

How Much Exercise is Good for Your Heart?

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January 17, 2015

Disclosures

- Merck
- Nihon Corp.

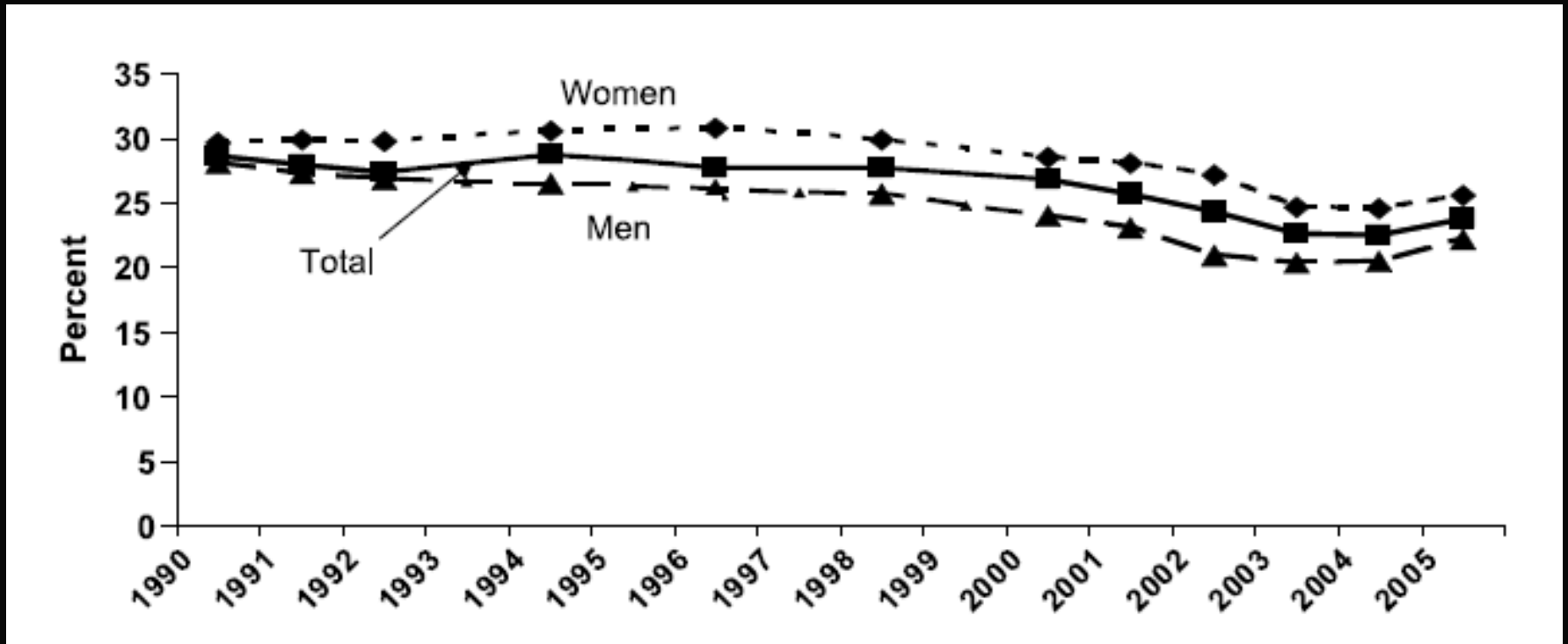
Case Presentation

- 45 yo male presents for routine evaluation; asymptomatic
 - Physical activity: none
 - Does not follow particular diet
 - Non-smoker
- Exam: BP 135/85, BMI 26
- Lab: glucose 110, lipids: TG 240, HDL 32

Physical Inactivity is Common

DATA FROM CDC BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM

Figure: Prevalence of Physical Inactivity in US Men and Women



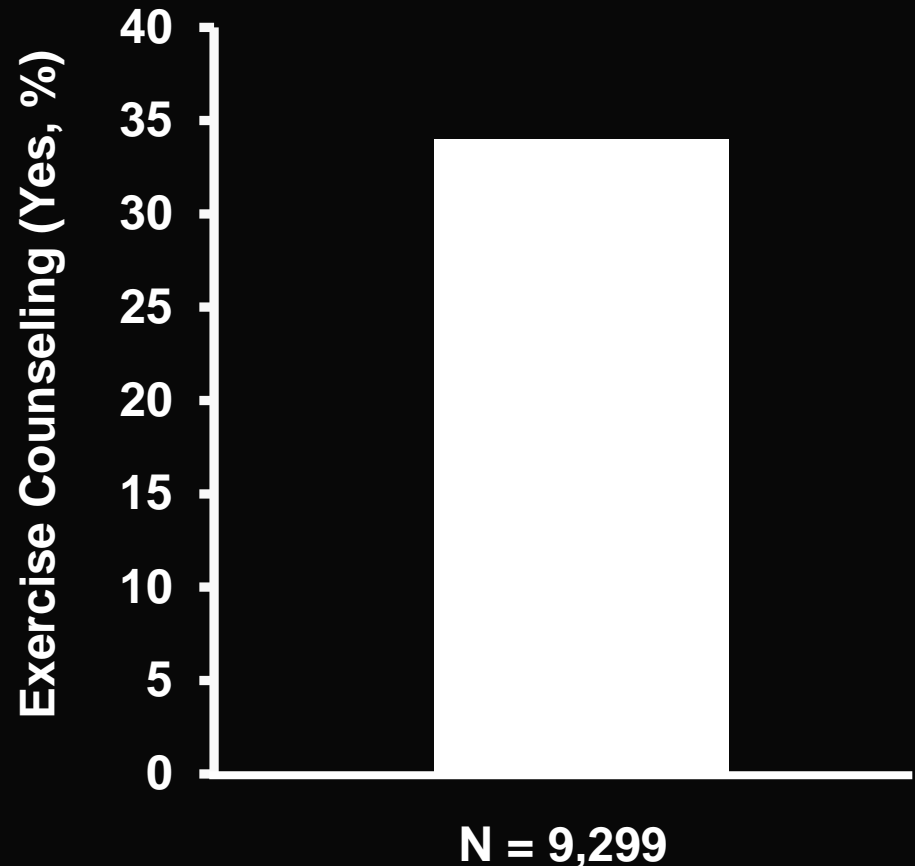


“What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?”

Physician Exercise Counseling

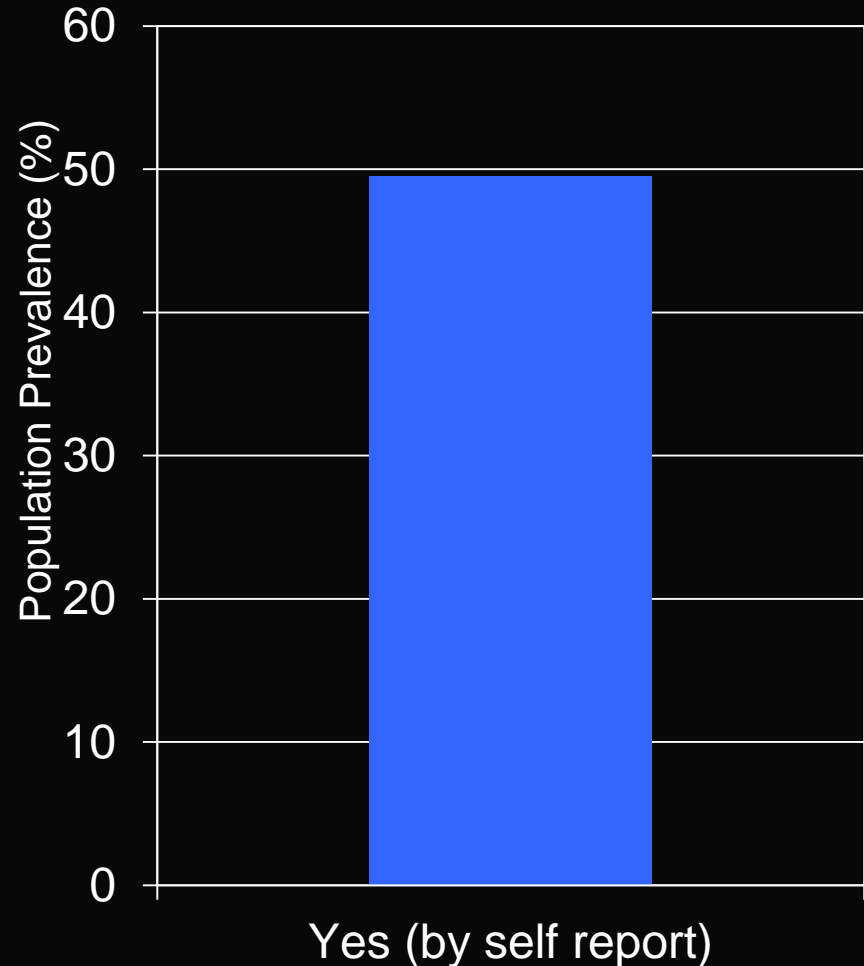
NATIONAL HEALTH INTERVIEW SURVEY

“During your last (medical) check-up, did the doctor recommend that you begin or continue to do any type of exercise or physical activity?”



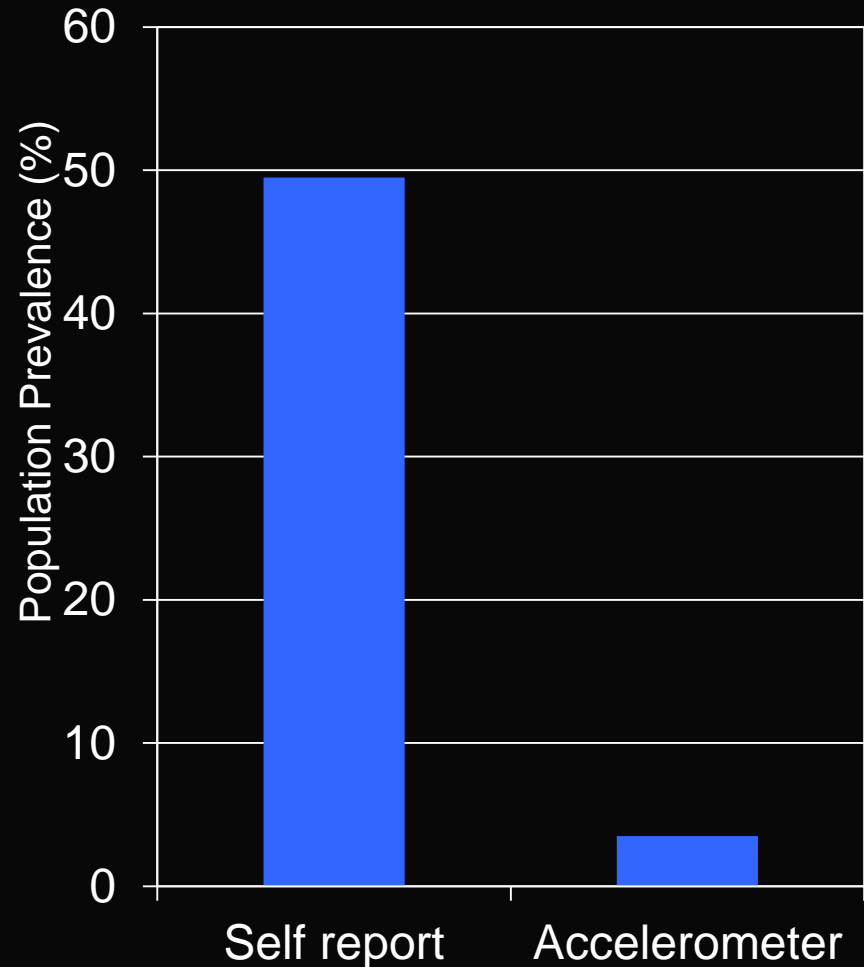
Better Education About Lifestyle and CVD Risk Needed

- What % of individuals achieve the recommended physical activity guidelines in the US?



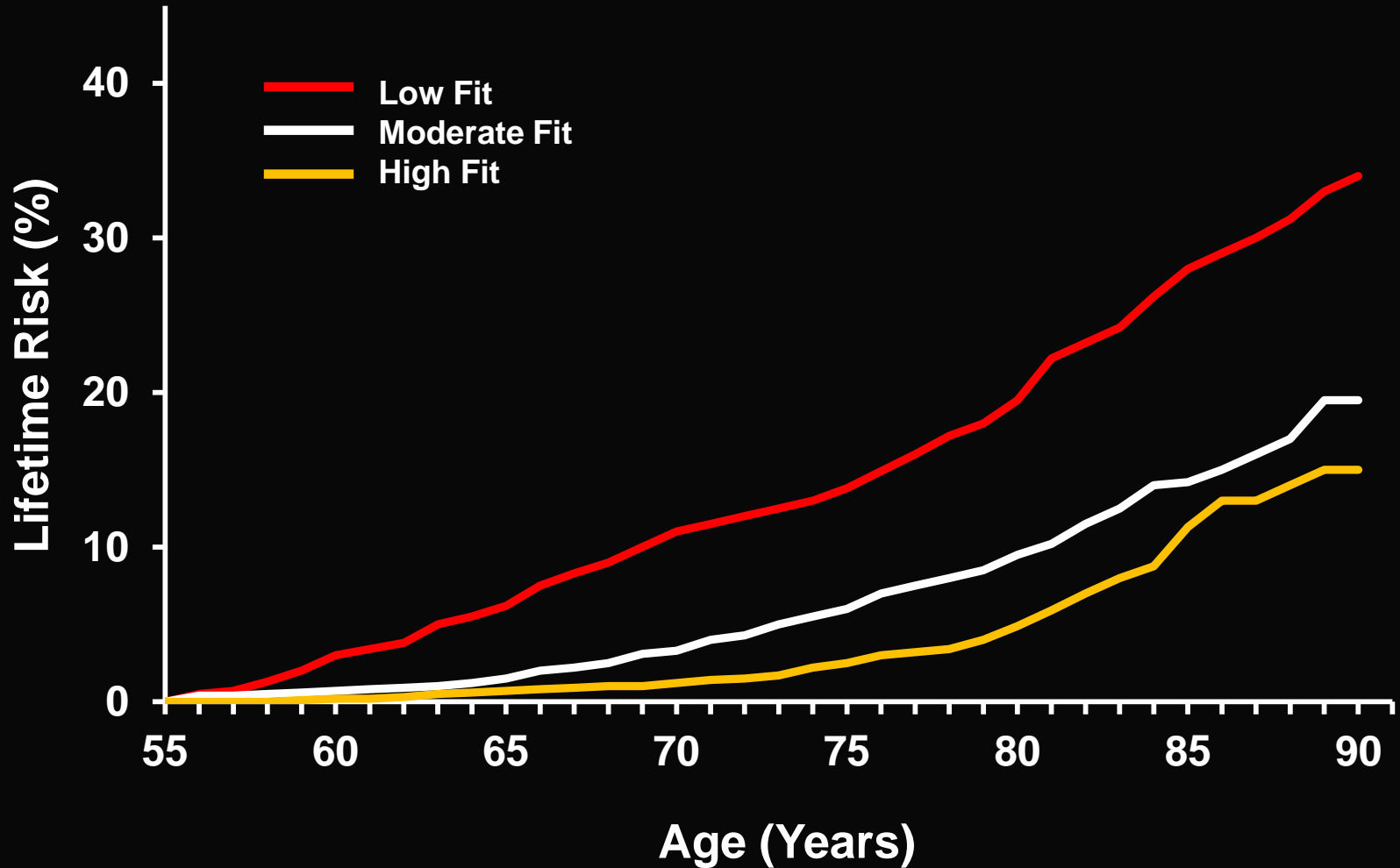
Better Education About Lifestyle and CVD Risk Needed

- What % of individuals achieve the recommended physical activity guidelines in the US?
- Discordance between self-report and objectively measured physical activity



Lifetime Risk of CVD by Fitness

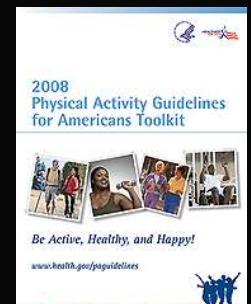
COOPER CENTER LONGITUDINAL STUDY



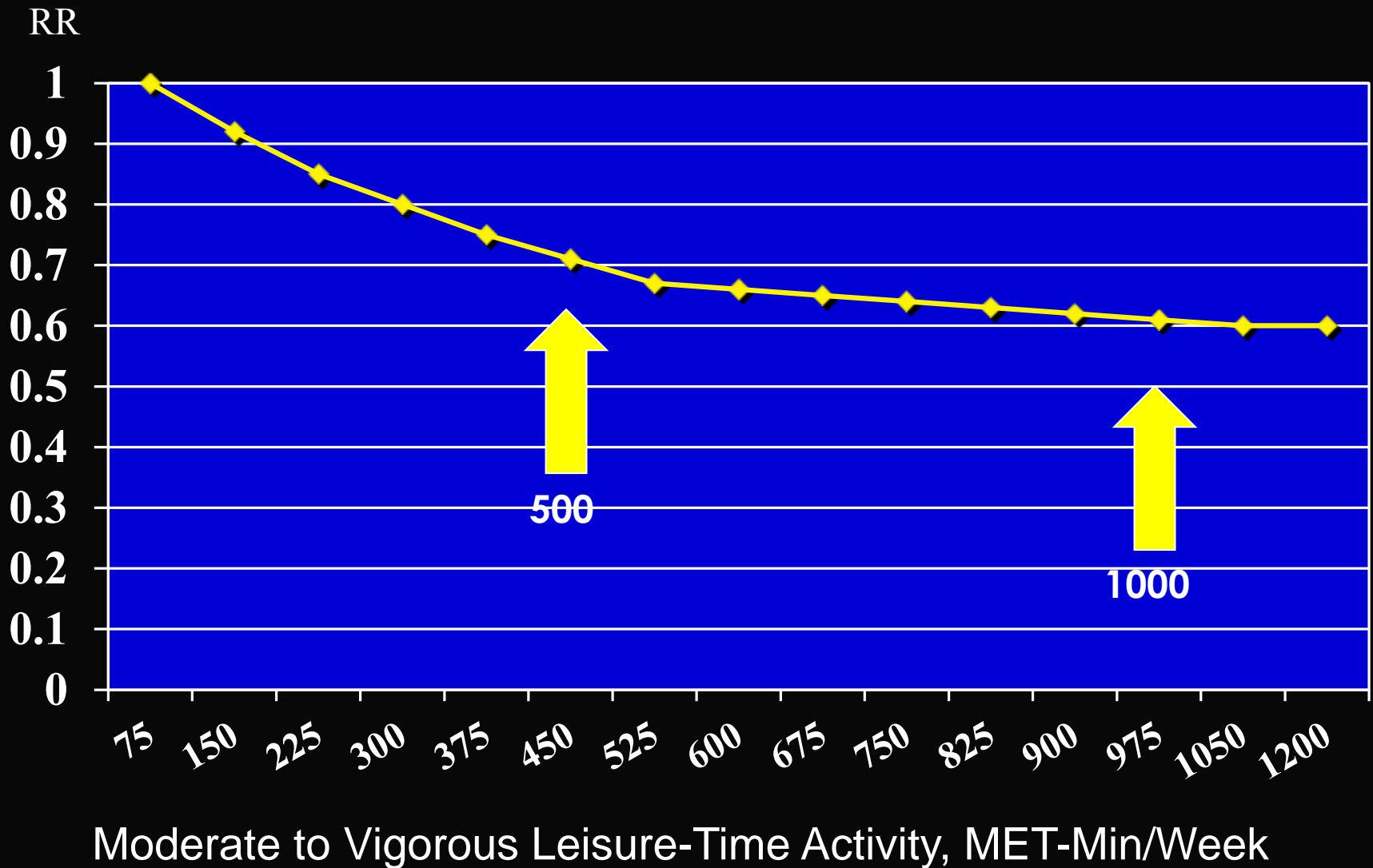
Physical Activity Guidelines for Americans

- For substantial health benefits, adults should perform at least 150 minutes of moderate-intensity, or 75 minutes of vigorous-intensity activity each week (*Public Health Target*).
- Mix moderate and vigorous intensity activity to meet the aerobic activity goal (500 - 1000 MET-minutes/week).

www.health.gov/paguidelines



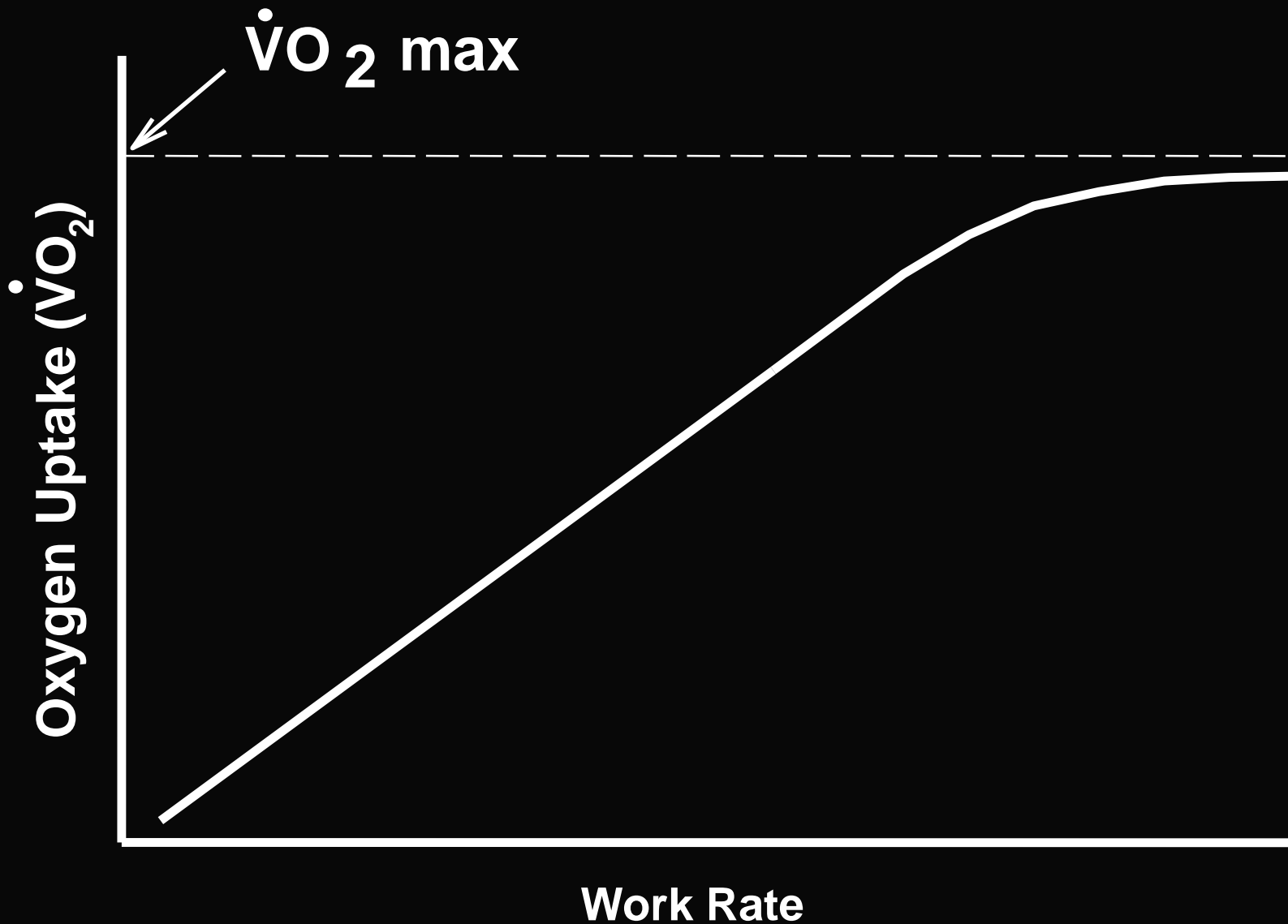
Shape of Dose-Response Curve for All-Cause Mortality



Assessment:

is my patient exercising enough?

- Ask patient if they currently exercise
- If yes, inquire about the following:
 - How hard? (INTENSITY)
 - How long? (DURATION)
 - How often? (FREQUENCY)



Estimating Intensity of Exercise

- Clinically relevant estimate:
 - Moderate: 40-60%; Vigorous: > 60%
- 4 Different Approaches:
 - Maximum heart rate:
 - $HR_{\max} = 220 - \text{age}$
 - Perceived Exertion
 - “Talk Test”
 - % of VO_2 max (or maximum METs) from exercise testing

Estimating Intensity of Exercise

HEART RATE TARGETS

■ Back to the case:

– 45 yo male, inactive

■ Max HR: $220 - 45 = 175$

– Moderate exercise intensity (40-60% VO_2):

■ $65\% \times 175 = 114$ bpm (lower target)

■ $75\% \times 175 = 132$ bpm (upper target)

– Vigorous exercise intensity ($> 60\% \text{VO}_2$):

■ $>75\% \times 175 = >132$ bpm (lower target)

“Talk Test”

- During exercise, 16 subjects asked to say the “Pledge of Allegiance”
- After speaking, subjects asked: “can you still speak comfortably?”
 - Pass: “yes”
 - Fail: “no”
 - Equivocal: anything in between
- Equivocal “talk test” = 60% VO₂ max
- Fail “talk test” = 80-90% max
- Implication: if you can talk freely, probably not exercising hard enough

Subjective Assessment of Exercise Intensity

- During exercise, ask participants to grade exercise intensity from 1 to 20:
 - “1”: sitting, watching TV or reading a book
 - “20”: “at limits of exercise”, can go no further
- Correlates well with objective exercise intensity:
 - < 12: Light
 - 12-13: Moderate
 - ≥ 14 : Vigorous

Assessment: Intensity of Exercise

Light < 3 METs	Moderate 3-6 METs	Vigorous > 6 METs
2 METs: Slow walking around house	3.3 METs: Modest walking speed (3 mph) 5.0 METs: Brisk walking (4 mph)	8 METs: jog (5 mph) 10 METs: jog (6 mph) 11.5 METs: 7 mph

Assessment:

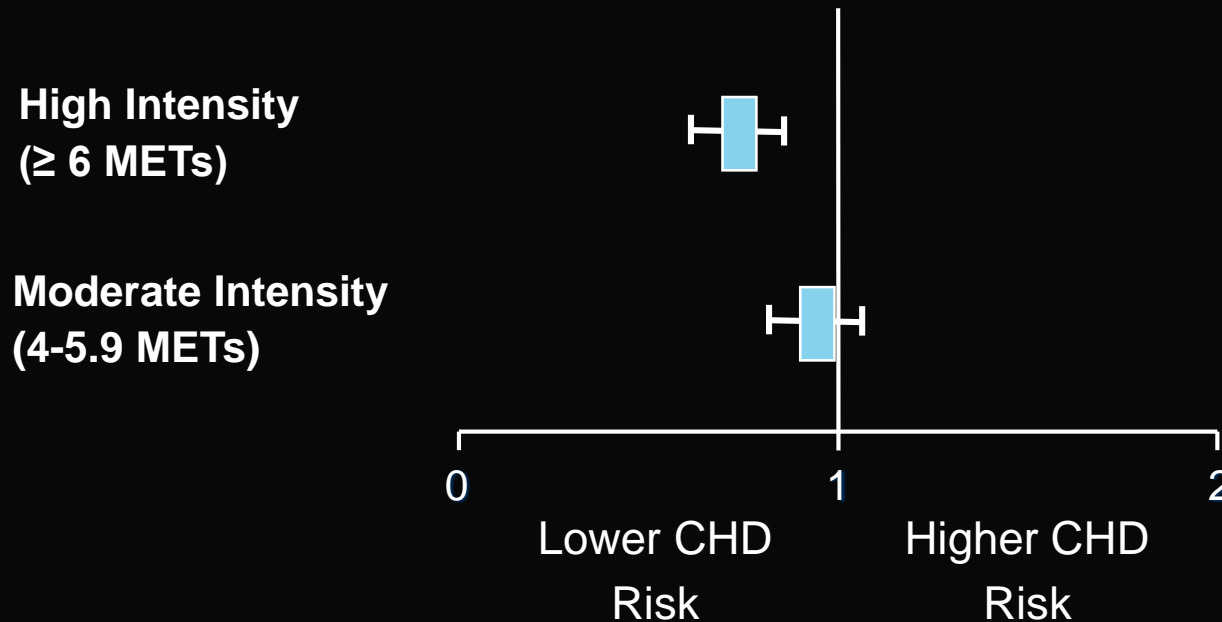
is my patient exercising enough?

- Patient #1: jog 20 minutes per day, 5 days per week at 10 minute/mile pace
 - 10 minute/mile (10 METs) x 100 minutes
 - 10 METs x 100 minutes = 1000 MET-minutes/week
- Patient #2: walk 60 minutes/day at 3 mph, 5 days per week
 - Walk 3 mph (3.3 METs) x 300 minutes
 - 3.3 METs x 300 minutes = 1000 MET-minutes/week

Exercise Intensity

Health Professions Follow-up Study (N= 44,452)

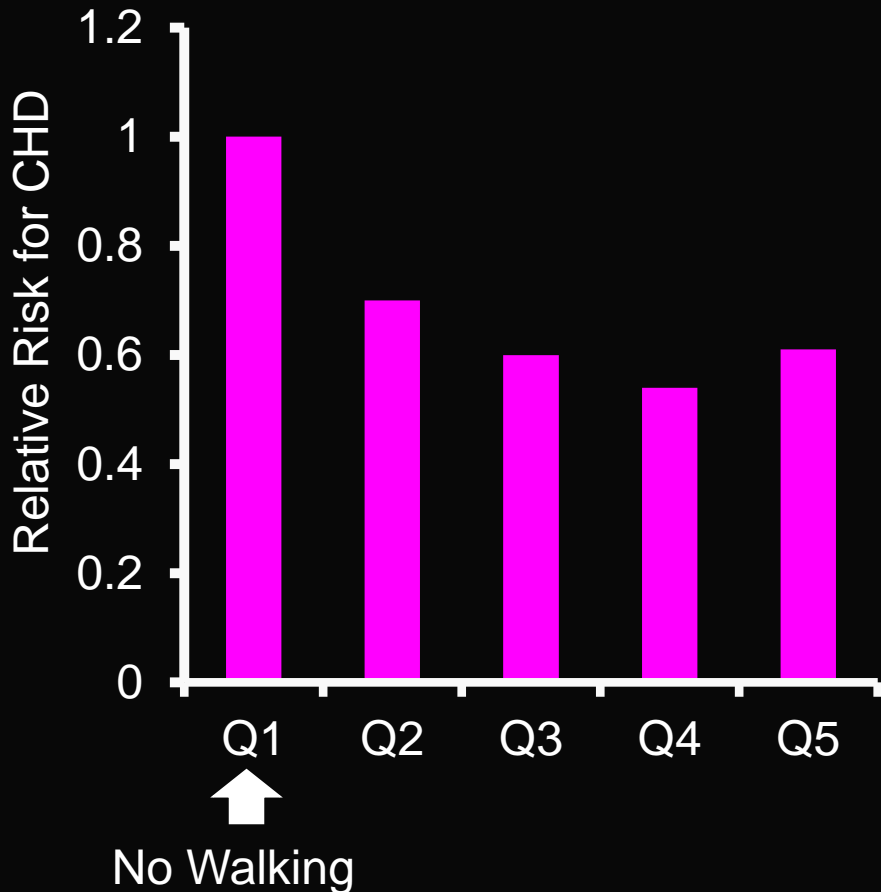
**Hazard Ratios* for Different Exercise Intensities
(vs. Low Intensity)**



*adjusted for CHD risk factors *and* volume of exercise

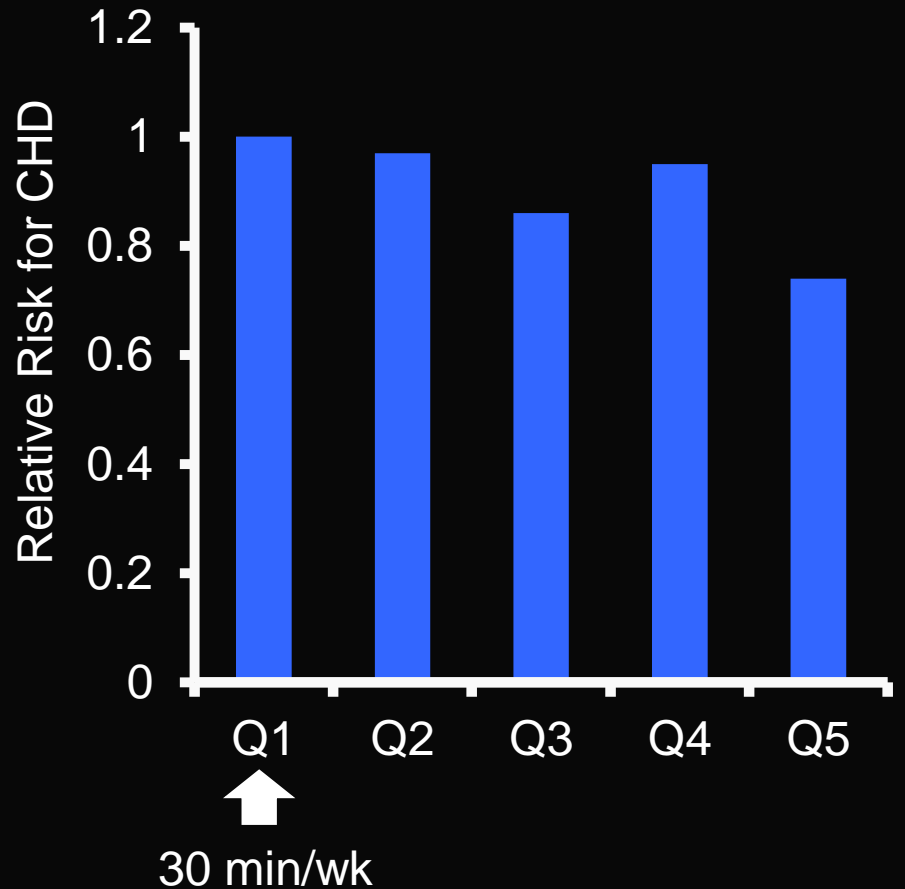
Walking and Risk for CHD

Women's Health Initiative



Manson *NEJM* (2002)

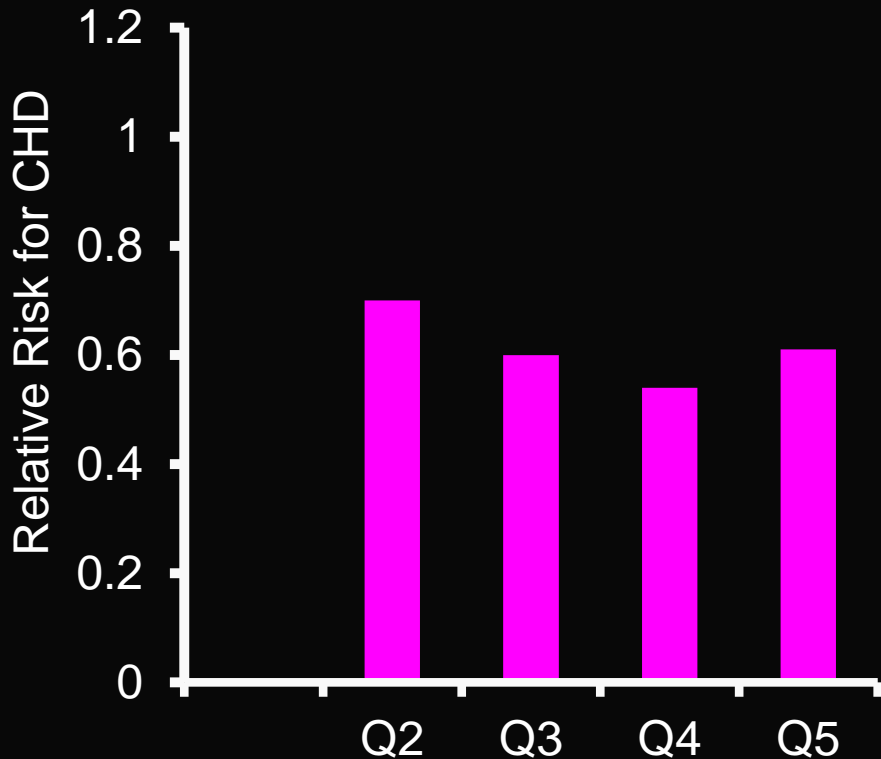
Health Professionals Follow-up Study



Tanasescu *JAMA* (2002)

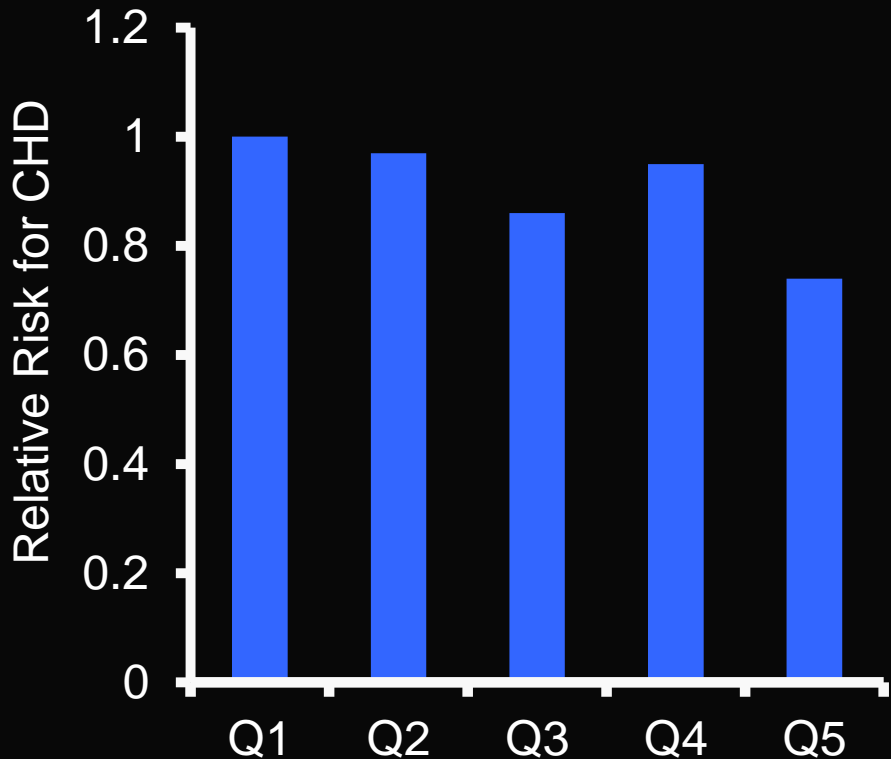
Walking and Risk for CHD

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Health Professionals Follow-up Study



Tanasescu *JAMA* (2002)

Three Types of Patients

Couch
Potato



Exercising
Some



Exercising
Regularly

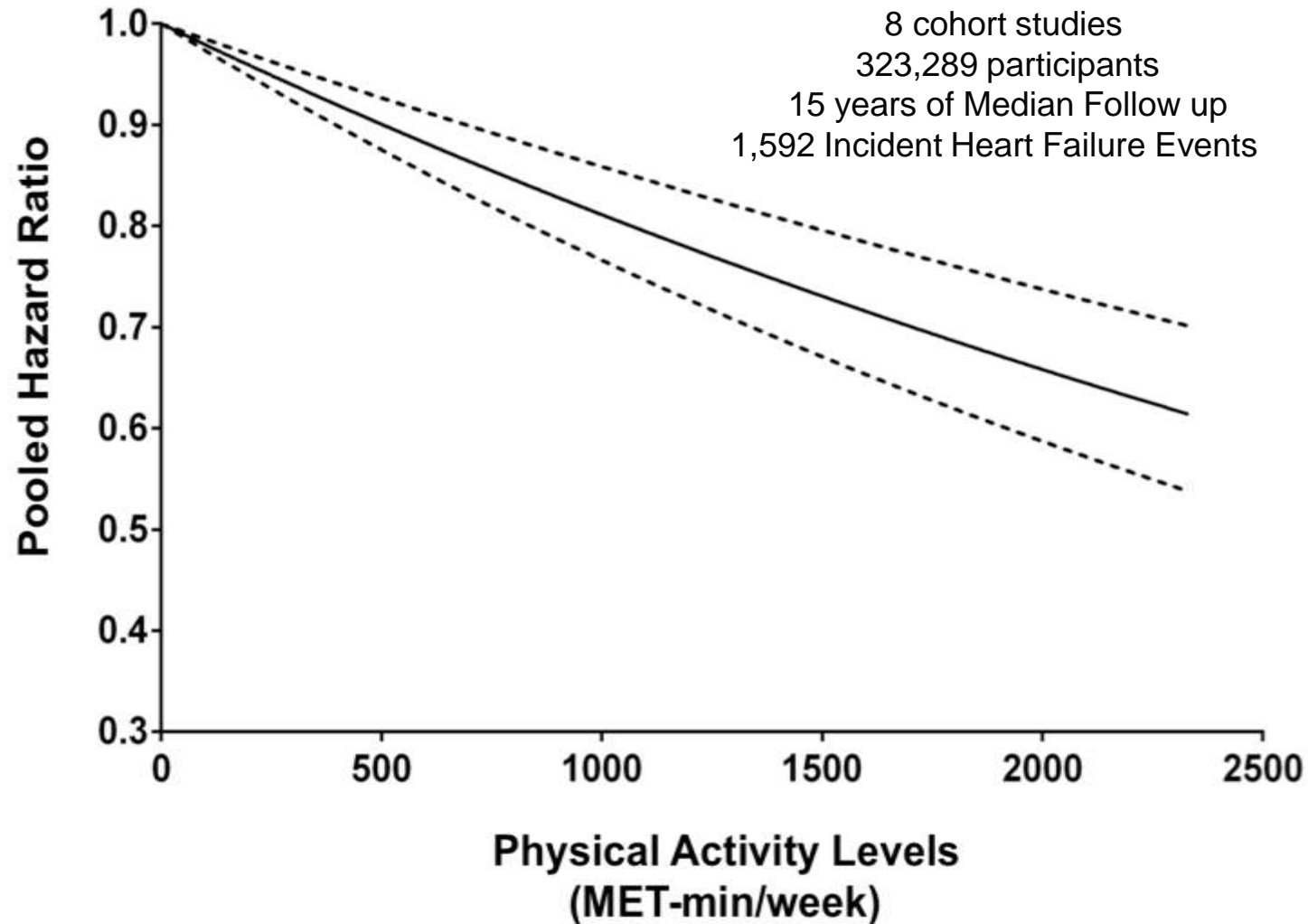


Assessment:

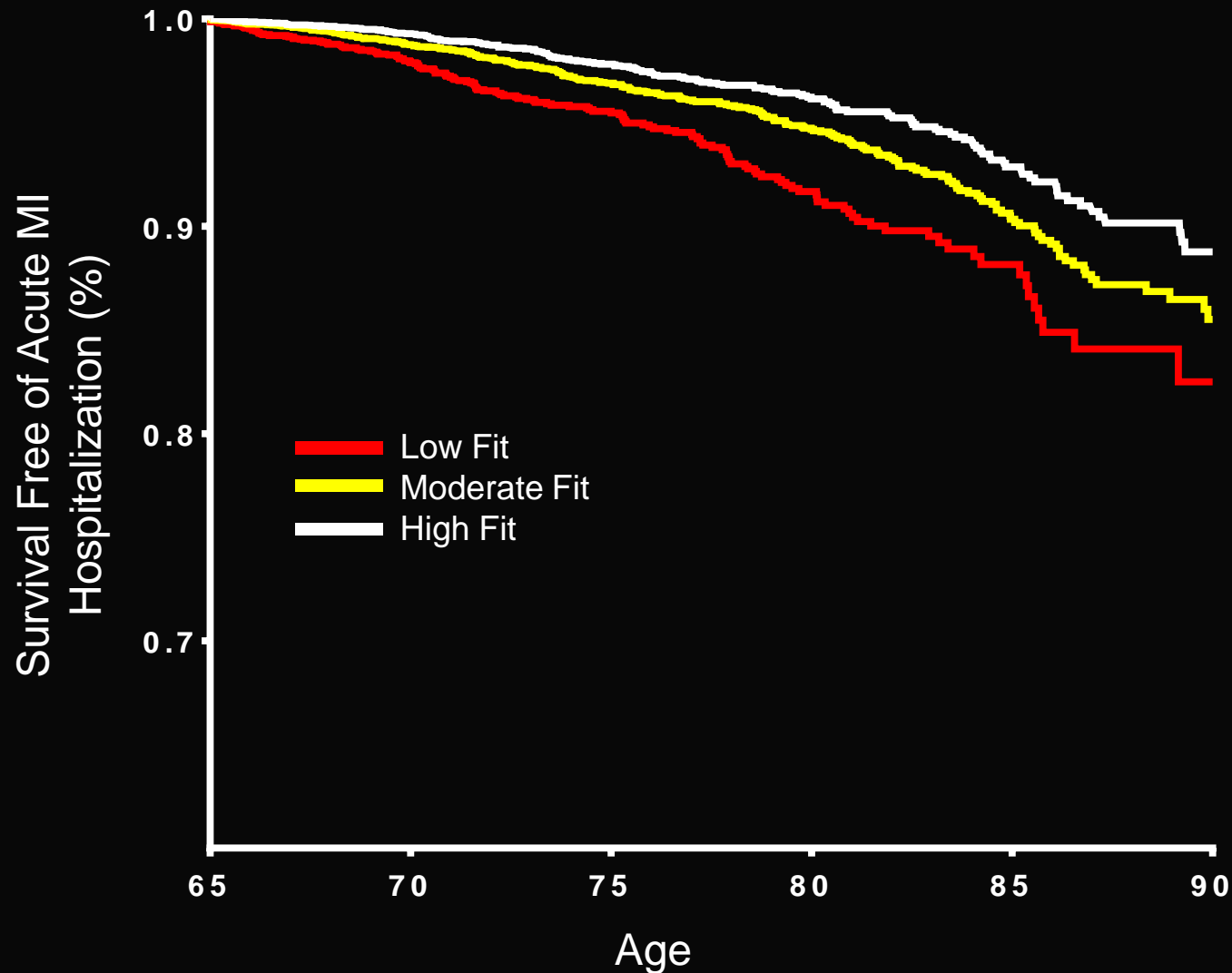
Is it safe for my patient to exercise?

- Estimated risks for vigorous exertion (6 METs or more) are short-term (i.e. approx. 1 hour);
 - Risks are small:
 - 1 event/792,000 person-hours of exercise
- But, benefits are NOT short-term
- Reasonable approach:
 - In the asymptomatic, sedentary patient:
 - Start with moderate activity first
 - Counsel higher risk patients on potential side effects/symptoms from starting exercise program

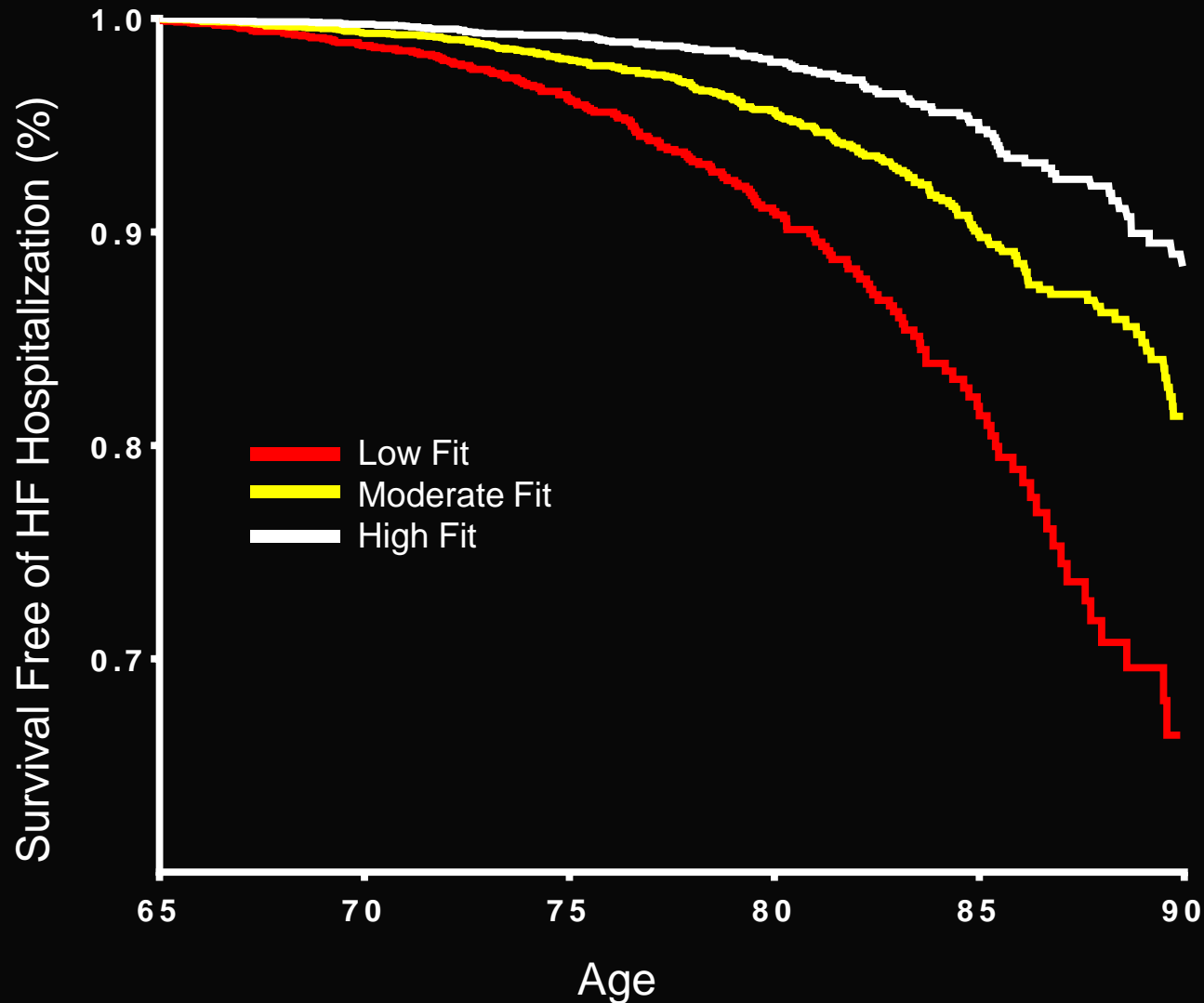
Dose Response Association Between Physical Activity and Heart Failure



Low Midlife Fitness: Acute MI



Low Midlife Fitness: Heart failure



Summary/Conclusions

- Exercise counseling is key, every visit
- “Exercise is Medicine”
 - Dose: Intensity, Duration, and Frequency
 - Needs a prescription
- Higher intensity > Lower
- 500 MET-min per wk
 - More benefit at higher dose
 - Particularly for HF risk

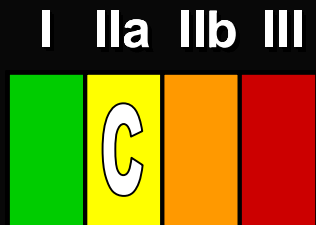
EXERCISE PRESCRIPTION & REFERRAL FORM				
PATIENT'S NAME: _____		DOB: _____	DATE: _____	
HEALTH CARE PROVIDER'S NAME: _____		SIGNATURE: _____		
PHYSICAL ACTIVITY RECOMMENDATIONS			REFERRAL TO HEALTH & FITNESS PROFESSIONAL	
Type of physical activity:	Aerobic	Strength	Name: _____	_____
Number of days per week:			Phone: _____	_____
Minutes per day:			Address: _____	_____
Total minutes per week*:			_____	_____
*PHYSICAL ACTIVITY GUIDELINES				
<small>Adults aged 18-64 with no chronic conditions: Minimum of 150 minutes of moderate physical activity a week (for example, 30 minutes per day, five days a week) and muscle-strengthening activities on two or more days a week. (2008 Physical Activity Guidelines for Americans)</small>				
			Web Site: _____	_____
			Follow-up Appointment Date: _____	_____

Thank You

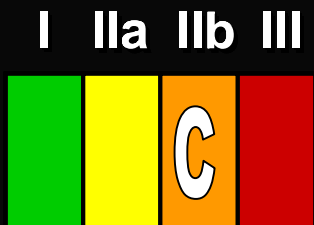


Reducing Risk Prior To Exercise

AHA Guidelines



Exercise testing is reasonable for patients with diabetes who plan to start vigorous exercise training



Exercise testing less well established for men age 45+ and women age 55+ who plan to start vigorous exercise training

Is my patient safe to exercise?

■ Other guidelines differ:

- ACSM: exercise testing for diabetics or metabolic syndrome starting moderate to vigorous exercise training
- USPSTF: no testing for low-risk individuals

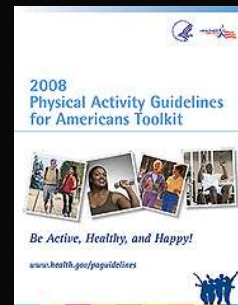
■ Reasonable approach:

- In the asymptomatic, sedentary patient:
 - Start with moderate activity first
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Physical Activity Guidelines for Americans

- Mix moderate and vigorous intensity activity to meet the aerobic activity goal (500 - 1000 MET-minutes/week).
- Aerobic activity can be accumulated in bouts of 10 minutes or longer (e.g., 3 x 10 minutes/day).
- Resistance exercise should be performed 2 x week: 1-2 sets (10-12 repetitions) of 8-10 exercises of major muscle groups.

<www.health.gov/paguidelines>



Resistance + Aerobic Better Than Aerobic Training Alone (HART-D)

