

# Relationship Between Cardiac Health and Mental Health

*Columbus O. Batiste, MD, FACC, FSCAI*

# Disclosures

**No financial relationships to disclose**



# The Healer Who Forgot Himself

# A Respected Physician

- *Highly skilled clinician*
- *Mentor to many*
- *Well-versed in cardiac risk factors*
- *Dedicated to patient care*



# He Knew the Statistics

**#1**

**Leading Cause of Death**

*Heart disease remains the top killer in America*

**>50%**

**Unaware of risk**

*Don't Know heart disease leading cause of death*

**60%**

**Heart Disease & Stroke**

*Affected Adults by 2050*

# He Knew The Risk Factors

**Hypertension**

**High Cholesterol**

**Smoking**

**Obesity**

**Diabetes**

**Sedentary Lifestyle**

**But He Felt  
Personally  
Exempt**



# His Personal Profile

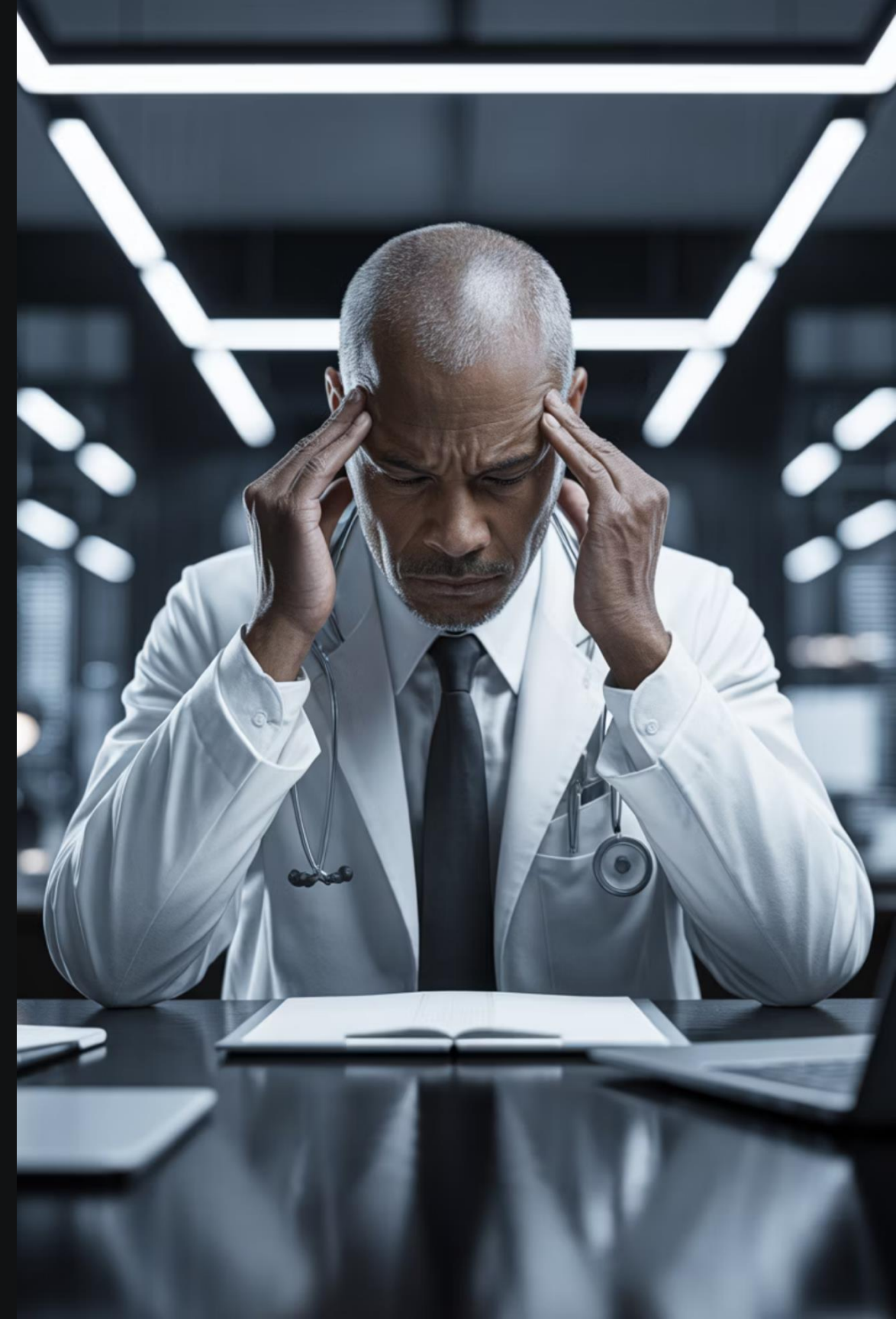
- **Not overweight**
- **Non-smoker**
- **Adhered to low carb diet**
- **Avid Exerciser**
- **Good labs**



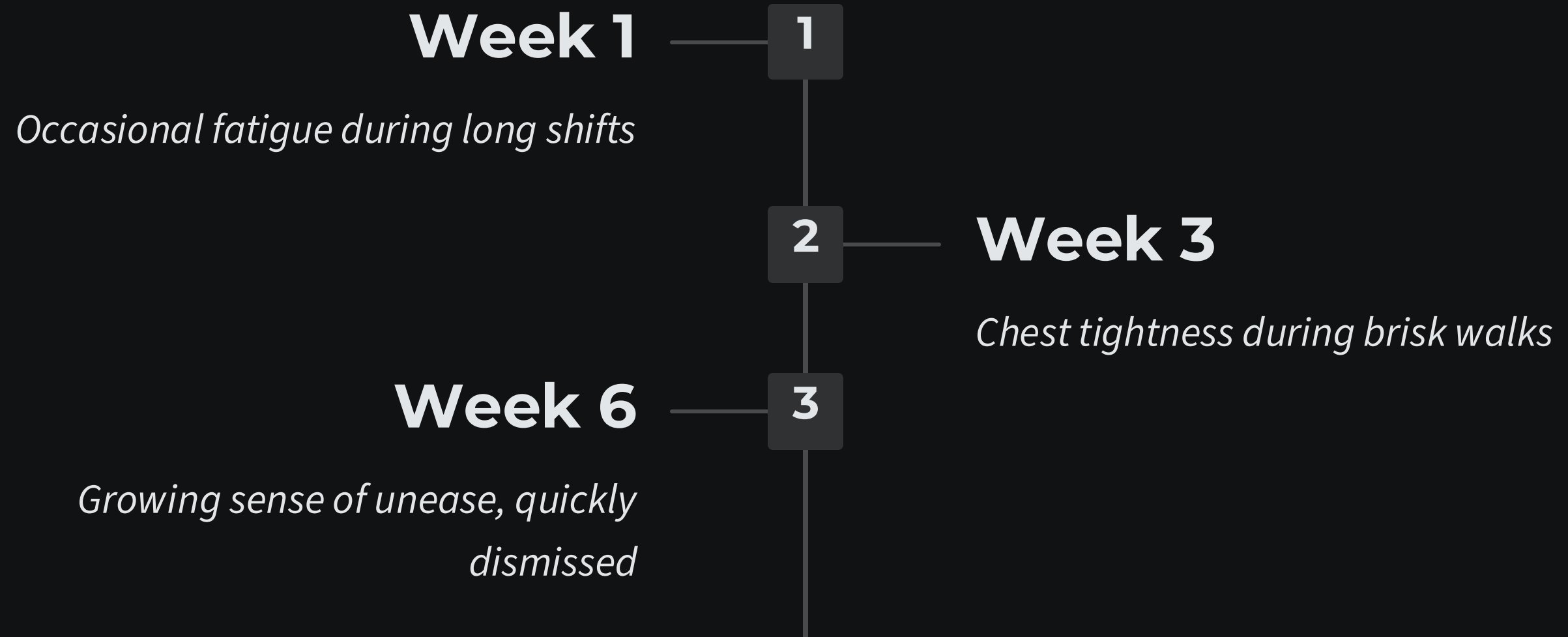
"I'm not the *type* to  
get heart disease."



**But there were  
signs in the silence**



# Subtle Symptoms Emerged



# The Dismissal

*"I'm just tired from work."*

*"I'm too young for this."*

*"It's nothing serious."*

**Then...**



# The Heart Attack

*During a routine shift, he became the patient*



# The Sharp Irony

*He had cared for countless patients with the same condition*

*Now he lay in the bed he knew so well*

# A Diagnosis Beyond the Chart

**His physician introduced a new concept:**

*SMURFless Heart Attack Risk*

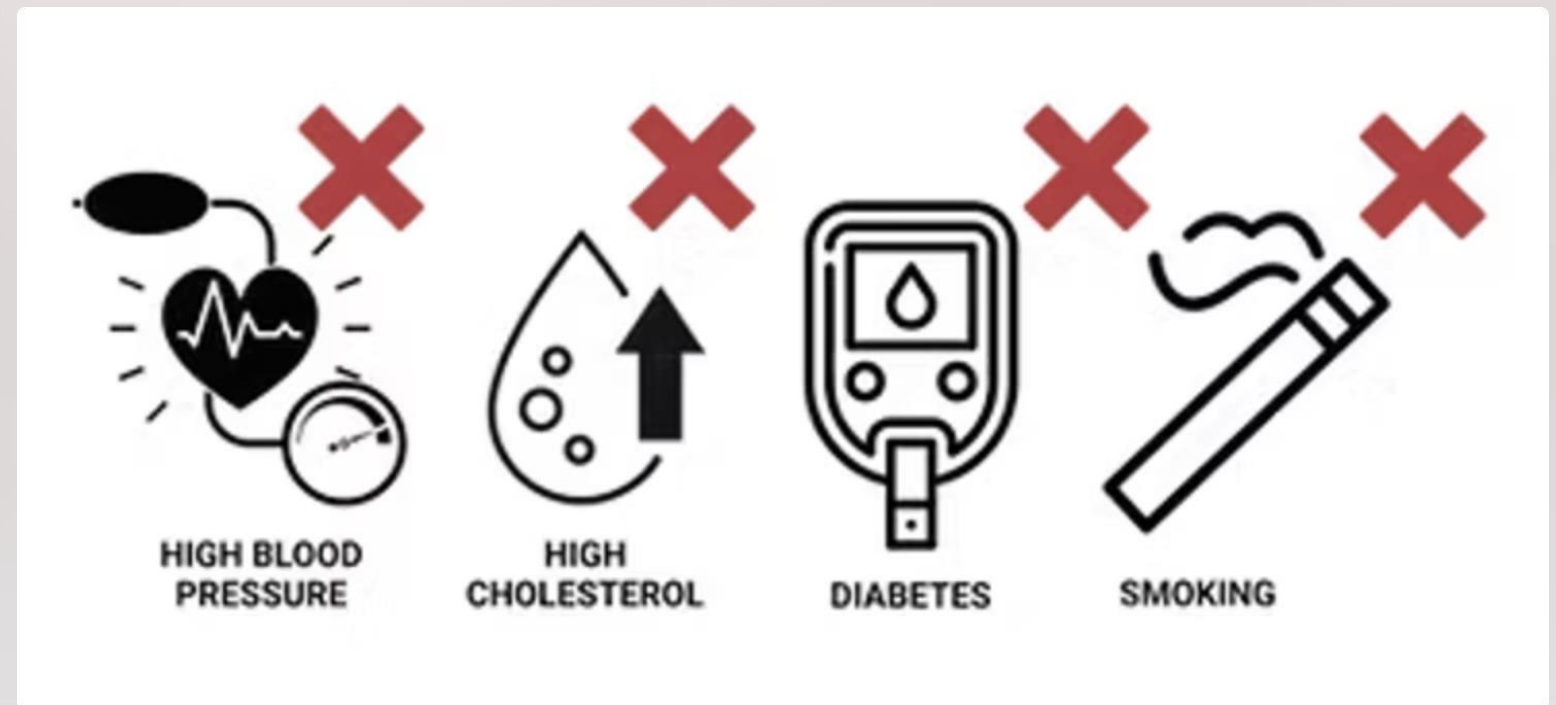


**What is  
SMURFless?**



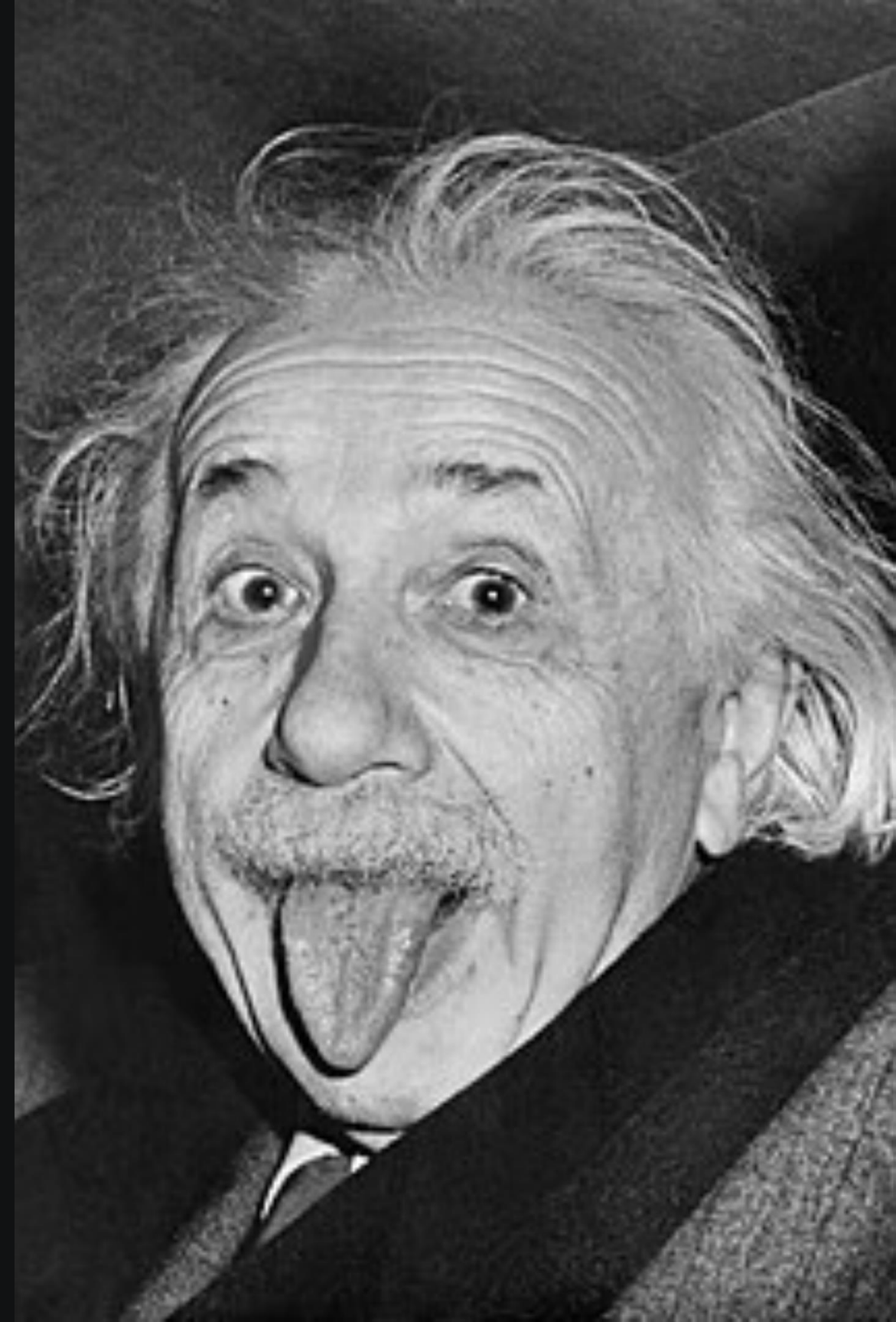
# Heart attacks without traditional risk factors:

- *Standard*
- *Modifiable*
- *Cardiovascular*
- *Risk*
- *Factors*

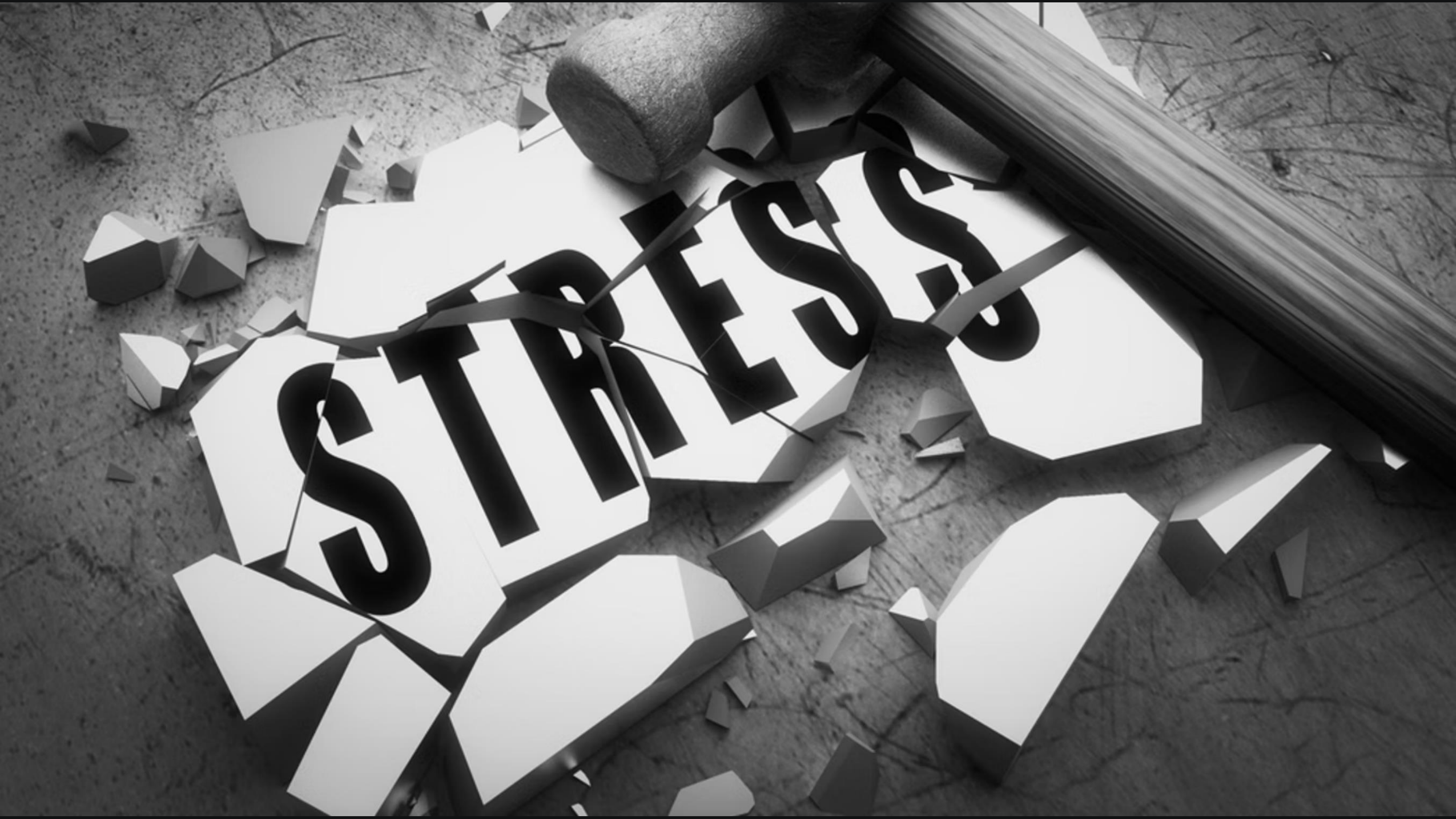


**"Not everything  
that counts can be  
counted."**

*— Albert Einstein*

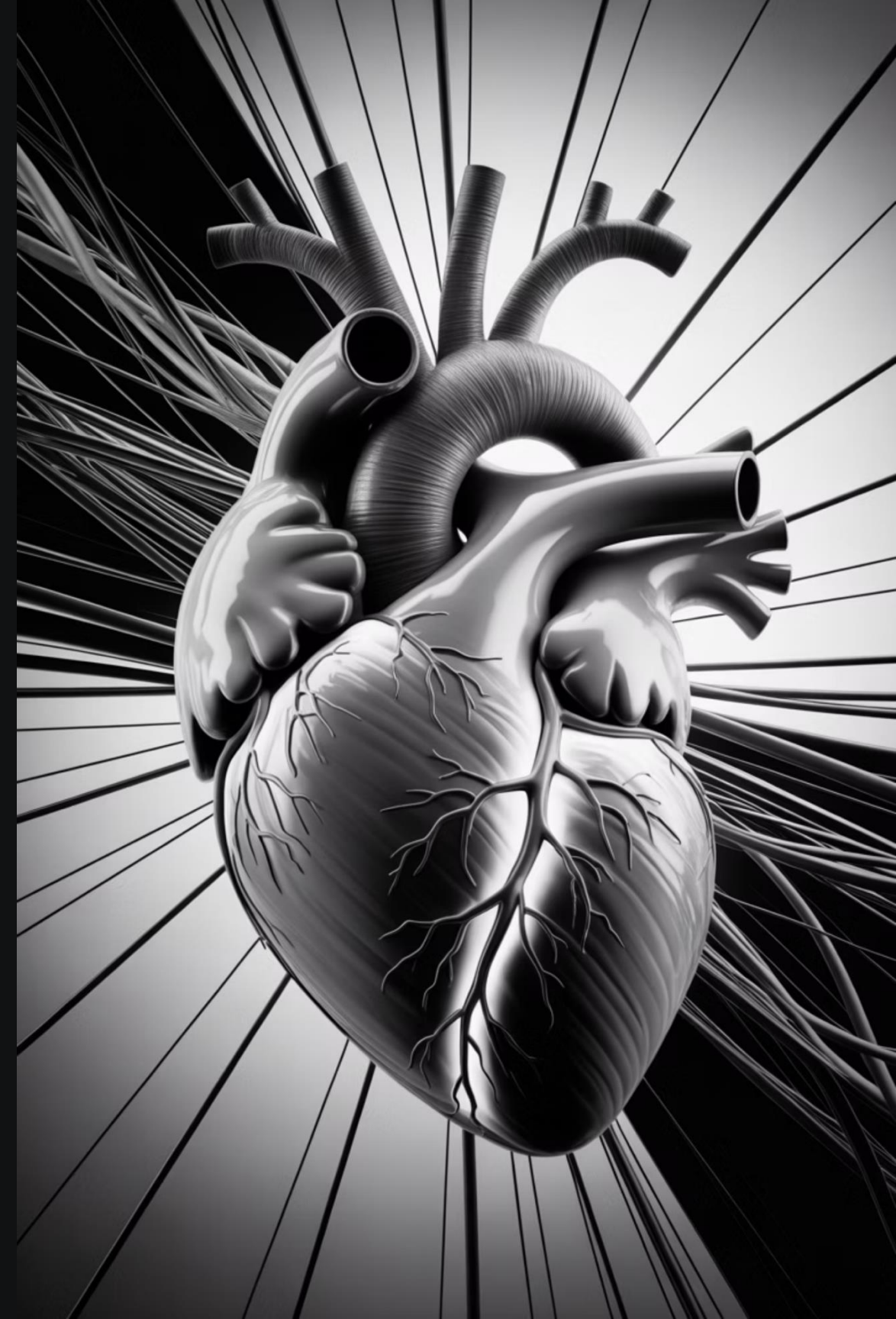


**What Counts?**



**STRESS**

**It Is The Missing  
Risk Factor**

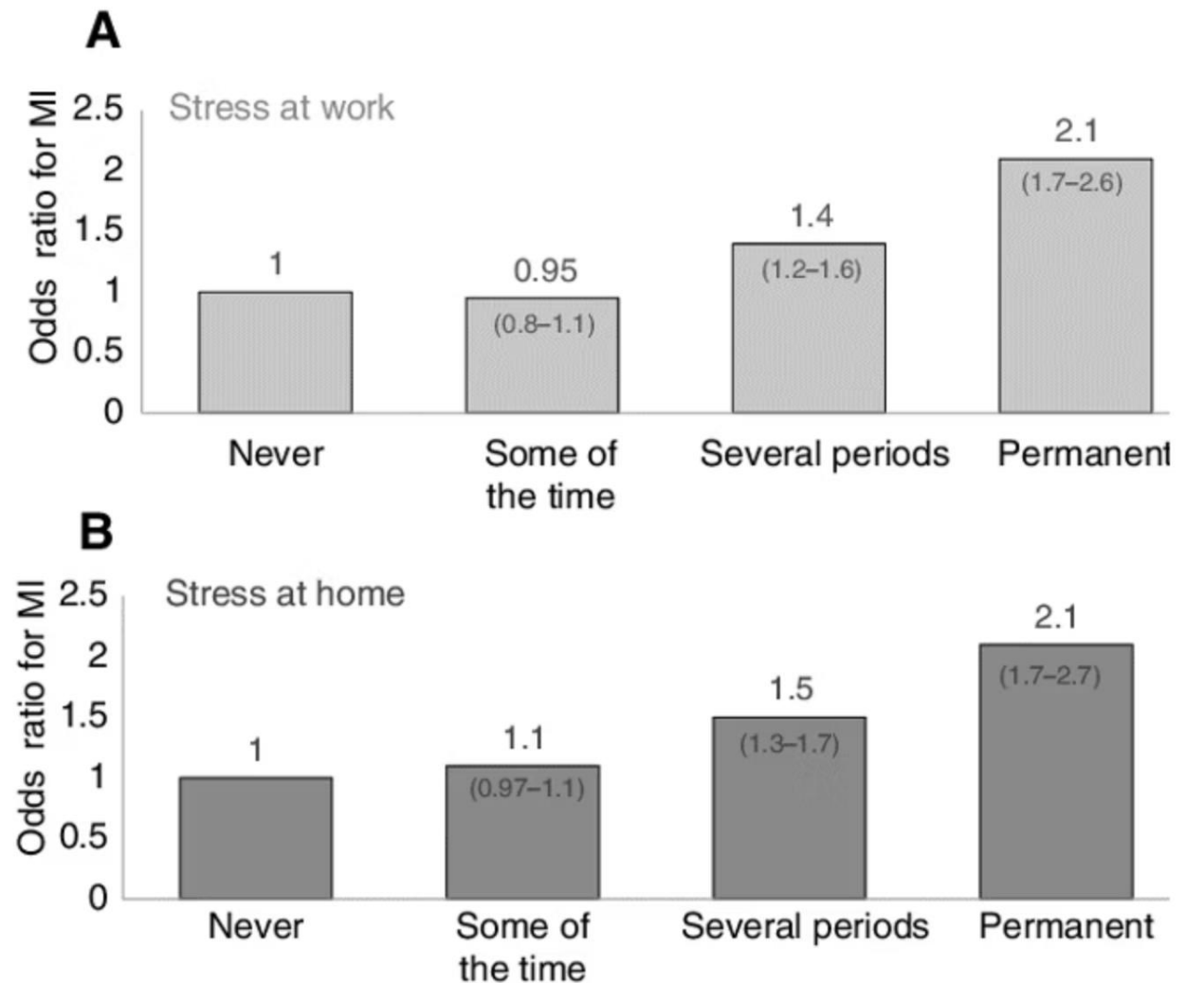


# INTERHEART Study Findings

Groundbreaking research revealed  
psychological stress as an *independent risk  
factor for myocardial infarction*




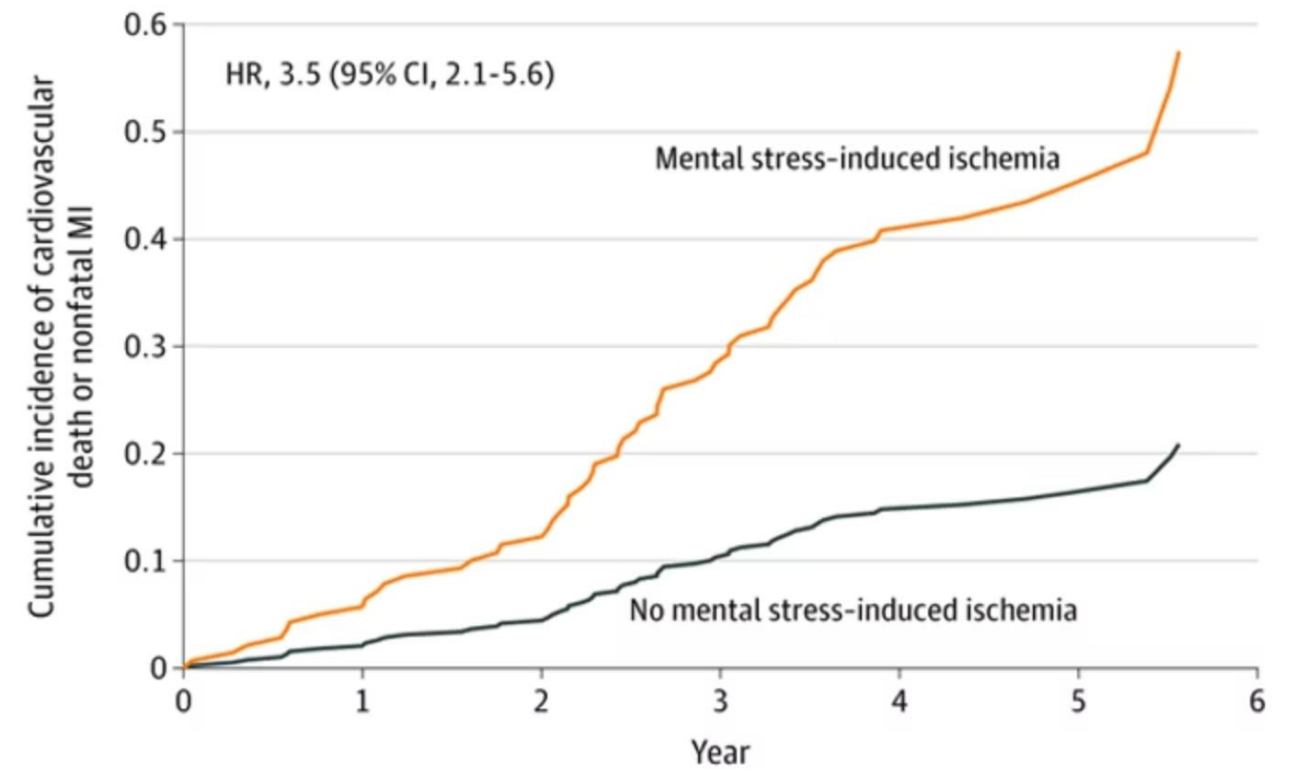
Lancet. 2004;364(9438):937-52



# Mental Stress– Induced Ischemia

*In stable coronary disease, mental stress–  
induced ischemia significantly raises the risk  
of CV death or nonfatal MI*

 JAMA. 2021;326(18):1818–1828





# Post-MI Psychological Impact

## Common Conditions

- *Stress disorders*
- *Depression*
- *Anxiety*

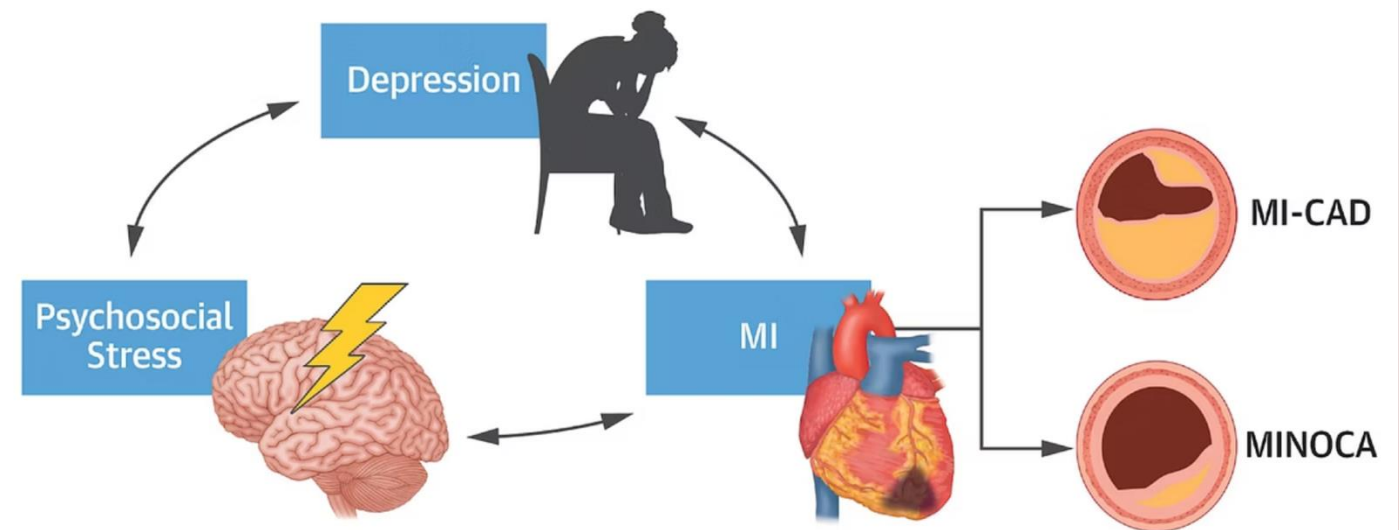
## Especially in Women

*Gender disparities in  
post-cardiac event  
mental health*



*J Am Coll Cardiol 2023;82:1649–1658*

**CENTRAL ILLUSTRATION:** Stress and Depression in Patients With Myocardial Infarction and Obstructive Coronary Artery Disease and Myocardial Infarction With Nonobstructive Coronary Arteries





Stress arises when  
*demands exceed*  
available personal  
and social  
*resources*

**Stress triggers  
adrenaline,  
causing rapid,  
temporary  
changes**



# — Fight or Flight Hidden Effects

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

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Adrenaline released  
To Increase strength for  
fight or flight

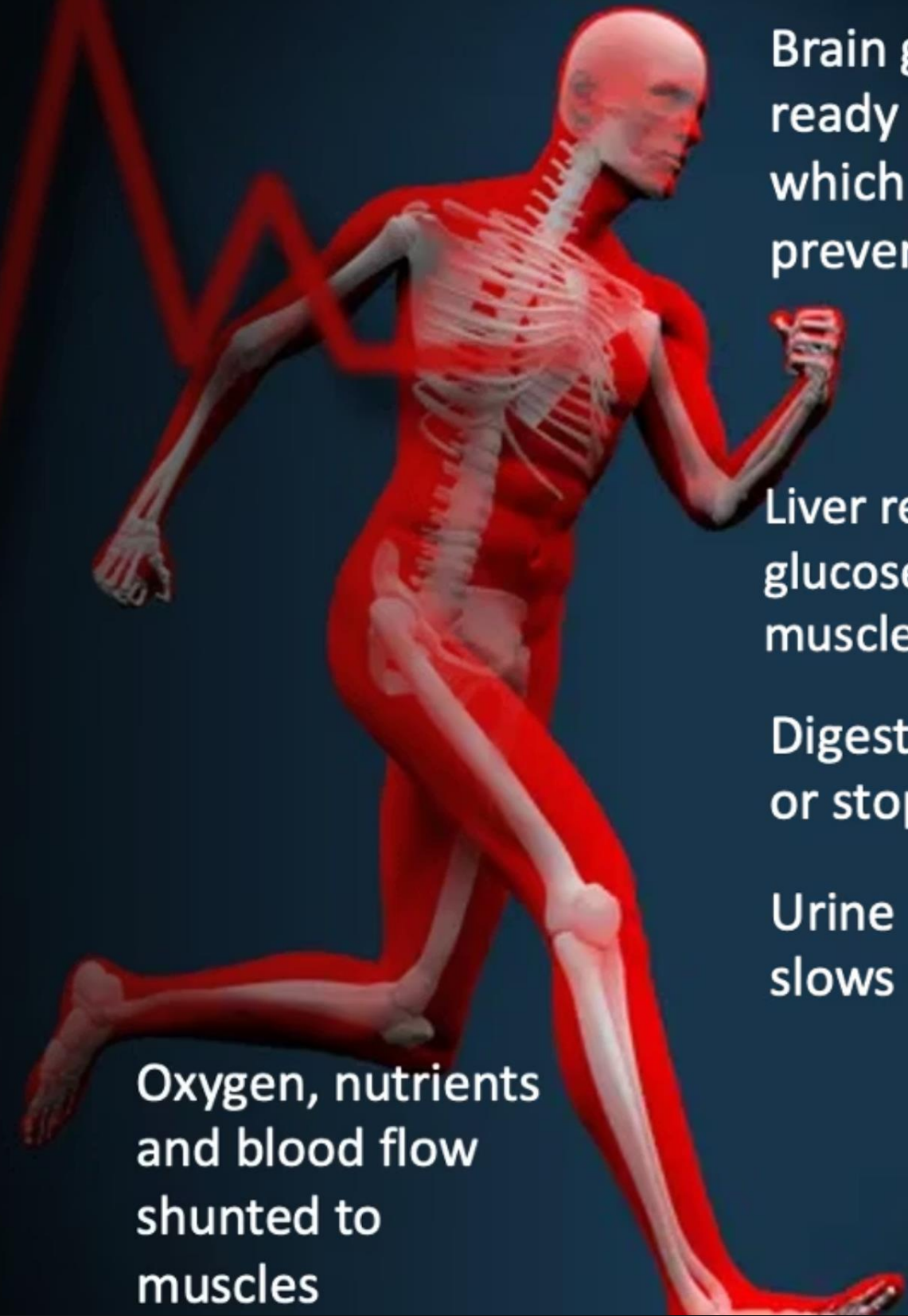
Oxygen, nutrients  
and blood flow  
shunted to  
muscles

Brain gets body  
ready for action  
which in turn  
prevents sleep

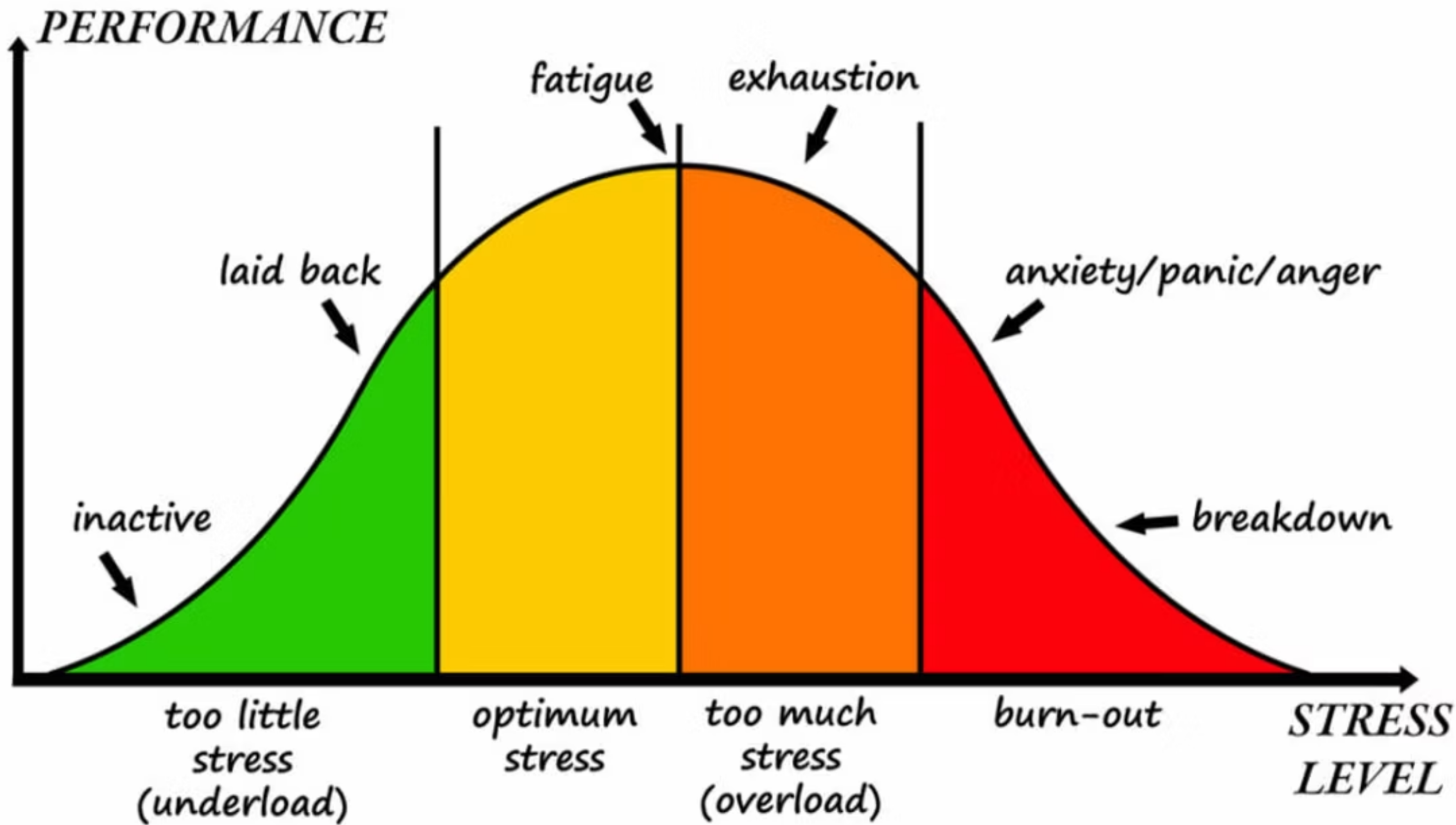
Liver releases  
glucose for  
muscle fuel

Digestion slows  
or stops

Urine production  
slows or stops



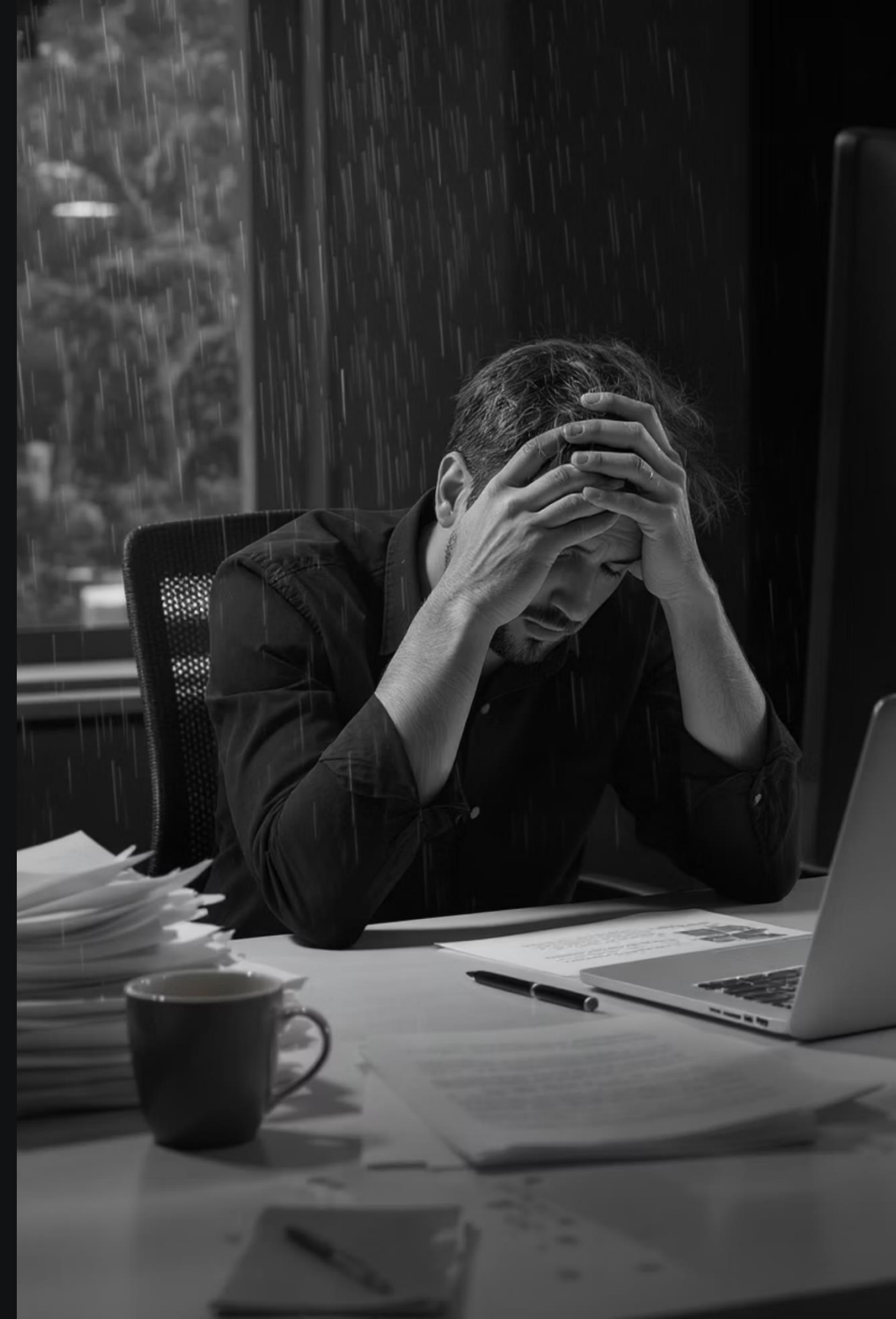
***"Too much of a good thing  
can be a bad thing"***



# Herbert Freudenberger's Burnout Theory

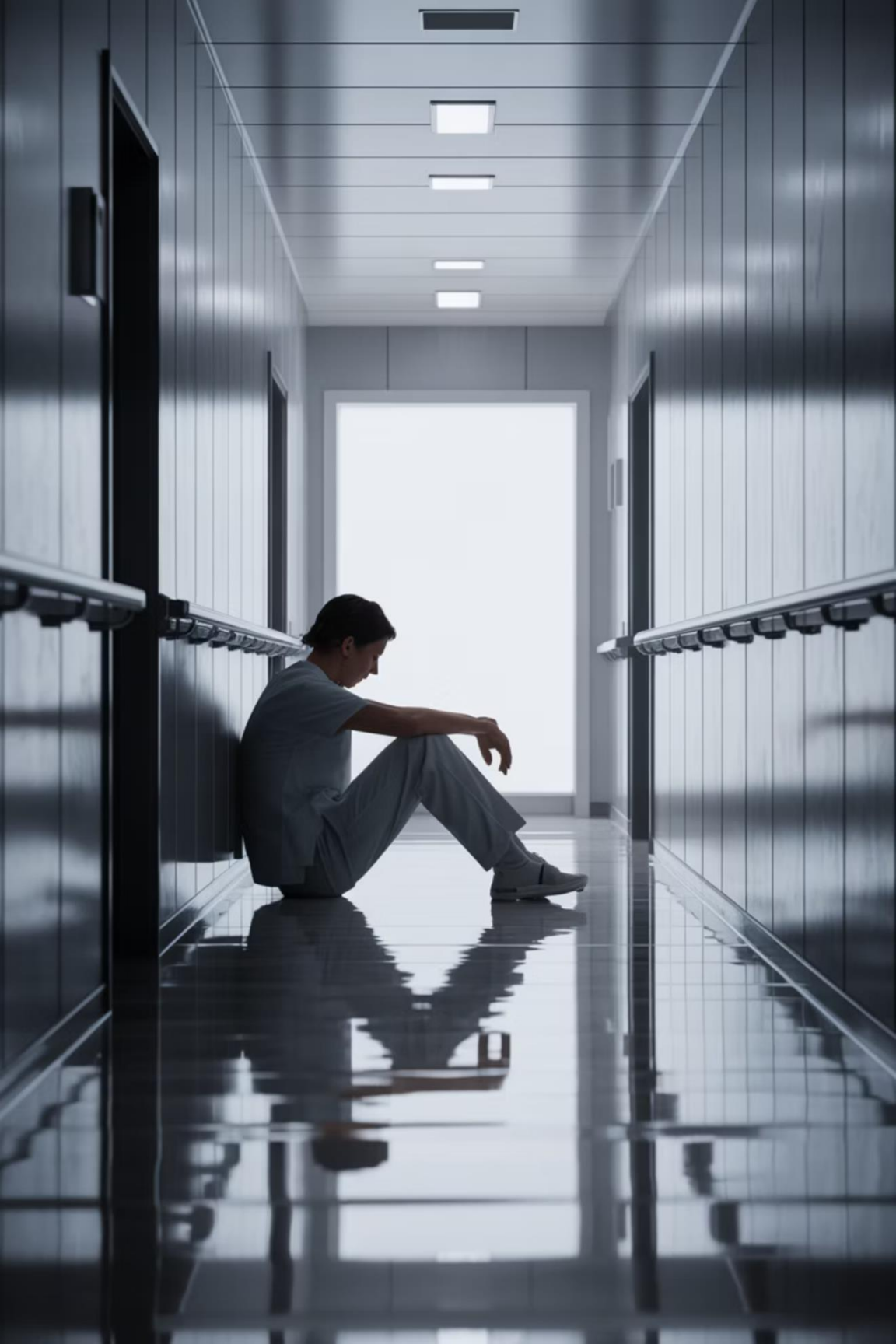
*Introduced in the 1970s, Freudenberger defined burnout as a syndrome of **emotional, physical, and mental exhaustion** resulting from chronic work stress.*

*His 12-stage model progresses from a "**compulsion to prove oneself**" to neglecting personal needs, denial of problems, isolation, depersonalization, and eventually, depression and a feeling of inner emptiness.*



== ONE NATION ==  
UNDER STRESS





# **Burnout: *Silent Epidemic in Healthcare***

# The "Man Up" Culture

*Deeply embedded in medical education, this culture fosters implicit and explicit expectations that trainees suppress vulnerability, endure extreme stress stoically, and demonstrate toughness regardless of physical or emotional cost.*



# Origins and Manifestations of "Man Up" Culture

1

## Historical Roots

*Evolved from 19th-century residency models, expecting unmarried male physicians to live at hospitals and work grueling hours.*

2

## Rite of Passage

*Enduring hardship without complaint was seen as a necessary part of professional development and acceptance.*

3

## Hazing & Presenteeism

*Established practices that normalized extreme endurance and constant presence, regardless of personal cost.*

4

## Emotional Suppression

*Fostered an environment where emotional stoicism became a key, often unspoken, professional expectation.*

# The Hidden Curriculum

*Beyond formal medical education, trainees absorb unspoken lessons through the "hidden curriculum"—implicit messages that shape their professional identity.*



## **Illness as Weakness**

*Physical or mental illness is often perceived as a sign of weakness within the medical culture.*



## **Betrayal of Colleagues**

*Taking time off, even for health reasons, can be seen as abandoning one's team and responsibilities.*



## **Threat to Credibility**

*Emotional expression is often suppressed, as it's believed to undermine professional credibility and stoicism.*



## **Toxic Resilience**

*This hidden socialization teaches a "curriculum of silence, self-sacrifice and toxic resilience."*



@chrislandau

# The Devastating Statistics

# 45.2%

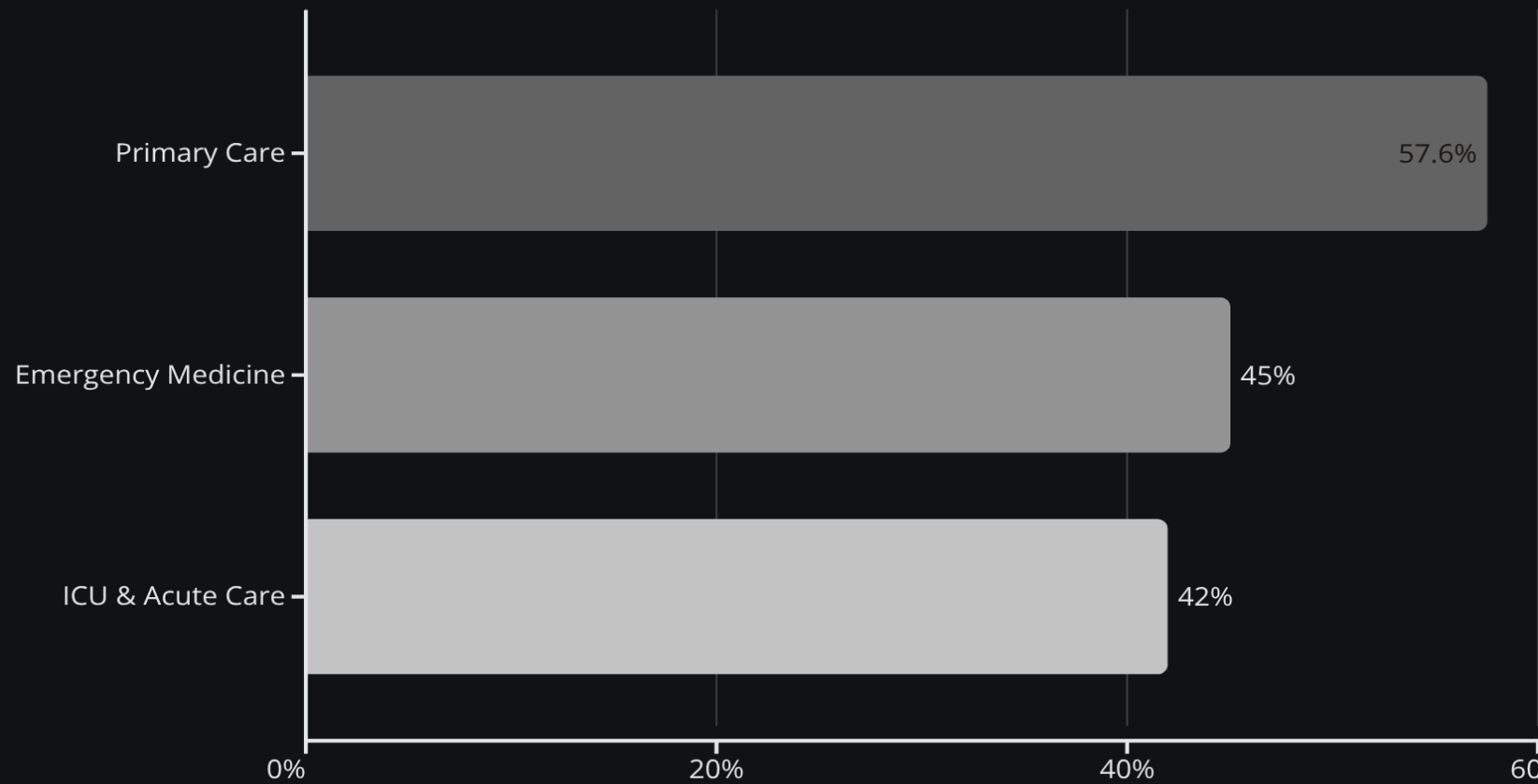
**Physicians Experiencing Burnout**

*From the most comprehensive national survey (Oct 2023 - Mar 2024)*

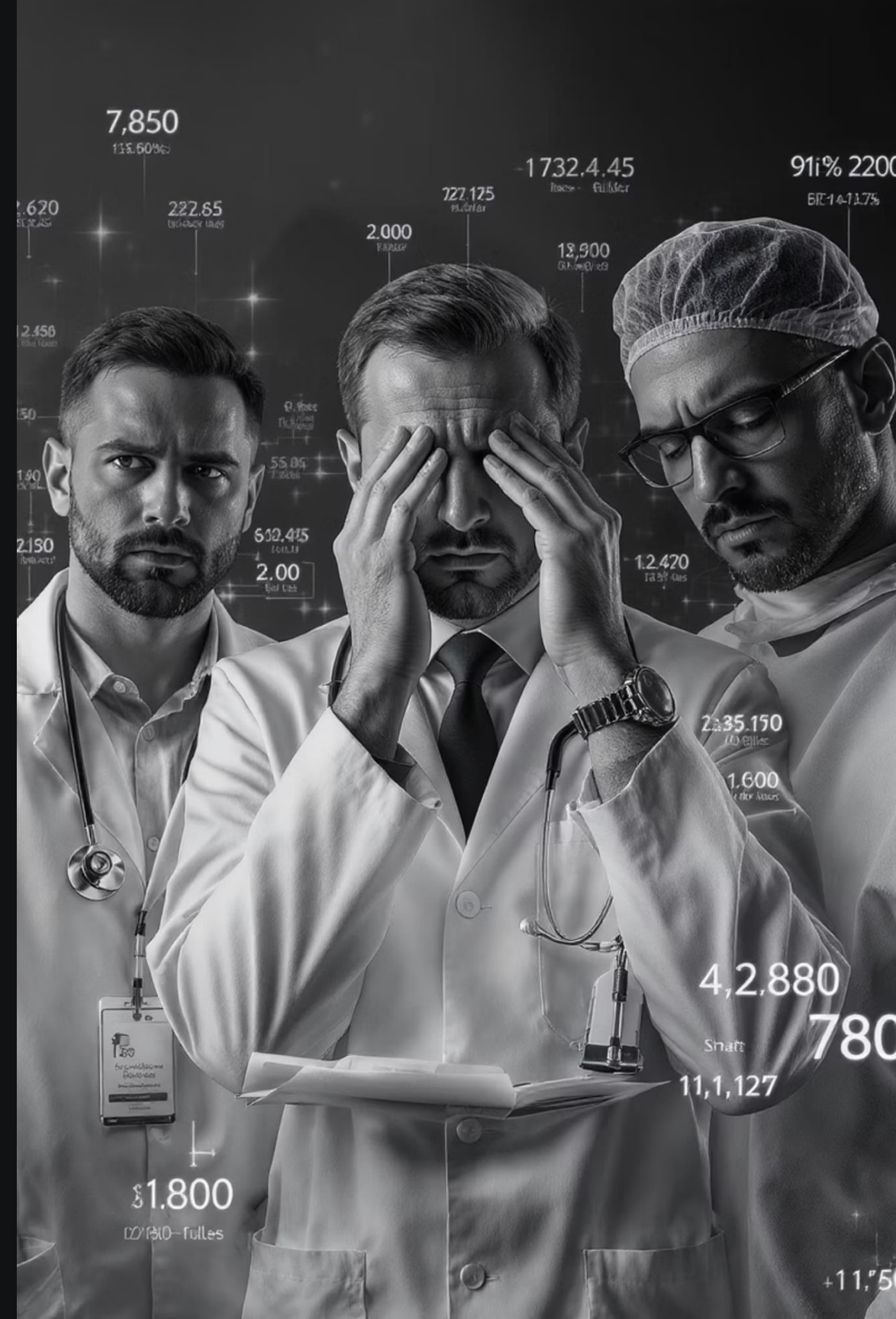


# The Devastating Statistics

*Burnout rates vary significantly across medical specialties, with primary care physicians consistently facing the highest burden.*



*National survey data reveal that primary care physicians reported burnout rates as high as 57.6% in 2022. Other acute care specialties also frequently exceed 40%.*



# The Results of Burnout

# 119-300

## Physician Suicides

*Lives lost annually to despair*

 *JAMA Psychiatry. 2025;82(5):451-458*

**RIP. Dr Bies died of suicide in Minnesota. He was completing pain fellowship @mayoclinic.**

**Michael Matthew  
"Mick" Bies**

1989 - 2023





# Not Just Physicians

*The pervasive issue of burnout and increased suicide risk affects a wide spectrum of healthcare professionals, extending beyond doctors.*

**Registered Nurses**

**Health Technicians**

**Health Care  
Support Workers**

 *JAMA. 2023;330(12):1161-1166*



# Health = Resiliency / Stress

*This equation highlights that health is a dynamic balance. **When chronic stress, such as burnout,** increases and resilience is low, overall health declines, significantly impacting cardiovascular well-being.*



# Burnout's Metabolic Impact

*Physician burnout linked to abnormal glucose metabolism*

- *Disrupted insulin sensitivity*
- *Increased diabetes risk*
- *Metabolic syndrome components*

 *Am J Med. 2020;133(2):160-164*

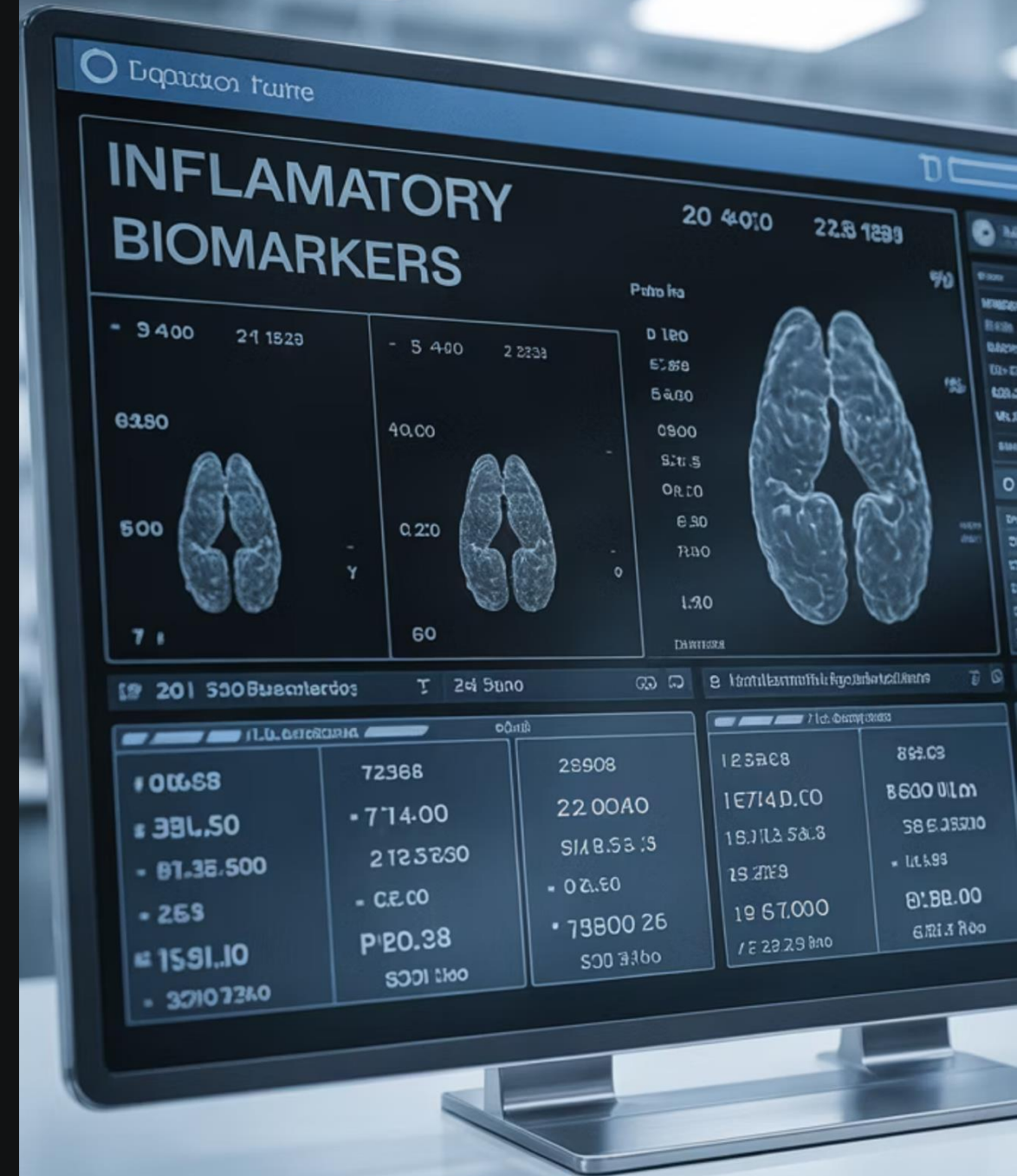
# Inflammatory Consequences

## *Burnout linked to:*

- *C-reactive protein (CRP)*
- *Fibrinogen*
- *Other inflammatory cytokines*



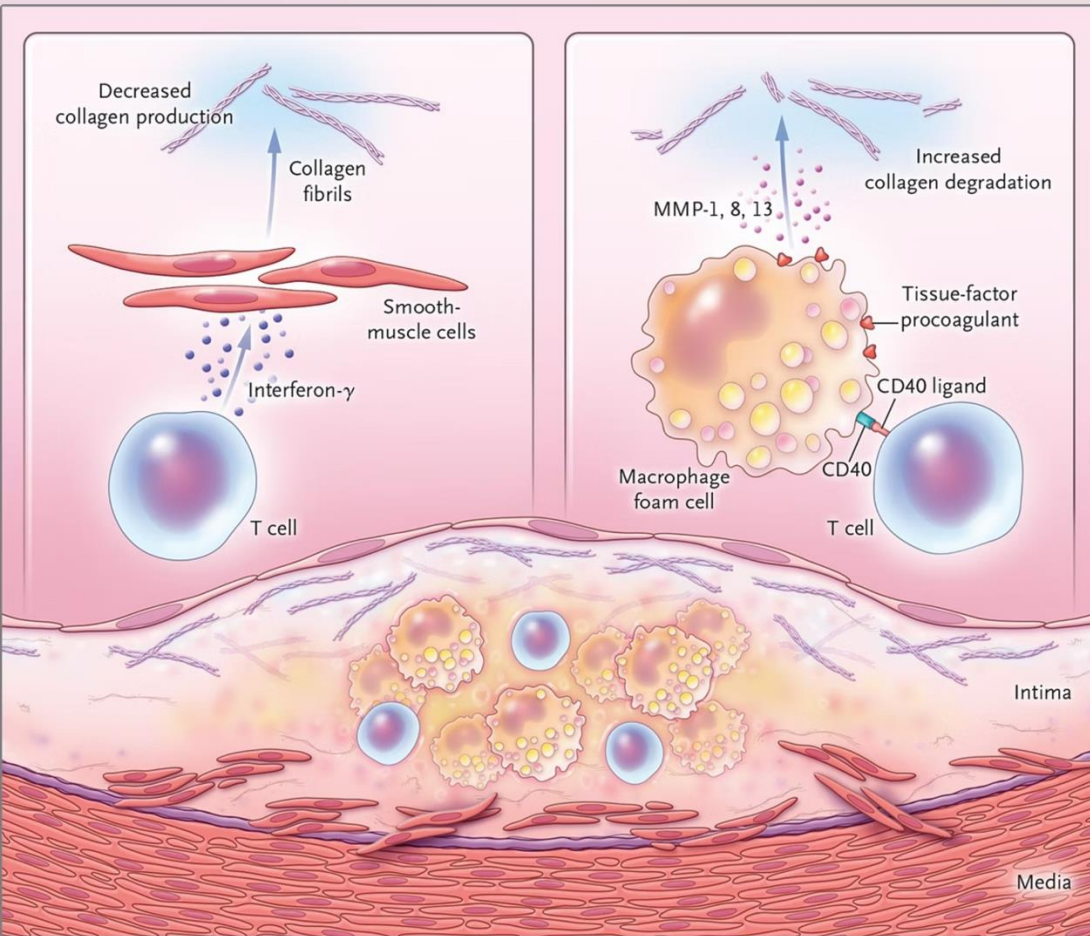
*J Occup Health Psychol. 2005;10:344-362*



# Vascular Inflammation

*Chronic inflammation within arterial walls significantly drives the progression and destabilization of atherosclerotic plaques.*

- It promotes endothelial dysfunction, lipid accumulation, and immune cell recruitment.*
- Immune cells secrete enzymes and cytokines that degrade the plaque's protective fibrous cap.*
- This weakens the plaque, substantially increasing the risk of rupture and dangerous clot formation.*

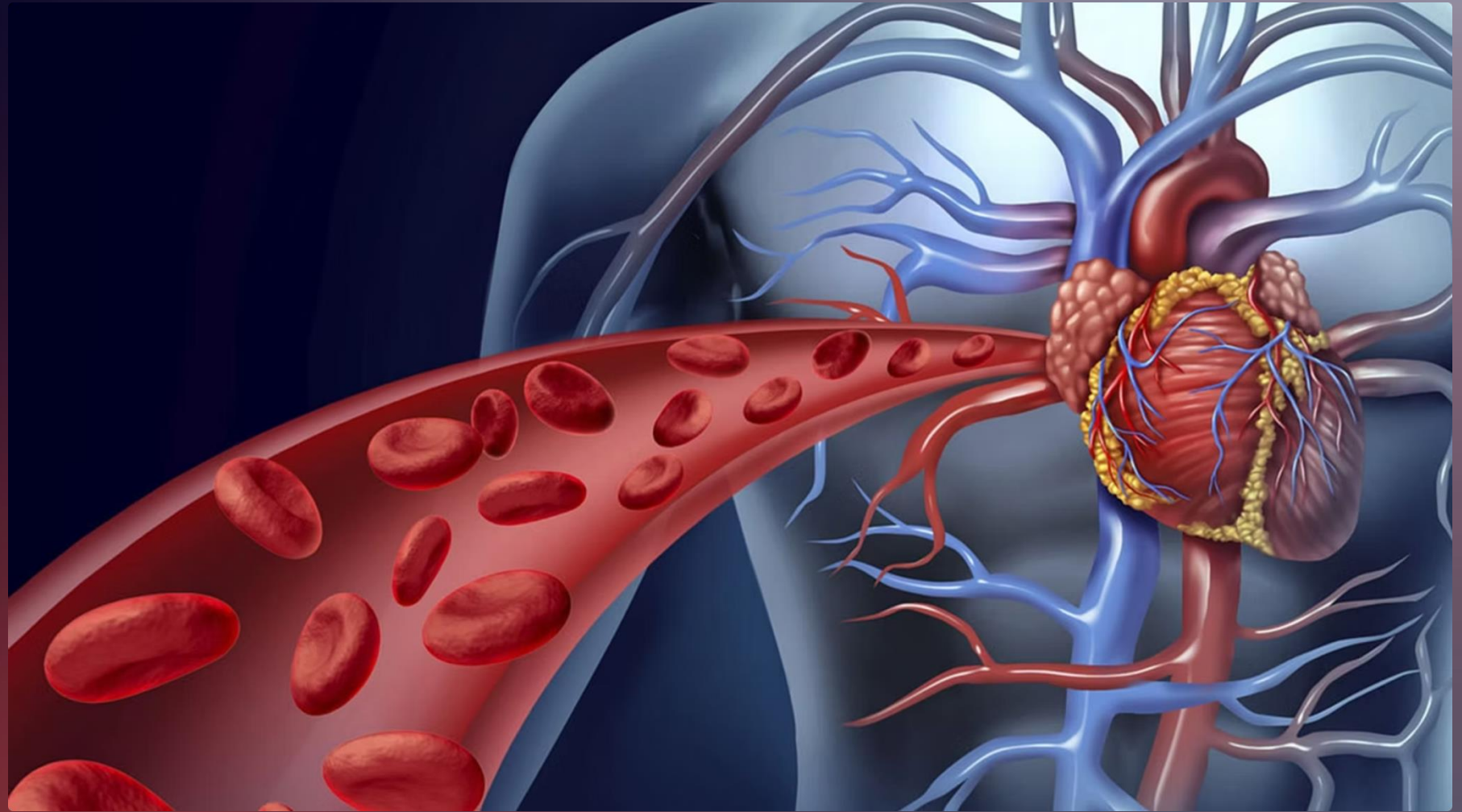


*International Journal of Molecular Sciences. 2022;23(21):12906.*

***Correlation Doesn't Mean  
Causation***

**What is the *pathway* for  
causation between stress  
and the heart?**

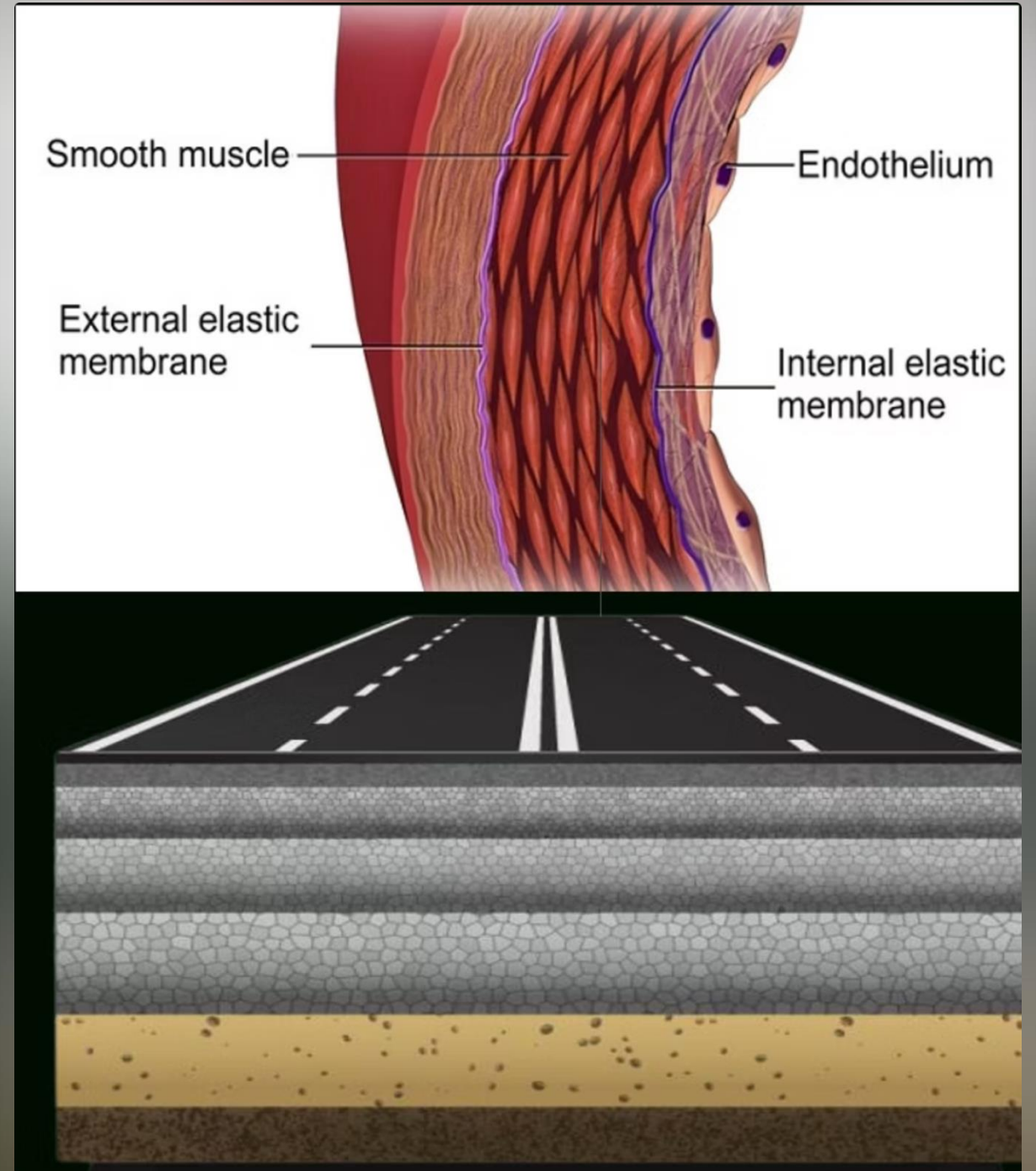
**All Roads  
Lead To  
The Heart**





# Paved By The Endothelium

*Your Body's Most Vulnerable Layer*



# Measuring Endothelial Health

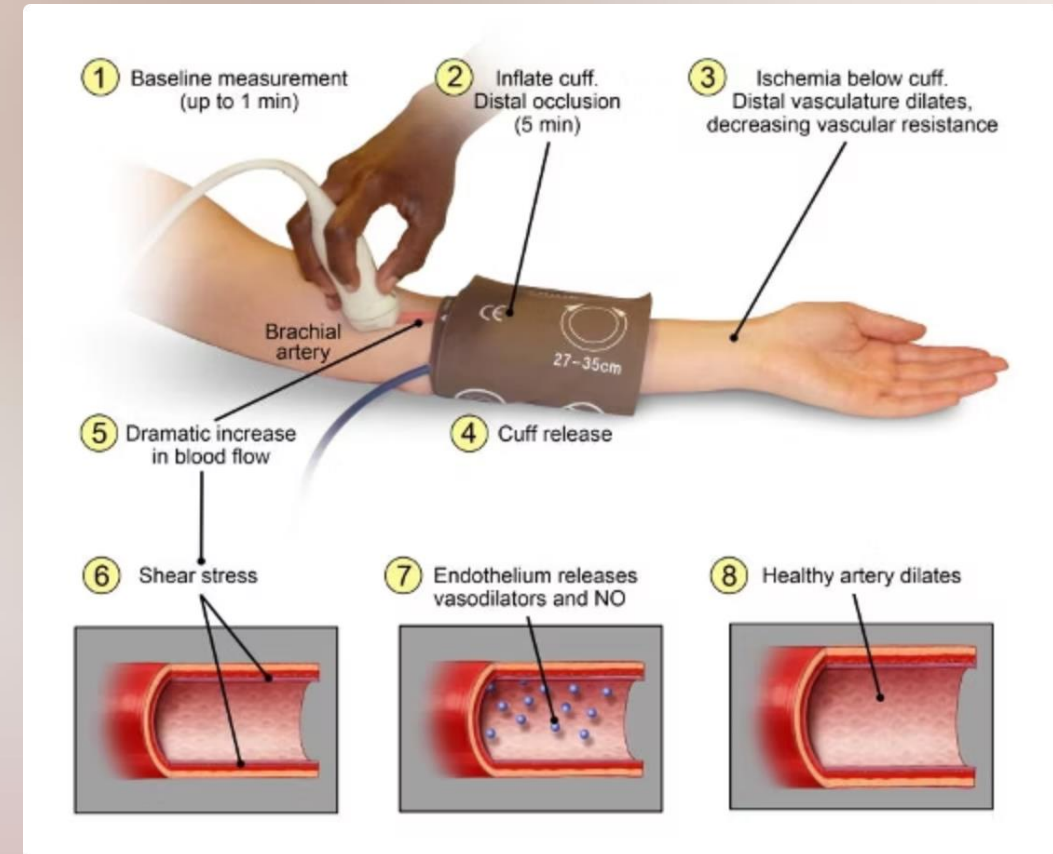
## Flow-Mediated Dilatation (FMD)

*Gold standard for assessing endothelial function*

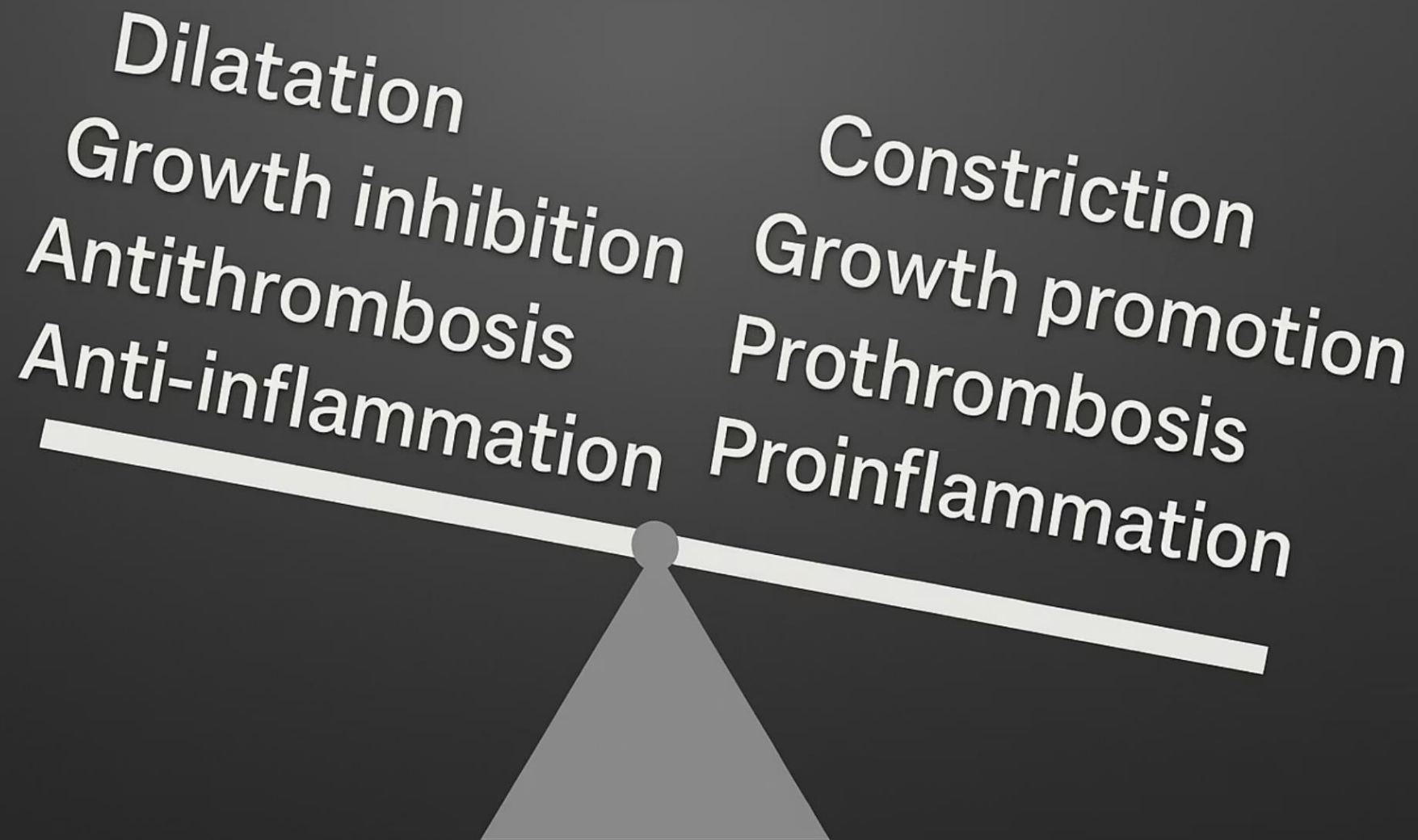
- *Non-invasive ultrasound technique*
- *Measures arterial response to increased blood flow*
- *Predicts cardiovascular events*



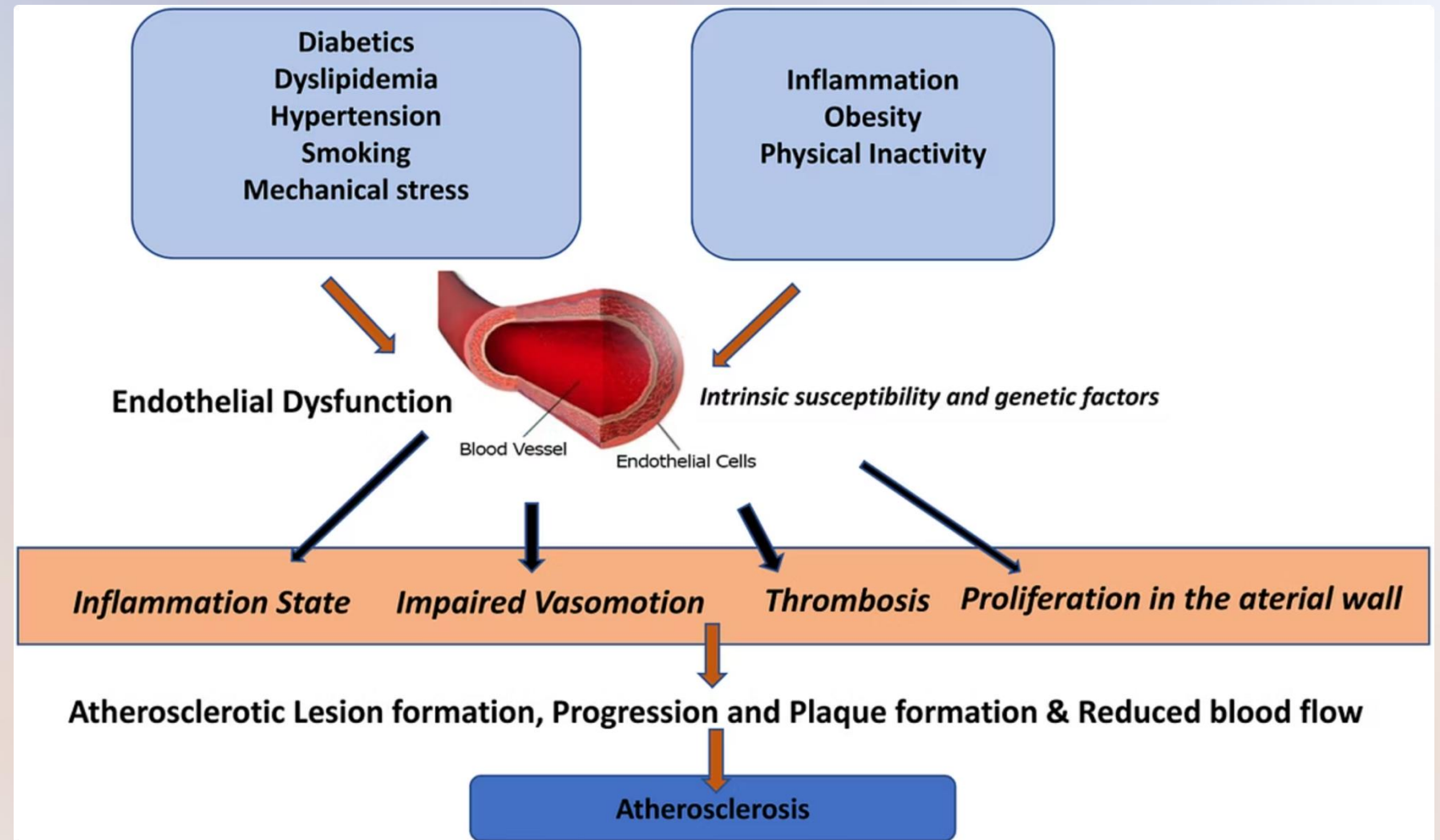
*Circulation. 2000;102:2473-2478*



# ENDOTHELIAL DYSFUNCTION



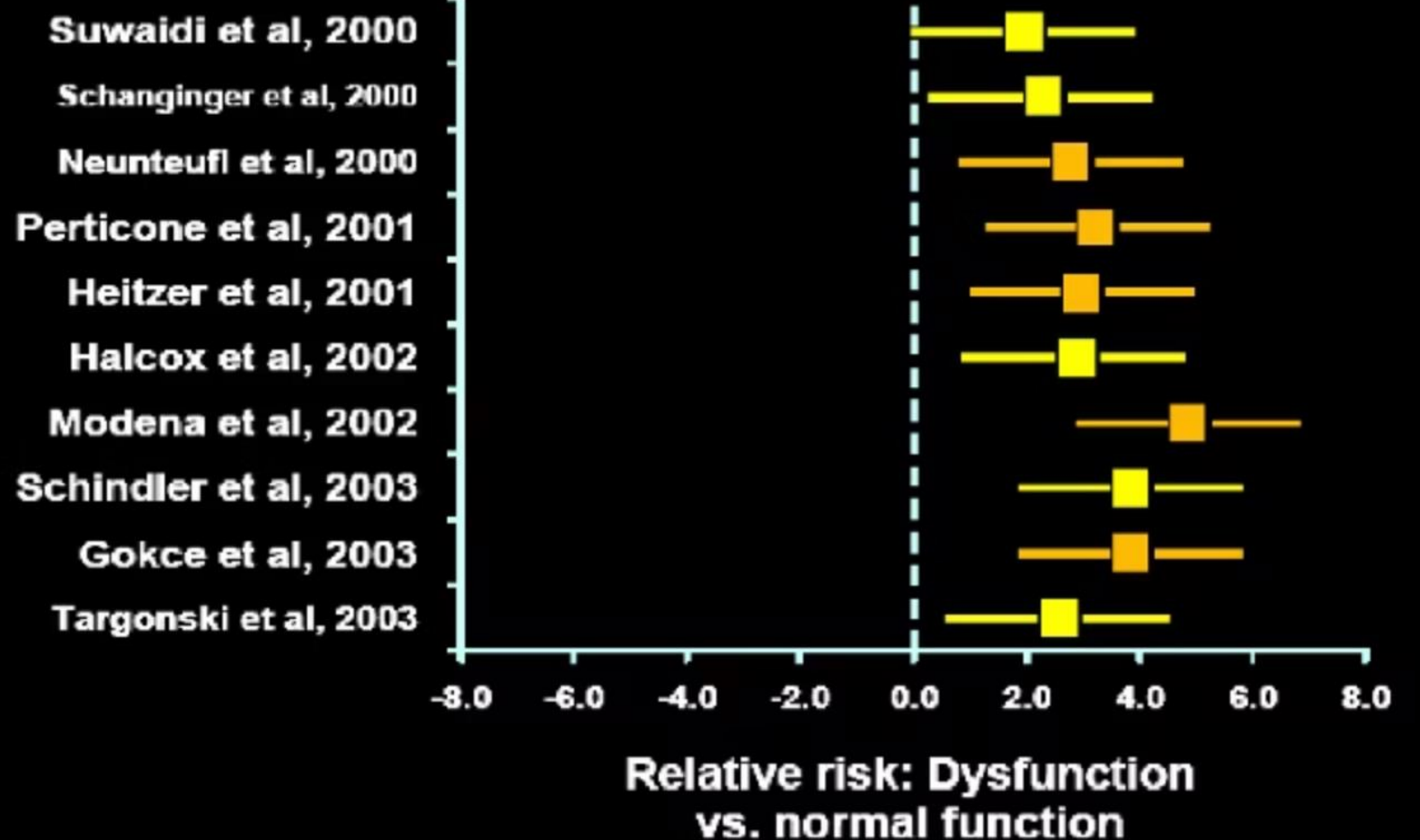
# Causes of Endothelial Dysfunction



# When the Road Becomes Damaged....Bad Things Happen



# Endothelial Dysfunction Predicts Future CV Events

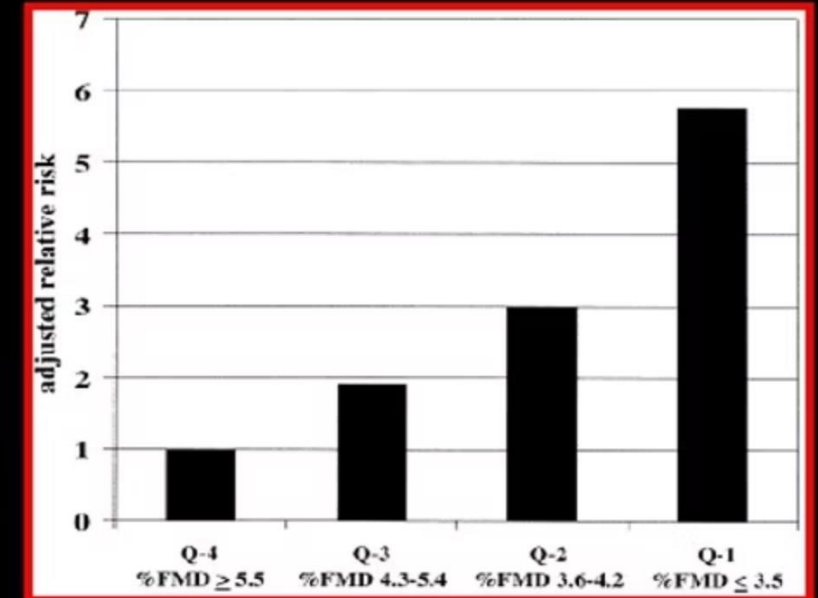


# Endothelial Dysfunction *Predicts Risk of Developing Hypertension*

952 healthy post menopausal  
women  
Age 44 to 60 years  
Baseline normal BP  
Follow-up for mean 3.6 years

**Results:**

112 developed hypertension  
Relative risk of developing HTN  
during follow-up was 5.8 fold in  
those in the lowest FMD tertile  
compared to the highest tertile.



Rossi R J Am Coll Cardiol 2004;44:1636

# Endothelial Dysfunction *Predicts Risk of Developing Diabetes*

840 healthy non-obese post-menopausal women  
Mean age 53 years  
Baseline normal glucose and OGTT  
Follow-up for mean 3.9 years

**Results:**

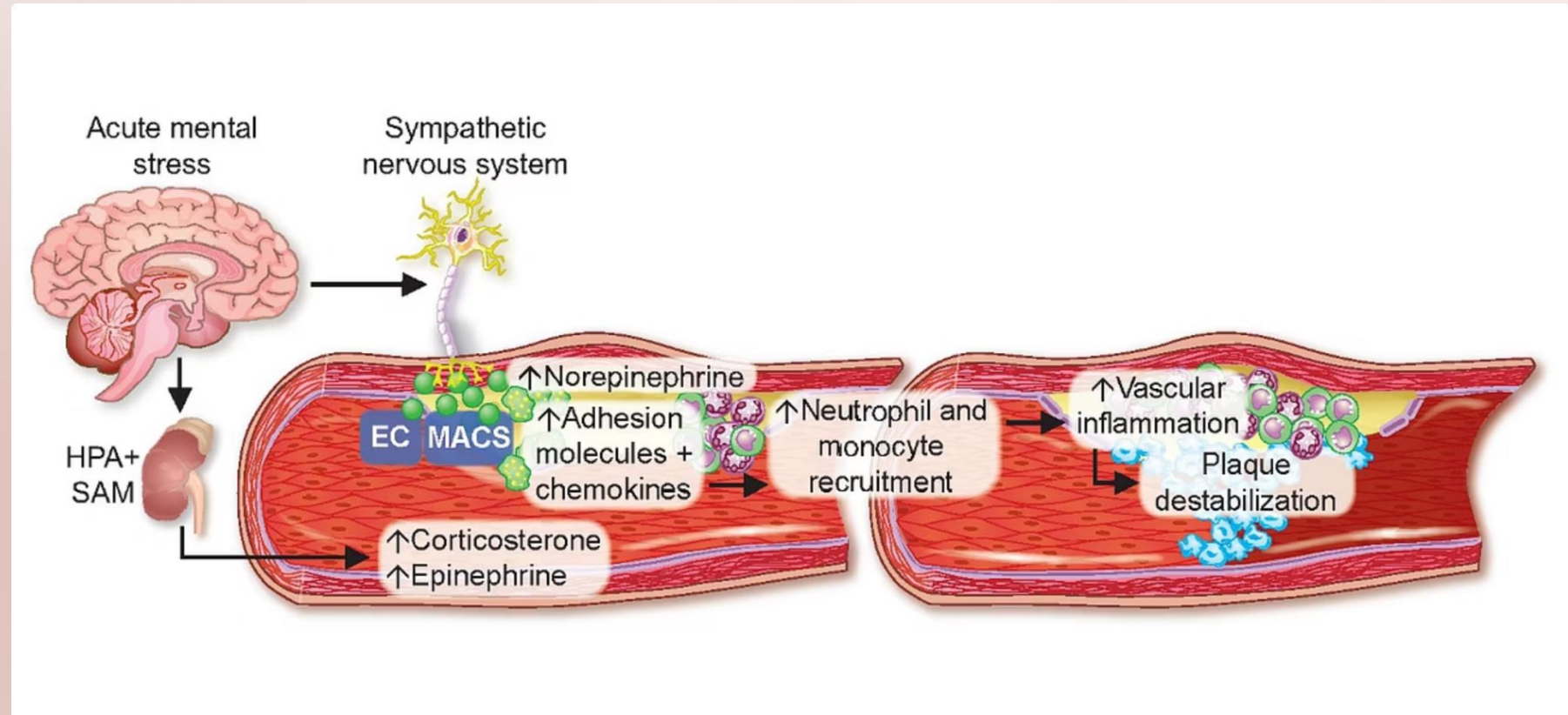
102 developed Type II diabetes  
Relative risk of developing diabetes during follow-up was 5.9 fold in those in the lowest FMD tertile compared to the highest tertile.

FMD tertile	Highest	Mid	Lowest
FMD %	>5.6	4.4-5.5	<4.3
Incident diabetes	9	35	58
Incident rate (per 1000 person years)	2.0	7.9	14.4
Multiple adjusted RR	1	2.85	5.4

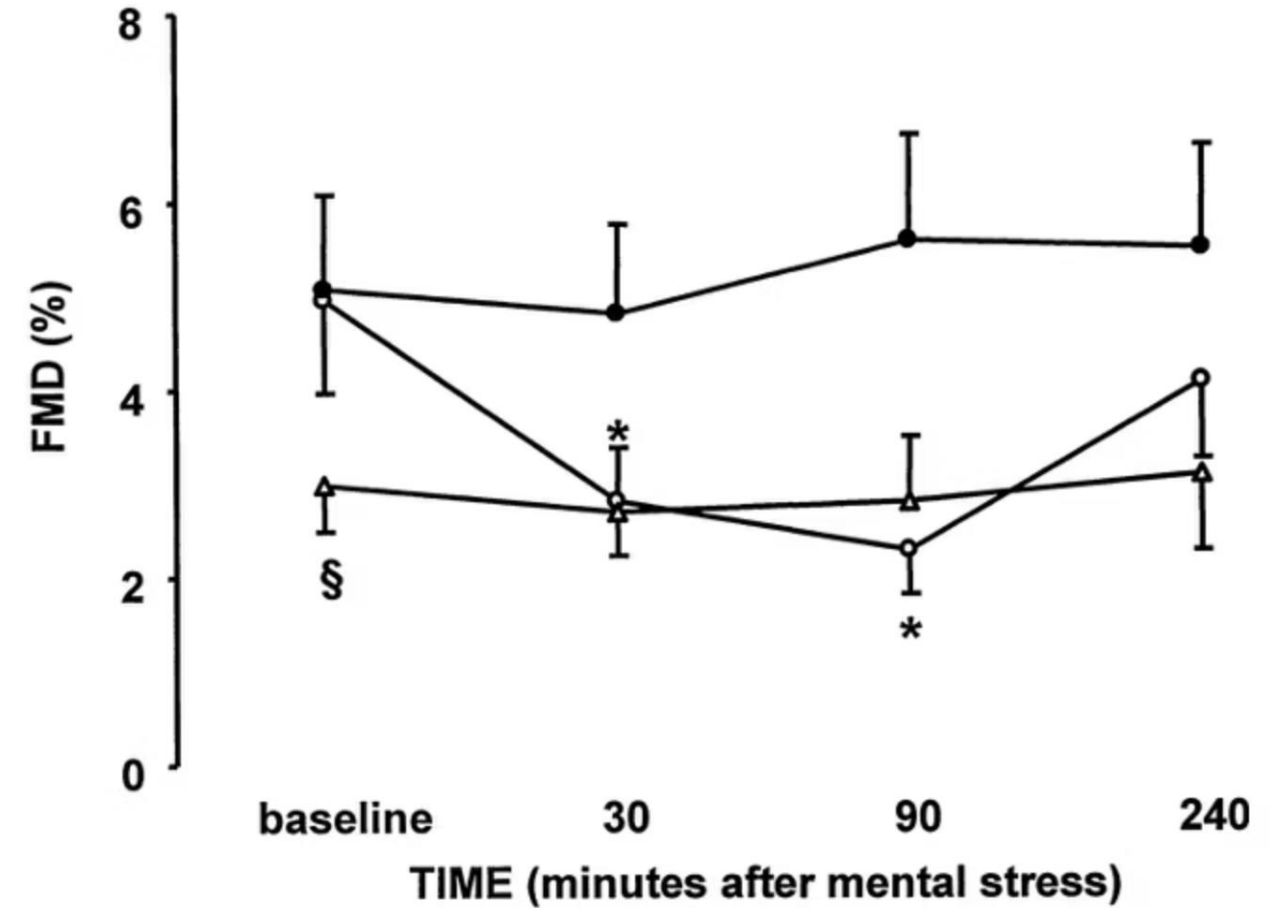


# *Impact of Stress on Endothelium*

# Mental Stress Causes *Endothelial Dysfunction*

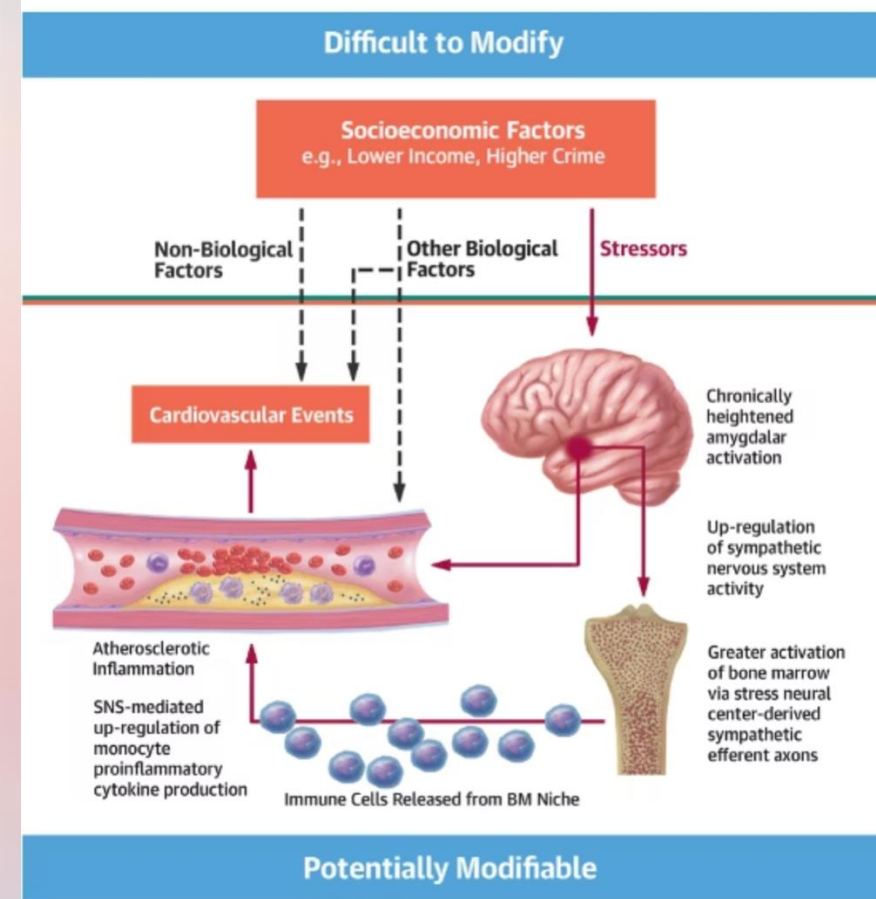


# Mental Stress Induces Transient Endothelial Dysfunction in Humans

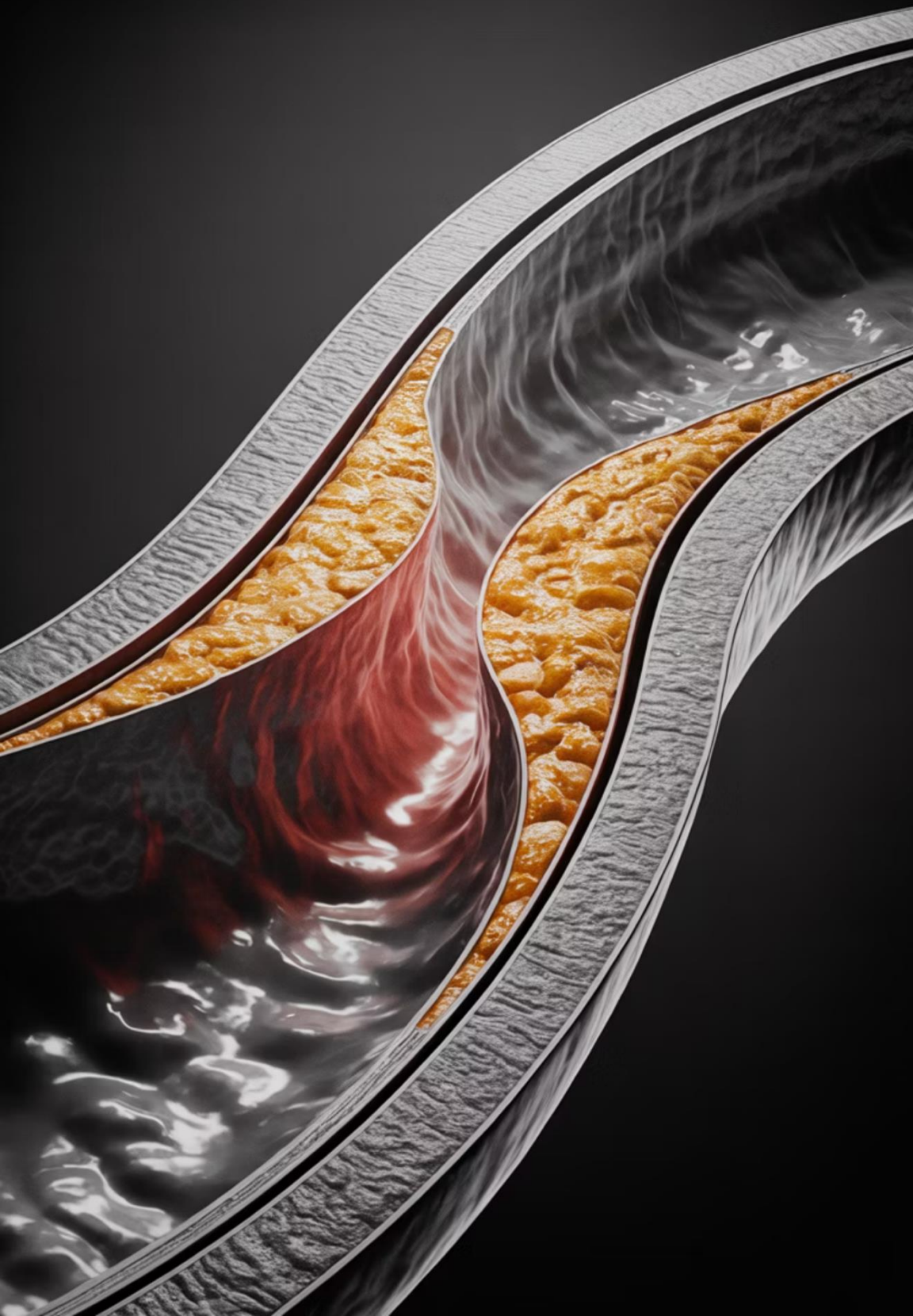


# Stress Impairs The Endothelium

**CENTRAL ILLUSTRATION: A Model of Lower Socioeconomic Status Leading to Major Adverse Coronary Events**



Tawakol, A. et al. J Am Coll Cardiol. 2019;73(25):3243-55.



# Plaque Destabilization

*Acute mental stress promotes vulnerable plaque rupture*



## Inflammatory Cascade

*Cytokine activation*



## Plaque Rupture

*Cap thinning and erosion*



## Thrombosis

*Acute coronary syndrome*



*Eur Heart J. 2021;42(39):4077–4088*



**“It's not stress that kills us,  
it is our reaction to it.”**

- HANS SELYE

***Stress = Demands - Resources***

**FAKE  
RESOURCES**

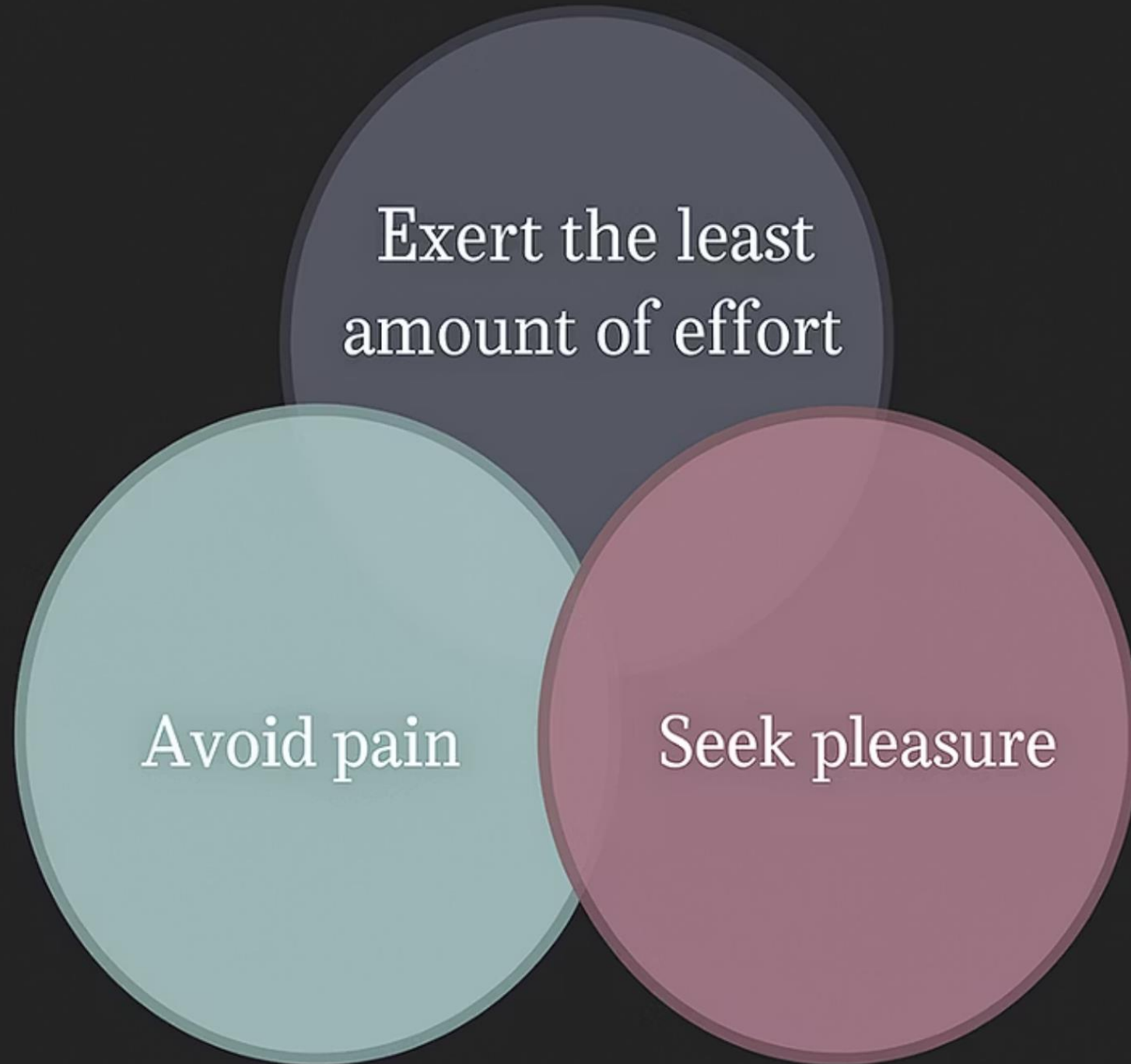


**REAL  
RESOURCES**





# The Motivational Triad



addiction person pressure  
unhealthy  
addicted nicotine  
medicine tobacco  
prohibition narcotic cigarette smoker  
bad healthy lifestyle  
hand stress  
smoke cancer  
warning drug  
forbidden stop  
alcohol harmful disease  
addict quitting health abuse  
illness break  
problem risk issues ban  
habit ending

**Go on a  
date  
with....**





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STRESSED

SPELLED BACKWARDS IS

DESSERTS

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# Physician Respondents

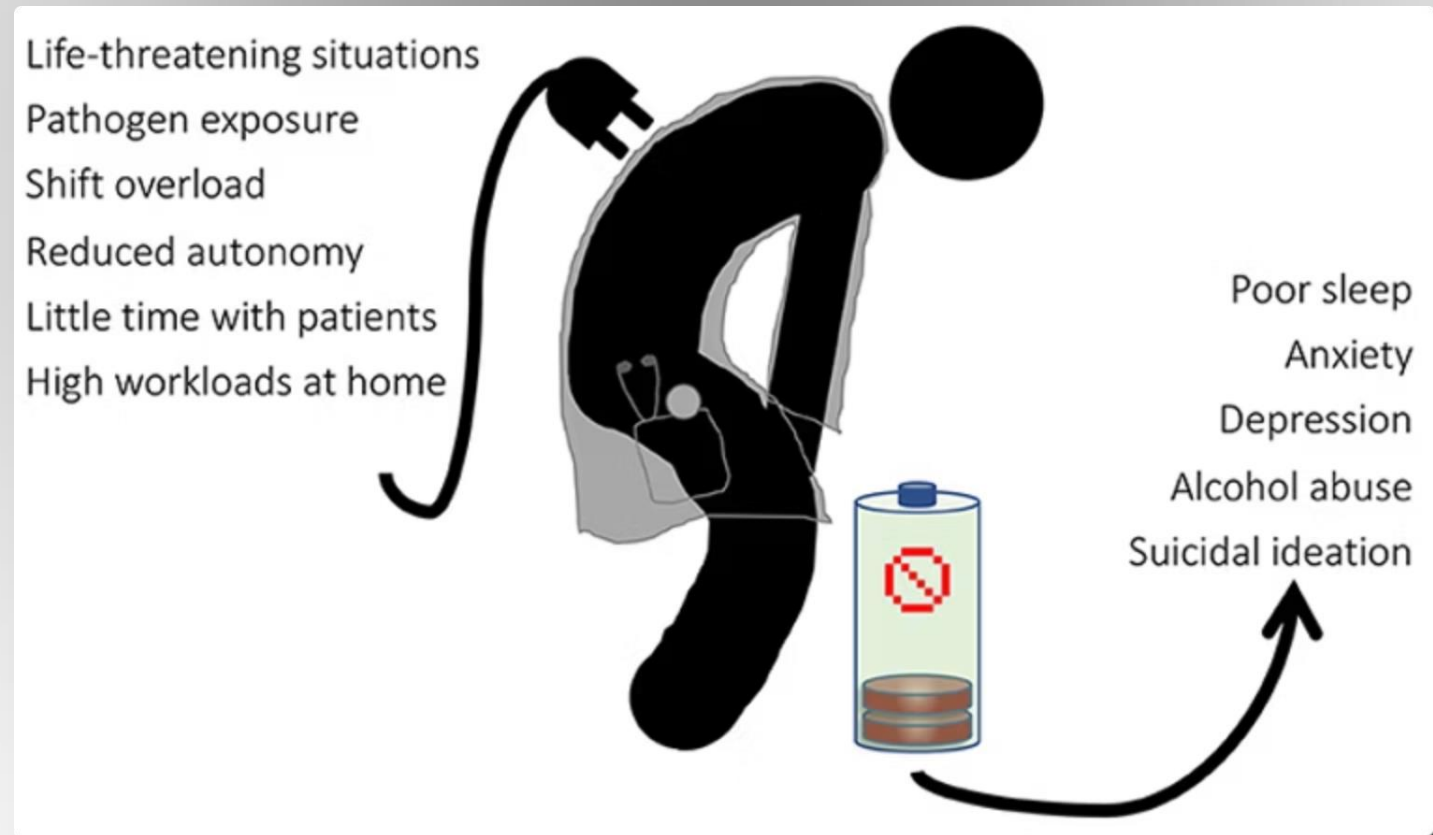
*45% isolate from others*

*35% eat junk food*

*24% drink alcohol*

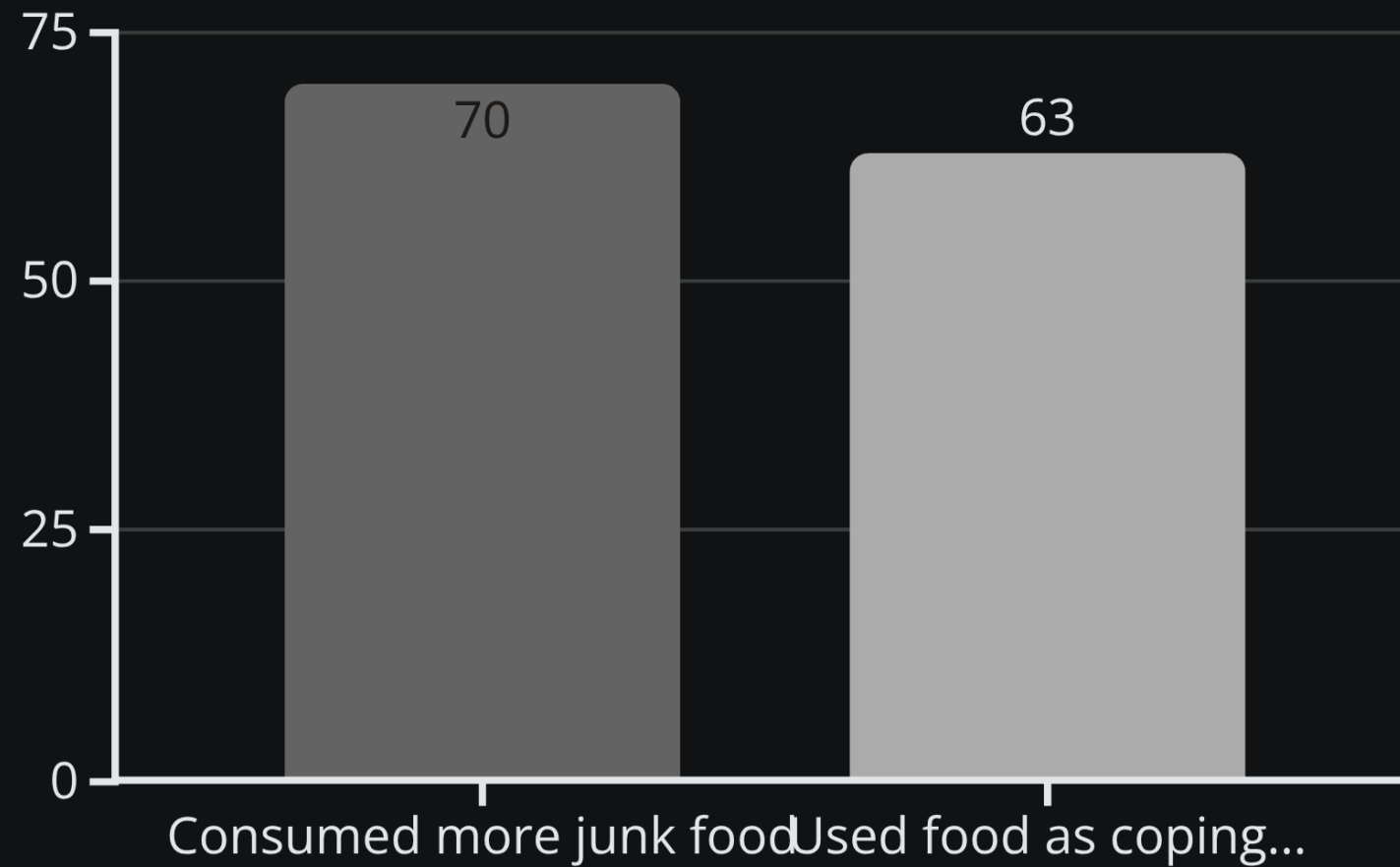
*21% binge eat*

*2% smoke, use drugs or cannabis*



# Nursing Response to Stress

*A study of 120 nurses revealed concerning trends in how they cope with workplace pressure:*





# Nutritional Stress

***Eating the disease forming foods***



## PROCESSED FOODS vs TOBACCO



# A Startling Comparison

*Suboptimal diet has emerged as a more significant global risk factor for mortality than tobacco use.*

## Suboptimal Diet

*Responsible for an estimated 11 million deaths globally in 2017.*

## Tobacco Use

*Accounted for approximately 8 million deaths globally in 2017.*

📄 *Lancet. 2019; 393: 1958–72; Lancet. 2020;396(10258):1223-1249.*

***Not eating the health  
promoting foods***

# Dietary Risk Factors

## High Sodium

*Excessive salt intake*

## Low Whole Grains


*Refined carbohydrate dominance*

## Insufficient Fruits

*Lack of protective phytonutrients*

## Low Nuts/Seeds

*Missing healthy fats*

 *Lancet. 2019;393(10184):1958-1972*

# The Fast Food

## Effect Increased Risk

- *Coronary heart disease*
- *Type 2 diabetes*
- *Metabolic syndrome*



# The Stress-Food Link

*High stress levels are strongly associated with an **increased likelihood of consuming ultra-processed foods.***



**"Betcha  
can't eat  
just one"**

# CVD Risk Per Serving

**5%**

**Lower Estimate**

*Minimum risk increase*

**9%**

**Upper Estimate**

*Maximum risk increase*

*Each additional serving of ultra-processed food compounds  
cardiovascular risk*



# The High Cost of Convenience

*Consuming fast food 2-3 times per week comes with significant health implications, drastically increasing the risk of serious conditions:*

**80%**

**Heart Disease**

*Increased risk of coronary heart disease*

**27%**

**Type 2 Diabetes**

*Elevated risk from regular consumption*

*These statistics reflect the impact of eating fast food just 2-3 times per week.*



# Sugar-Sweetened Beverages

## Stroke Risk

*Increased ischemic events*

## Revascularization

*More interventions needed*

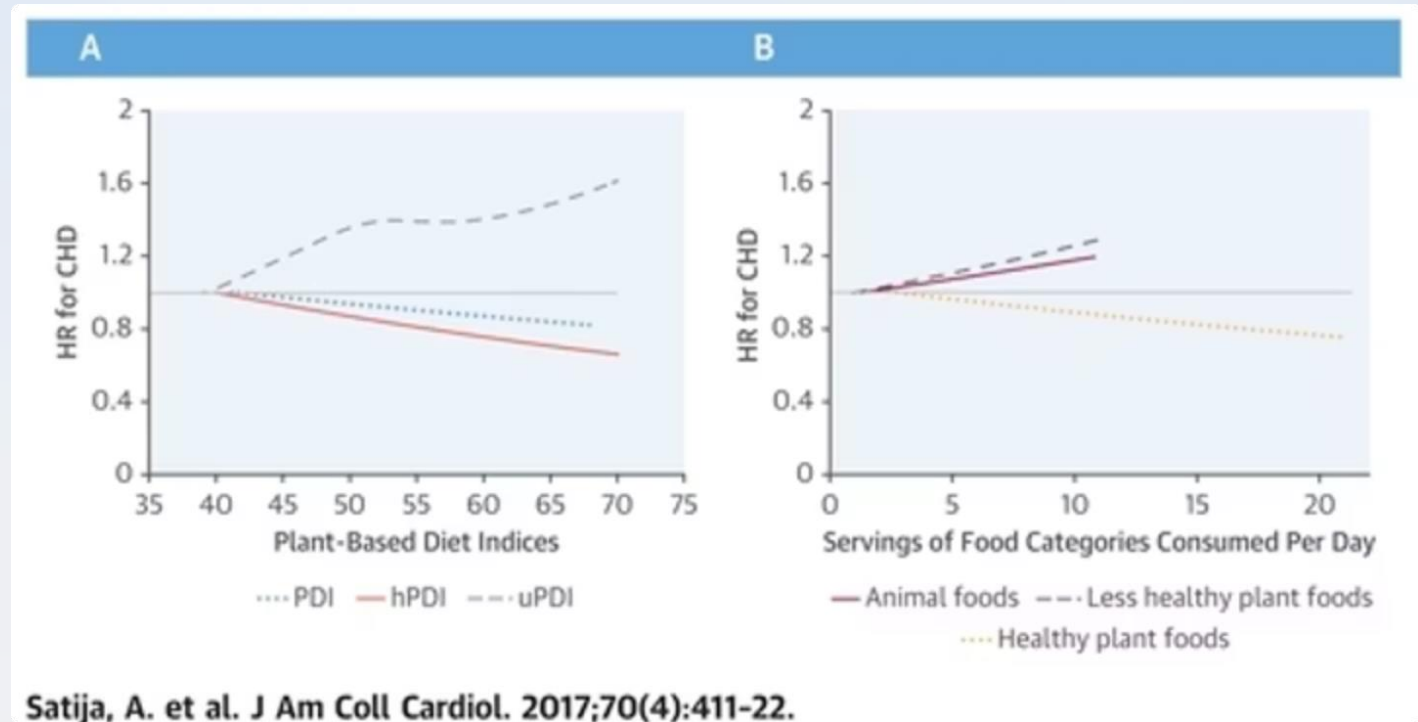


*J Am Heart Assoc. 2020*





A plant-based diet index that emphasizes *less-healthy plant foods* is associated with higher CHD risk.



# Building Resilience

*The Path Forward*



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

-Dr. Wayne Dyer





# A New Approach

*Following his diagnosis, the physician was introduced to a new "**prescription**" for the underlying "**SMURFless**" risk factors contributing to his heart attack.*

# *Selfish* Framework

**Spirituality**

**Exercise**

**Humor**

**Love**

**Sleep**

**Food**

**Intimacy**



**S: Spirituality**



# Breathwork Benefits

*Controlled breathing improves mood better than mindfulness alone*



## Physiological Reset

*Activates parasympathetic nervous system*



## Emotional Regulation

*Reduces anxiety and stress response*



*Balban et al., Cell Reports Medicine, 2023*

# Cardiac Benefits of Mindfulness

## Improved Function

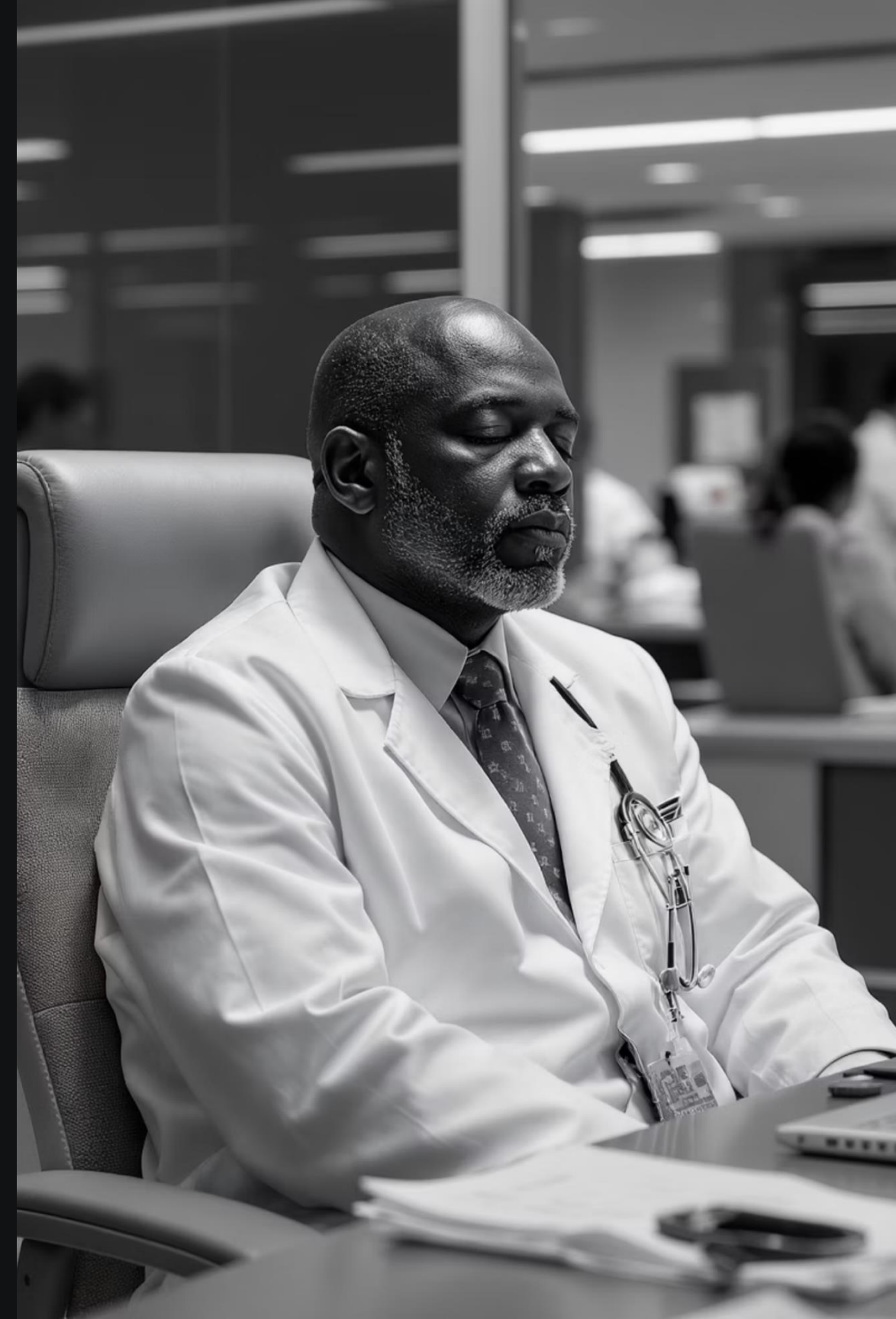
- *Enhanced myocardial performance*
- *Better endothelial health*
- *Reduced inflammation*

## Clinical Outcomes

- *Lower blood pressure*
- *Reduced arrhythmias*
- *Better stress resilience*



*J Cardiovasc Ultrasound. 2017;25(4):118–123; AHA Scientific Sessions 2022; Frontiers in Psychology. 2023;14:1158760.*







**E: Exercise**

# Central Nervous System Benefits

## CNS Resilience

*Enhanced neural plasticity*

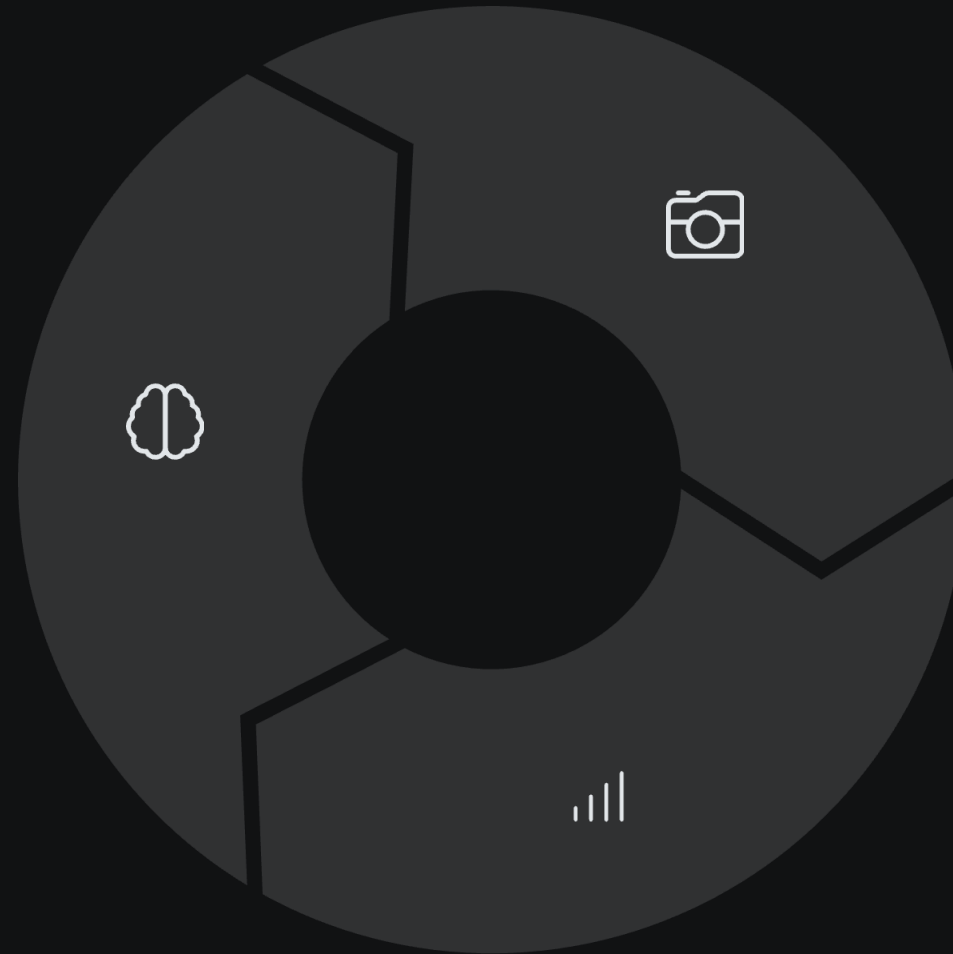


## HPA Modulation

*Balanced stress axis*

## Improved Function

*Better stress response*

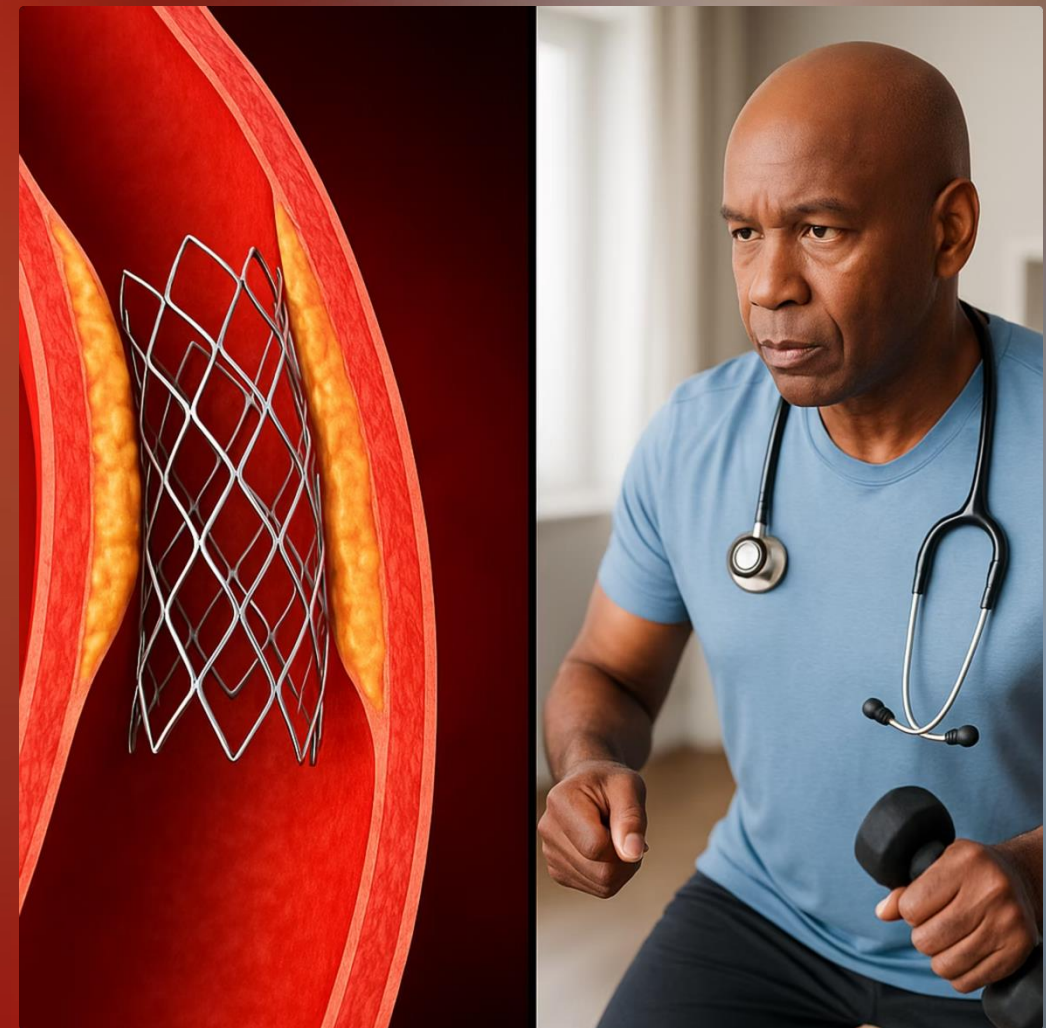


# Exercise vs. Stents

*In 2004, a study comparing exercise training to stenting for stable coronary artery disease found that **exercise was superior to stenting in a selected group of patients**, leading to better event-free survival, improved exercise capacity, and lower costs over one year.*



*Circulation. 2004;109:1371-1378*





**L: Love**

# The Healing Power of Volunteering

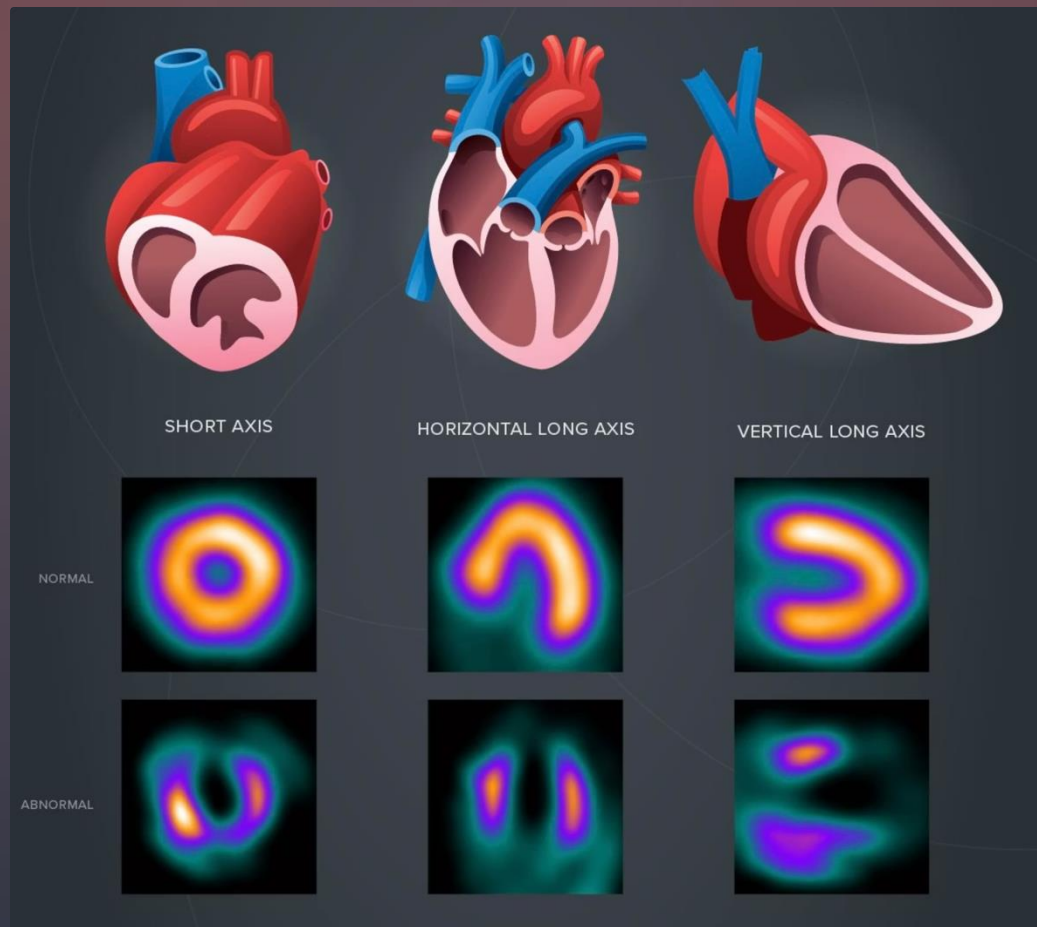
*A study looking at volunteering as an intervention found that physicians and nurses experienced a significant **drop in burnout characteristics**, highlighting the therapeutic benefits of giving back.*

 [behavioralhealthnews.org](https://behavioralhealthnews.org)



# The Healing Power of Forgiveness As Love


*A randomized controlled pilot study demonstrated that patients with coronary artery disease who participated in a forgiveness intervention showed significantly fewer anger-recall induced myocardial perfusion defects compared to controls.*



 *Psychology and Health Vol. 24, No. 1, January 2009, 11–27*

# The Healing Power of Gratitude

*Gratitude journaling has been shown to lead to a reduction in inflammatory biomarkers and an increase in parasympathetic heart rate variability. This suggests a direct positive impact on both cardiac autonomic function and systemic inflammation, key factors in cardiovascular health.*

 *Psychosomatic Medicine. 2016 Jul-Aug;78(6):667-76.*



**F: Food**







# Plant-Based Benefits



## Enhanced Heart Health

*Significantly reduces the risk of cardiovascular disease, improves cholesterol levels, and helps maintain healthy blood pressure.*



## Reduced Inflammation

*Packed with antioxidants and phytonutrients that combat chronic inflammation, a key driver of heart disease and other conditions.*



## Improved Mental Well-being

*Provides essential nutrients for optimal brain function, contributing to better mood stability, reduced anxiety, and enhanced cognitive clarity.*

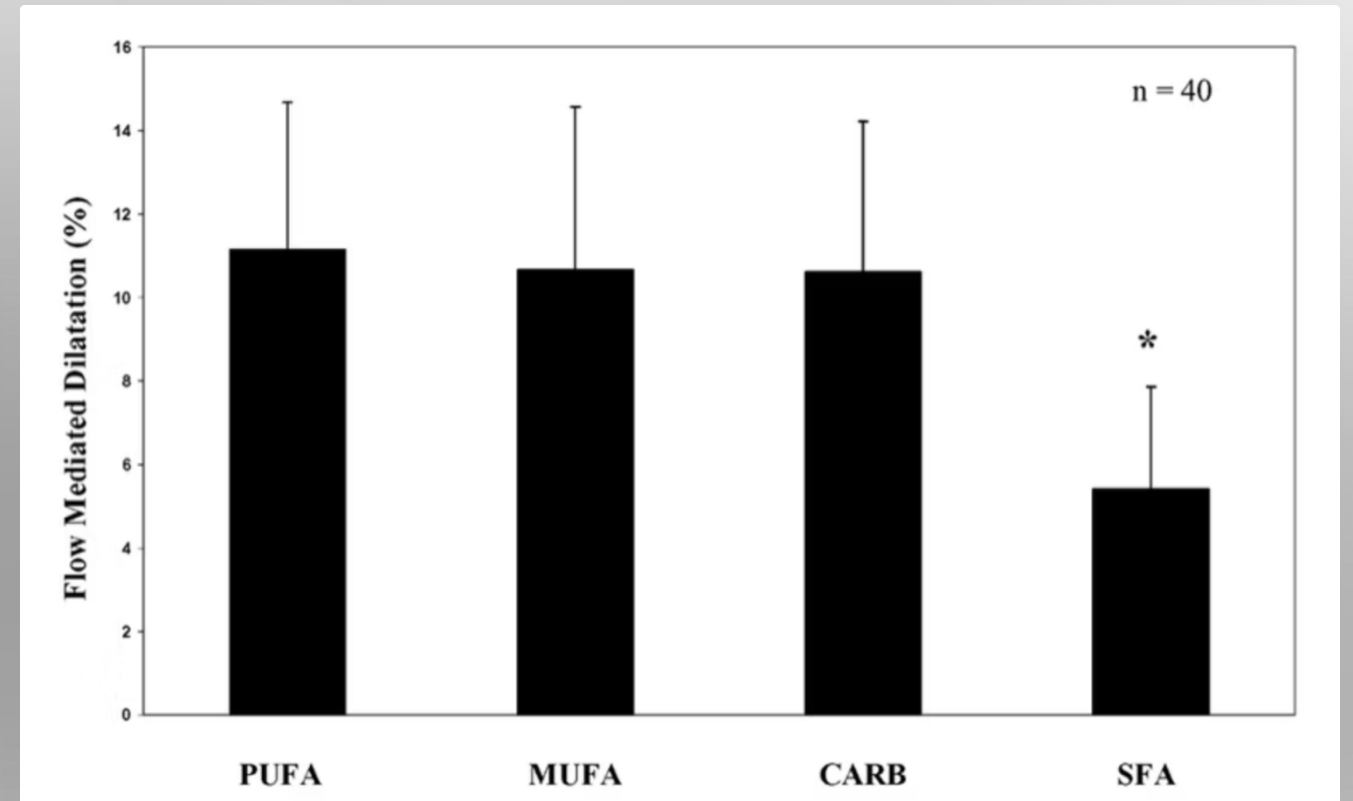
# Saturated Fats and Vascular

Impaired Dilatation

Endothelial Dysfunction

Carbohydrates Not Implicated

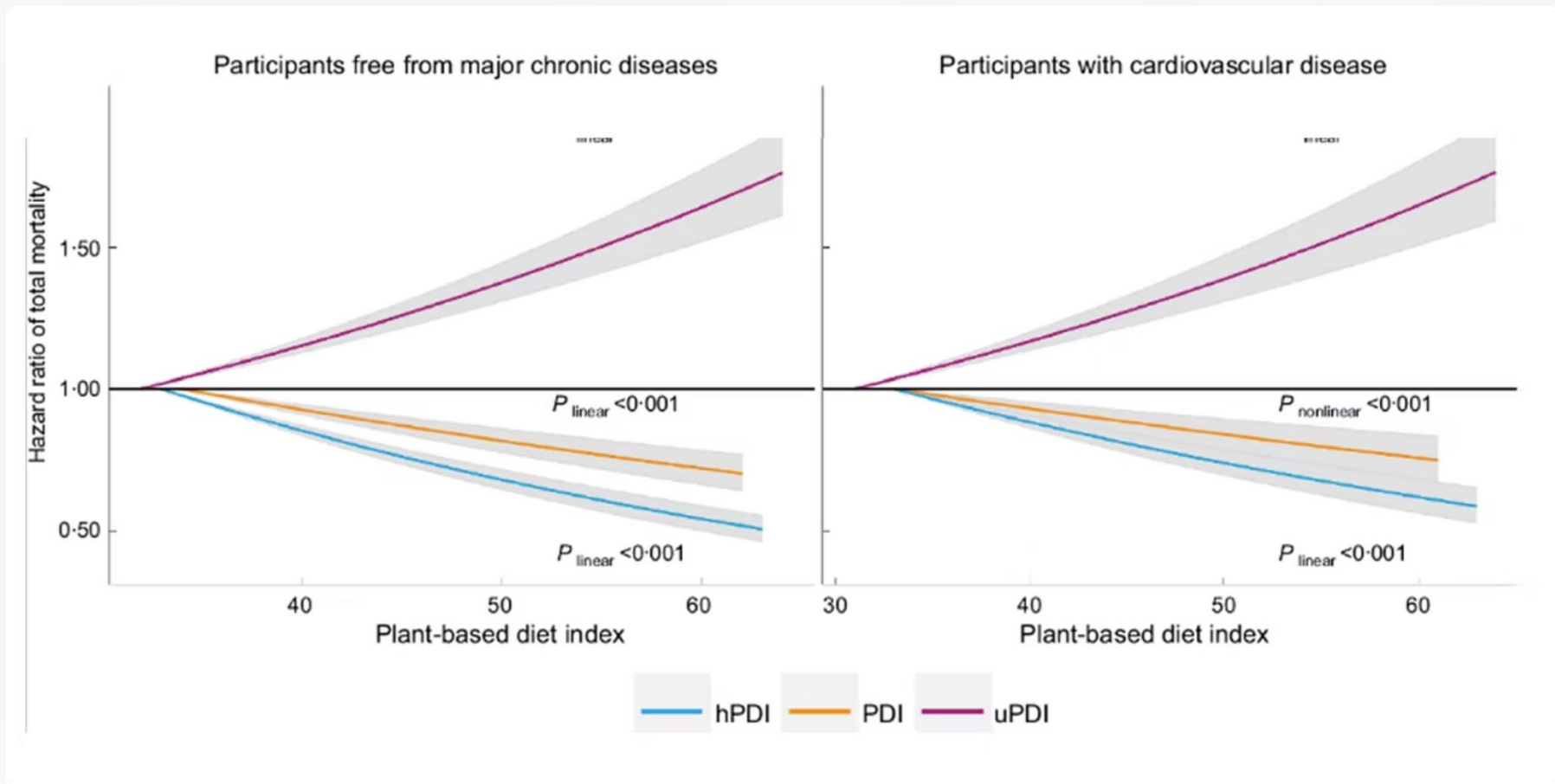
☐ *Arteriosclerosis, Thrombosis, and Vascular Biology. 2005;25:1274-1279.*



# Nutrition Quality and Disease

In veterans, stricter plant-based eating meant much lower mortality—backing plant-rich diets to prevent chronic disease.

Public Health Nutrition. 2023;26(2):381-39



# I: Intimacy



# Arterial Benefits of Connection

*Social bonds reduce arterial stiffness*

1

**Strong Relationships**

2

**Reduced Inflammation**

3

**Better Vascular Health**

 *Vasc Med. 2023;28(3):188-196*



# Emotional Support Animals

## Biochemical Benefits

- *Increased oxytocin*
- *Reduced cortisol*
- *Lower blood pressure*

 *EurekAlert*





**S: Sleep**

# Sleep Restriction Impact

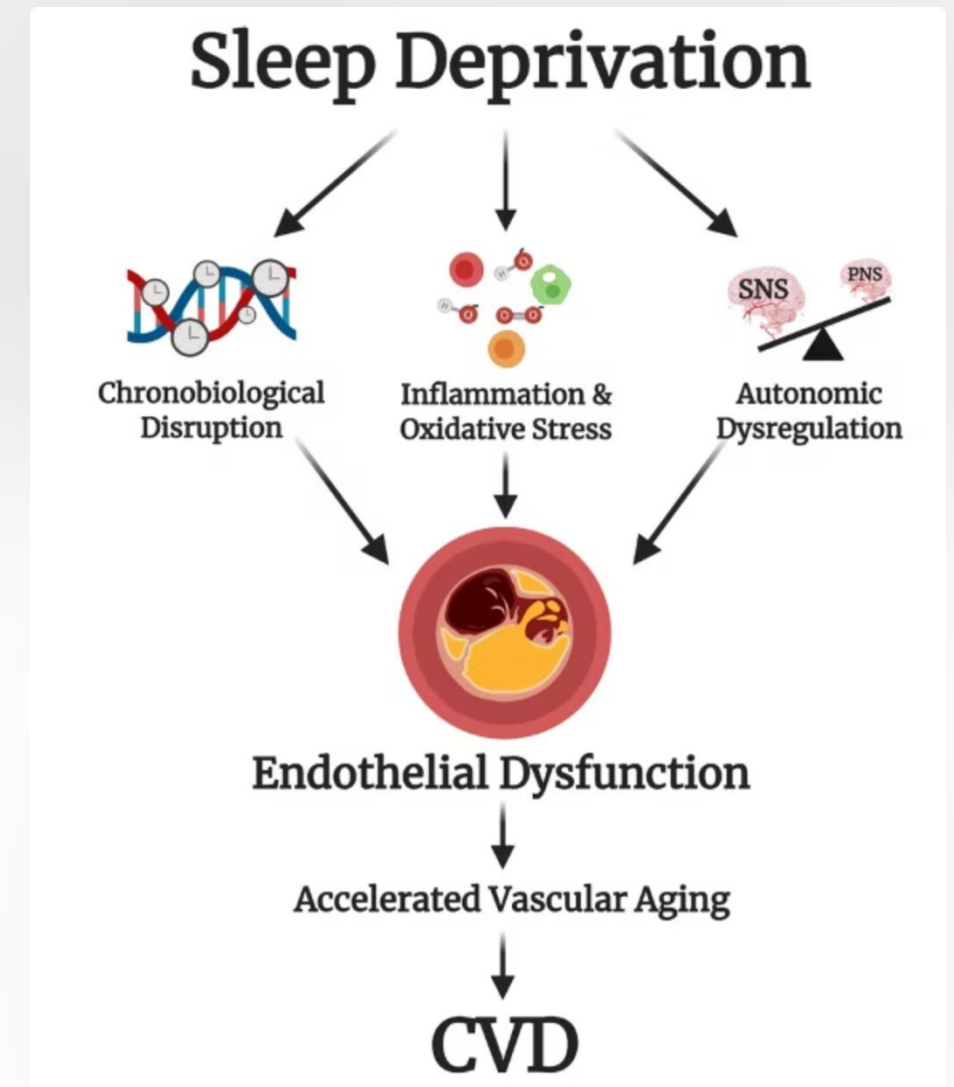
*Sleep deprivation impairs FMD to levels similar to coronary artery disease*

## Acute Restriction

*Immediate endothelial dysfunction*

## Chronic Deprivation

*Sustained vascular damage*

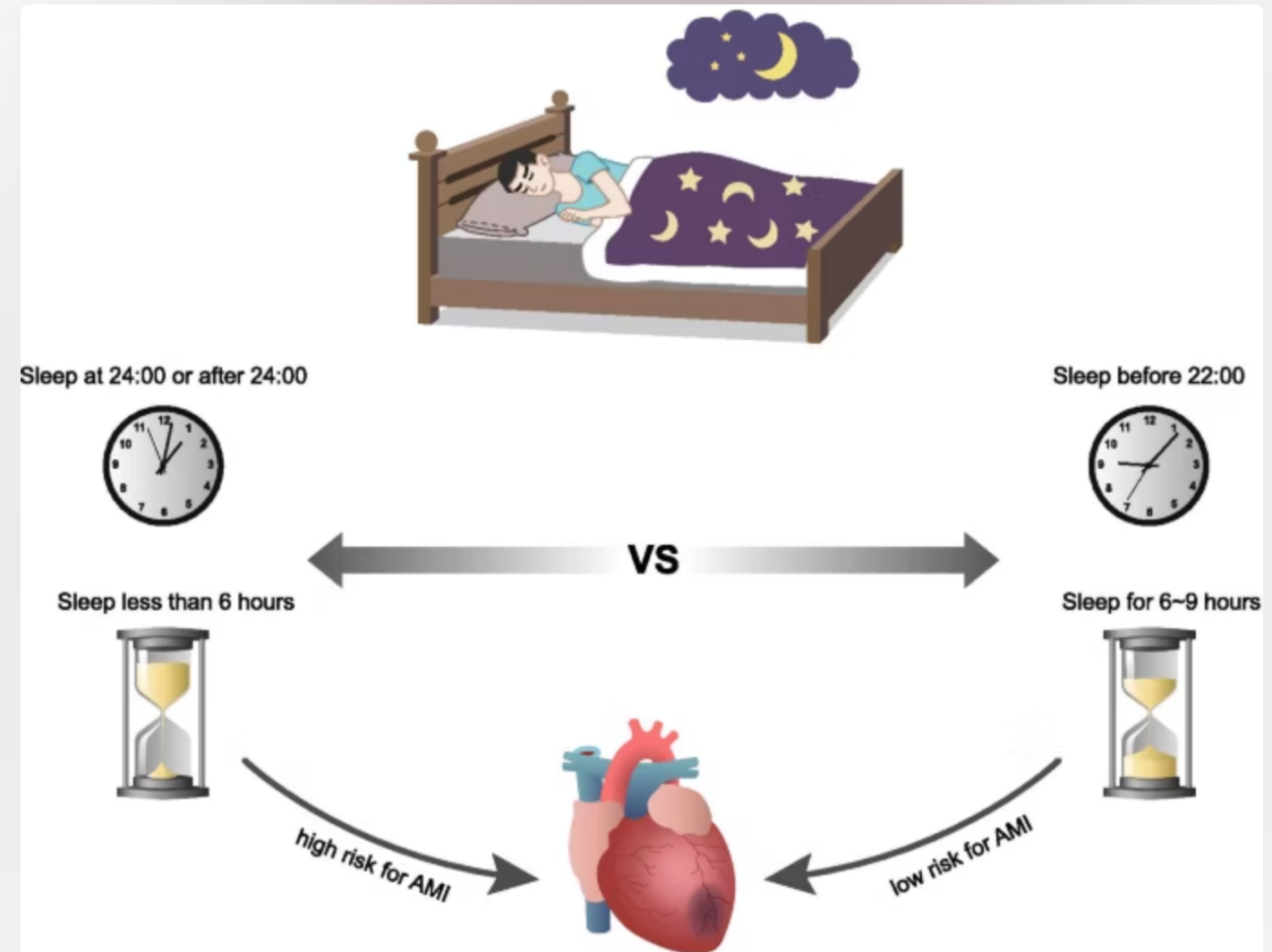




# The Good News

*Sleep recovery partially restores endothelial function*

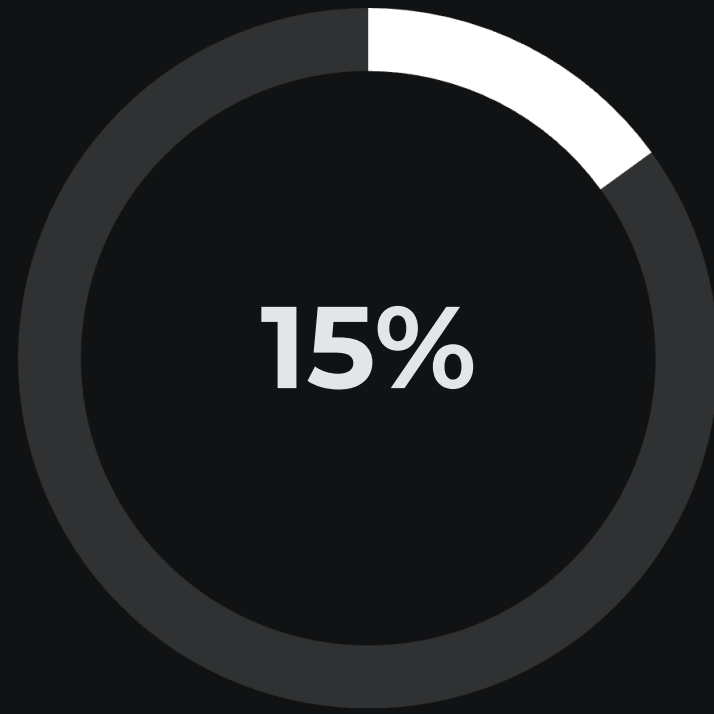
- *Reparative processes during rest*
- *Inflammation reduction*
- *Cardiovascular system restoration*





**H: Humor**

# Laughter's Cardiovascular Benefits



## BP Reduction

*Mirthful laughter lowers blood pressure*

📄 *Medical Science. 2014;12(46):19-23*



# Daily Laughter Protection

*A study found that individuals who rarely or never laughed had a **21% higher prevalence of heart diseases** compared to those who reported laughing every day.*



*J Epidemiol 2016;26(10):546-552*



**Health = Resiliency ÷  
Stress**

# Get *Selfish* to combat the SMuRF & SMuRFless



## Recognize Hidden Risks

*Acknowledge stress as a cardiac threat*



## Build Resilience

*Implement SELFISH framework daily*



## Sustain Change

*Lifestyle modifications for lasting health*



## Thrive

*Enhanced cardiovascular and mental wellness*



**Get SELFISH**

*To Live a Life of Purpose*

