Rx For a Healthy Heart

Barry W. Ramo, MD
New Heart Fitness and Health

RX for a Healthy Heart

- Assessment of cardiovascular risk
- Cardiac rehabilitation: a model for heart disease prevention
- Inflammation role in atherosclerotic coronary Disease
- Risk Stratification guides management
- Interventions to manage risk factors

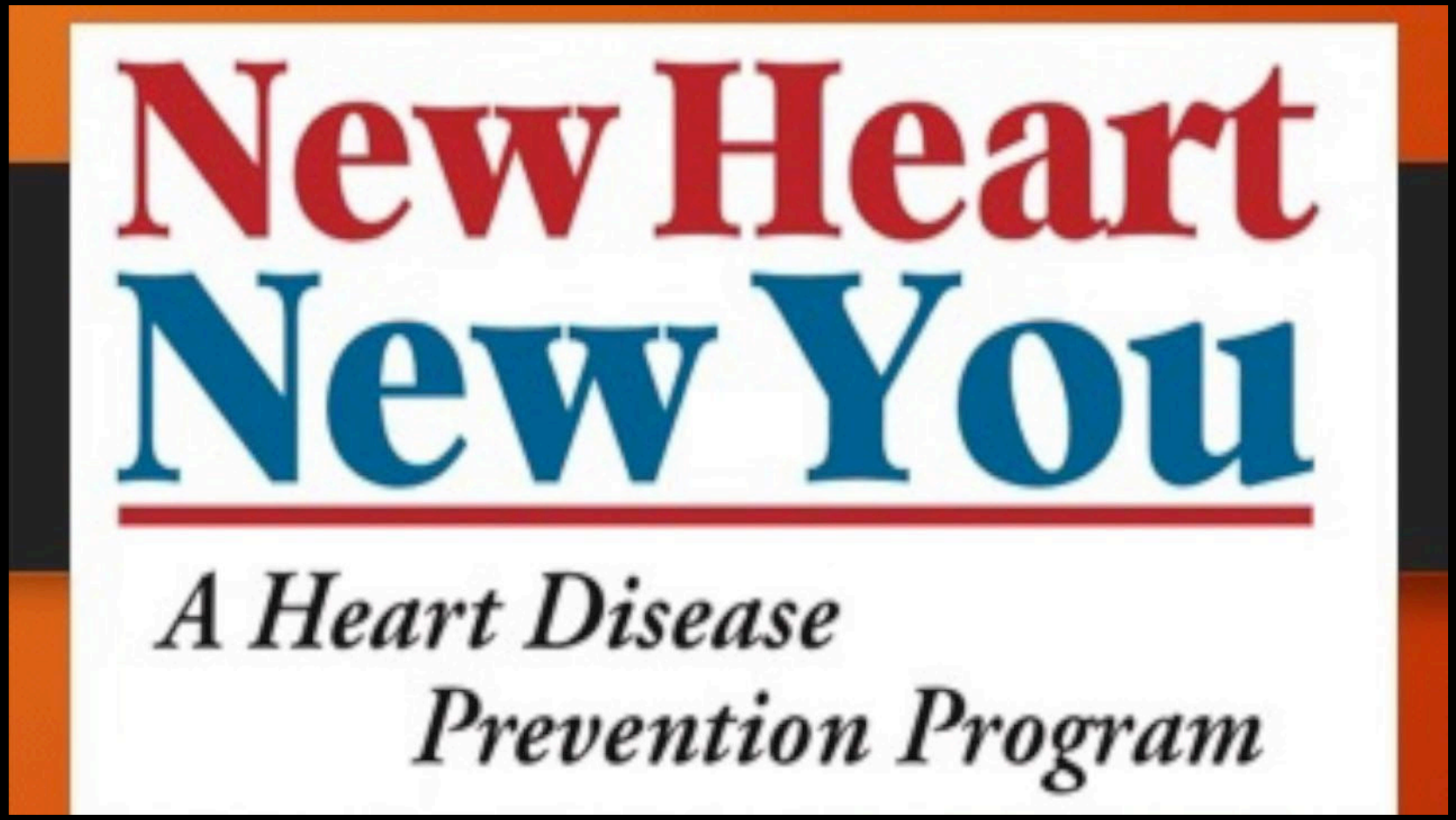
80% of Second Heart Attacks are Preventable with Lifestyle

- Quit smoking
- Eat a healthy diet
- Get regular physical activity
- Modify risk factors
- Take medications to control your cholesterol and blood pressure
- Reduce Stress

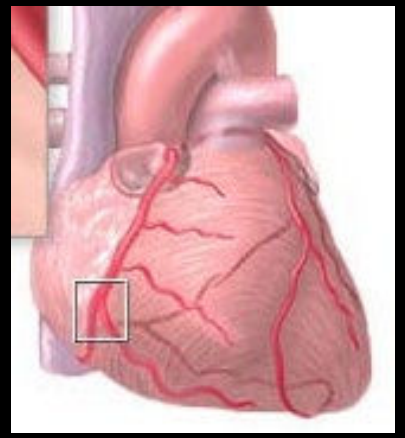
Dose Response Relationship for CR Sessions and Risk of Death / MI *

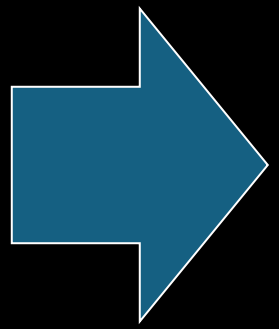
Sessions Attended	36 vs 24 Sessions	36 vs 12 Sessions	36 vs 1 Sessions
Death	- 14%	- 22%	- 47%
Myocardial Infarction	- 12%	- 23%	- 31%

Nutrition and weight management

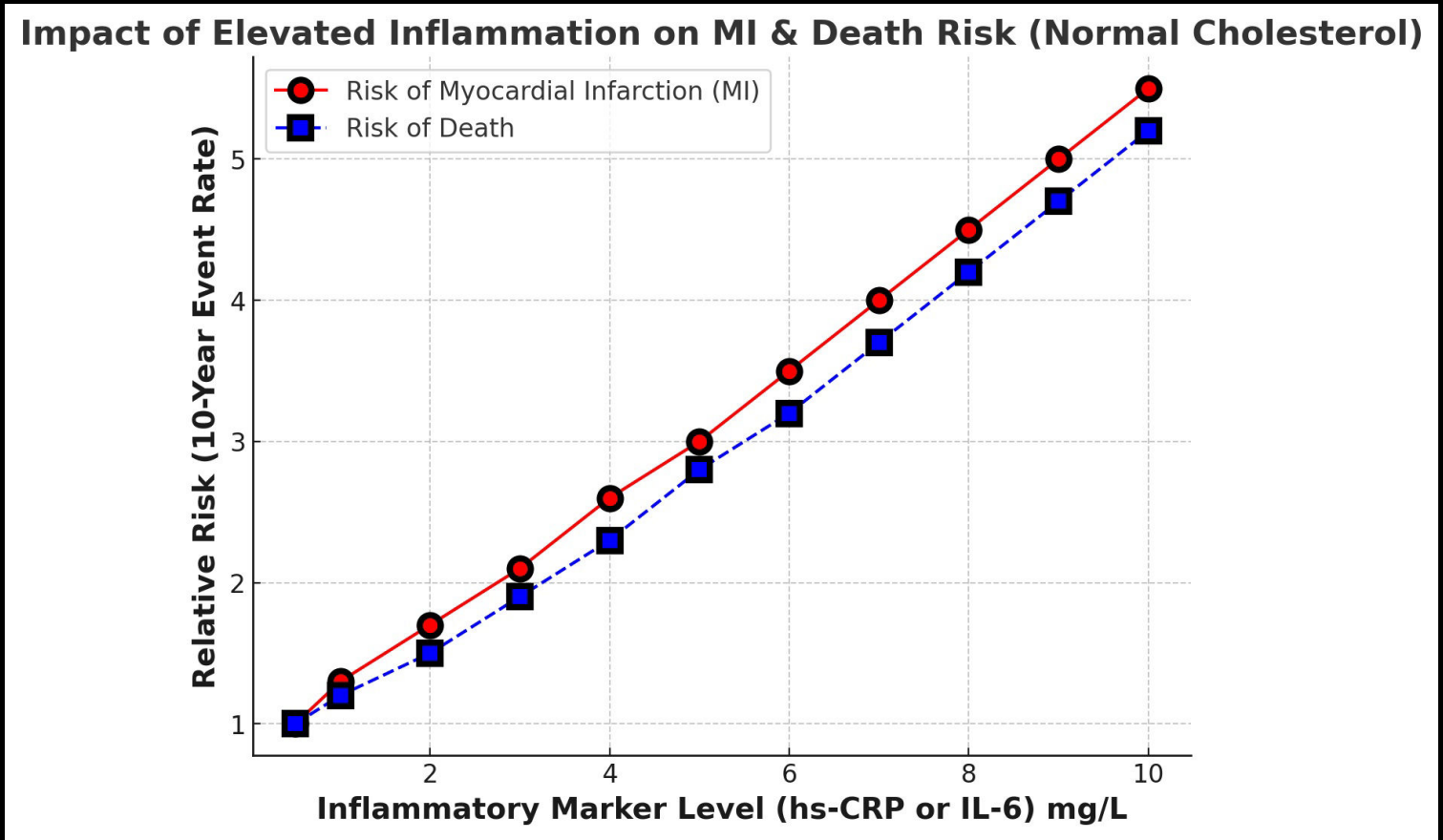


What are we trying to prevent?



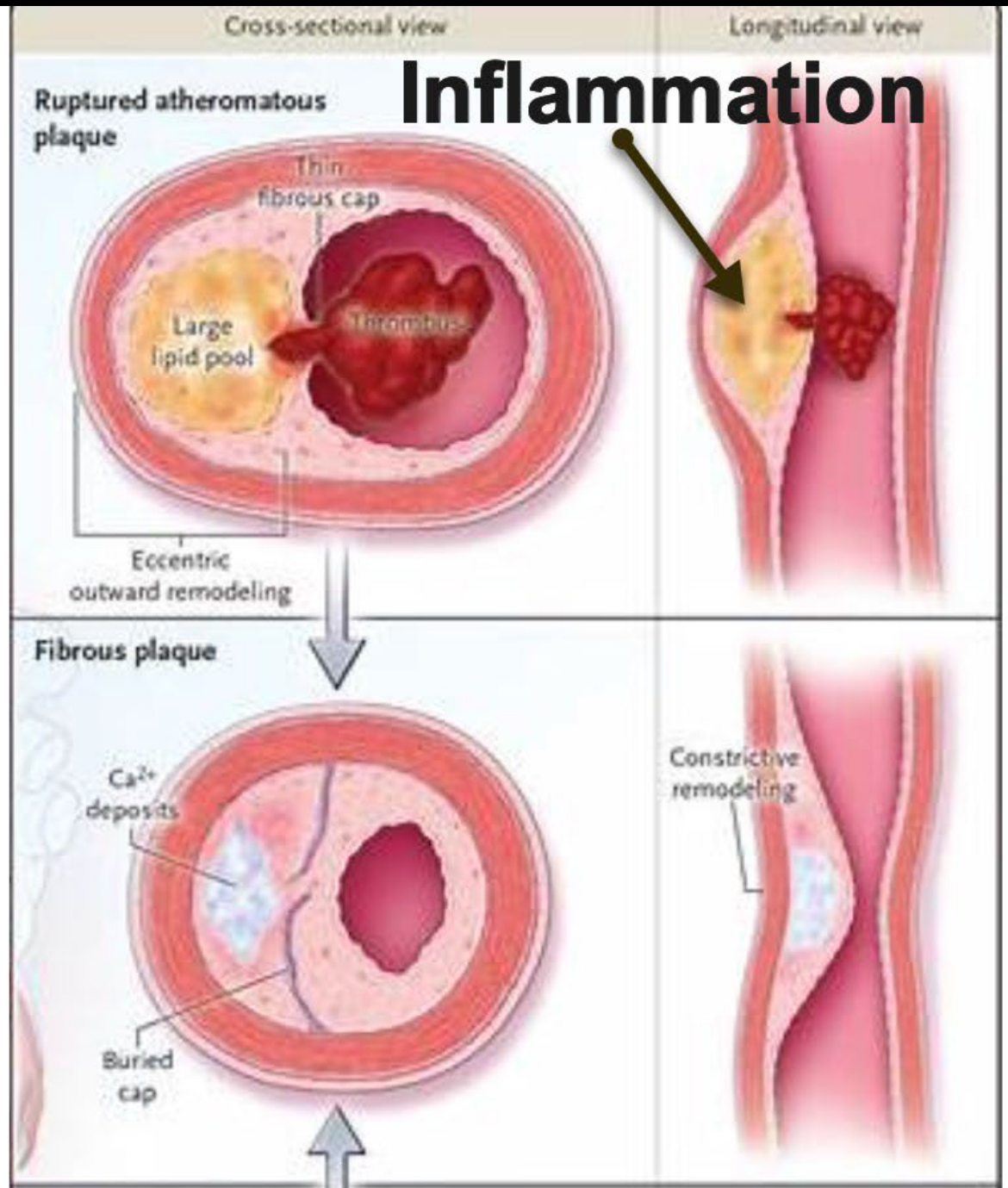


Hs-CRP andIL-6 Risk for MI and Death



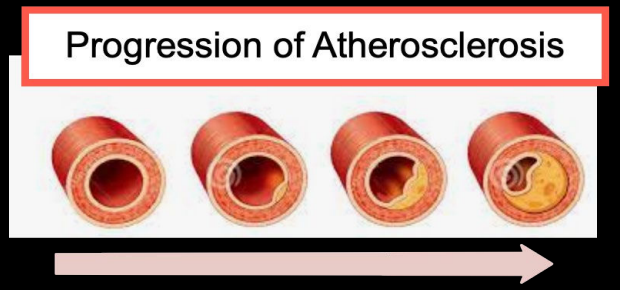
Acute Coronary Syndrome

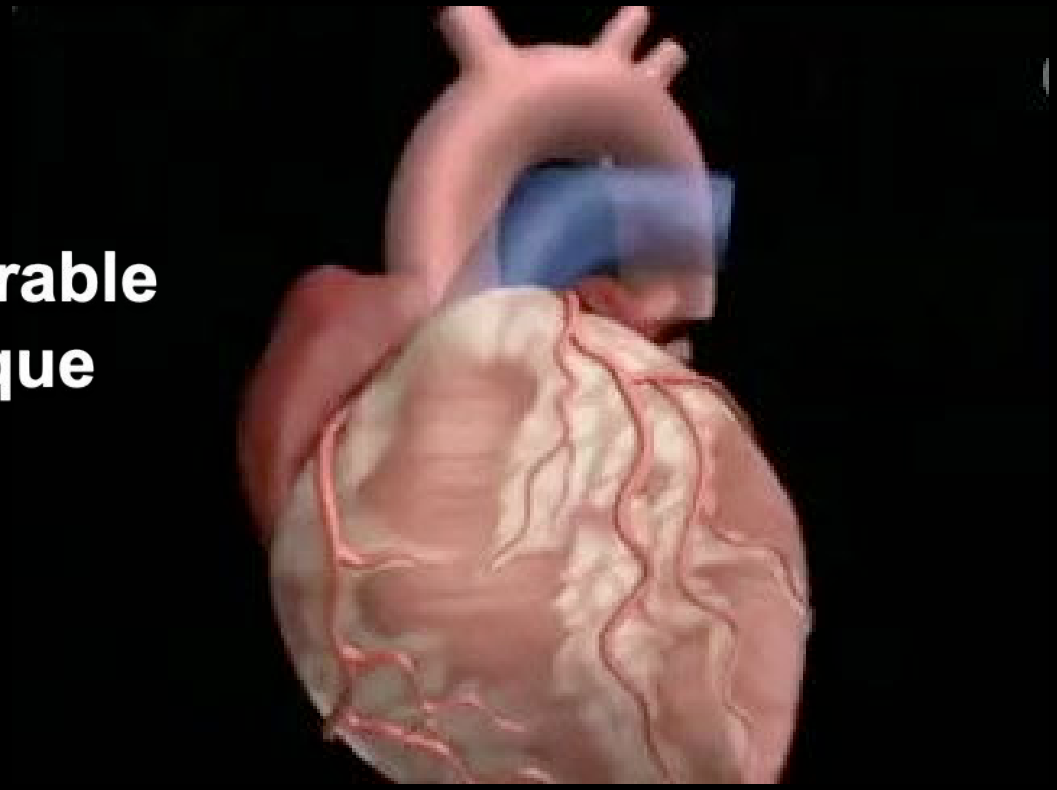
Stable Angina



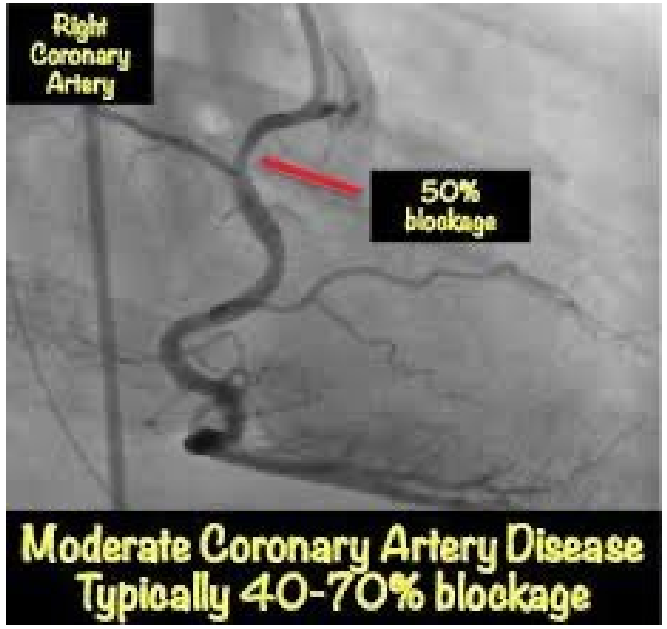
Inflammation differentiates stable from unstable Angina

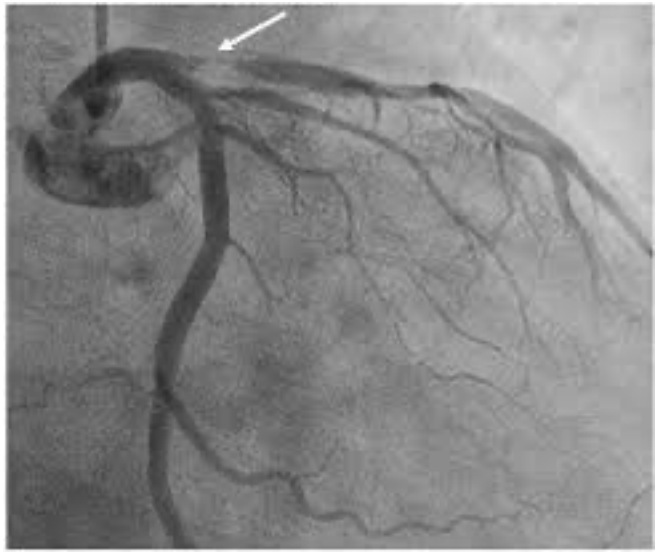
Vulnerable Plaque





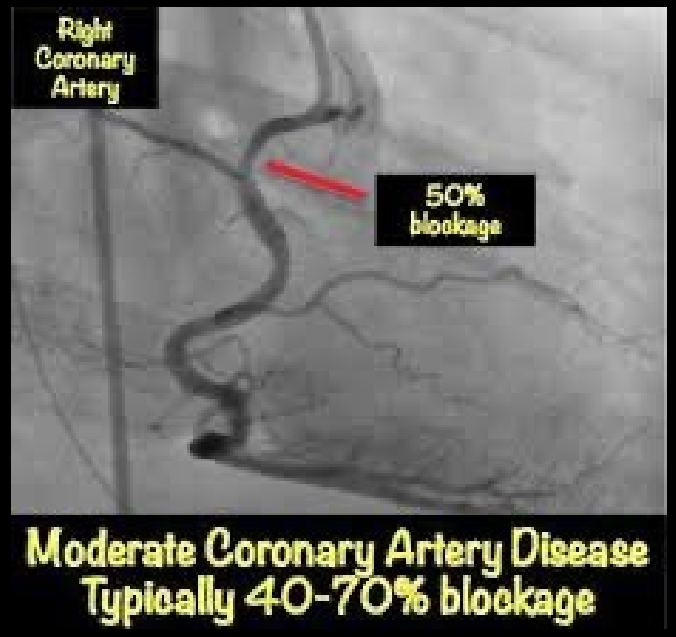
Which lesion is most likely to cause an acute myocardial infarction





ROSPECT trial (Stone GW, et al., New England Journal of Medicine, 2011) found that the **culprit lesions leading to myocardial infarction were often in vessels that had less severe narrowing (<70%) at baseline.**

Which lesion is most likely to cause an acute myocardial infarction



ROSPECT trial (Stone GW, et al., New England Journal of Medicine, 2011) found that the **culprit lesions leading to myocardial infarction were often in vessels that had less severe narrowing (<70%) at baseline.**

Asymptomatic Coronary Artery Disease
Less Testing and more Prevention

Coronary Artery PCI does not save lives in asymptomatic patients.
Trials: Ischemia (2020),Courage(2010)

Routine Stress testing in not indicated for most individuals
High risk
5 yr. p CABG

[redacted]

Quotes for illustration purposes only

Risk Stratification for Coronary Atherosclerosis

Traditional

Smoking
Lipids
Hypertension
Diabetes
Sedentary Lifestyle
Obesity
OSA
HS-CRP

Precision

Coronary Calcium
Carotid Doppler
AI Analysis

Risk Factors for Coronary Artery Disease

Modifiable Risk Factors

- Cigarette Smoking
- Hypertension
- Hyperlipidemia
- Sedentary Lifestyle
- Obesity
- Diabetes

Non-Modifiable Risk Factors

- Family History
- Age
- Gender

Advanced Risk Assessment Markers

- Coronary Calcium Score
- Carotid Doppler Intima-Media Thickness
- C-Reactive Protein (CRP)

Profile: Ann

63-year-old white female Accountant

History

No Cardiac history. Post menopausal, Hypertension: No RX, Sedentary

Exam and Labs

5’3 166 lbs Waist 37»
BP 135/85BMI 31 kg/m^2

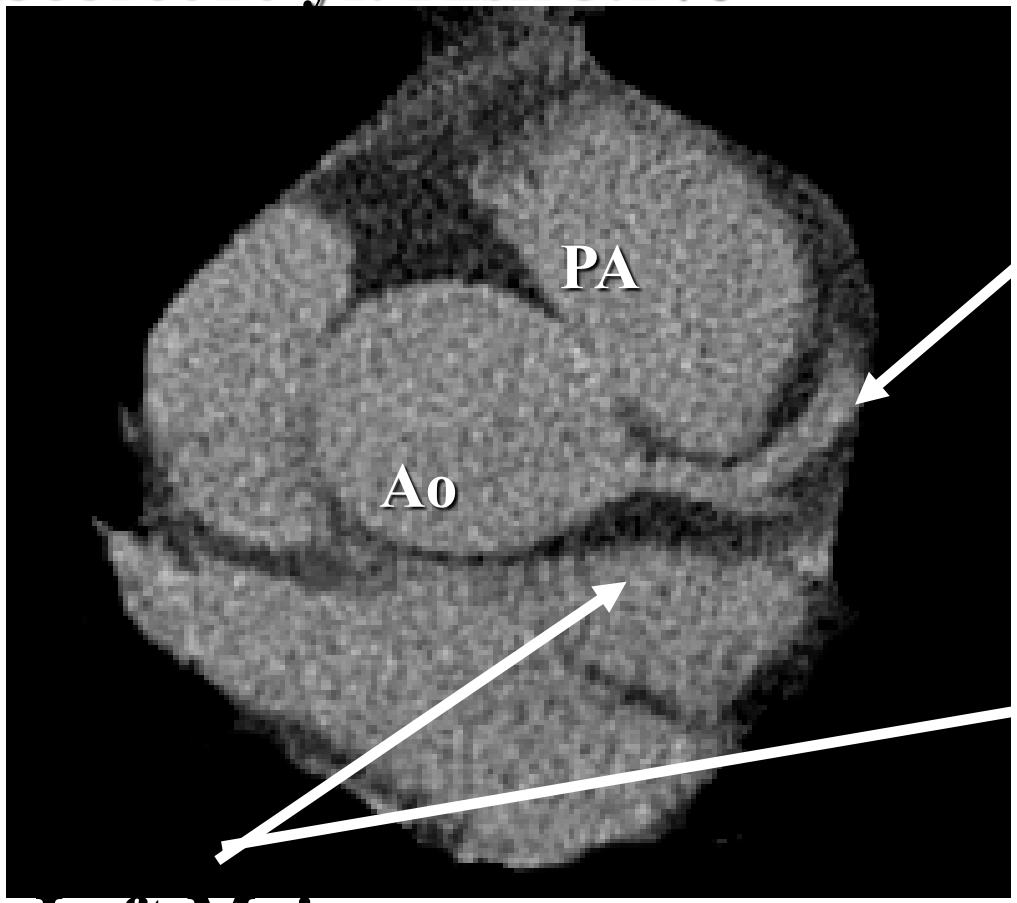
Assessments

CRP 4.0
A1C 5.7%

TG 220 mg/dL
HDL-C 35 mg/dL
LDL-C 120 mg/dL

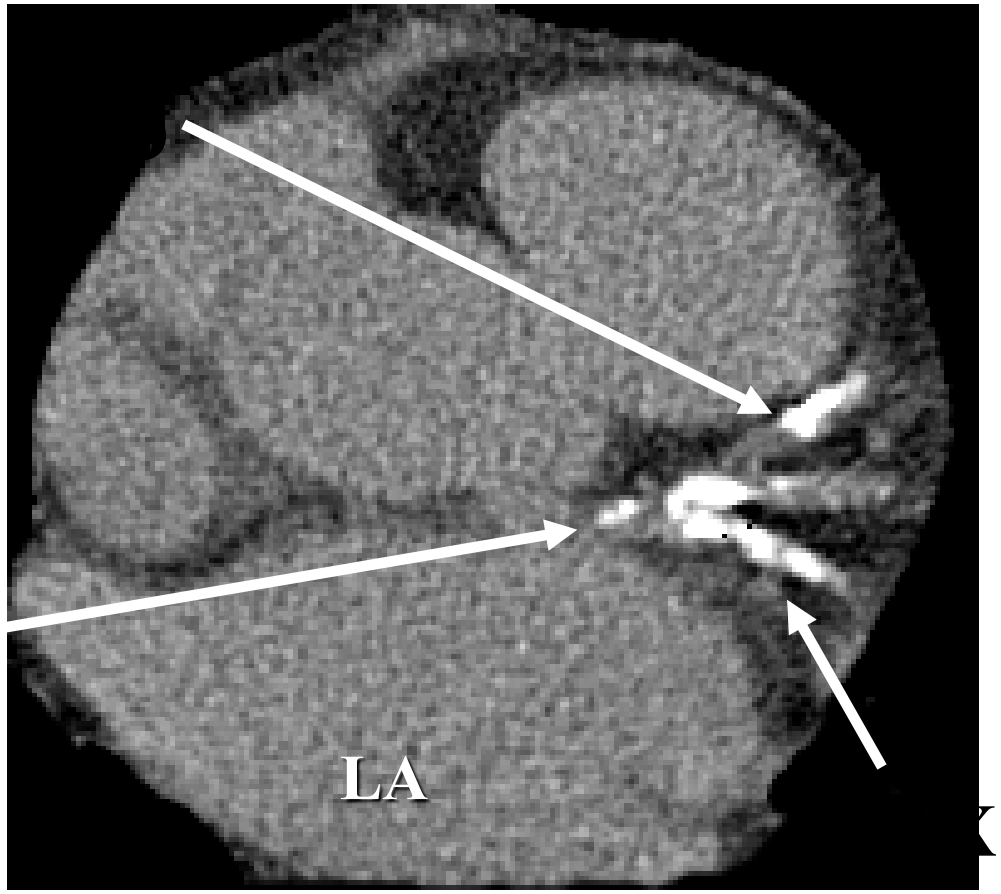
CT Coronary Artery Calcium Score

Score010 yr. Risk 5.1%



Left Main

Score 35010 yr. risk 11%



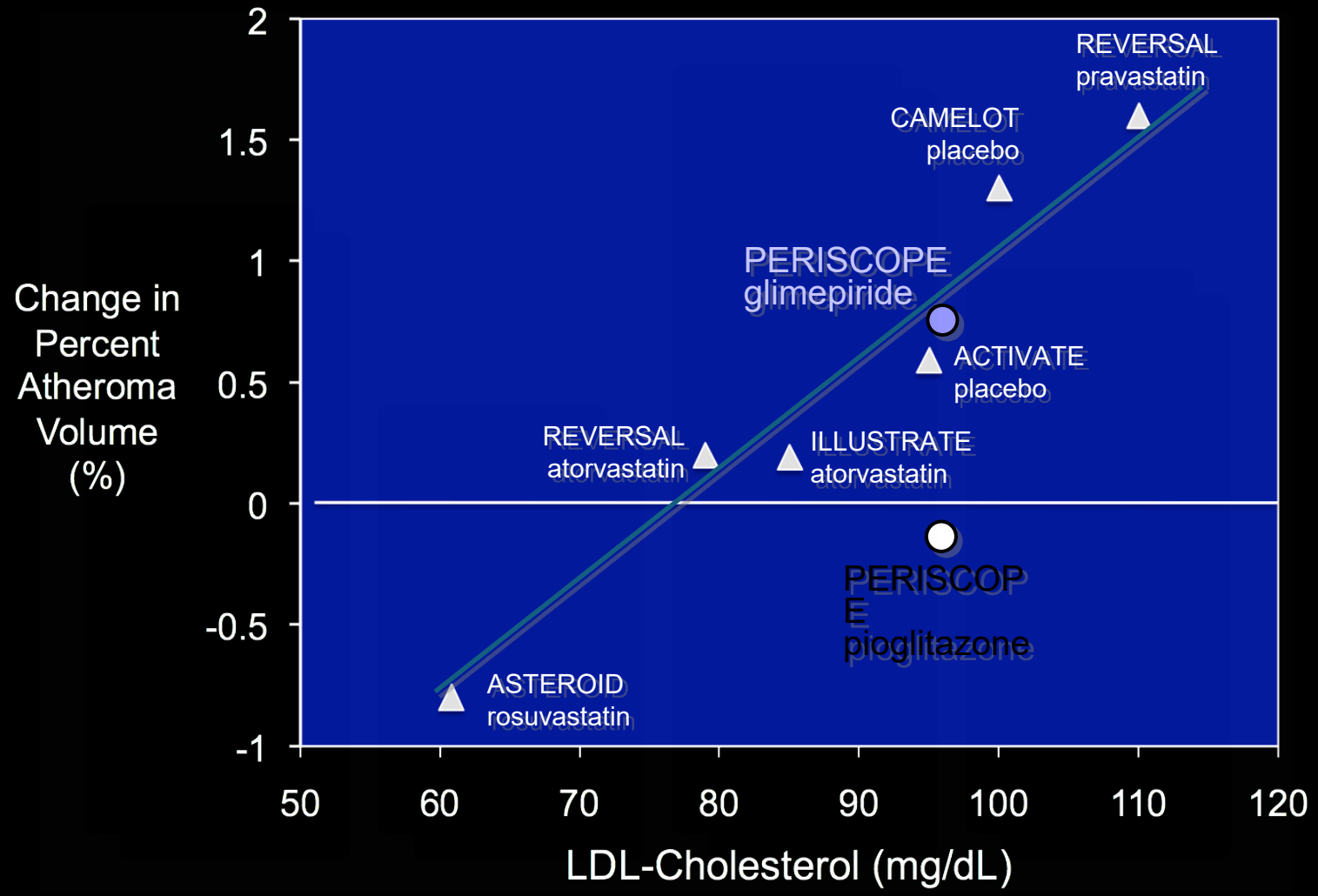
Take-Home Messages

- CAC score is a powerful tool for cardiovascular risk stratification
- High CAC scores warrant aggressive lipid-lowering therapy
- CAC = 0 can help avoid unnecessary medication in select patients
- Use CAC scoring in intermediate-risk individuals for better clinical decisions

Lipid Management for Primary Prevention LDL 70-189 mg/dL

- Low risk (<5%): Lifestyle changes only
- Intermediate risk (7.5-19.9%*: Moderate-intensity statin
- High risk (≥20%): High-intensity statin, aiming LDL <70 mg/dL

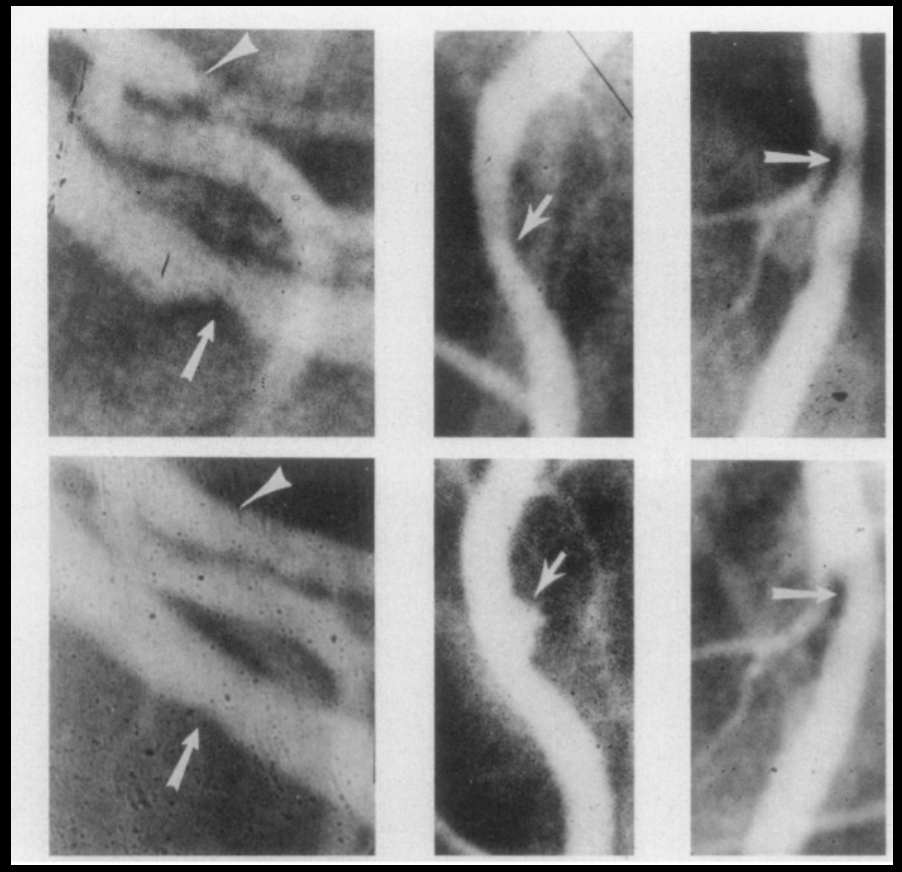
Lower LDL Less Plaque
?Does that translate to outcomes?



Lower LDL Cholesterol to Reverse Disease

Before

3 years Later

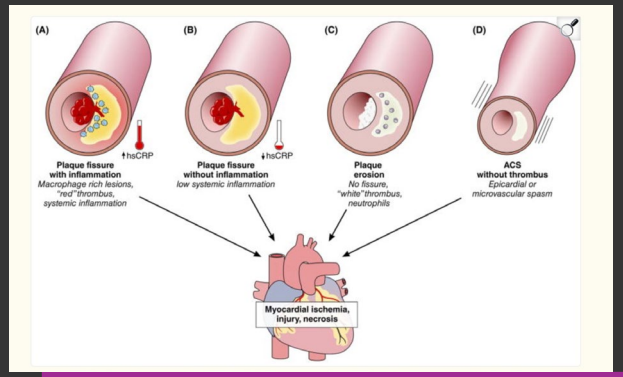


Moderate vs. High-Intensity Statins

- **Moderate-Intensity Statins (LDL ↓30-49%)**
- - Atorvastatin 10-20 mg
- - Rosuvastatin 5-10 mg
- - Simvastatin 20-40 mg

- **High-Intensity Statins (LDL ↓≥50%)**
- - Atorvastatin 40-80 mg
- - Rosuvastatin 20-40 mg

Evaluation of Asymptomatic Coronary Artery Disease



Coronary Artery PCI does not save lives in asymptomatic patients.
Ischemia(2020), Courage(2010)

Routine Stress testing in not indicated for most individuals
High risk
5 yr. p CABG

Providers role : identify risk and recommend preventative interventions

Quotes for illustration purposes only

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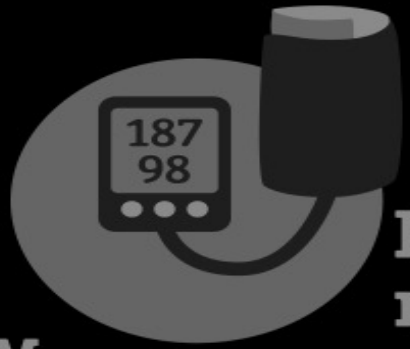
How to PREVENT it

Don’t smoke

Adopt a heart-healthy eating plan

Manage stress

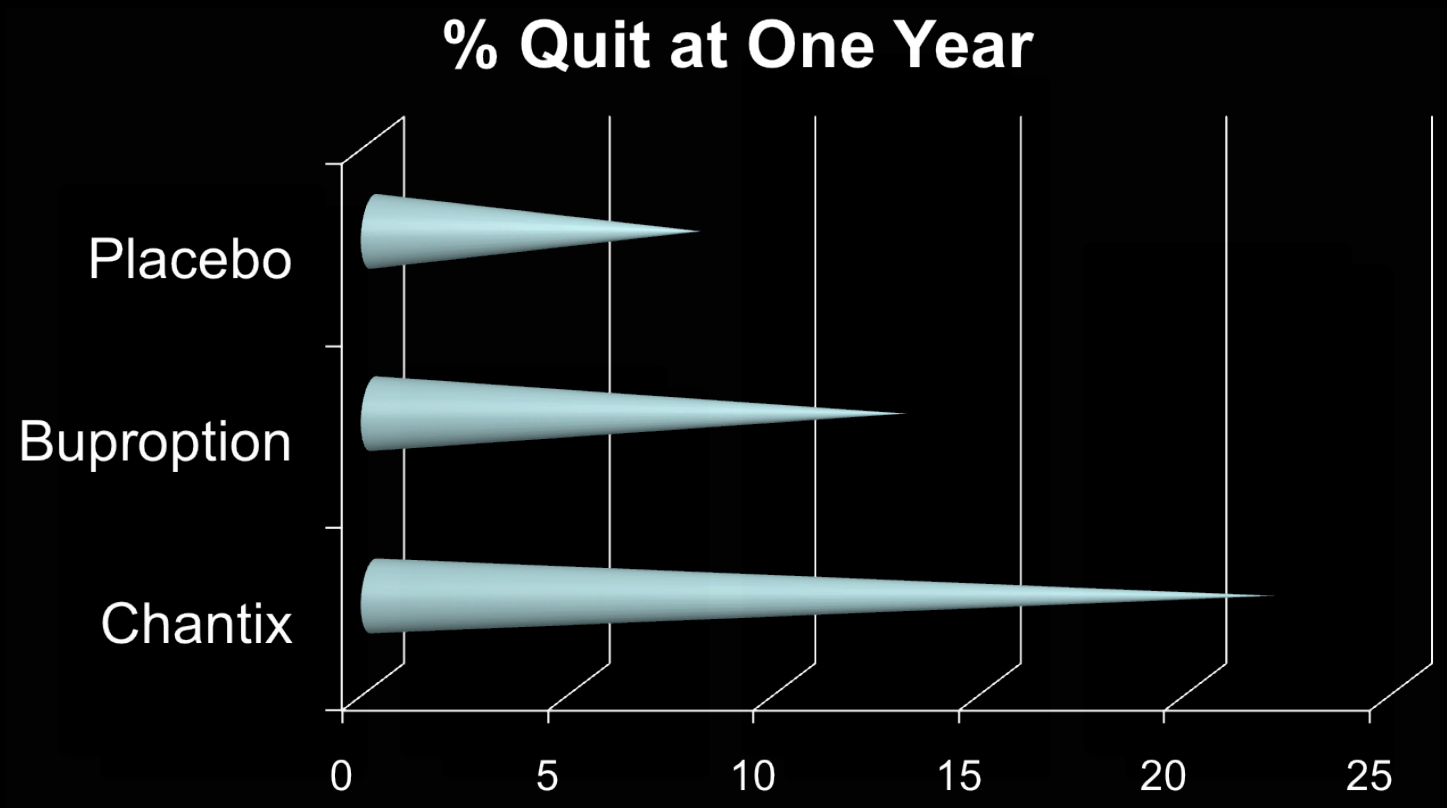
Exercise regularly



Know your numbers

Get to a healthy body weight

Drug Therapy and Smoking Cessation



Tobacco and electronic cigarettes

Research . February 24, 2018

Smoking E-Cigarettes Daily Doubles Risk of Heart Attacks

When Combined with Daily Cigarette Use, Heart Attack Risk Rises Five-Fold, Study Finds

By **Elizabeth Fernandez**

Mediterranean Lifestyle Heart Disease Prevention

Key Scientific Evidence

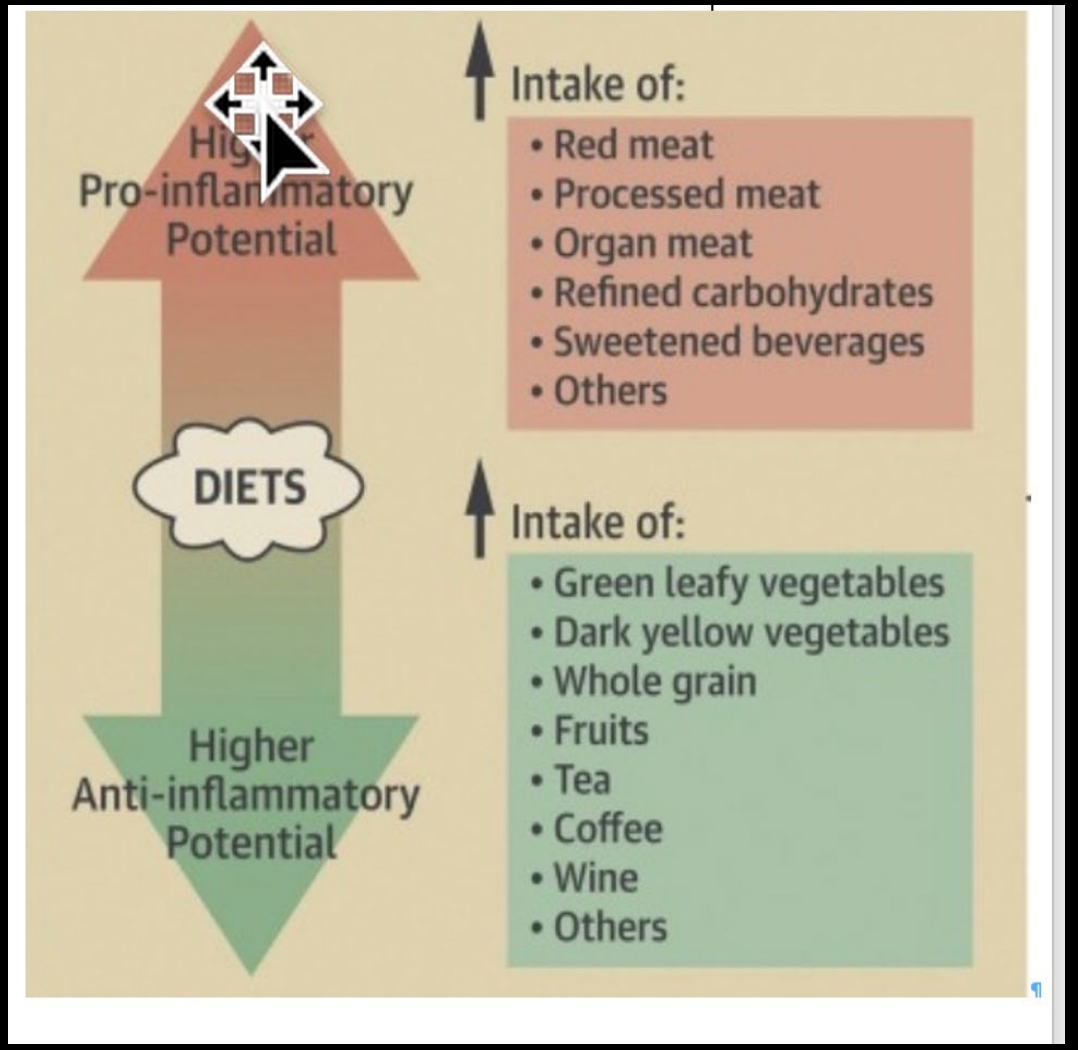
Cario vascular Benefits

- Reduces LDL cholesterol and triglycerides
- Reduces insulin resistance and fasting blood sugar
- Antihypertensive therapy
- Lowers blood pressure and inflammation .
- Associated with reduced cardiovascular
- - PREDIMED trial : 30% reduction in cardiovascular events.
- - Lyon Diet Heart Study : 70% reduction in recurrent heart attacks.

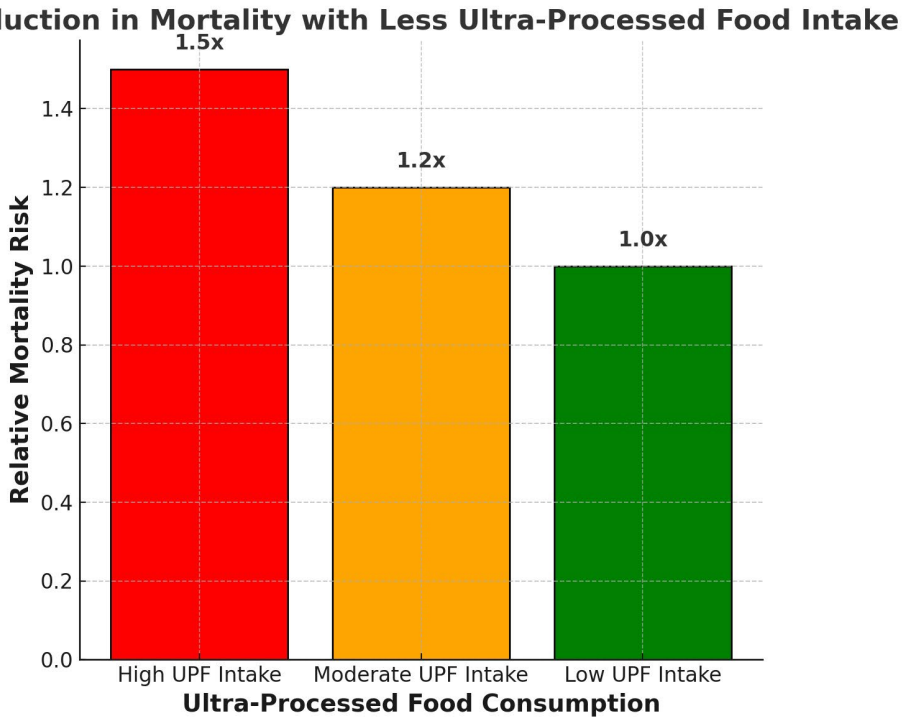
Mediterranean Lifestyle Elements

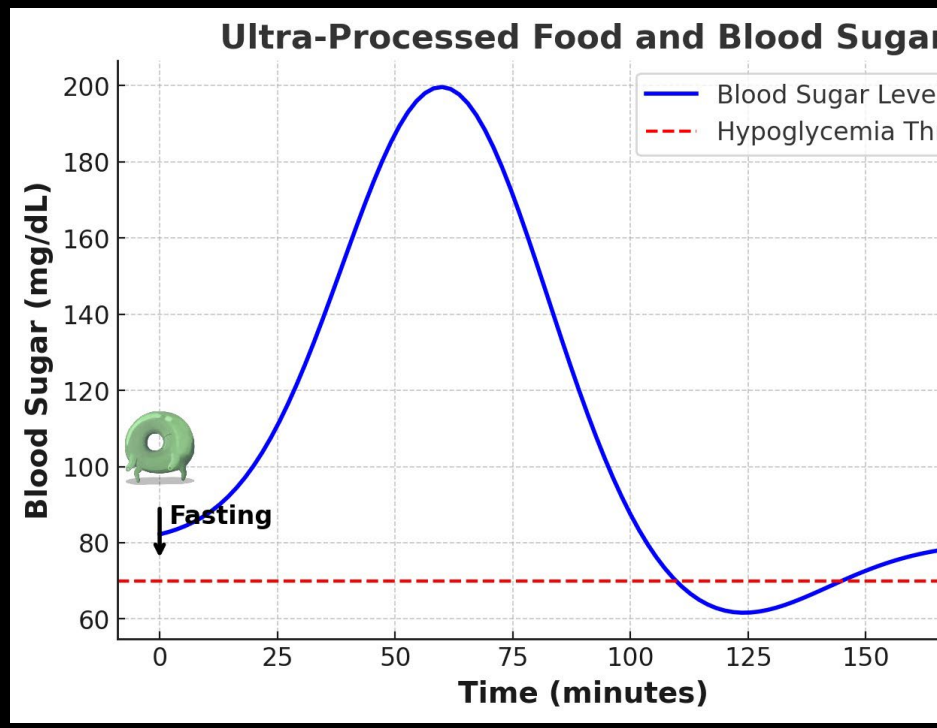
- Unrefined carbohydrates: fruits vegetables, whole grains cereals potatoes and beans.
- Fish: oily fish several times a week
- Low fat milk: and milk products
- Eggs: 3 to 5 per week
- Read Meat: several times a week lean cuts
- Nuts: nuts and seeds as snacks
- Olive oil: virgin olive oil

Cardiovascular risk and anti-inflammatory diet

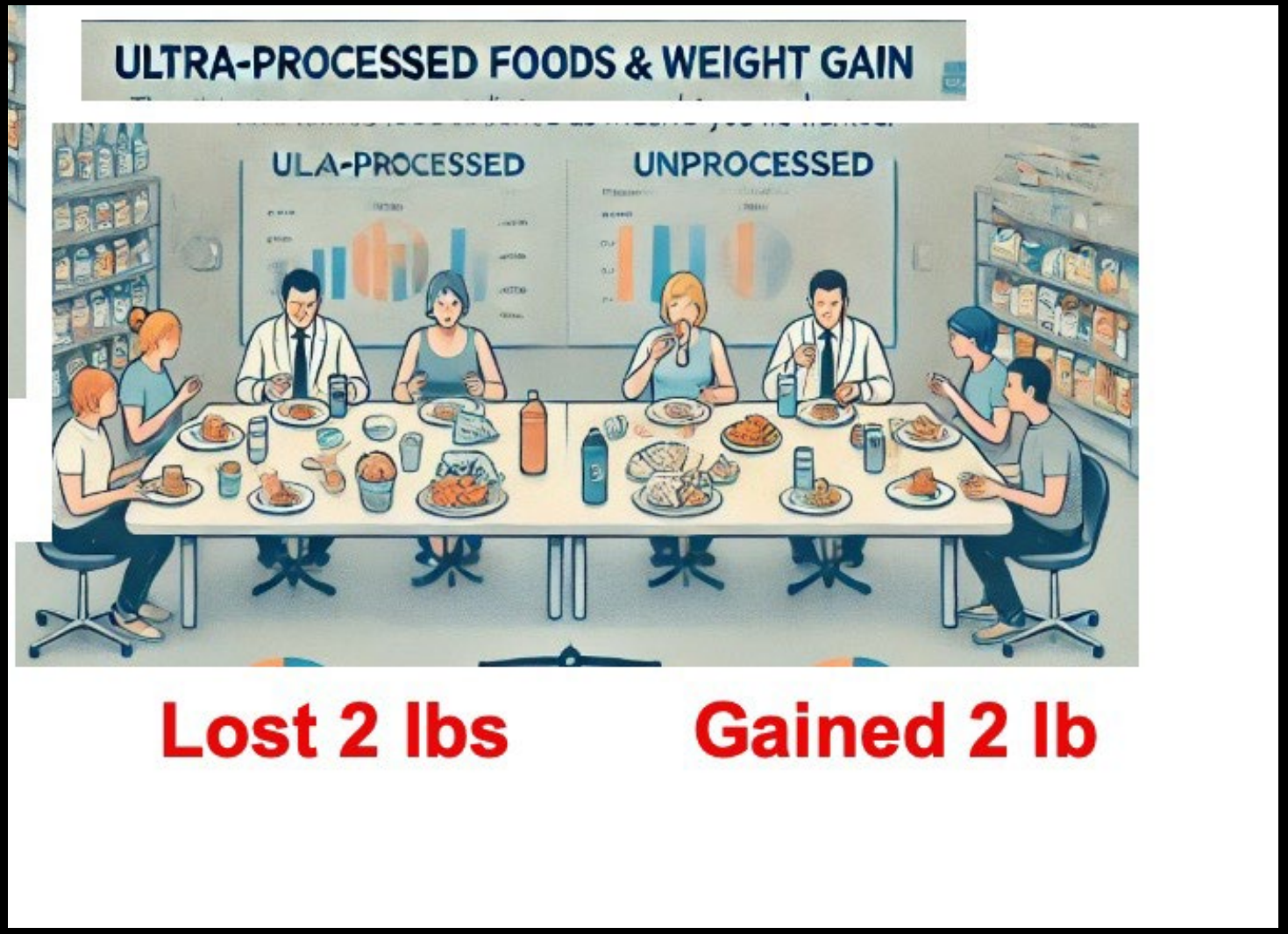


Ultra processed food is poison for the heart



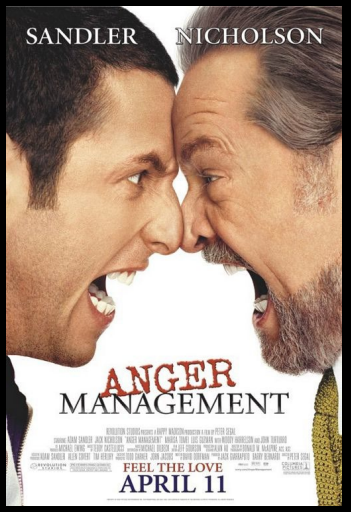


Ultra processed food and weight gain



Which Diet for You

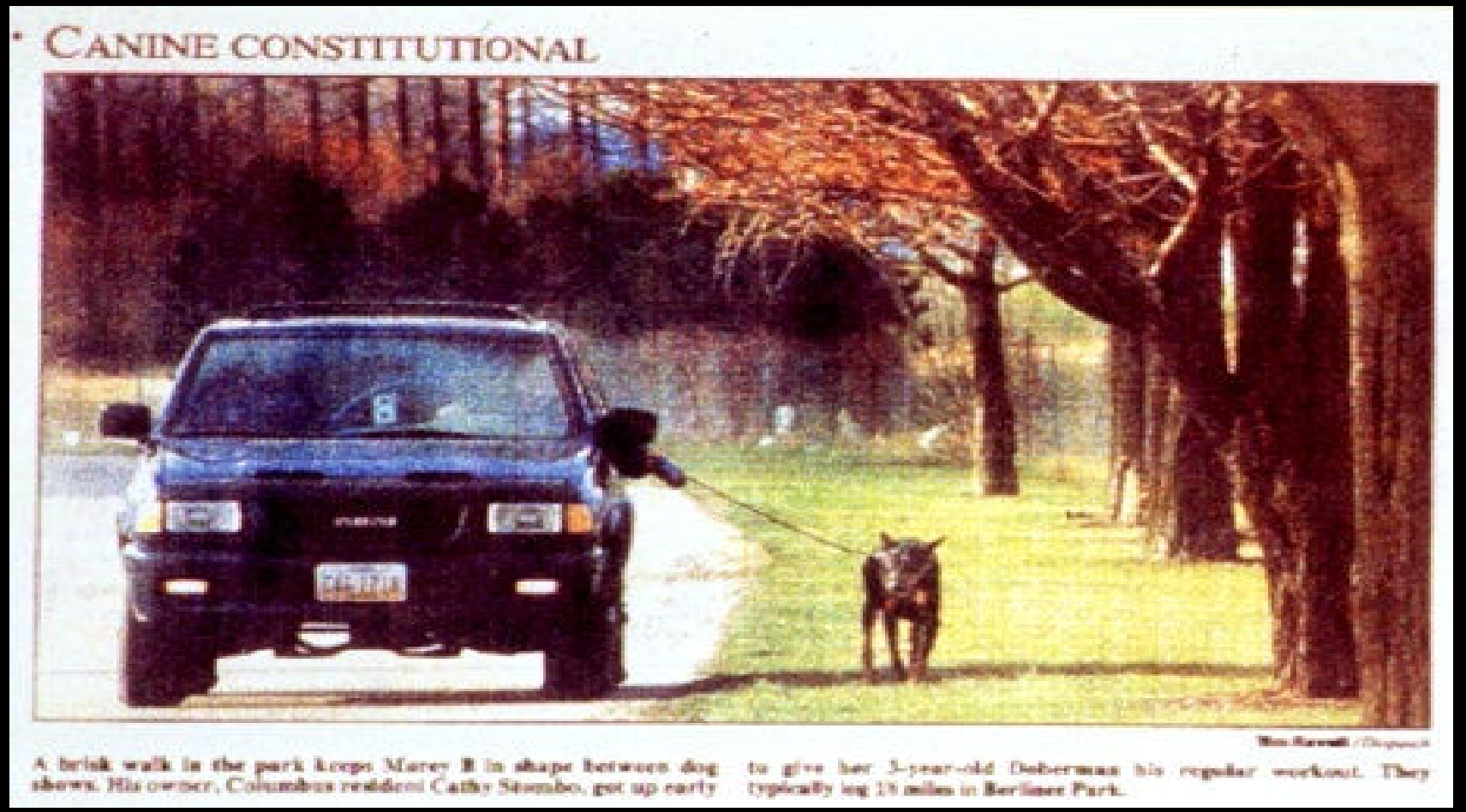
Food Fight at ACC2002



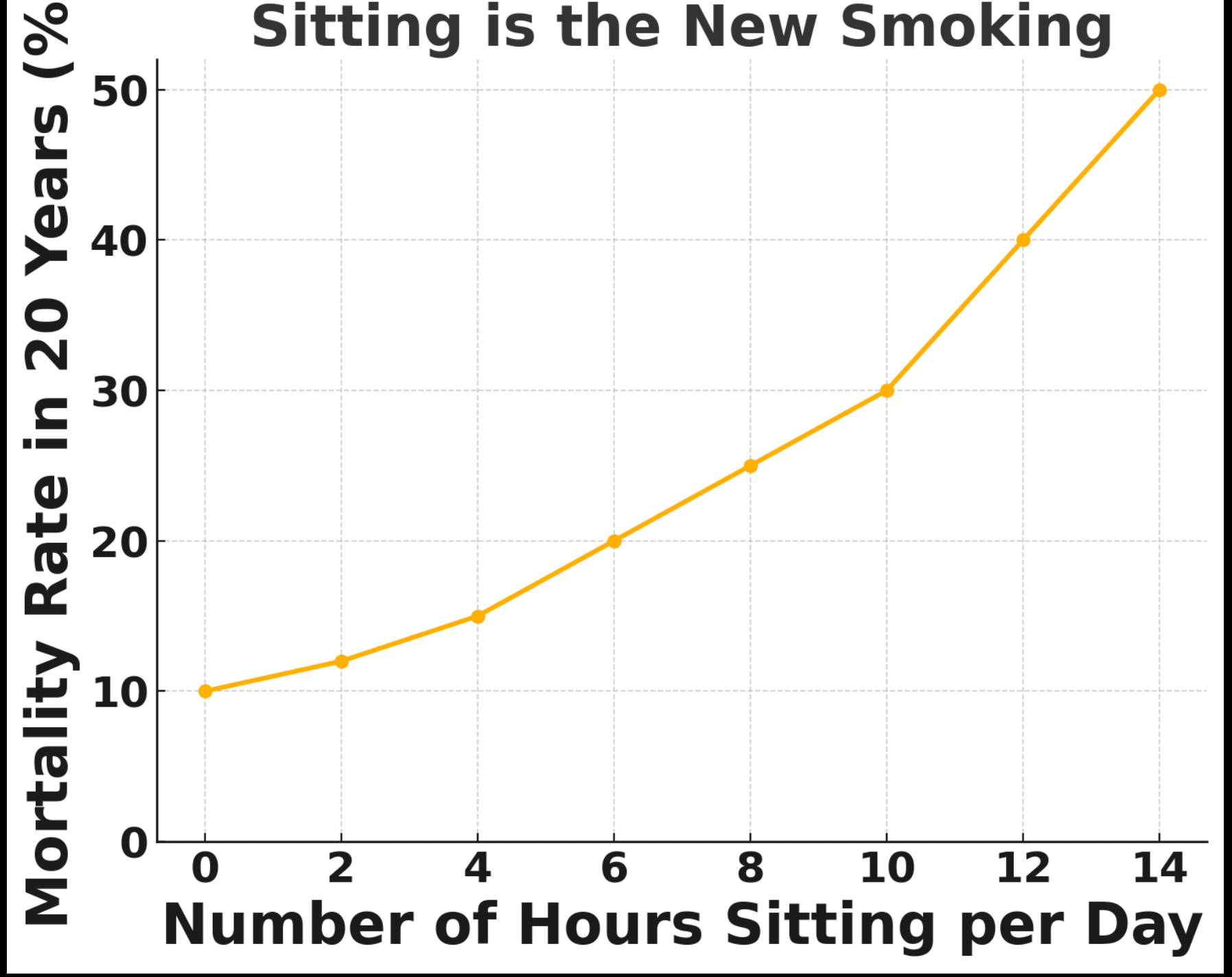
Dr. Robert Atkins "The government has been pushing a low-fat, high-carbohydrate diet that is creating an epidemic of insulin resistance and hyperinsulinemia."

Dr. Dean Ornish: "I may be old fashioned," Ornish carped, "but I believe you should first have the scientific data, then write the book."

You said if I got a dog, i would enjoy exercising

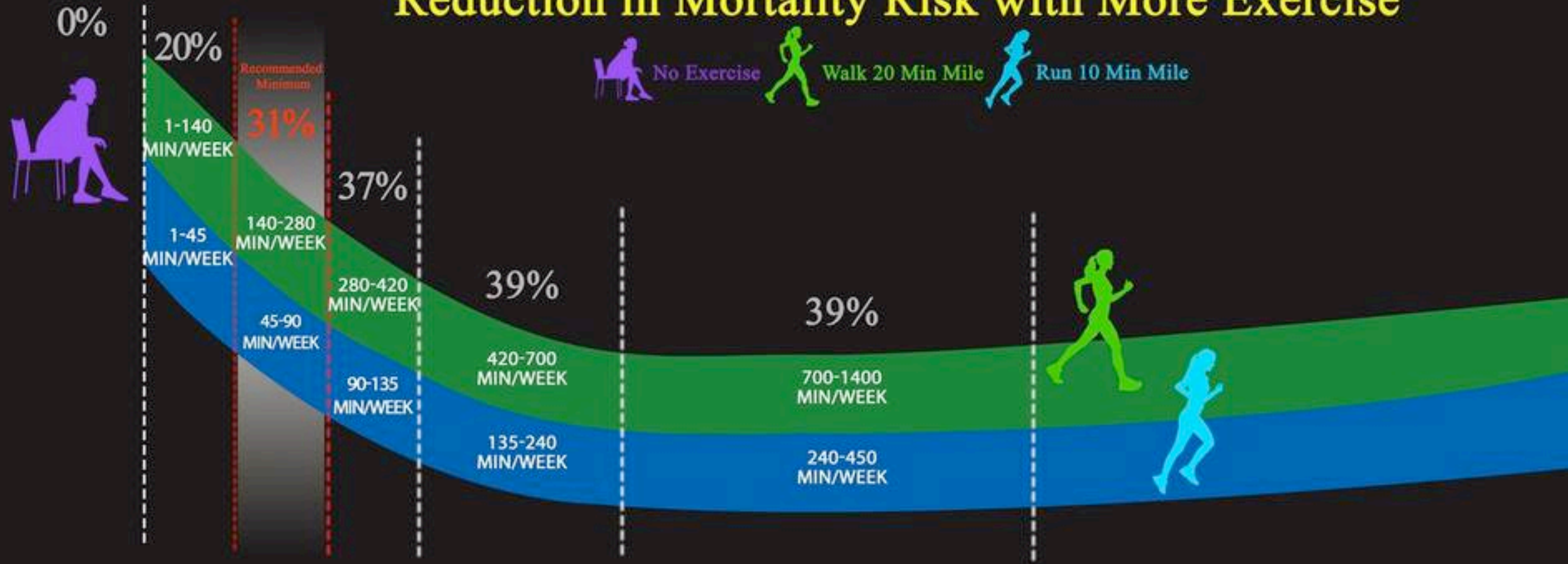


SITTING
IS THE NEW SMOKING


Sitting is the New Smoking
Mortality Rate in 20 Years (%
0
10
20
30
40
50
0
2
4
6
8
10
12
14
Number of Hours Sitting per Day

Exercise

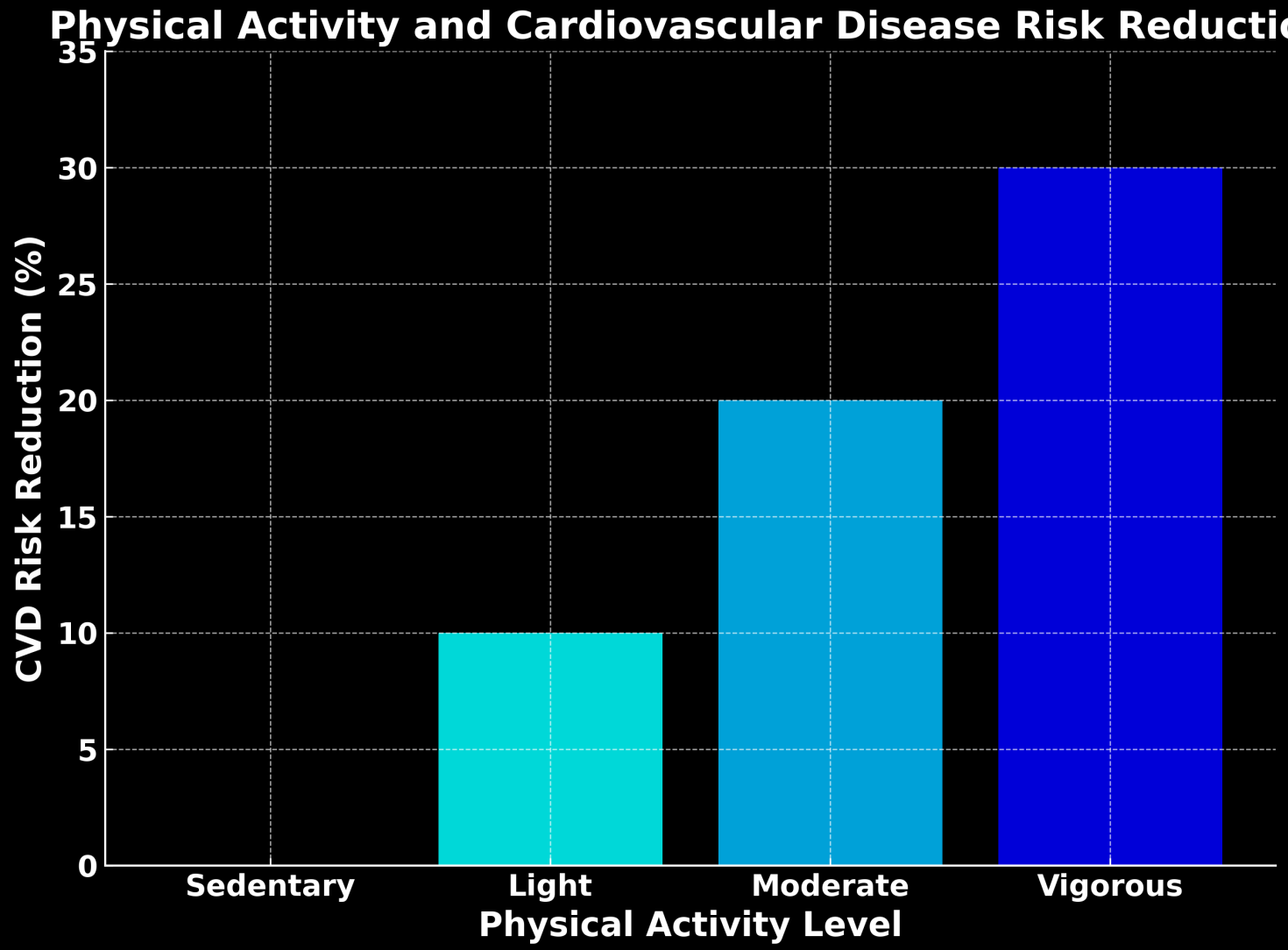
Reduction in Mortality Risk with More Exercise



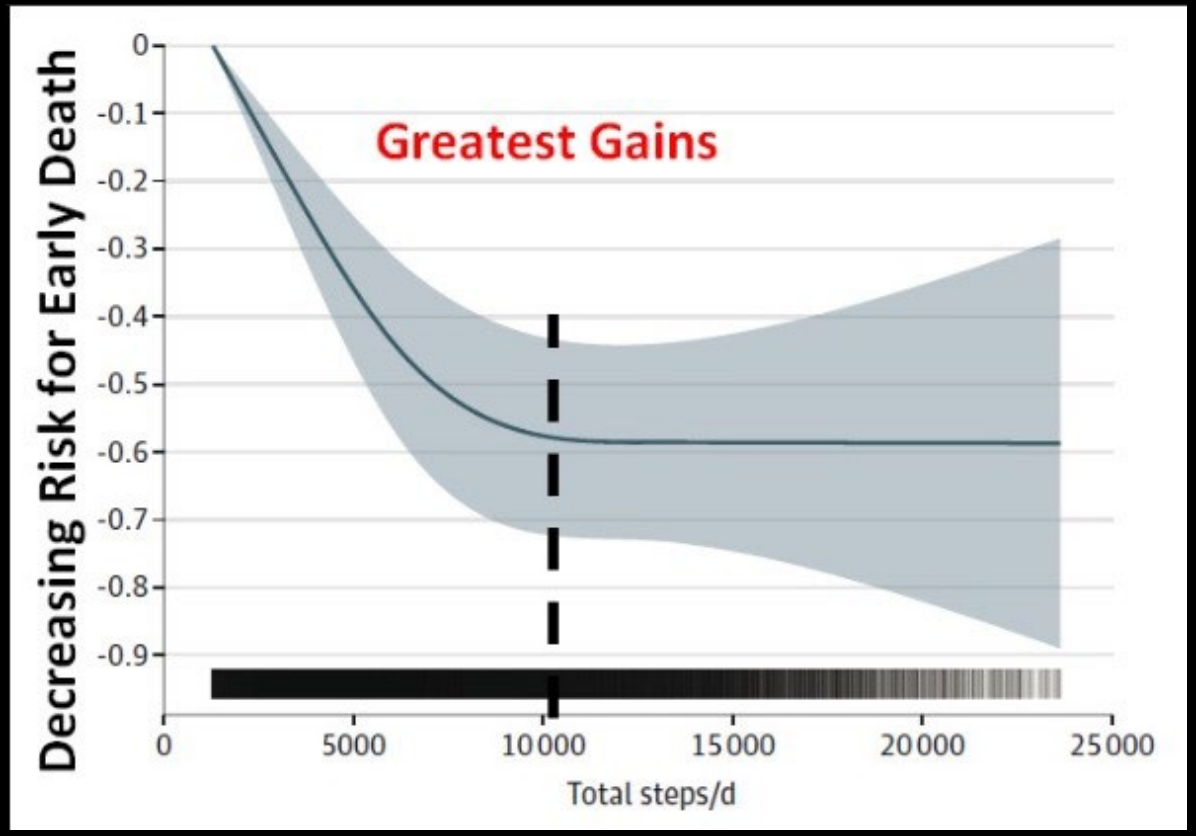
This infographic summarizes the findings as reported in the manuscript published by Arem, et.al. *JAMA Internal Medicine* 2015

@NCIEpiTraining

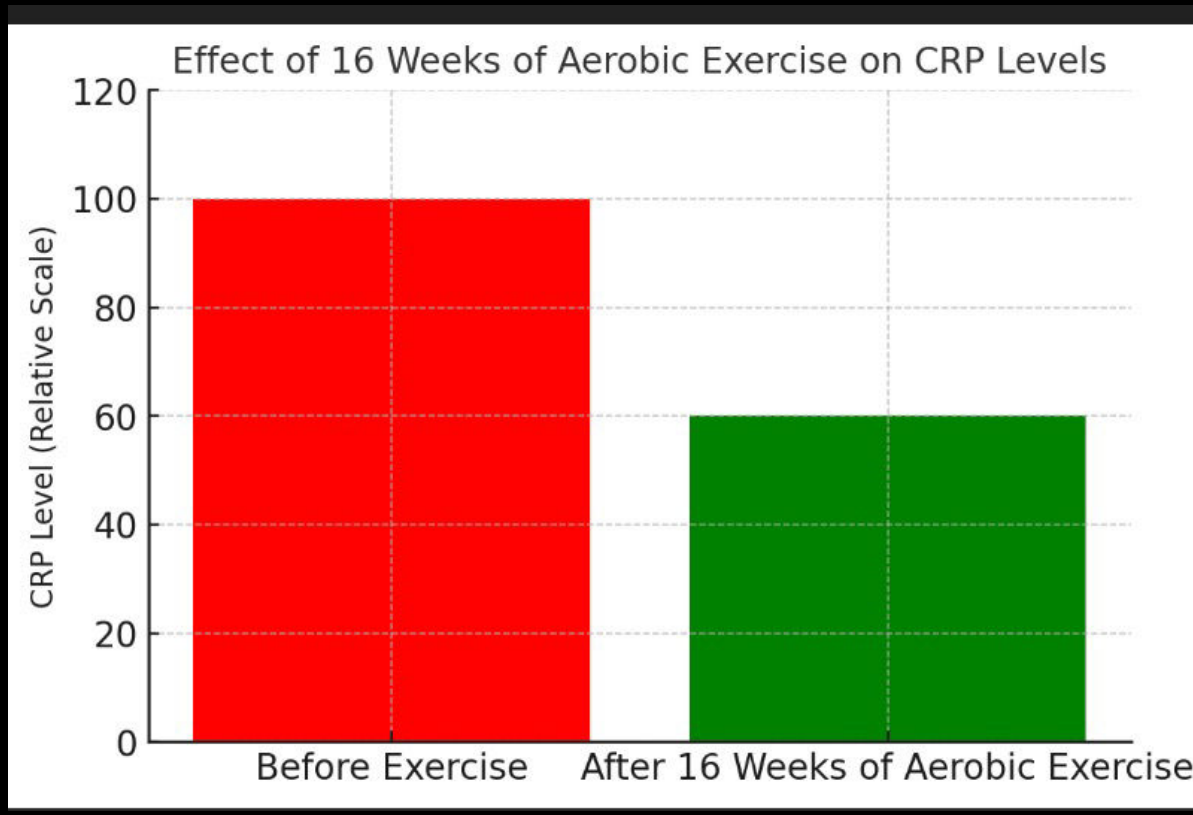
Physical Activity and Cardiovascular Disease Risk Reduction



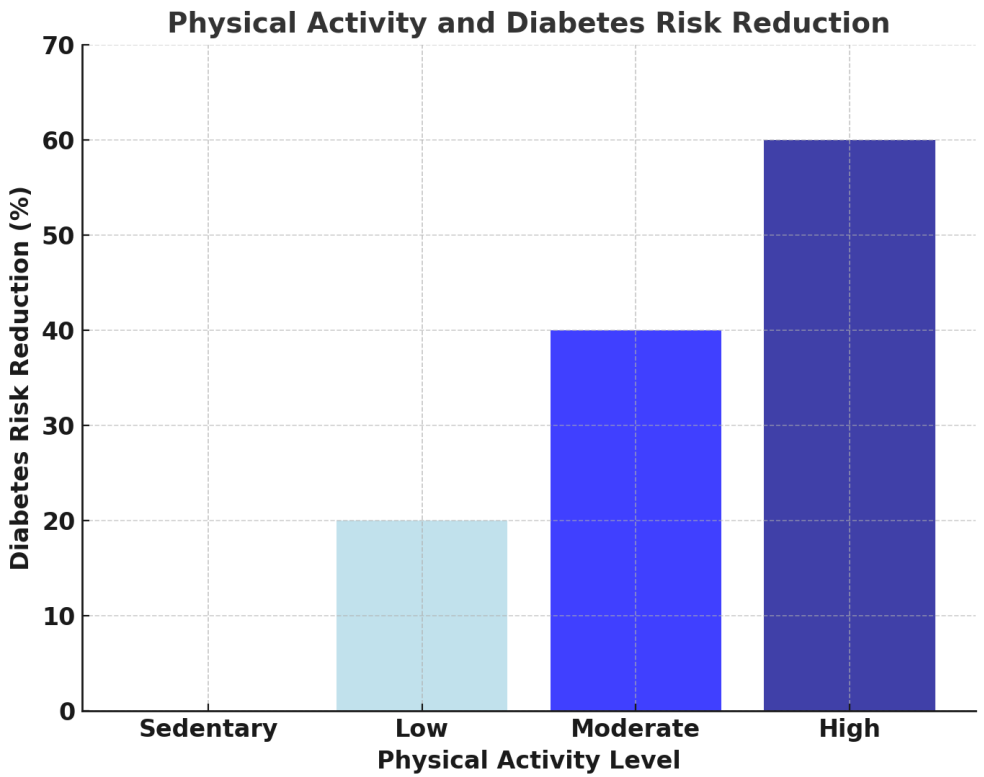
Step Count and Mortality.



Hs-CRP with exercise



Physical Activity and Diabetes Risk Reduction



Exercise Goals:

- Moderate-intensity aerobic 150 minutes/wk.
- Intense 75 minutes/week
- Strength, Balance, Tone 20 minutes twice a week.

Kraschnewski JL et al, Prev Med 2016 Jun;87:121-127

1997-2001 National Health Interview Survey: Strength Training (ST) vs. All-cause Mortality in U.S. Adults ≥65 Years Old

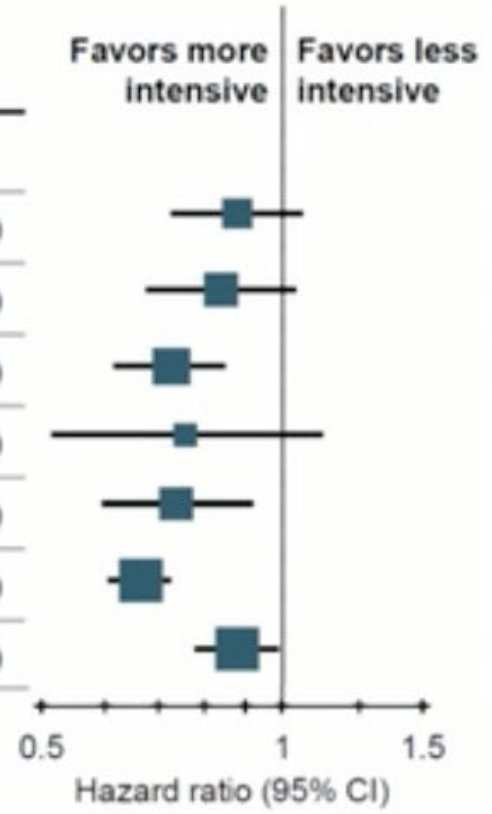
Guidelines for Prevention, Detection, Evaluation and Management of HBP in Adults 2017

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

Aggressive BP lowering Not always effective in reducing CV risk

Major CVD Events

	No. of events/total No.		
	More Intensive	Less Intensive	Hazard ratio (95% CI)
<130 mm Hg vs ≥130 mm Hg			
ACCORD, 2010	208/2362	237/2371	0.88 (0.73-1.06)
SPS3, 2013	160/1501	188/1519	0.84 (0.68-1.04)
SPRINT, 2015/2021	264/4678	354/4683	0.73 (0.62-0.85)
RESPECT, 2019	46/633	59/630	0.76 (0.52-1.12)
STEP, 2021	147/4243	196/4268	0.74 (0.60-0.92)
CRHCP, 2023	808/17407	1127/16588	0.67 (0.61-0.73)
ESPRIT, 2024	547/5624	623/5631	0.88 (0.78-0.99)



European Society of cardiology Hypertension Guidelines 2024

New 2024 ESC categories

-Non-elevated

<120/70 mmHg

Rx NO

-Elevated

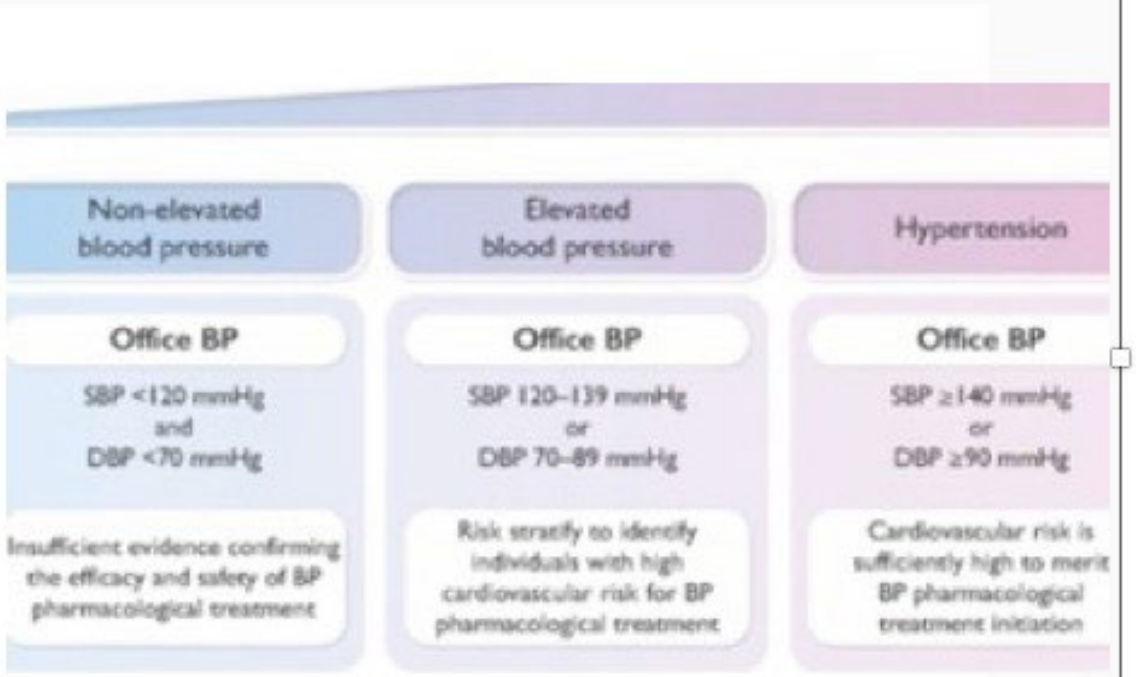
120-139/70-89 mmHg

Risk Based RX

-Hypertension

≥140/90 mmHg

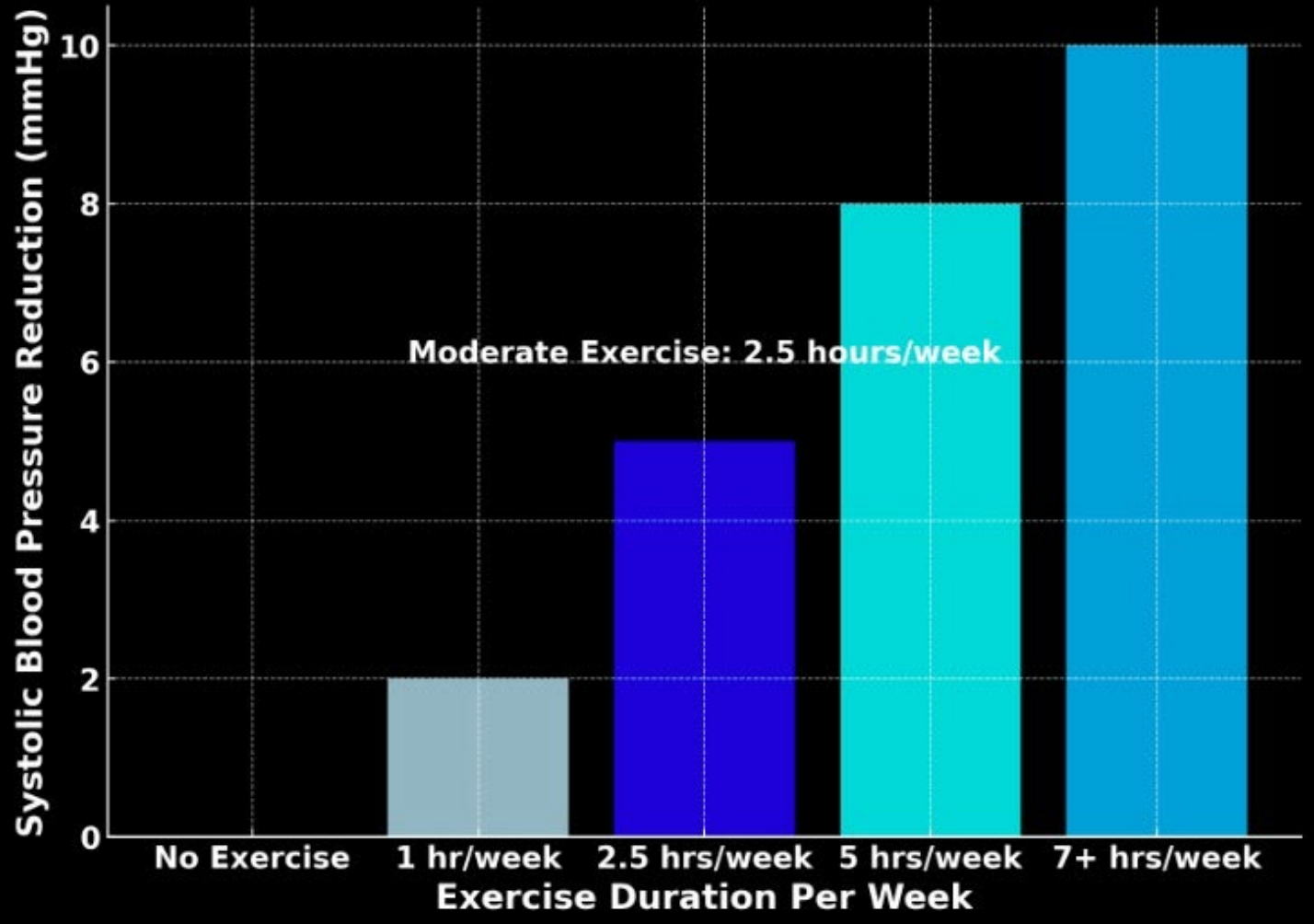
Rx Yes



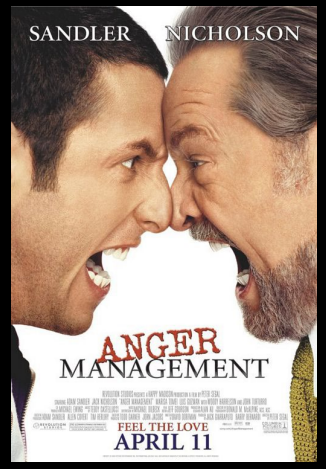
Therapy for Blood Pressure Control

BP Level	10-year risk	Therapy
120/79-90	-	Lifestyle
120-139/79-90	<10%	Lifestyle
120-139/79-90	≥ 10%	3 months Lifestyle then Medication
140/90	-	Lifestyle + Medication

Effects of Aerobic Exercise on Blood Pressure



Head and the Heart



Head and the Heart

- 3 to 4 times increased risk of death in first year following MI
- Psychosocial factors associated with CAD risk:
  - Type A personality
  - Hostility/Anger
  - Depression/Anxiety

Conclusions

- Cardiac Rehabilitation is a model for heart disease prevention
- 80% of heart attacks are related to lifestyle

- Risk assessment is critical in providing evidence-based care

- Nutrition and Exercise are the cornerstone of Rx for a healthy heart

- Successful Rx for a healthy heart requires psychological support

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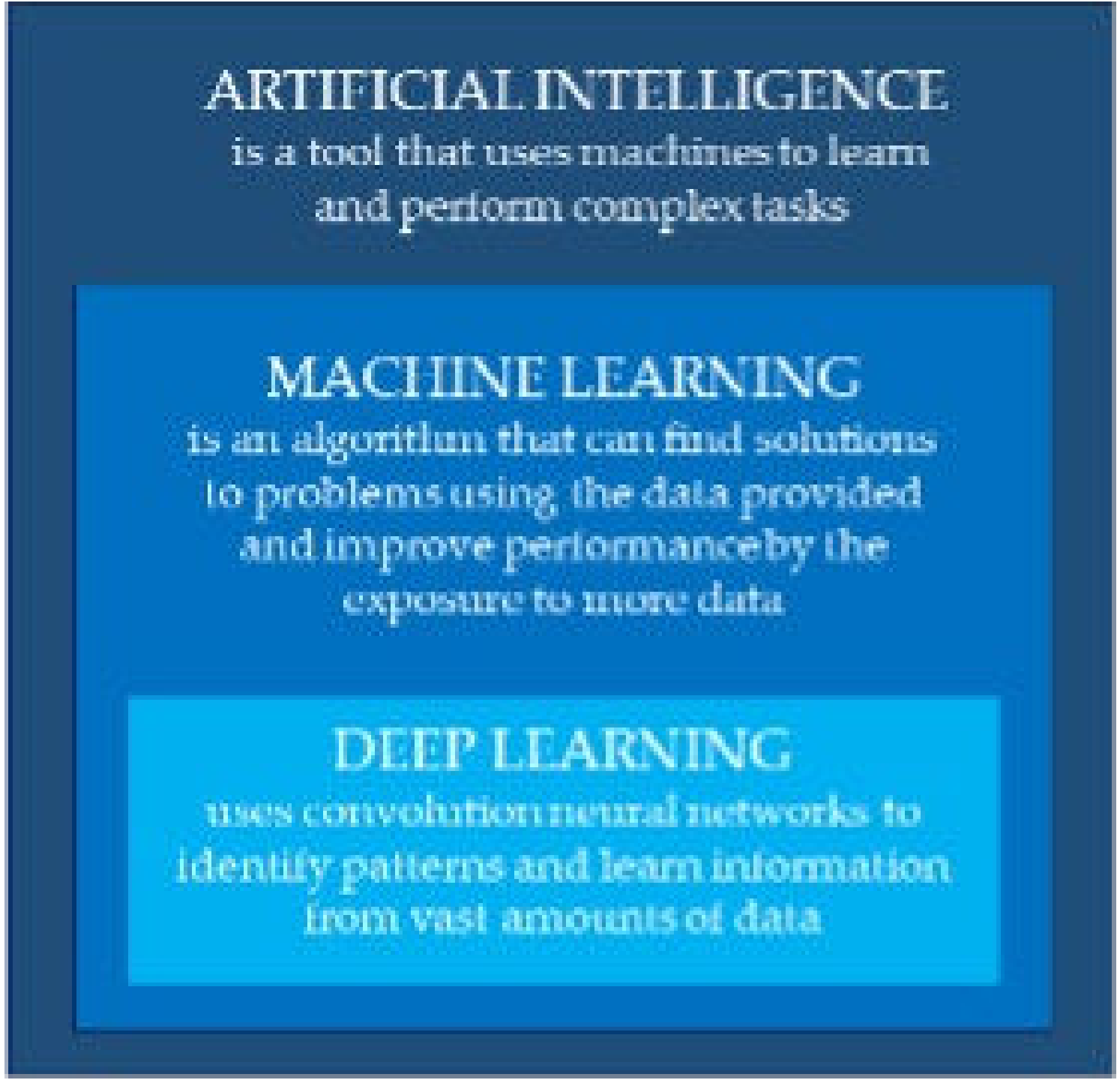
ARTIFICIAL INTELLIGENCE
is a tool that uses machines to learn
and perform complex tasks
MACHINE LEARNING
is an algorithm that can find solutions
to problems using the data provided
and improve performance by the
exposure to more data
DEEP LEARNING
uses convolution neural networks to
identify patterns and learn information
from vast amounts of data