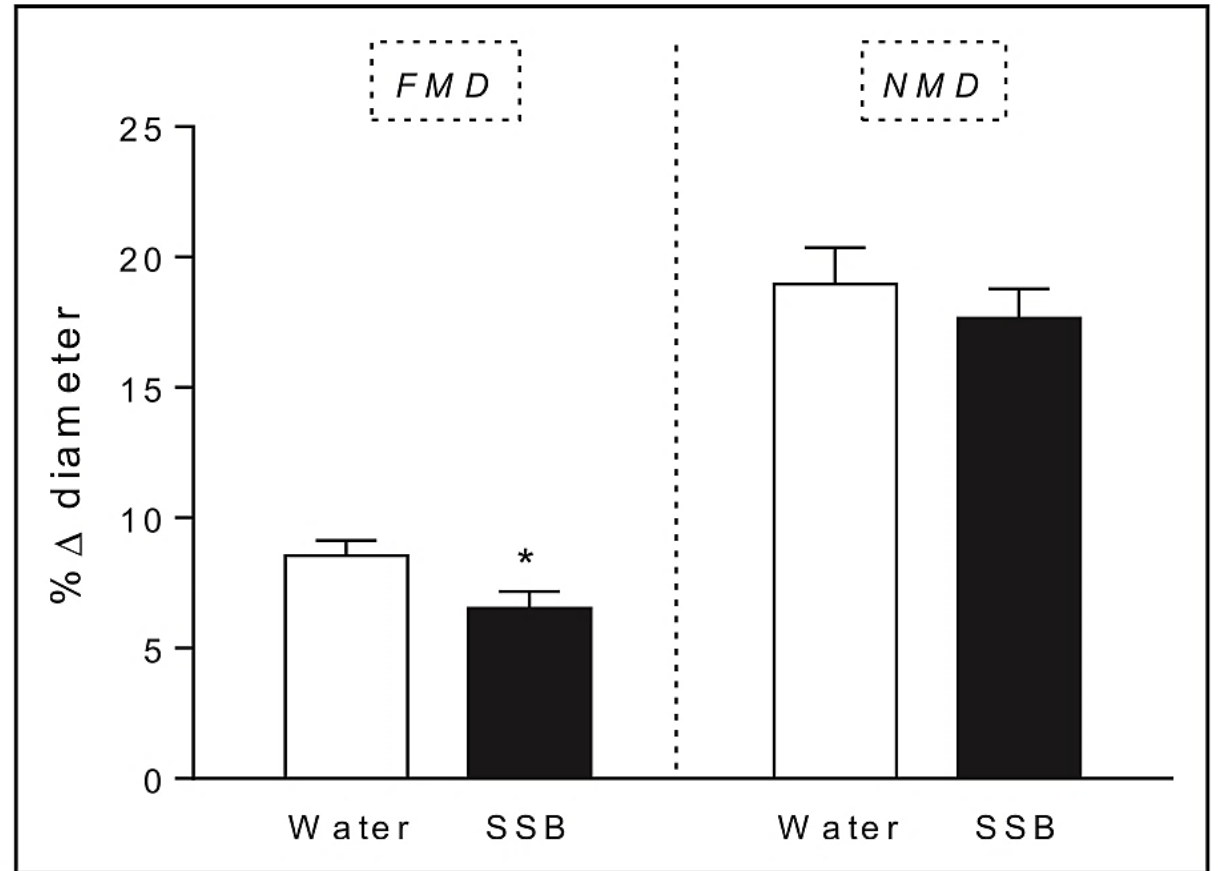
Salt, Sugar, & Fat



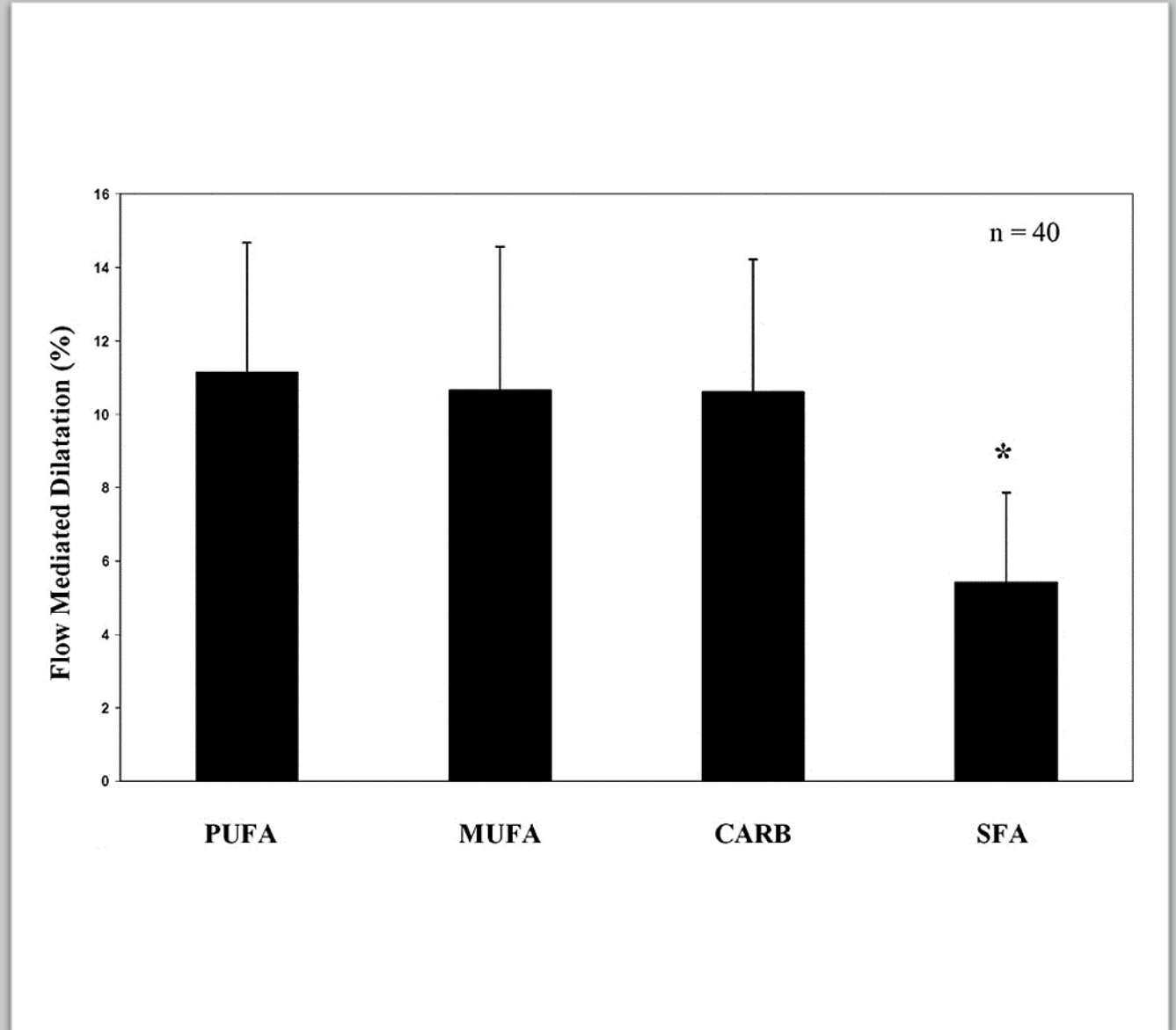
Endothelial function is impaired after a high-salt meal in healthy subjects

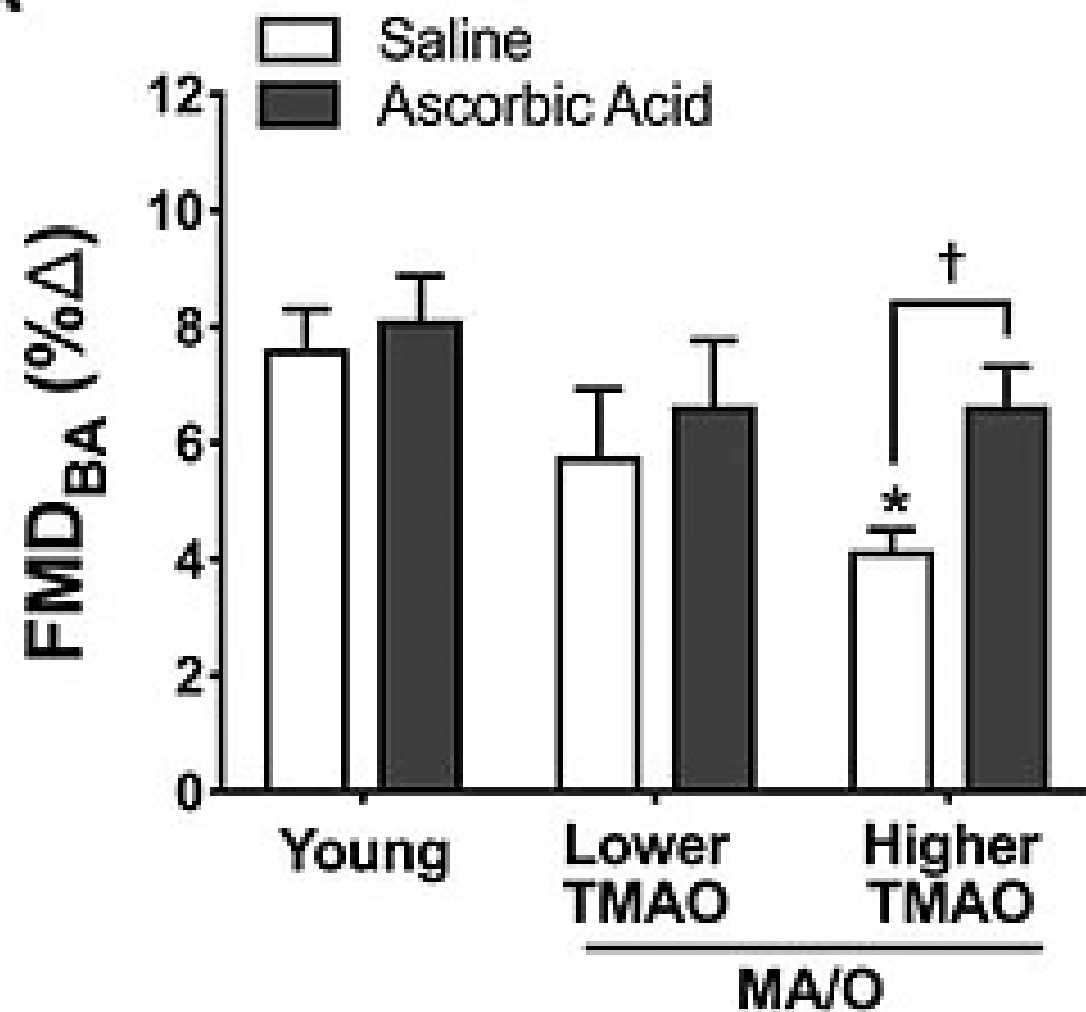
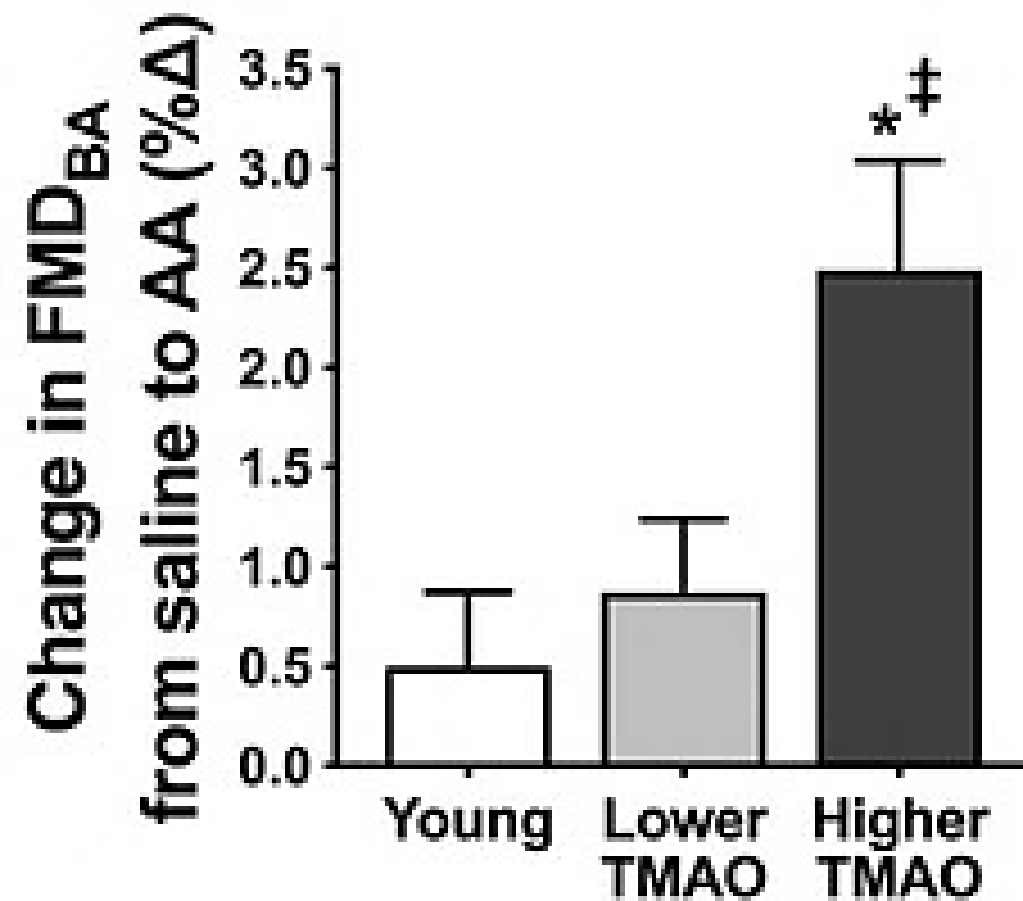


Effects of **Sugar-Sweetened Beverage** Consumption on Microvascular and Macrovascular Function in a Healthy Population



Flow-Mediated Dilatation Is Impaired by a **High-Saturated Fat Diet** but Not by a High-Carbohydrate Diet



A**B**

Researchers defined ultra-processed foods as *highly processed industrial formulations* made with no or minimal whole foods that include flavorings or preservatives.

Each additional daily serving of ultra-processed foods conferred:



7%

increased risk
for hard CVD



5%

increased risk
for overall CVD



9%

increased risk
for CVD mortality





Dutch study that found that adults living within a half-mile of fast-food outlets were more likely to develop heart disease than those living further away

It's never too late to
change the direction that
your life is going in.

-Dr. Wayne Dyer

EmilysQuotes.Com

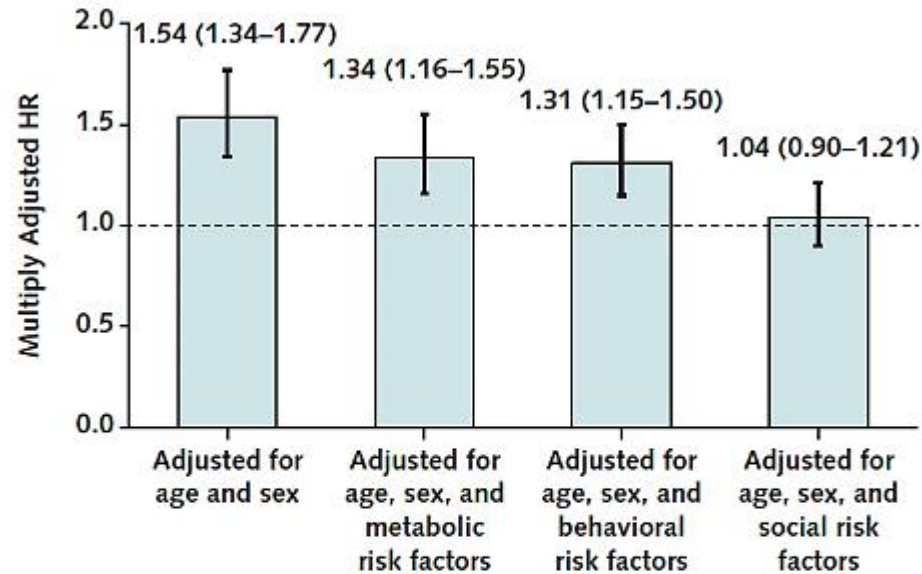






Health=Resiliency/Stress

Figure 3. HR of Black-White difference in CVD mortality, adjusted for metabolic, behavioral, and social risk factors, in U.S. adults aged ≥ 20 y.




Metabolic risk factors included obesity, central obesity, hypertension, diabetes, and total-high-density lipoprotein cholesterol ratio ≥ 5 . Behavioral risk factors included current smoking, Healthy Eating Index score < 52 , no leisure-time physical activity, and sleep duration < 6 or > 8 h/d. Social risk factors included unemployment, family income-poverty ratio $< 300\%$, marginal or low food security, not owning a home, less than high school education, no regular health care access, no private health insurance, and not married nor living with a partner. CVD = cardiovascular disease; HR = hazard ratio.

In MESA (Multi-Ethnic Study of Atherosclerosis), HRs for the Black-White difference in CVD mortality decreased from 1.72 to 0.95 after adjustment for socioeconomic status (neighborhood socioeconomic status, education, income, and health insurance), lifestyle and psychosocial factors, and clinical risk factors

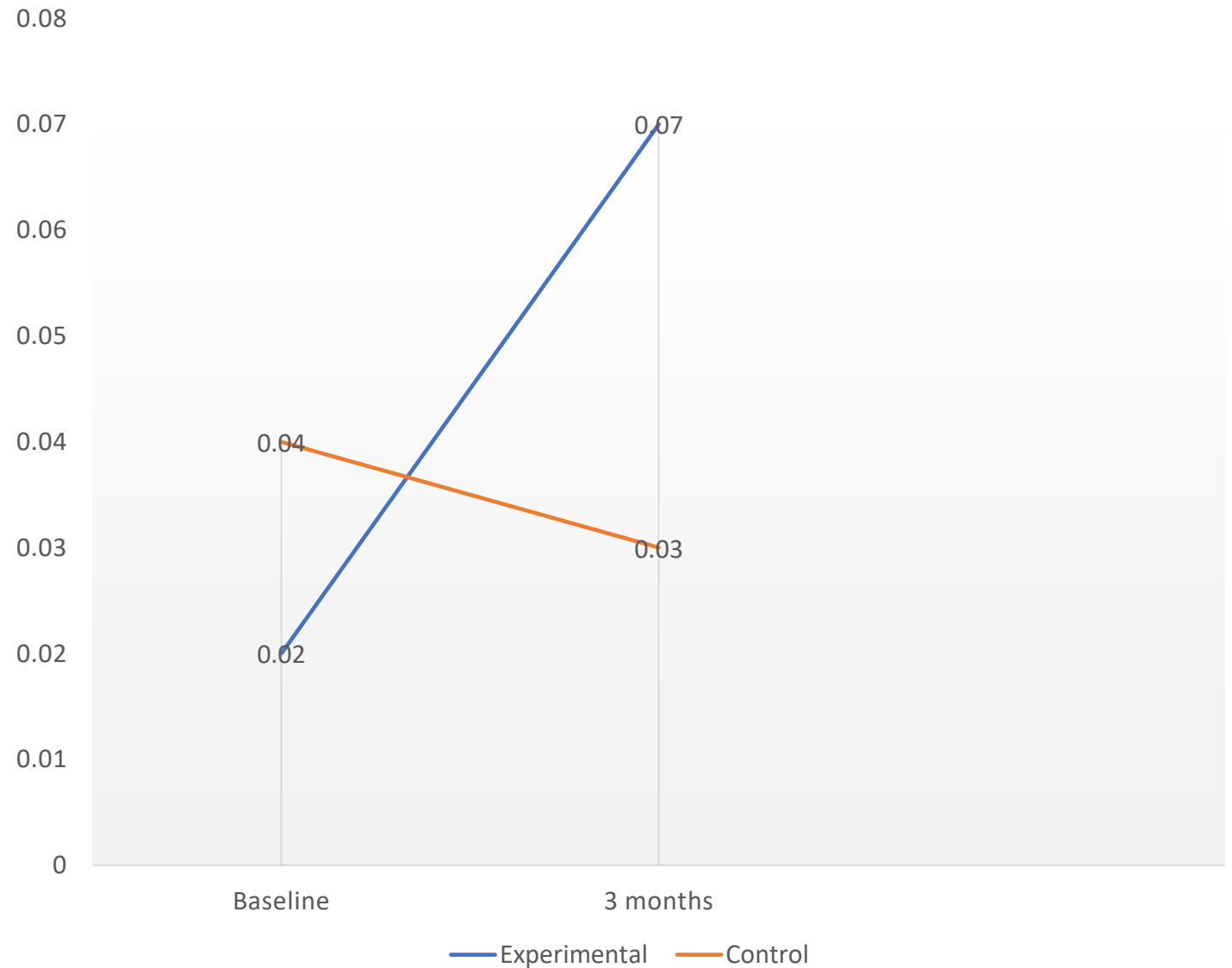


Nutrition for Resilience
Instead of For Stress



A computer simulation model, projected that a national policy combining a 30% fruit and vegetable subsidy targeted to low-income Supplemental Nutrition Assistance Program recipients and a population-wide 10% price reduction in fruits and vegetables in the remaining population could prevent $\approx 230\,000$ deaths by 2030 and reduce the socioeconomic disparity in CVD mortality by 6%.

Effect of Intensive Lifestyle Changes on Endothelial Function

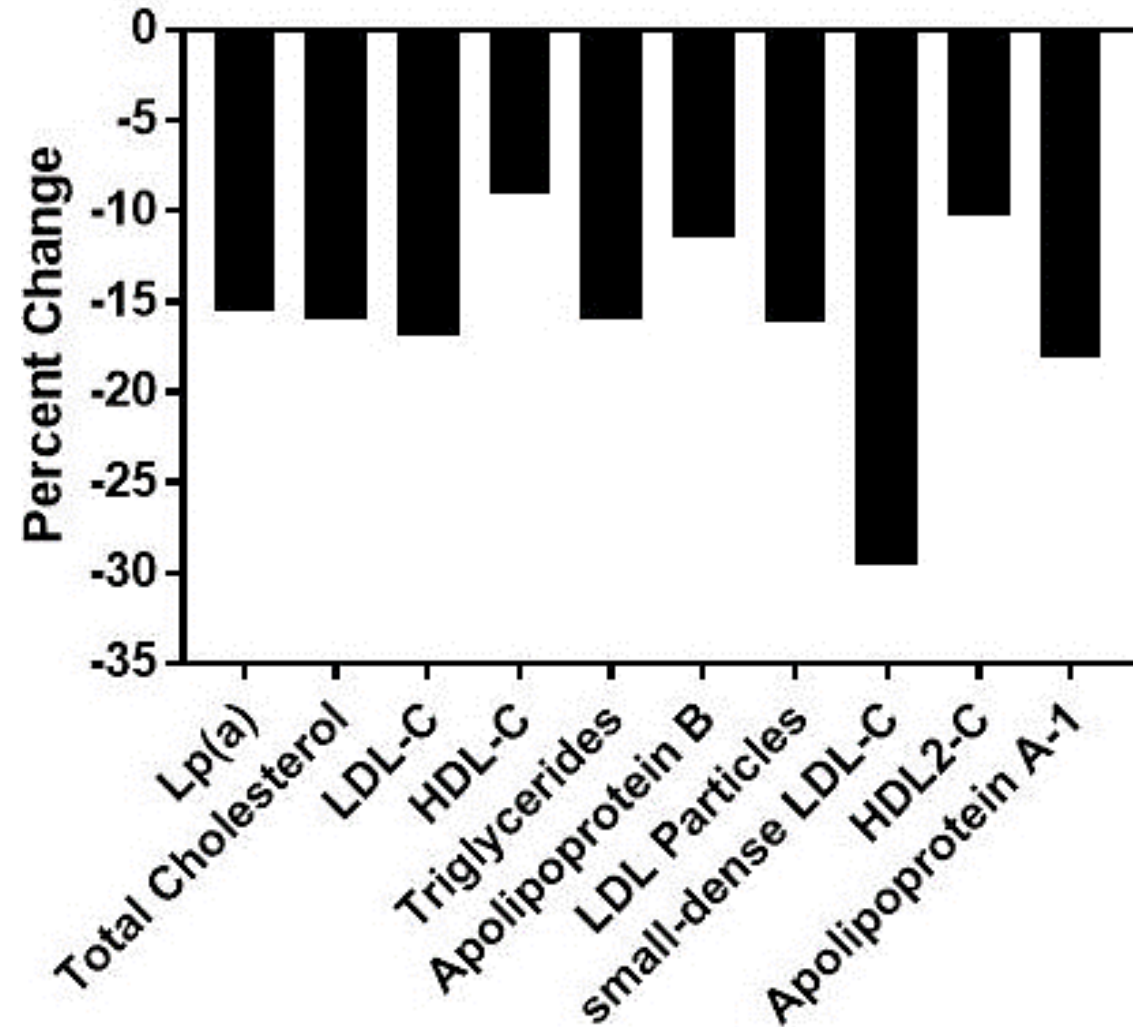


CLINICAL INVESTIGATIONS

Consumption of a defined, plant-based diet reduces lipoprotein(a), inflammation, and other atherogenic lipoproteins and particles within 4 weeks

Rami S. Najjar¹ | Carolyn E. Moore² | Baxter D. Montgomery^{3,4}

Reductions in Biomarkers





Diets higher in plant foods and lower in animal foods were associated with a lower risk of cardiovascular morbidity and mortality in a general population.

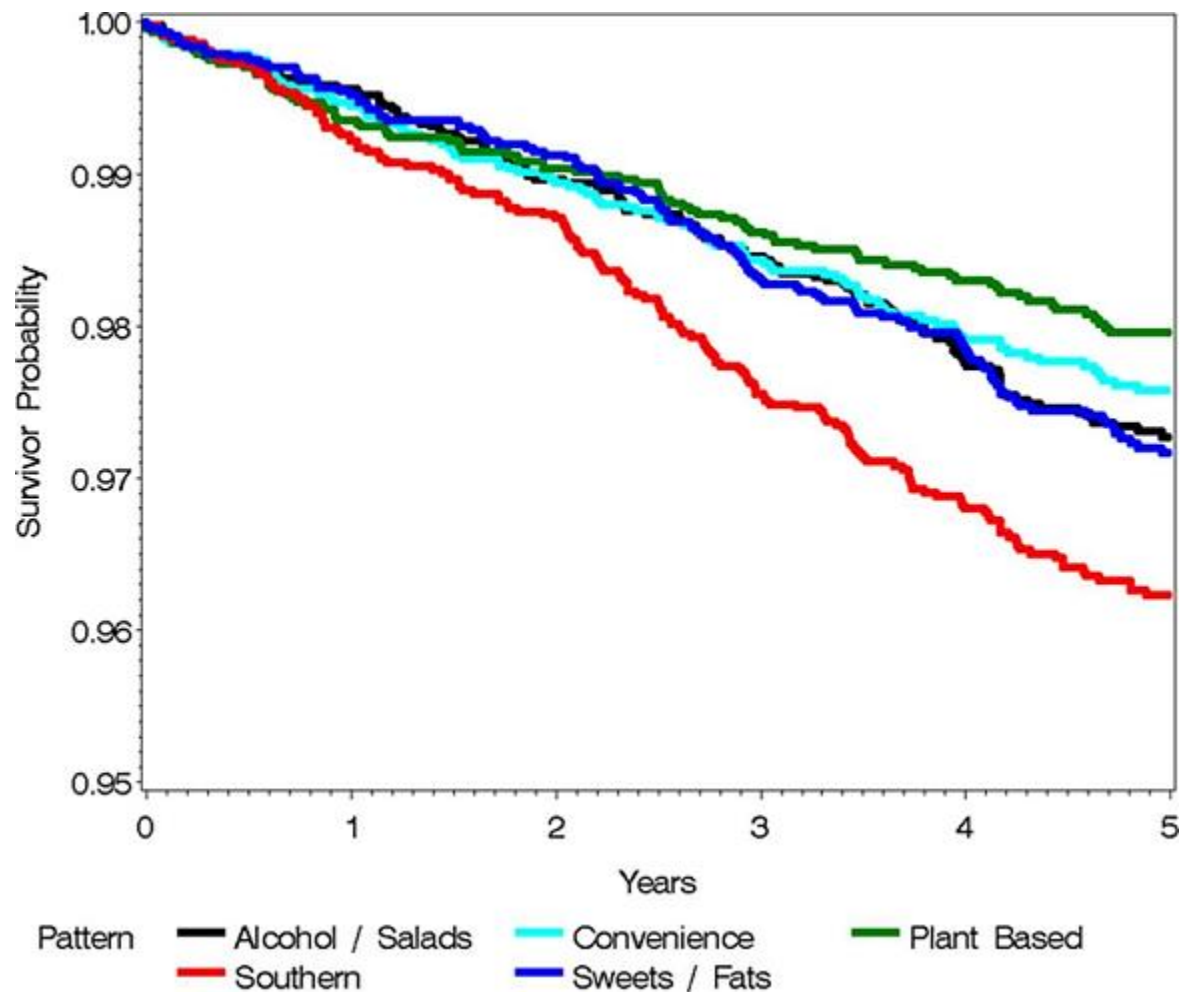
Dietary patterns and risk for sudden cardiac death



- High Mediterranean diet score trended toward reduced 10-year risk for SCD
- High Southern diet score trended toward increased 10-year risk for SCD
- There was no relationship between other dietary patterns and SCD risk

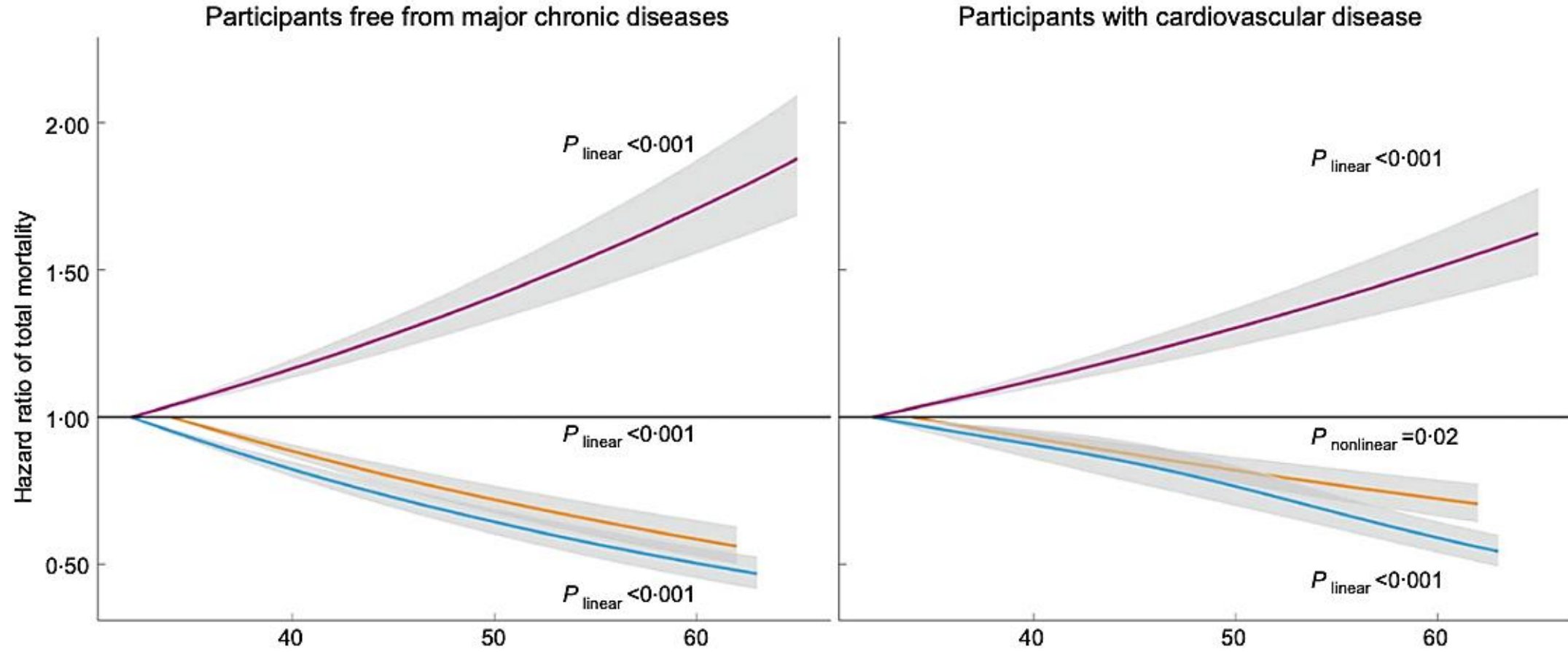
Healio 

Southern
diet pattern
and risk of
sudden
cardiac
death

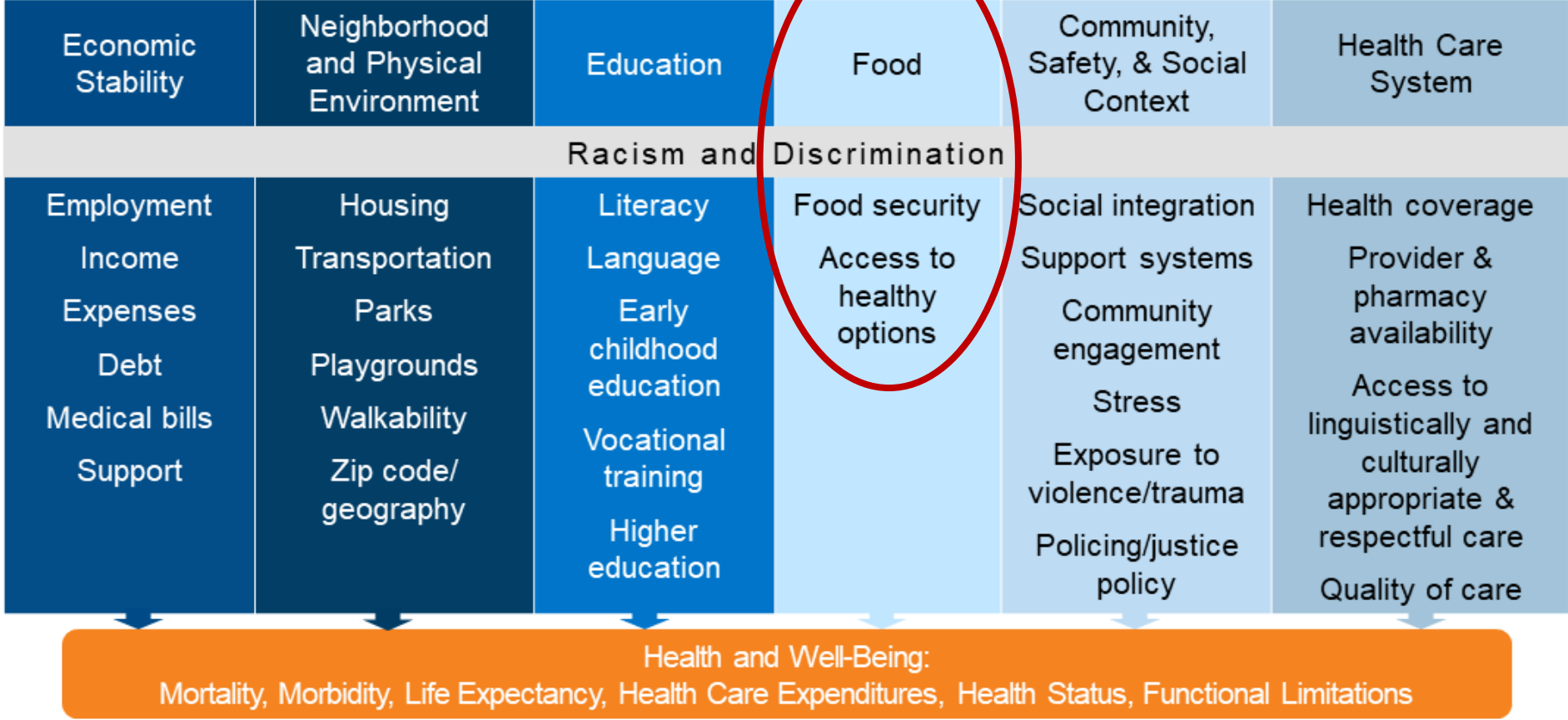


Southern diet pattern associated with acute heart disease

Plant-based diet and mortality



Health Disparities are Driven by Social and Economic Inequities



The Solution: Disruptive Approach to Driving Equitable Care for the Vulnerable Populations

LAYING THE CULTURAL FOUNDATION

Purposeful approach to cultural awareness, education, competency, and hiring including addressing language gaps and seeking to mirror the population



EMBRACING DIGITAL HEALTH INNOVATIONS

Expanding reach of technology, including telemedicine and remote across the care continuum, encompassing ambulatory and post acute care settings



IMPROVING CARE DELIVERY

Becoming the “provider of choice” marked by world class service, eradicating care variation and disparities and delivering high quality outcomes (convenient, accessible, affordable, equitable, effective, efficient).



DRIVING “CARE ANYWHERE”

Shifting care from traditional hospital centered care to the “right care, right place, right time, right purpose”, including Hospital at Home and Mobile Health



WIDENING THE FRONT DOOR

Addressing barriers to care access by expanding needed services/centers of excellence and making care more accessible/convenient, including transportation and central access



ADDRESSING THE SOCIAL DETERMINANTS

Healing the wounds that you don’t see by addressing food insecurity, housing insecurity, poverty, violence and leveraging community health workers to serve as the bridge to connect all the resources



From Health Disparities to Health Equity

Health Disparities:

“...**preventable** differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by socially disadvantaged populations”¹



Health Equity:

“When every person has the **opportunity to ‘attain his or her full health potential’** and no one is ‘disadvantaged from achieving this potential because of social position or other socially determined circumstances’²

1. Community Health and Program Services (CHAPS): Health Disparities Among Racial/Ethnic Populations. U.S. Department of Health and Human Services; 2008.
2. Whitehead M, Dahlgren G. Levelling Up (Part 1): A Discussion Paper on Concepts and Principles for Tackling Social Inequities in Health. World Health Organization. Available at <http://www.euro.who.int/document/e89383.pdf>.

Resources to help you

For more about this topic, consider viewing:

- [Racism in American Medicine](#) (recorded webinar – 54 mins)
- [Implicit Bias in Healthcare and What You Can Do About It](#) (online course – 10 mins)
- [Advancing Health Equity: A Guide to Language, Narrative and Concepts](#) (print-based guide – AMA [ama-assn.org])