

# Successful Aging in People Living with HIV

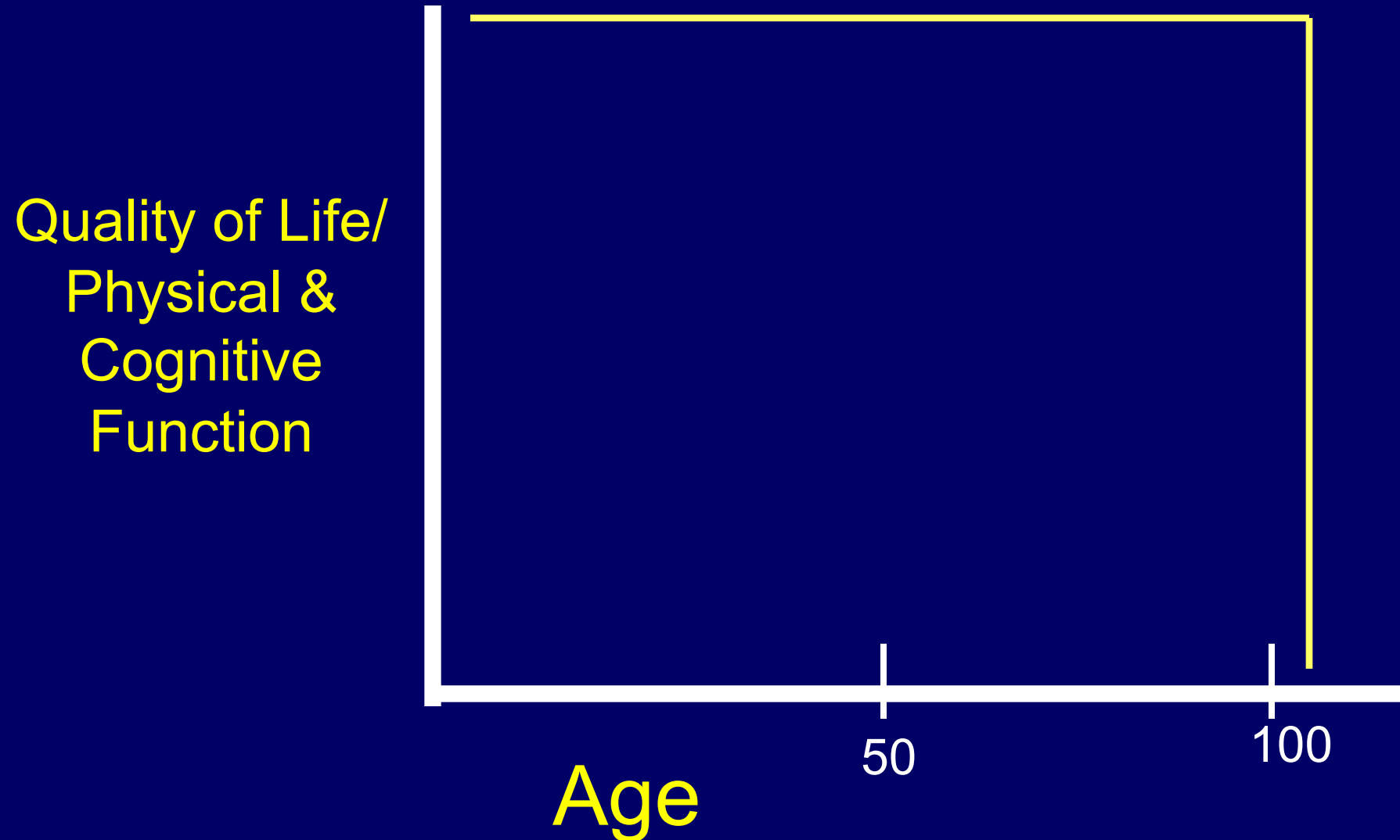


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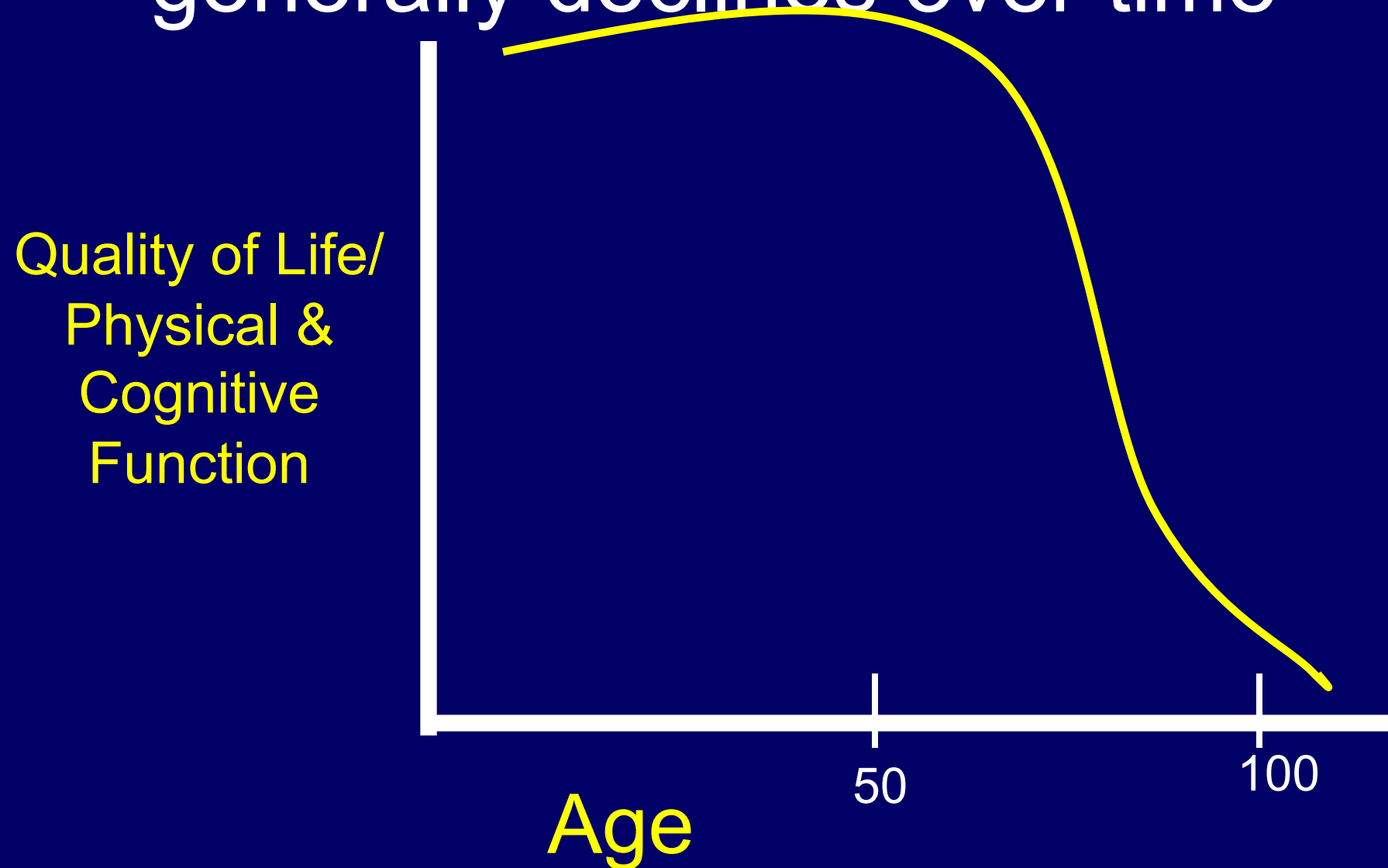


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# The Ideal Life: Quality x Time



# Physical & cognitive function generally declines over time



# The Spectrum of Aging



# Why do we age?

- Chronologic Age= Age on driver's license
- Biologic Age= wear and tear on organs/Age we look and feel
- Chronological Age  $\neq$  Biological Age

# Why do we age?

- Chronologic Age= Age on driver's license
- Biologic Age= wear and tear on organs/Age we look and feel



# Biologic vs Chronologic Age

John Turner - weightlifter



How old is he?

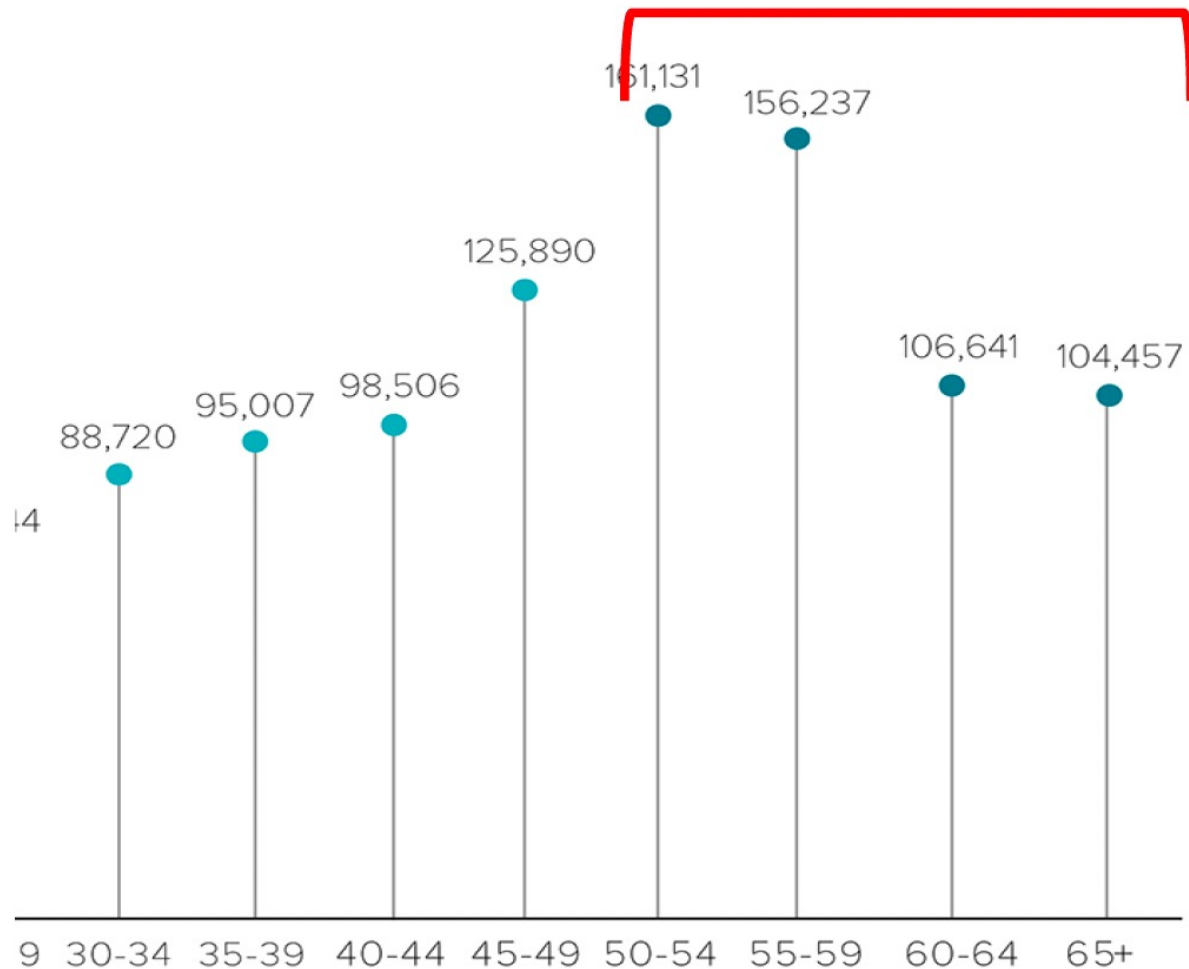
- A.33
- B.43
- C.53
- D.63

# Aging & HIV: What do we know?

- People living with HIV are getting older

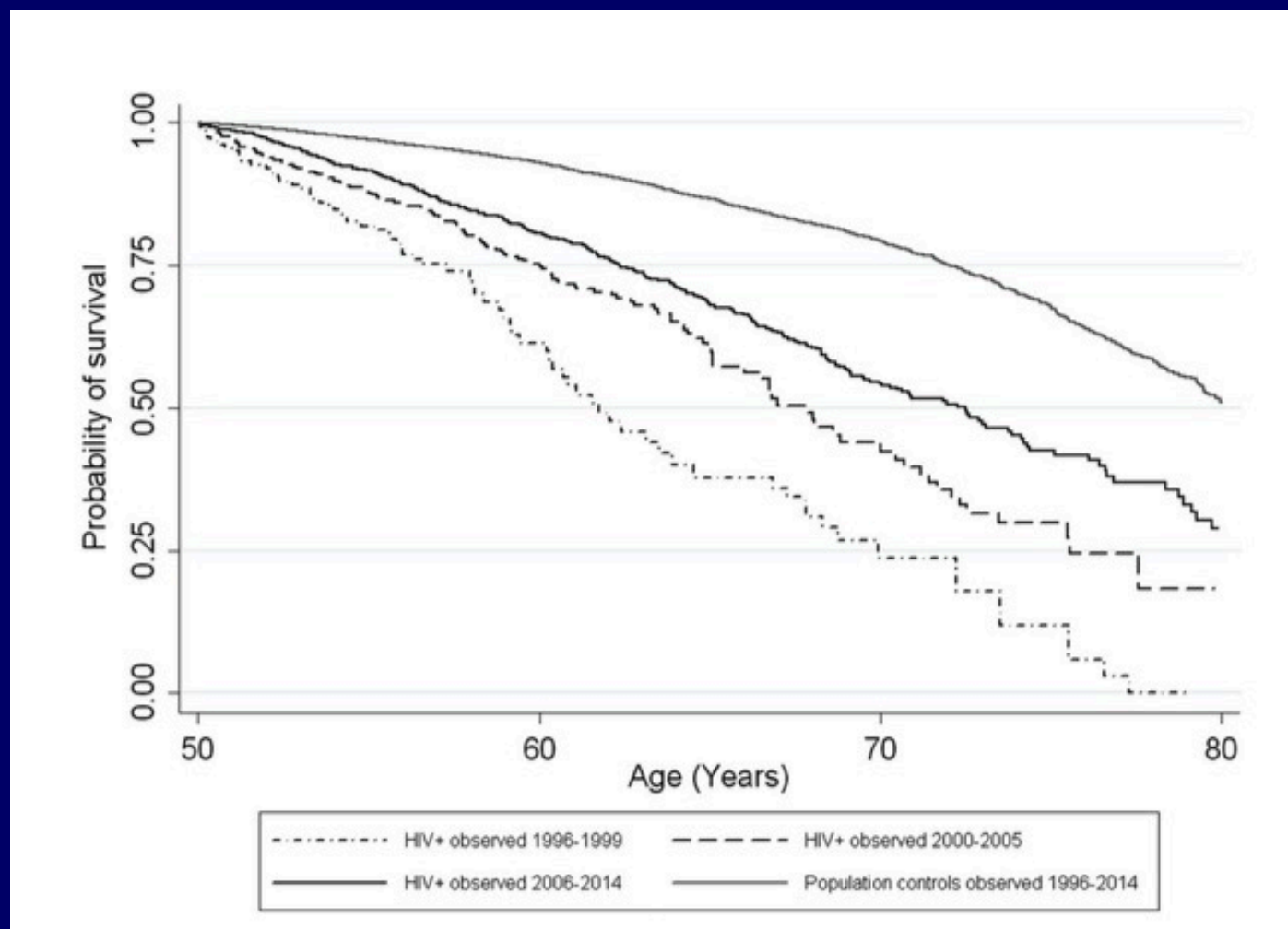


# More than 50% of People with HIV in the US are Aged 50 or Older



- People with HIV are successfully growing older
- New diagnoses of HIV in older people
- *Proportion of people living with HIV  $\geq$  50 years of age is estimated to reach  $\sim$  75% by 2030*

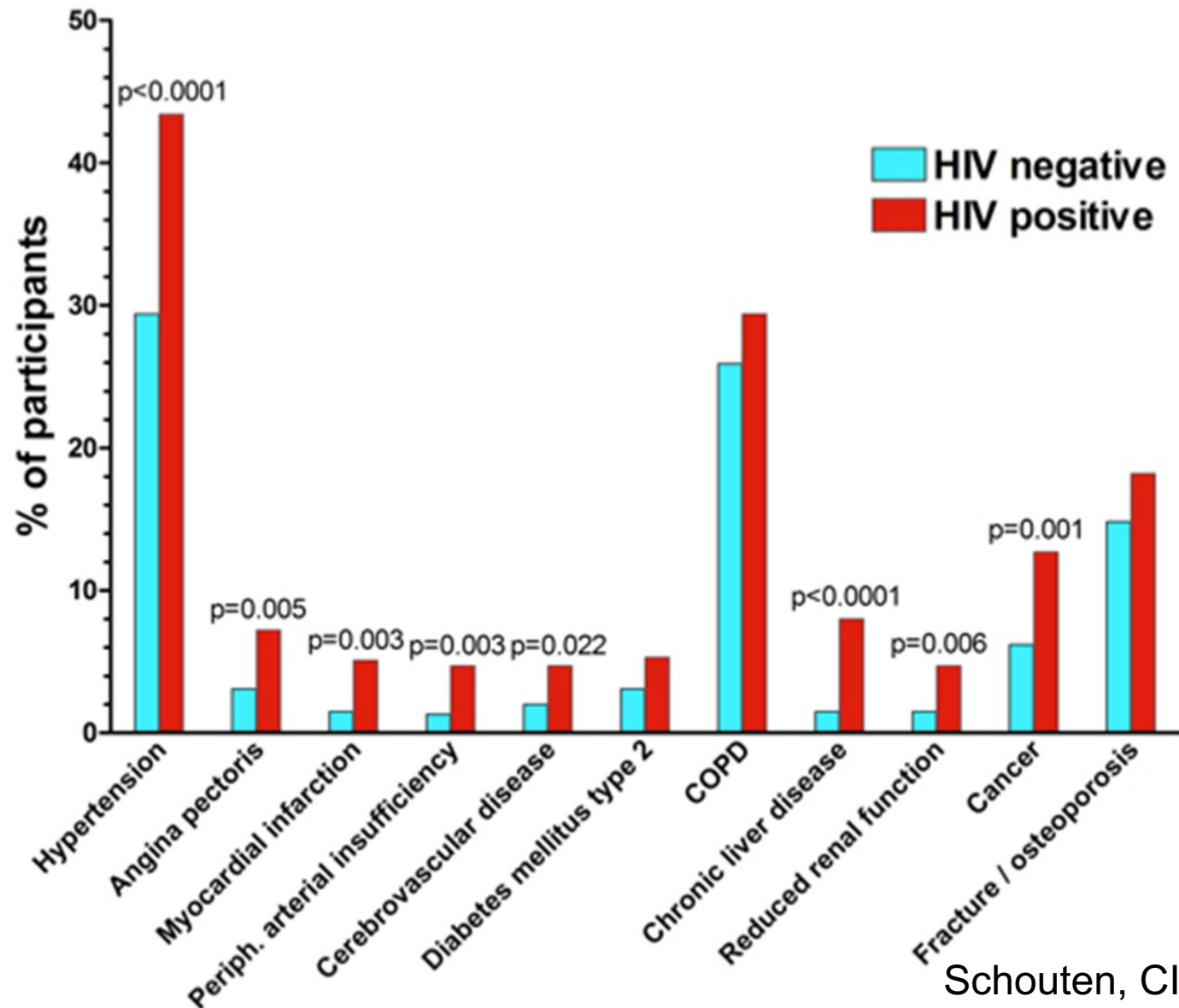
# The Mortality Gap in Older Persons Living with HIV



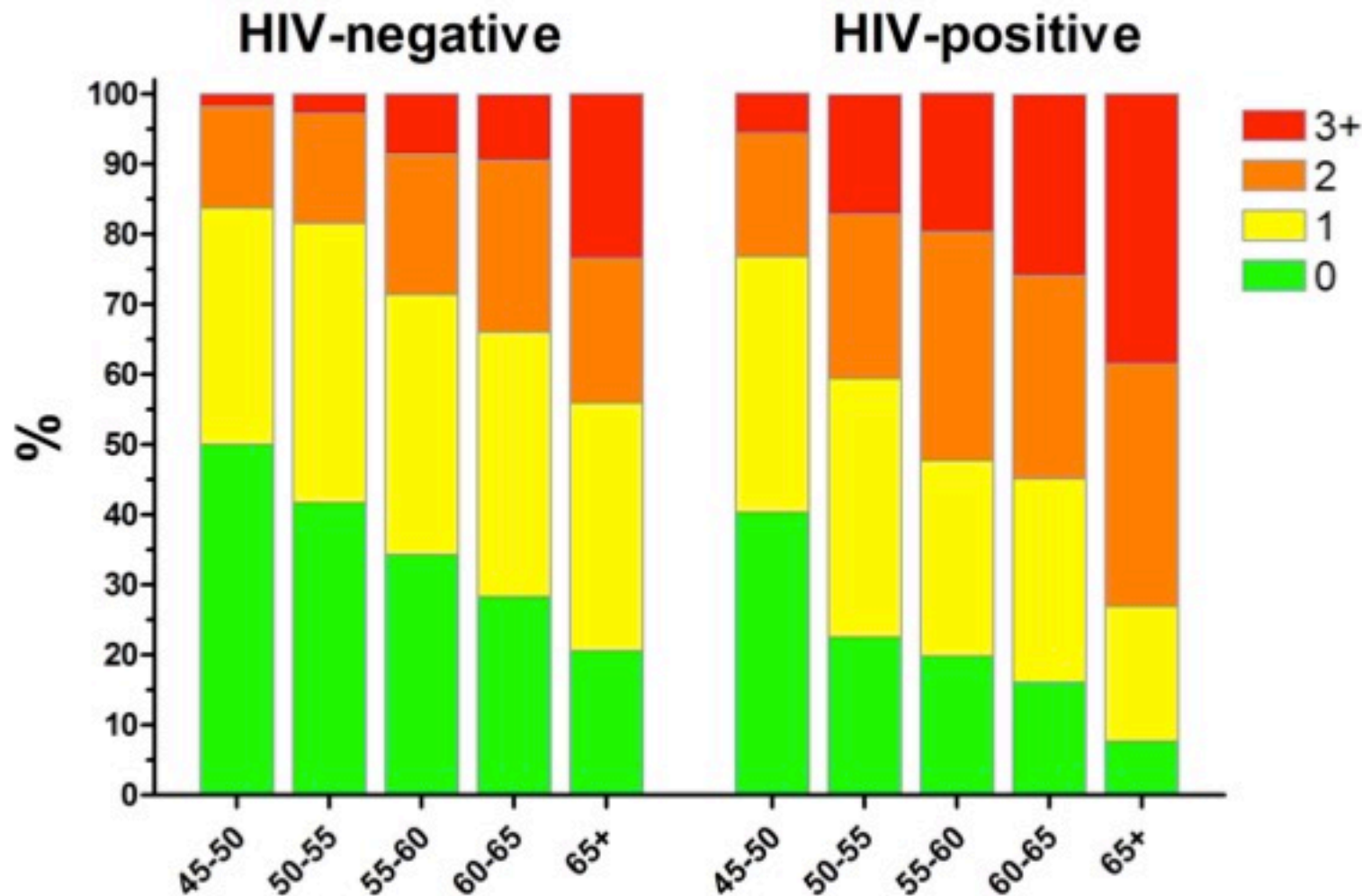
# Aging & HIV: What do we know?

- People living with HIV are getting older
- Many aging-related diseases are more common in populations with HIV compared to populations without HIV

# Comorbidity distribution

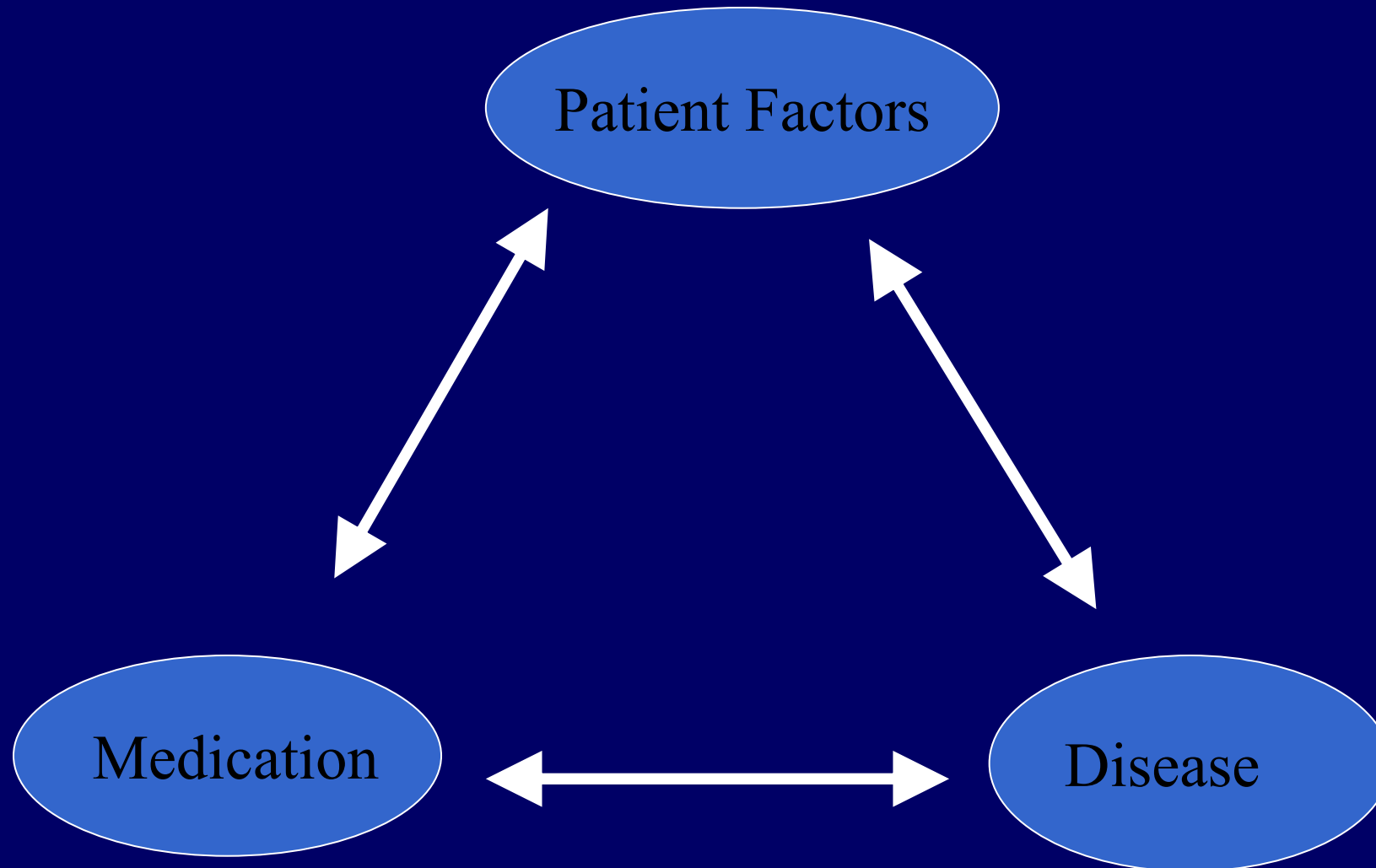


# Comorbidity in relation to age



HIV-negative					HIV-positive					
Mean number of AANCC	0.68	0.80	1.03	1.15	1.47	0.89	1.35	1.52	1.65	2.04
Number of participants	166	108	70	53	34	159	111	86	62	52

# Causes of Comorbid Diseases in HIV



# HIV Medications & Comorbidities

## Current Effects

- TDF (eg Truvada, Atripla) → Bone and Kidney
- Protease Inhibitors → Cholesterol
- Integrase Inhibitors → weight gain

## Legacy Effects

- Past use of stavudine (Zerit) can persist

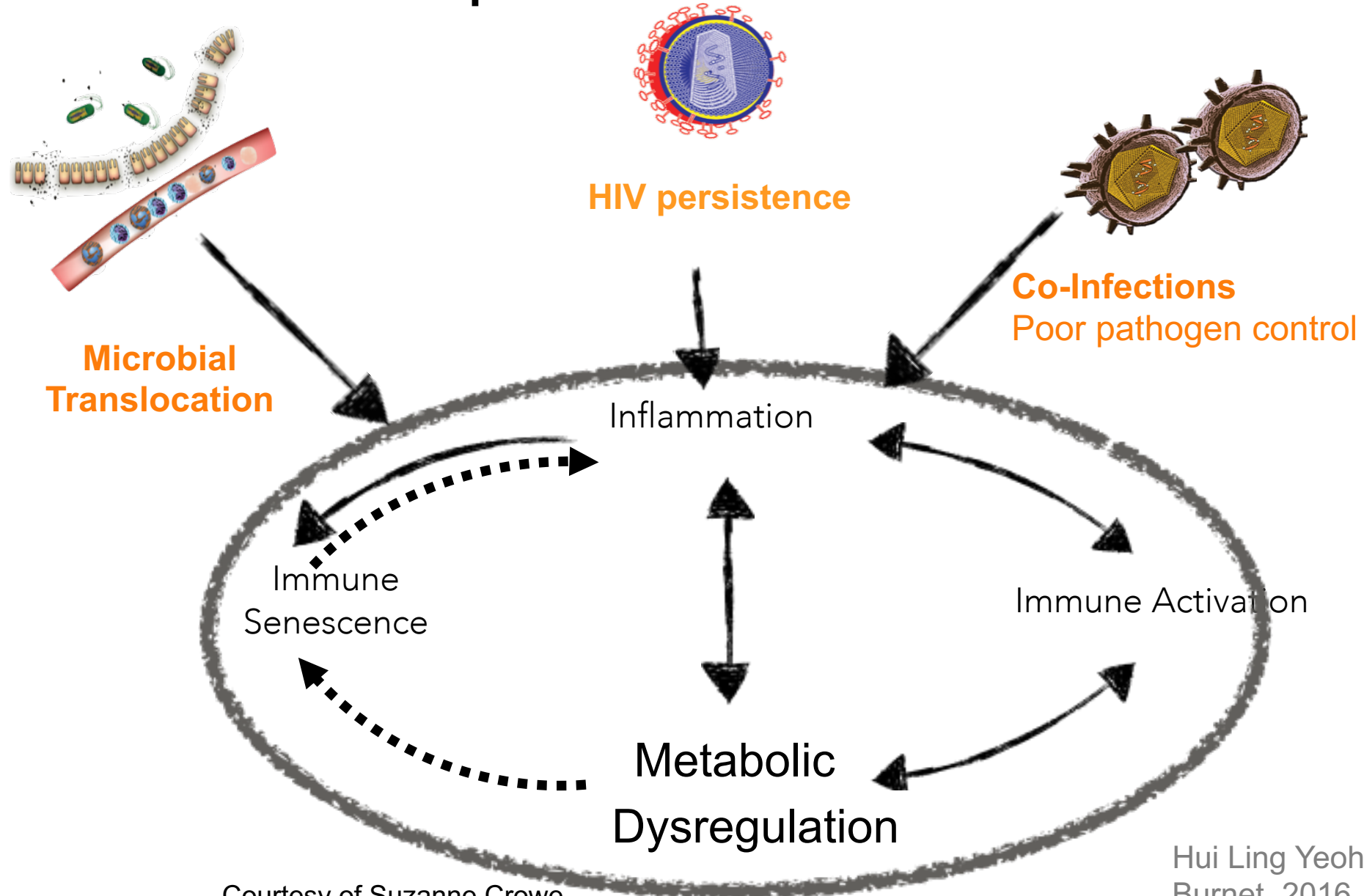
# Effects of Chronic HIV Infection

- Legacy effect of immunosuppression
- Chronic inflammation is higher in people with HIV vs people without HIV and has been associated with comorbidities



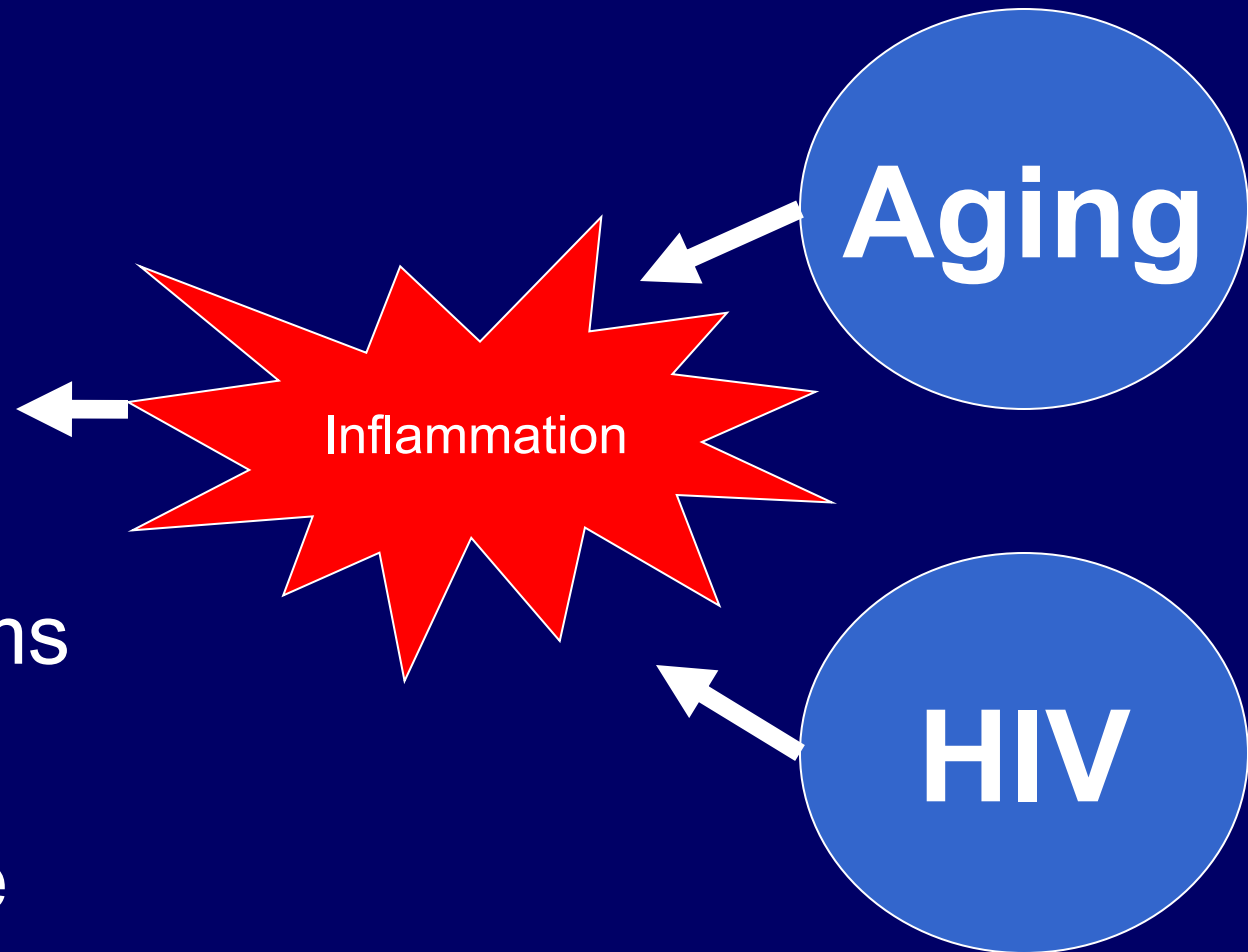


# Microbial translocation, HIV persistence and coinfections cause persistent innate immune activation

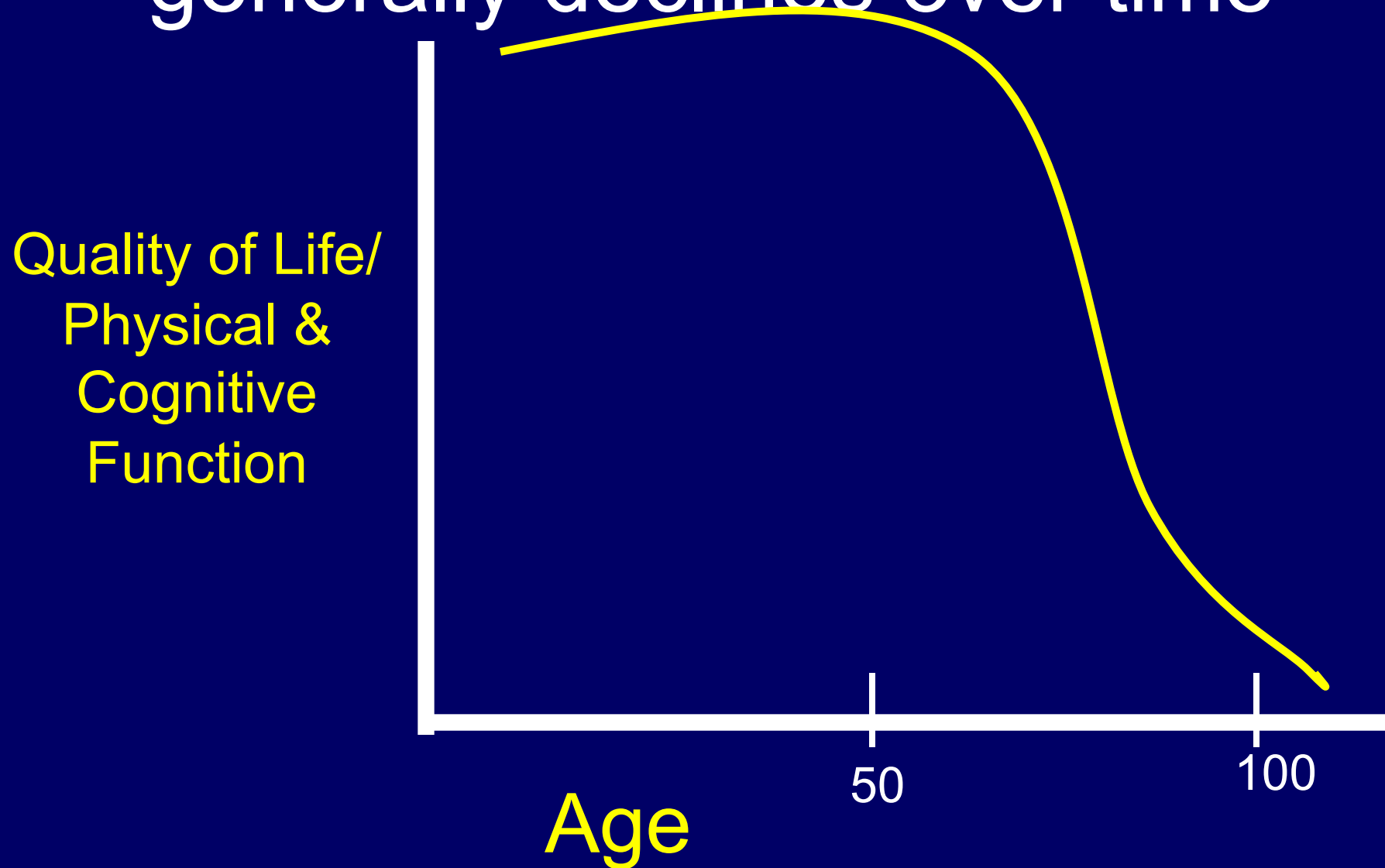


# Aging and HIV: A Double Whammy of Inflammation

- Diabetes Mellitus
- Cardiovascular Disease
- Cancer
- Kidney Problems
- Cognitive Problems
- Osteoporosis
- Low Testosterone

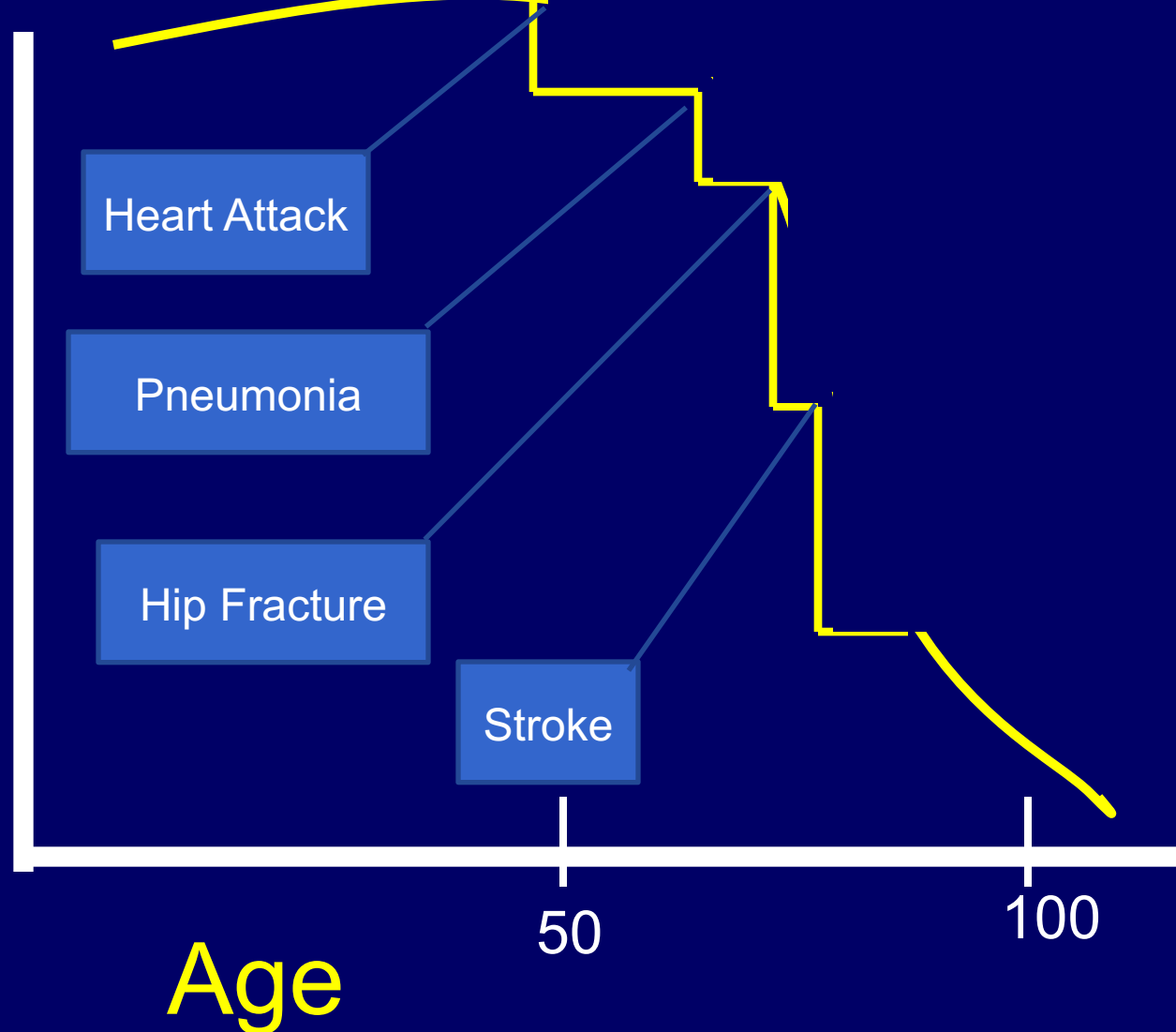


# Physical & cognitive function generally declines over time



# Decline in Function May Not Be Gradual

Quality of Life/  
Physical &  
Cognitive  
Function





“An ounce of prevention is worth a pound of cure”

Benjamin Franklin

# Comorbidities & HIV: What to do about it now?

- Optimize a Healthy Lifestyle
  - Stop smoking, excessive drinking, drugging
  - Work to lose weight if you are overweight (5-10%)

# Lifestyle Modification: Diet

- Cutting 500 calories per day will decrease your weight by 1-2 lbs week
- Watch portion sizes



# Portion Distortion

What you're served



1/2 lb. cheeseburger, French fries,  
3/4 cup ketchup, tomato slice and lettuce.  
**1,345 calories**  
**53 grams fat**

What's one serving



1/4 lb. cheeseburger, half the French fries,  
2 tablespoons ketchup, tomato slice and lettuce.  
**685 calories**  
**33 grams fat**

## DID YOU KNOW?

- Americans are the heaviest of people in developed countries. The U.S. surgeon general has called obesity a national epidemic.
- 61 percent of Americans are overweight.

- Consuming an extra 100 calories daily for a year, without using them up, can lead to a weight gain of 10 pounds.
- Every gram of carbohydrate or protein equals 4 calories.

- The number of overweight people in the world – 1.1 billion – now equals the number of undernourished people.
- With each decade as we age, we need 100 fewer calories per day.

- Every gram of fat equals 9 calories.
- 10 calories a day (2 hard candies) of unexpended energy puts on an extra pound a year.

© L S Dean

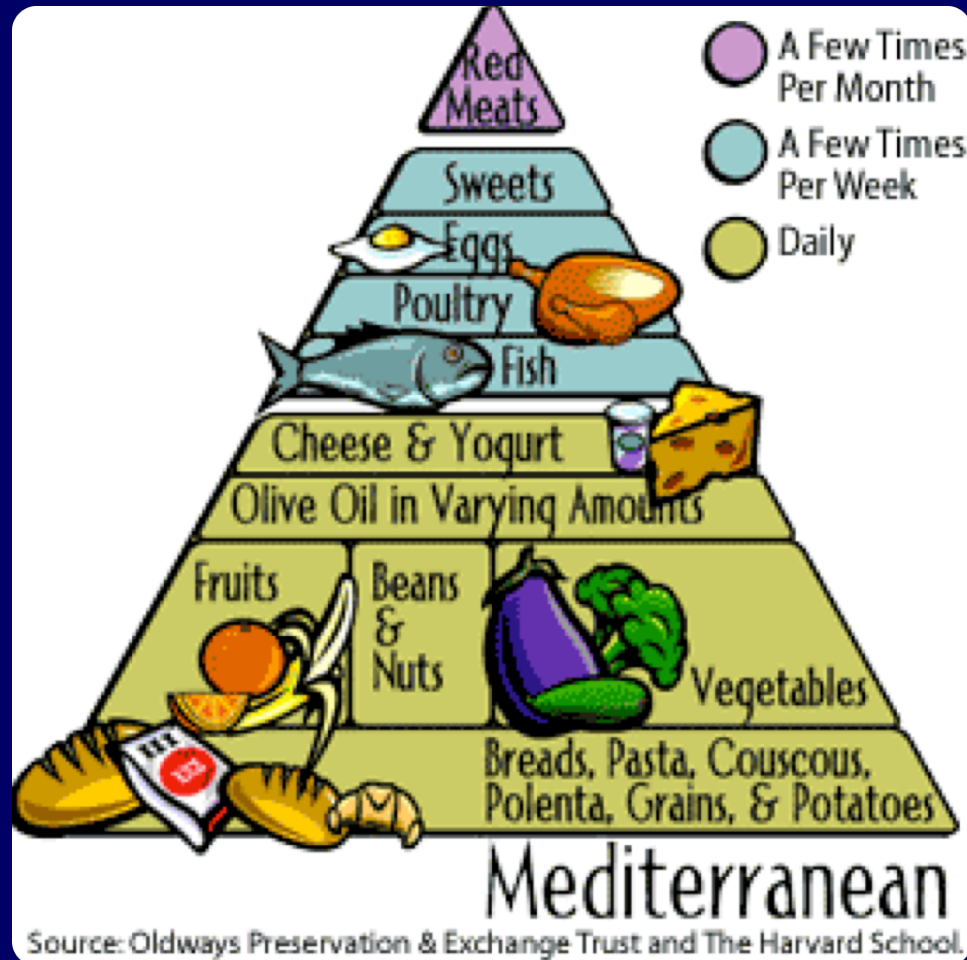
# Lifestyle Modification: Diet

- Cutting 500 calories per day will decrease your weight by 1-2 lbs week
- Watch portion sizes
- Watch liquid calories (soda, juice, fruit drinks)
- Watch simple sugars and starches (white bread, white rice, bagels, potatoes, corn flakes)

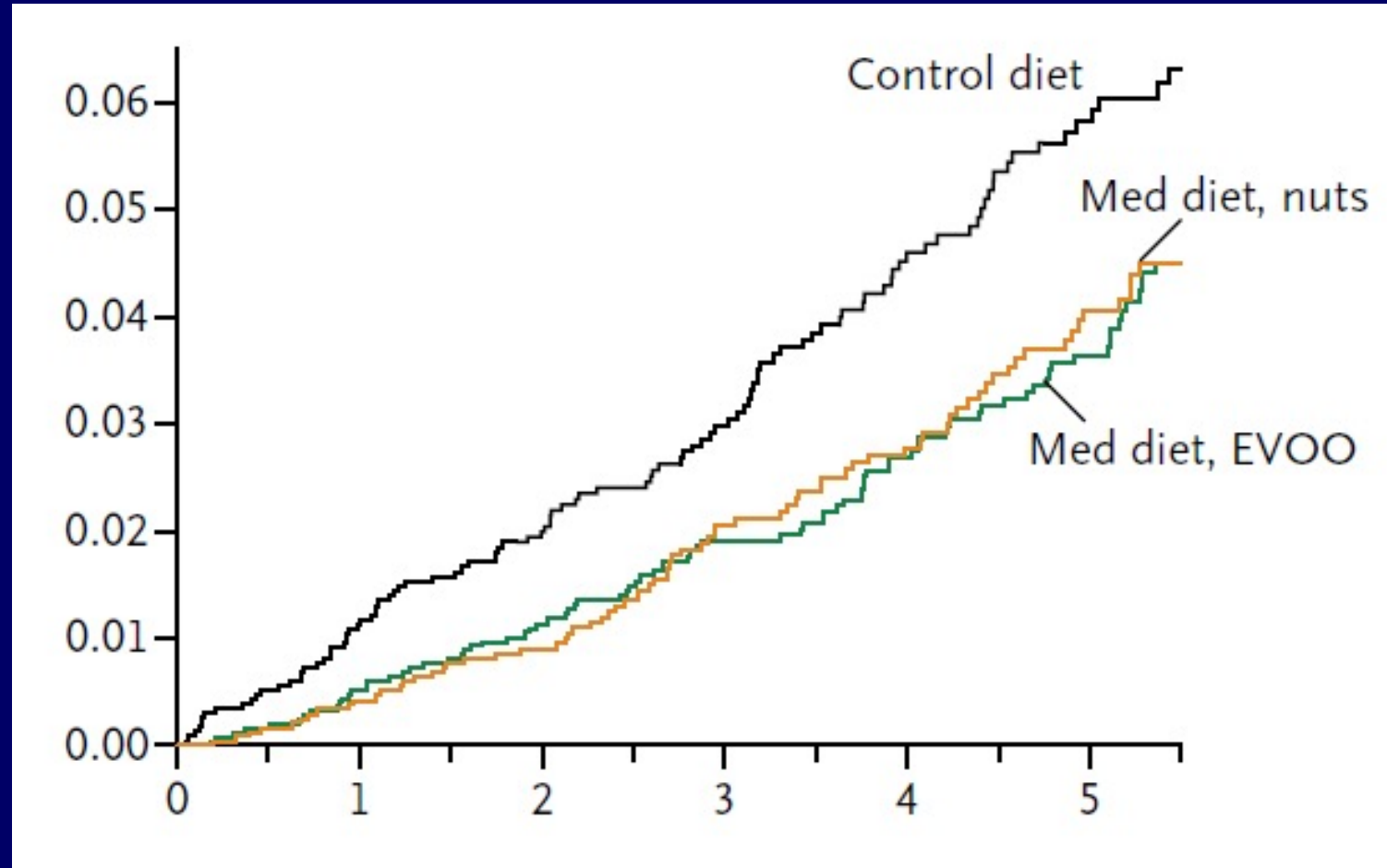
# Lifestyle Modification: Diet

- Cutting 500 calories per day will decrease your weight by 1-2 lbs week
- Watch portion sizes
- Watch liquid calories (soda, juice, fruit drinks)
- Watch simple sugars and starches
- Go natural
  - Avoid foods in boxes and cans (less salt and preservatives)
  - Maximize fresh fruits and vegetables

# The Mediterranean Diet



# Effect of Mediterranean Diet on Heart Attack and Stroke



**IS**  
**SITTING**

There's no running away from it:  
The more you sit, the poorer your  
health and the earlier you may die,  
**no matter how fit you are**

**THE NEW**  
**SMOKING**

**?**  
BY SELENE YEAGER PHOTOSHOP BY Nick Ferreri

# Get Screened

Condition	Test	Frequency
Diabetes	Fasting Glucose	Yearly
High Cholesterol	Lipid Panel	Yearly
High Blood Pressure	BP	At least yearly
Kidney Disease	Creatinine blood test, urine test for protein	Every 6-12 months
Osteoporosis	DXA Scan	Age 50+
Anal/Cervical Cancer	Pap test	Yearly
Liver cancer	Ultrasound (if HCV+)	Yearly
Lung Cancer	CT (if a smoker)	
Breast Cancer	Mammogram	Yearly
Colon Cancer	Colonoscopy	Every 5 years
Prostate Cancer	PSA	

# Comorbidities & HIV: What to do about it now?

- Optimize a Healthy Lifestyle
- Comorbidities: Get Screened. Get Treated
  - Osteoporosis
  - Cardiovascular Disease
  - Diabetes



# How to prevent fractures

- Optimize a Healthy Lifestyle: Weight bearing exercise
- Get a DXA scan
  - Men with HIV > 50; Post-menopausal with HIV (earlier than general population)
- If indicated, get on osteoporosis medications
- Prevent falls
  - Most fractures happen when people fall
  - If at risk for falls, get physical therapy for strength and balance training
    - At risk for falls: previous falls, worried about falling, medications related to falls, nerve problems in feet

# How to prevent heart attacks

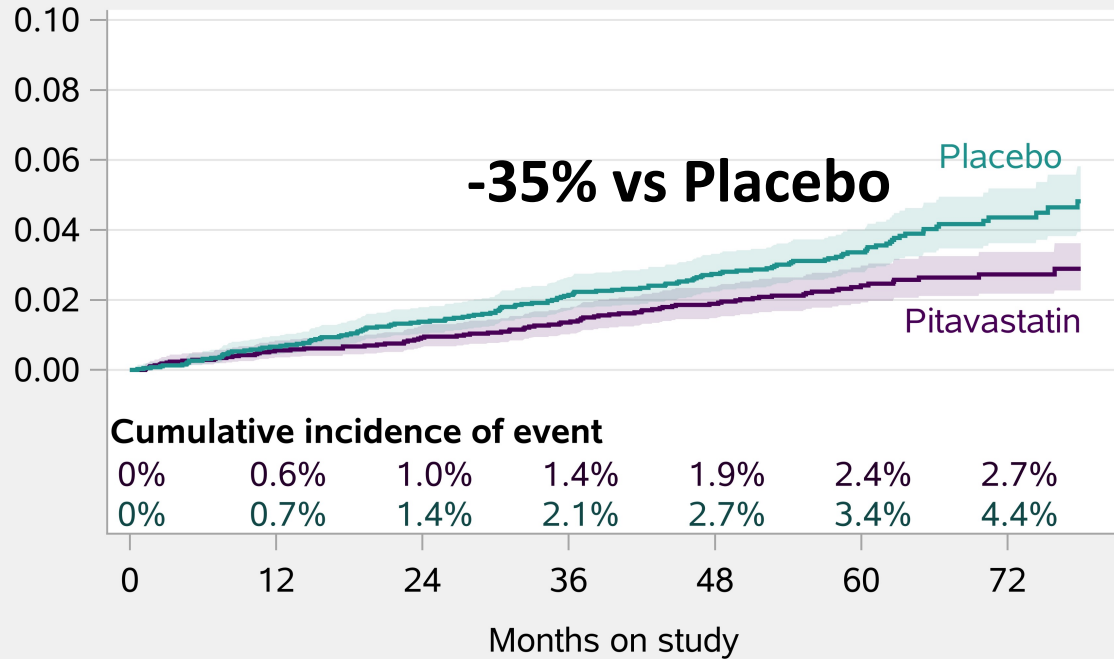
- Optimize a Healthy Lifestyle
- Get screened for cardiovascular risk factors
  - Blood pressure
  - Cholesterol
  - Blood Sugar
- Know what your 10-year risk is for having a heart attack or stroke (<https://tools.acc.org/ascvd-risk-estimator-plus>)
- Get on a statin if living with HIV and between 40-75 y



IAS 2023

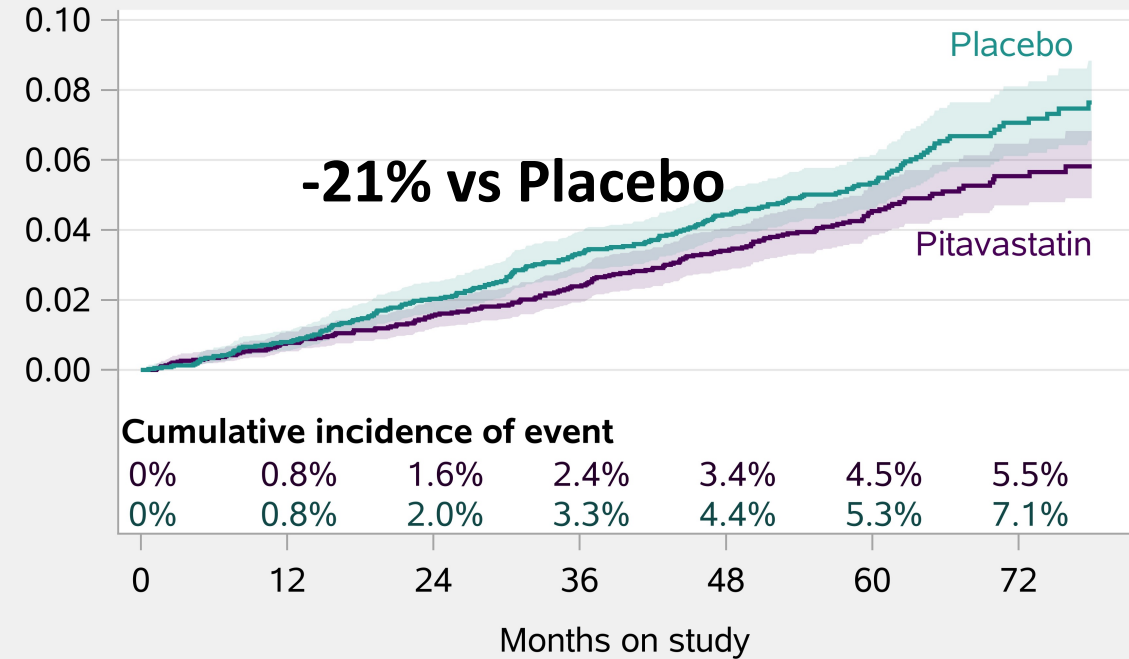
# REPRIEVE: Statins prevent cardiovascular events in PWH with low/moderate CVD risk

(a) First Primary MACE



	0	12	24	36	48	60	72
<b>Number at risk</b>							
Pitavastatin	3888	3647	3475	3364	2997	1947	1052
Placebo	3881	3693	3506	3356	2997	2182	959

(b) First MACE or Death



	0	12	24	36	48	60	72
<b>Number at risk</b>							
Pitavastatin	3888	3647	3475	3364	2998	1948	1027
Placebo	3881	3693	3506	3356	2997	1975	919

MACE: Major adverse cardiovascular event

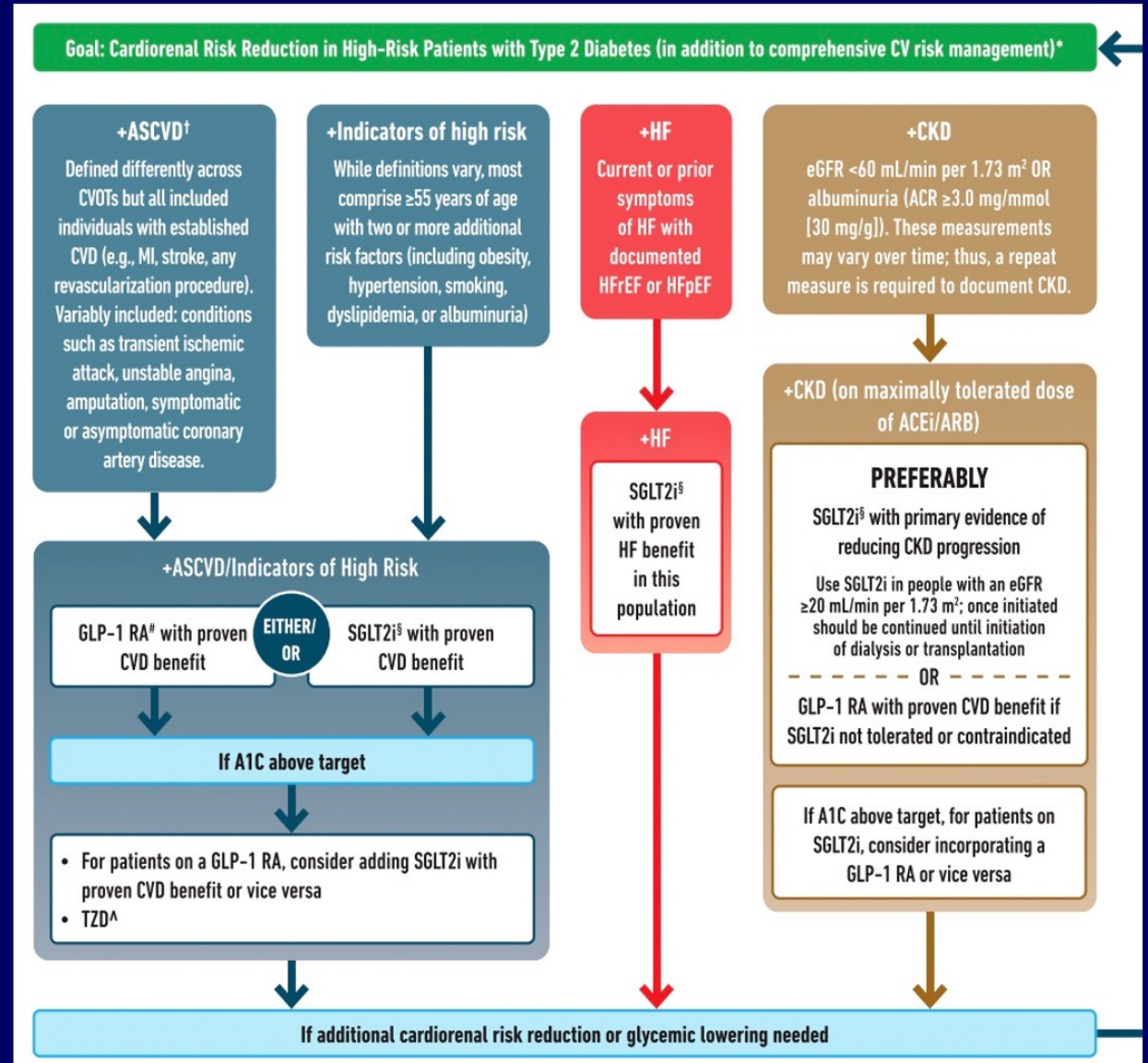
# How to prevent and optimally treat diabetes

- Optimize a Healthy Lifestyle: Weight loss is key
- If you don't have diabetes, get screened with a fasting glucose yearly
- If you do have diabetes,
  - Keep blood sugars under control
  - Get on diabetes medications that prevent comorbid events
  - Get screened for kidney disease, eye disease, neuropathy
  - Manage cardiovascular risk factors

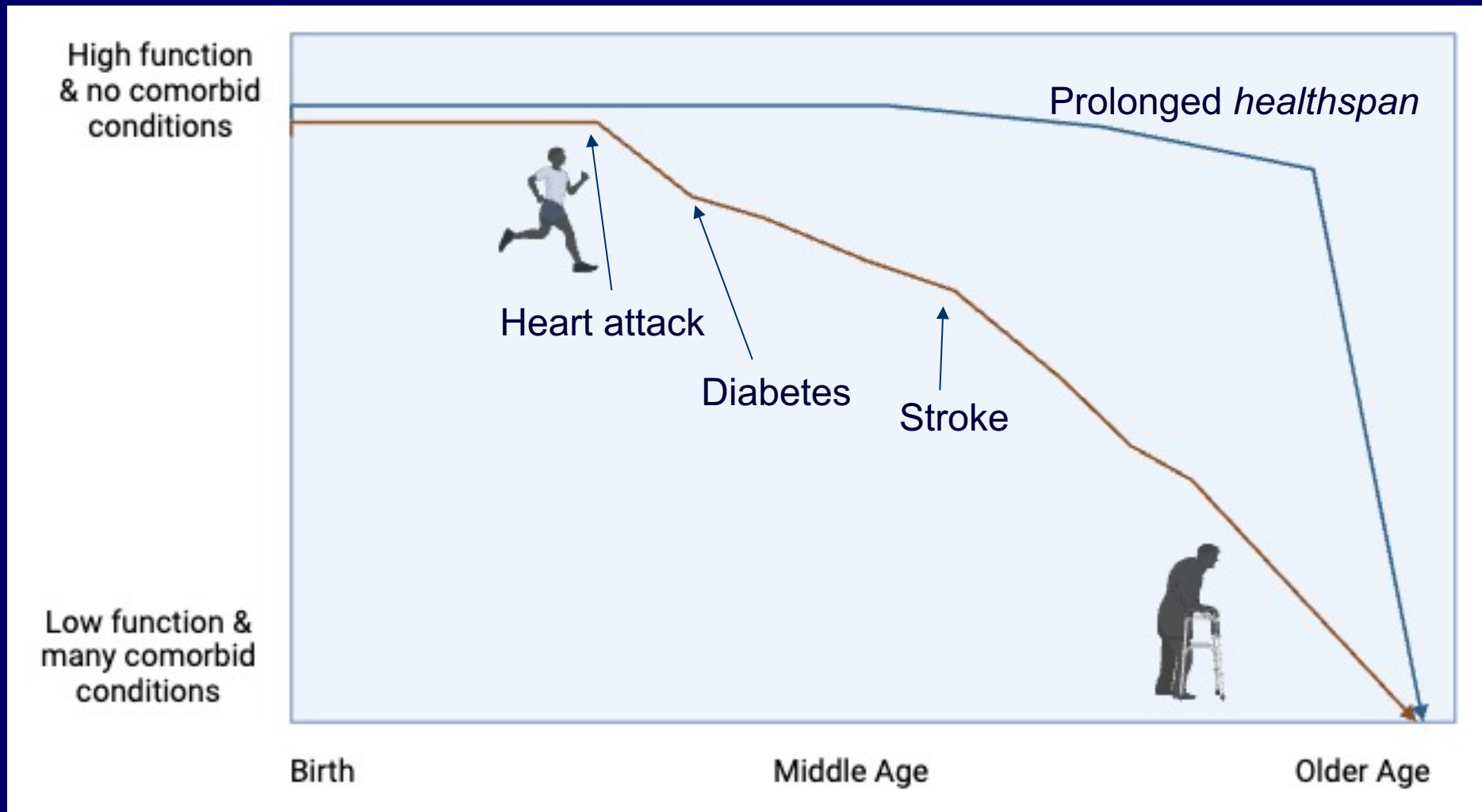
# What's first line therapy for DM? It depends...

- High risk of heart attack/stroke → GLP-1 RA
- Heart failure → SGLT2i (GLP1 RA)
- Kidney disease → SGLT2i (GLP1 RA)

ADA, Standard of Medical Care in Diabetes, 2024



# Aging is inevitable, but can we prolong the time before other conditions develop?



# What is Frailty?

- *Frailty* = “the condition of being weak and delicate”
- Vulnerable to stressors



- Phenotype:
  - Weakness
  - Slowness
  - Weight loss
  - Fatigue
  - Low activity
- Index:
  - Greater number of comorbidities

# Muscle : A Major Component of Frailty

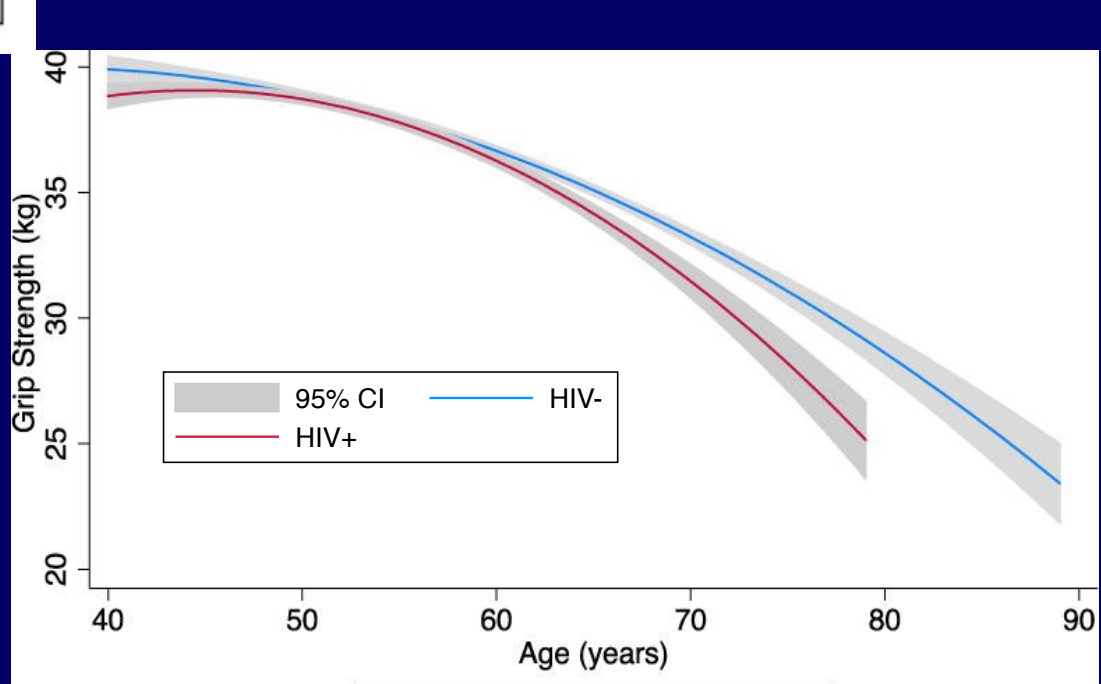
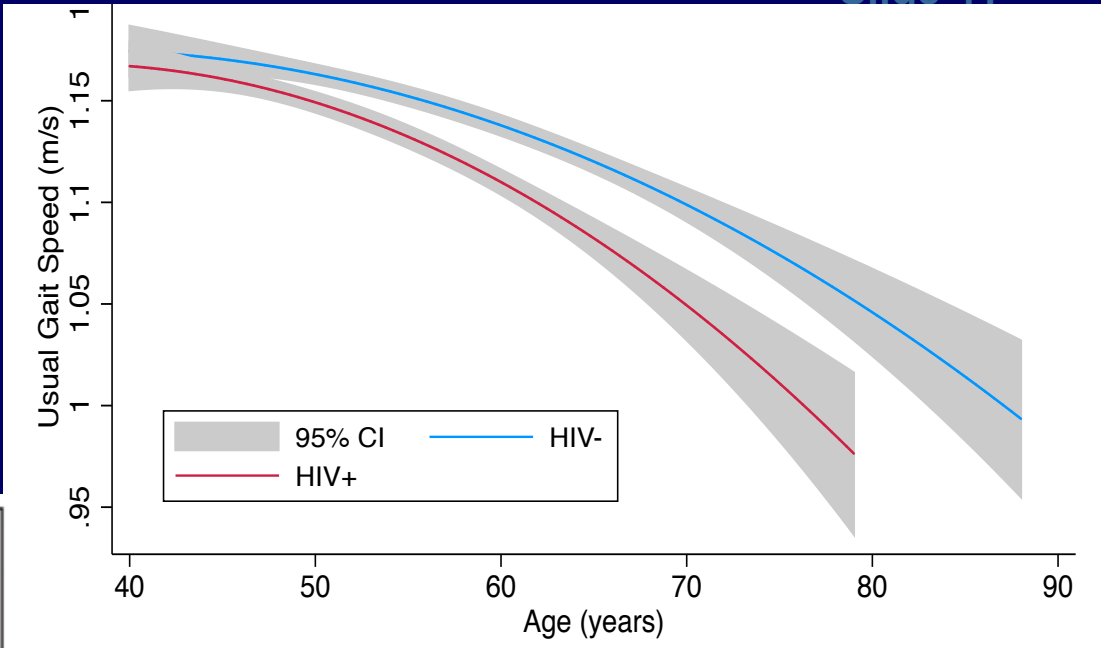
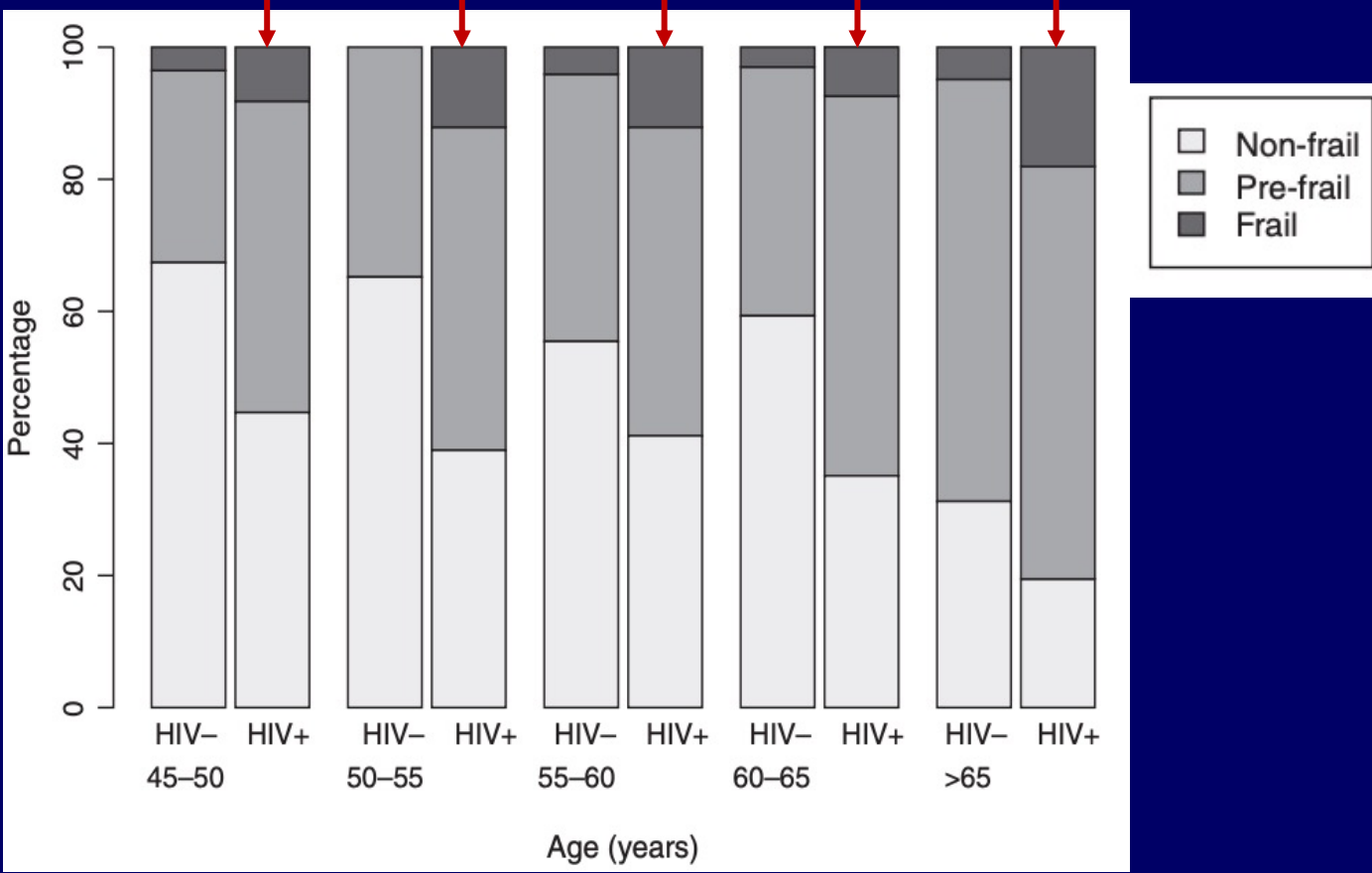
- Muscle mass declines ~ 3% per decade starting at age 30
- Strength declines 30% between the ages 50-70
- In the general population:
  - 40% of females 55 to 64 years of age, 45 % aged 65-74 and 65% between 75-84 *cannot lift 10 pounds*

What is 10 pounds?





# Physical Function Impairment and Frailty Occur more Commonly among People with HIV



Schrack J, et al. *JAIDS* 2015. Schrack, J et al. *AIDS* 2016; Kooij *AIDS* 2016

# Can we incorporate frailty and function measures in the clinic?

Frailty assessments have strengths and weaknesses<sup>2</sup>:

## Fried Phenotype

32 studies



Takes  
5 to 20 min



Least feasible



Most associated with delirium

## Clinical Frailty Scale

12 studies



Takes  
<2 min



Most feasible

Most associated with mortality & nonhome discharge

## Frailty Index

9 studies



Takes  
10 to 12 min



Largely feasible



Moderate to strong complication discrimination

## Edmonton Frail Scale

7 studies



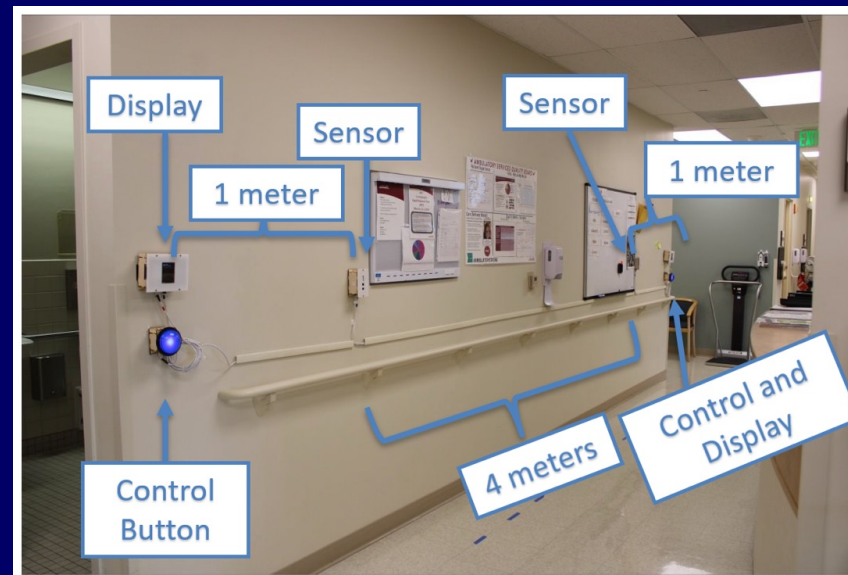
Takes  
<5 min



Largely feasible



Most associated with complications



GaitRate Gait Speed Assessment (<1 min)

# Can we incorporate frailty and function measures in the clinic?

- Treat/manage slow gait or frailty
  - Referrals to appropriate resources (i.e., nutrition, physical or occupational therapy)
- Inform general care
  - Prioritize advance care planning
  - Identify patients for geriatric referral/case management support
  - Determine frequency of clinic visits
- Guide treatment decisions
  - Inform risk/benefit of preventive care

# What else can we do to prevent or slow frailty?

- Frailty:

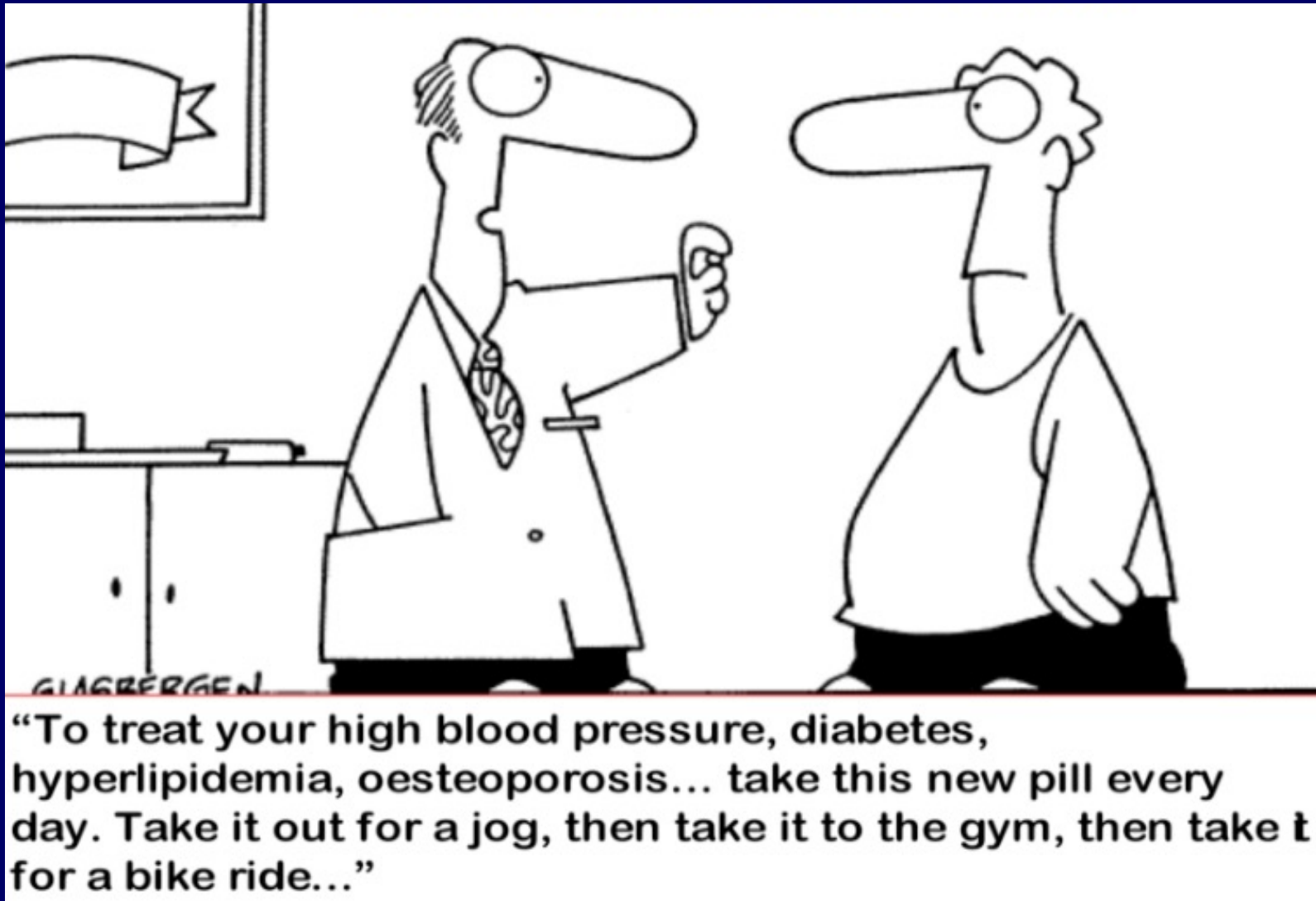
- Age
- Education
- Insurance
- Obesity
- Lower **physical activity**
- Initial randomized NNRTI
- Smoking
- Neurocognitive impairment

Modifiable risk factors:  
Smoking, weight, and physical activity

ART may play a role

- Slow gait:

- Race/ethnicity
- Education
- Insurance
- Weight gain with ART
- Lower **physical activity**
- Prior D4T/DDI
- INSTI *was protective*
- Renal disease
- Neurocognitive impairment



Regular **physical activity** can prevent/slow decline.  
Exercise is the most consistent intervention to successfully improve function and decrease frailty.

# The only prescription with unlimited refills.



Regular exercise (150 minutes per week) lowers risk of developing heart disease, high blood pressure, diabetes, stroke and Alzheimer's disease. What prescription medication can say all that?

**Ask your healthcare professional how you can benefit from an exercise prescription.**



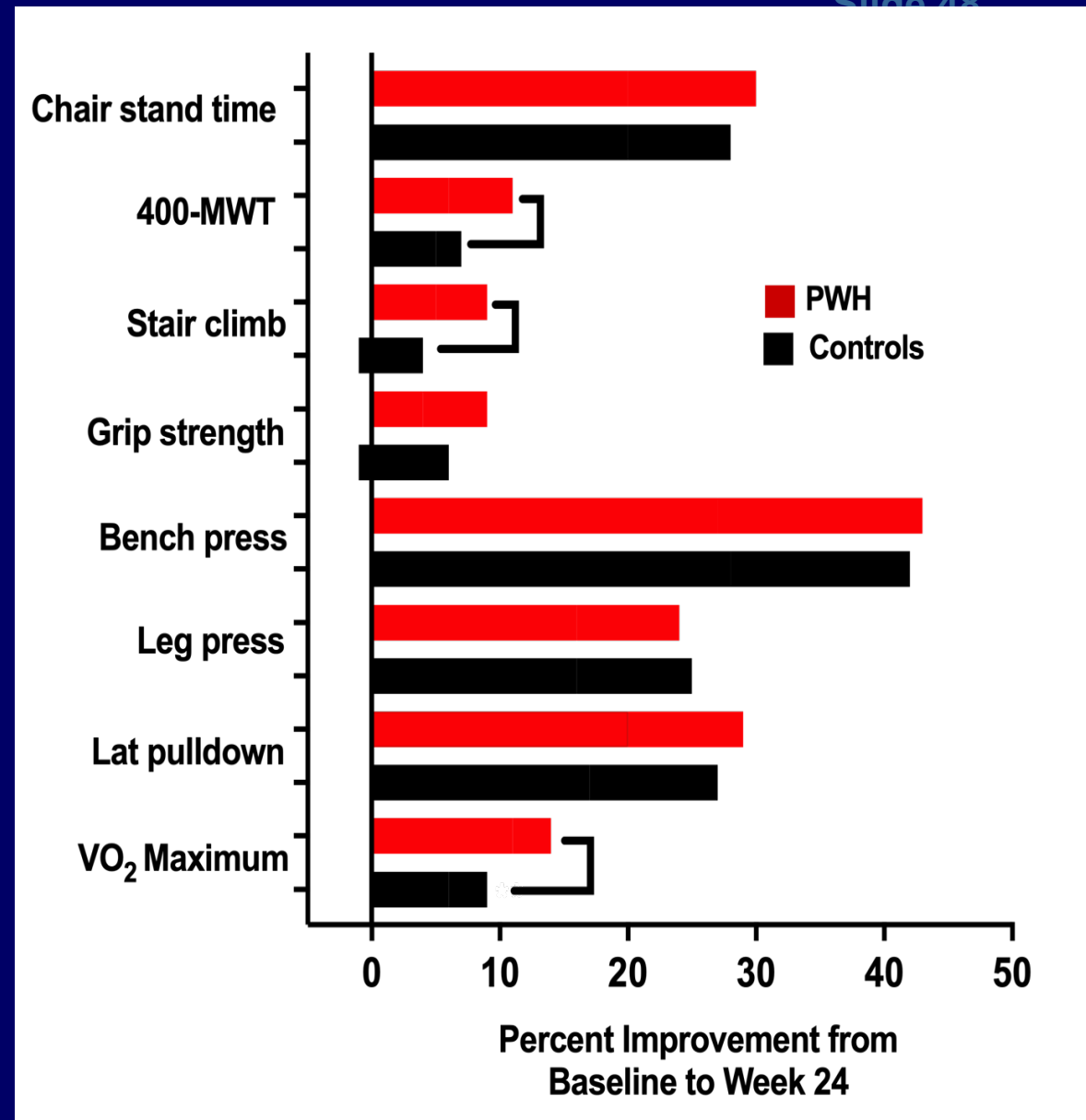
# Should exercise recommendations differ for people with HIV?

- Underlying low level inflammation
- Comorbidity burden
- Mitochondrial dysfunction
- Myopathy (AZT, raltegravir)
- Fatigue (ART, sleep apnea, etc)
- Neuropathy
- Low testosterone

# People with HIV have *Similar or Greater* Improvements in Function with Exercise

70 people with and without HIV, ≥50 years

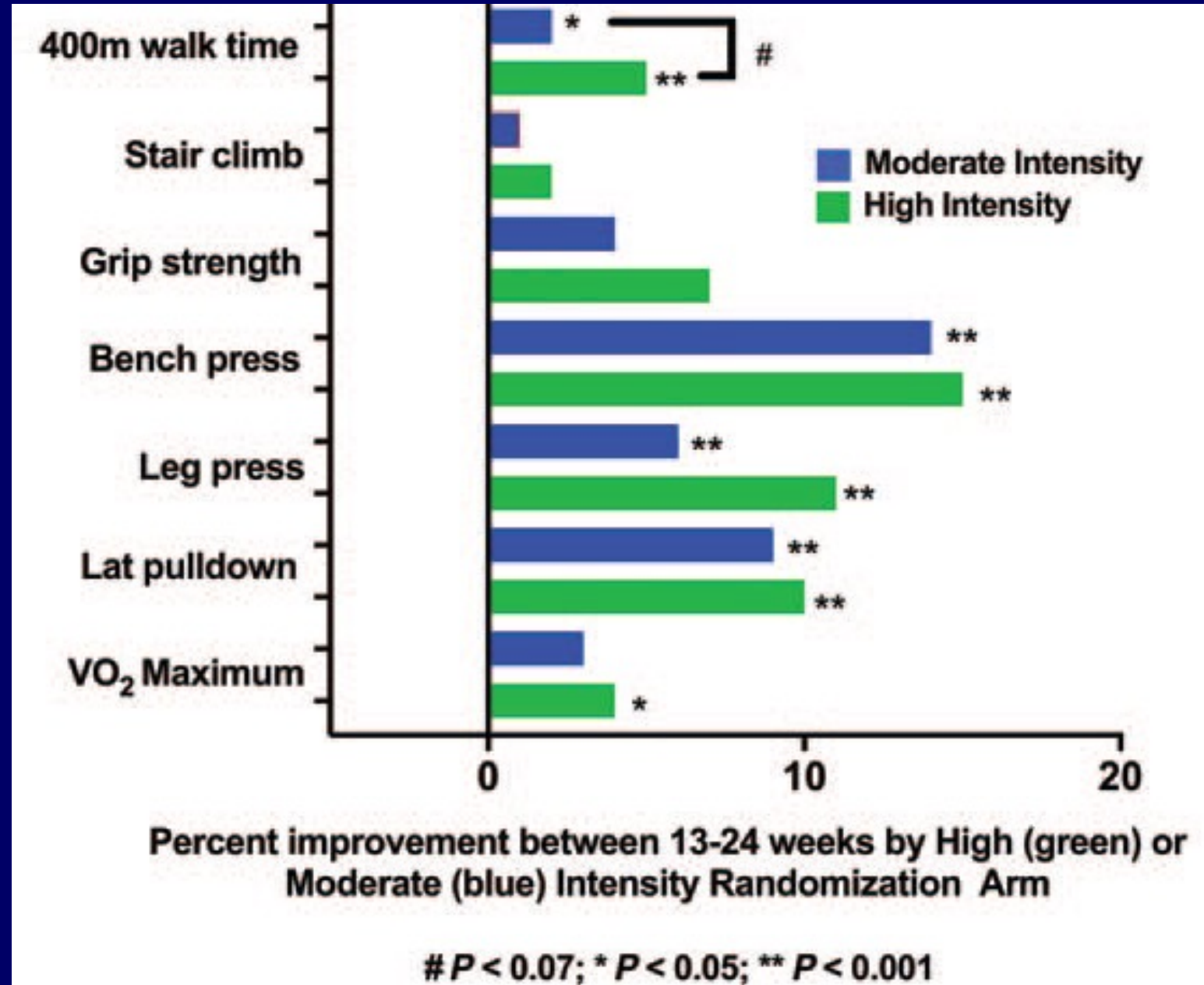
- 24 weeks mod to high intensity exercise (resistance + cardio)
- Between a 10-45% improvement in both groups
  - People with HIV experienced *greater* gains in 400-m walk time, stair climb, endurance



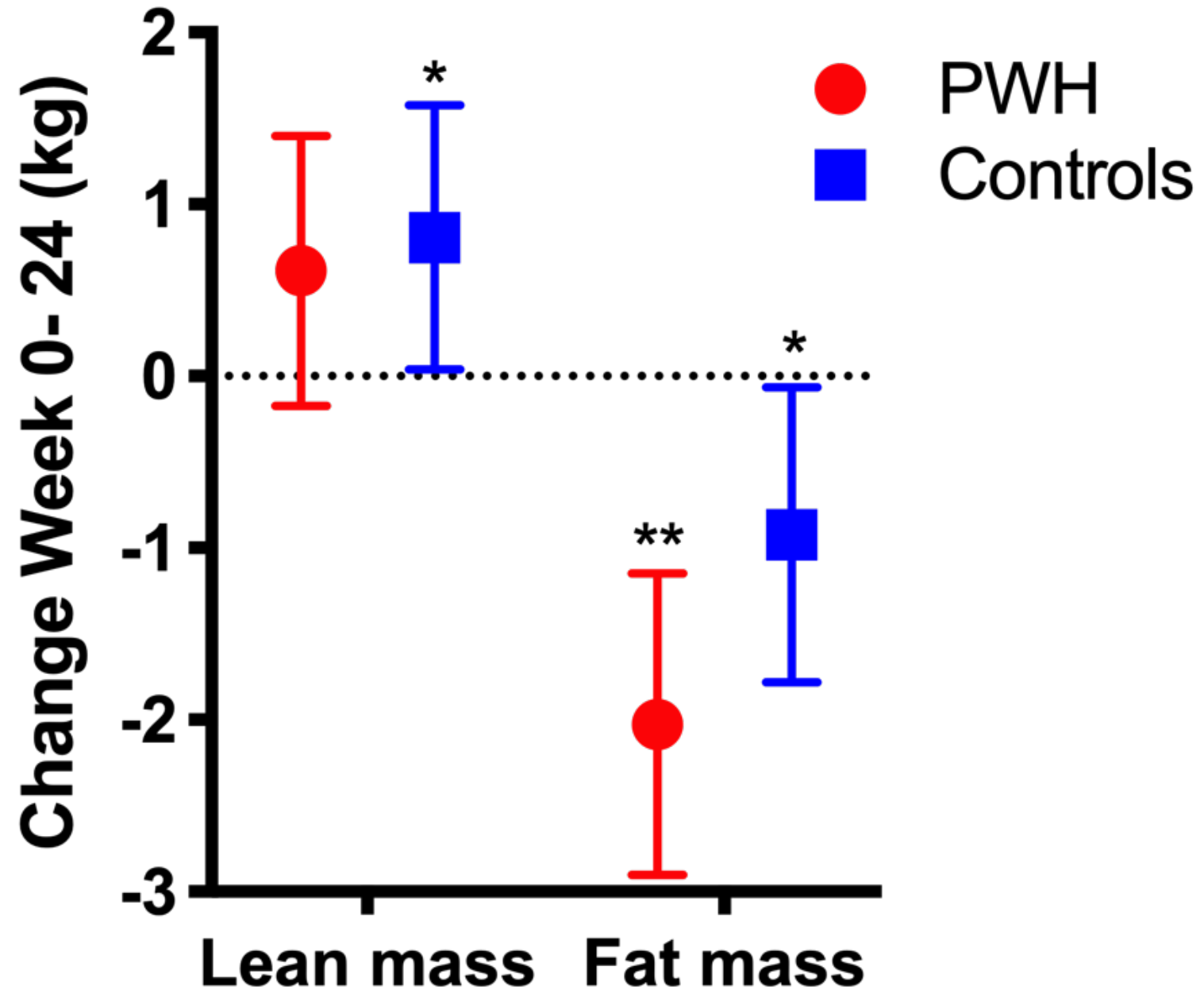


# MORE is Better!

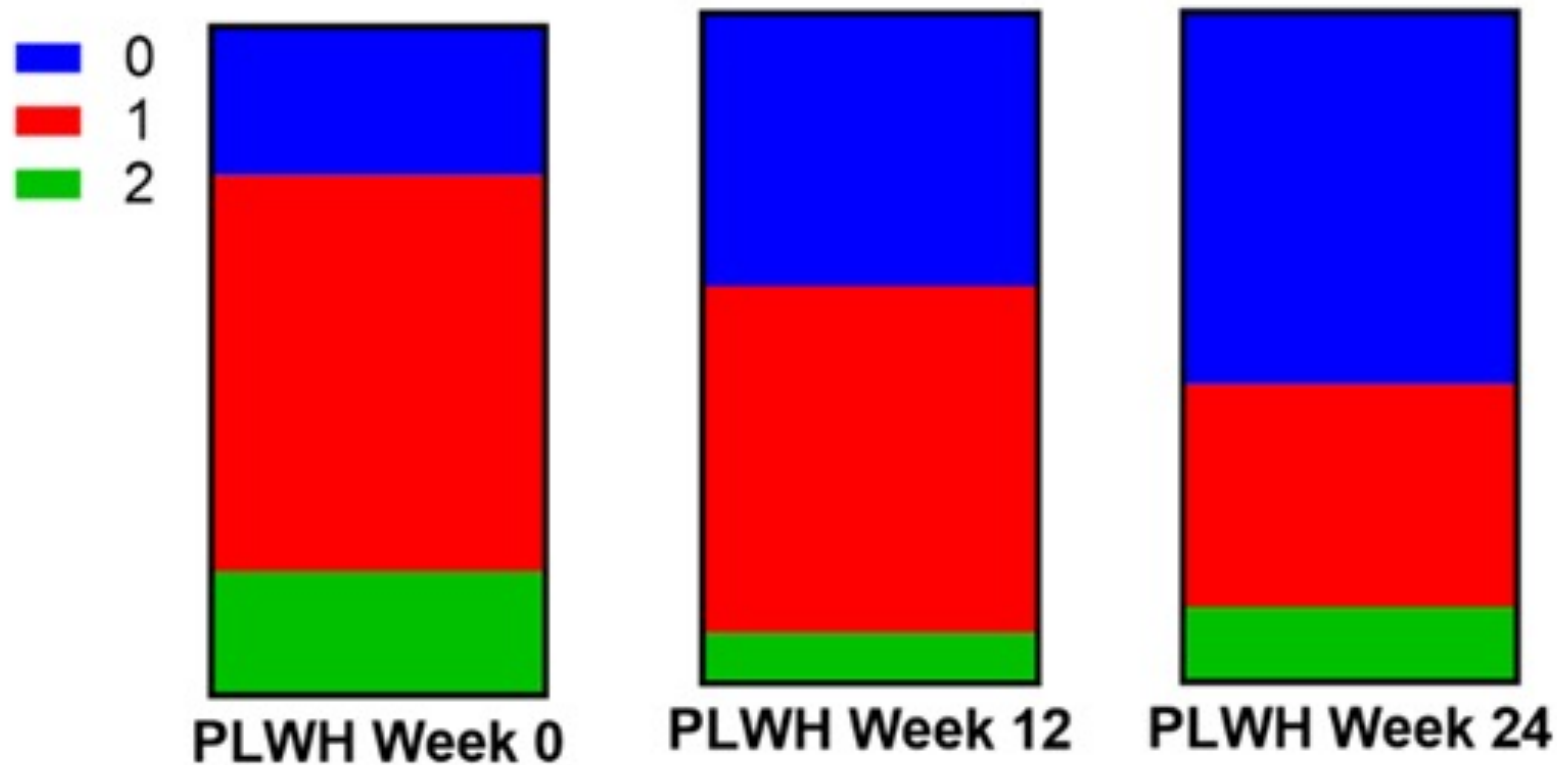
Higher “Dose” of Exercise (Green Bars) Leads to Greater Improvements in Strength and Endurance



# Exercise Can Improve Lean (Muscle) Mass and Decrease Fat Mass



# Frailty Components at Baseline and After 12 and 24 Weeks of Exercise



# Does Exercise Worsen Inflammation?

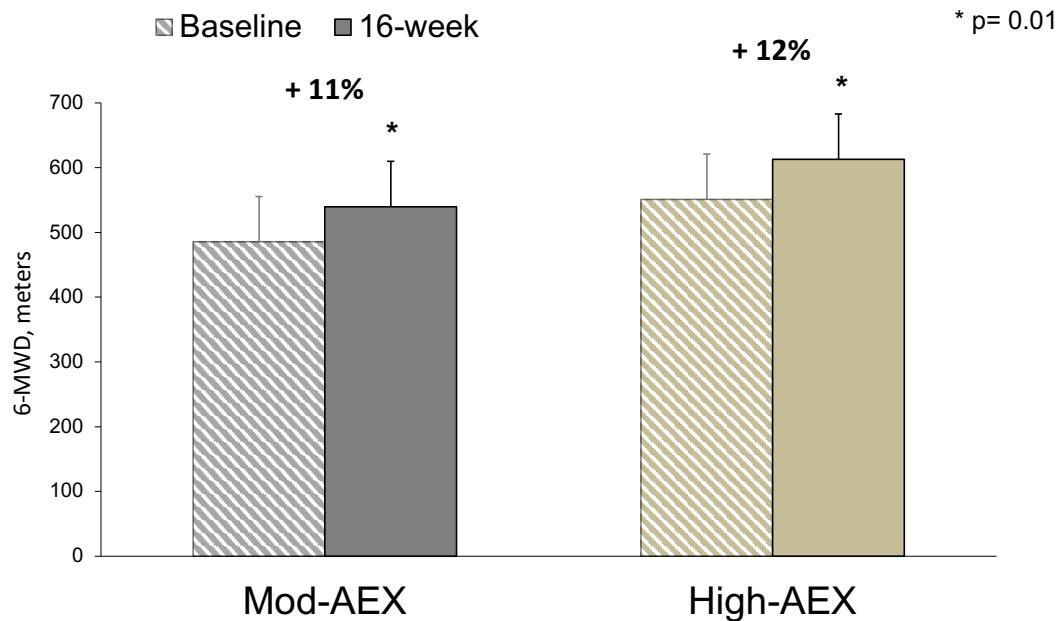
- Exercise training did not induce significantly greater inflammatory response to acute or chronic exercise in people with HIV
- *Higher-intensity* exercise may lower chronic inflammation (hs-CRP)
- Blunted IL-10 responses to exercise may suggest that PWH need a higher-intensity of exercise to experience some benefits
- We found no reasons to dissuade older, sedentary PWH from advancing to high-intensity exercise following moderate-intensity training

# What other Benefits Are Achieved with Exercise?

- “And the thing about exercise is as soon as you start doing it, **you start feeling good**”
- “In a very short period of time ...your mood changes and you start to feel like, my god, **I'm happier than I was.**”
- “And then when I started exercising, I learned to...use the exercise to help build inner core to bring the pain down to a minimum”.
- “I feel empowered when I'm here. **I think it pulled me out of always wanting to be alone.**”

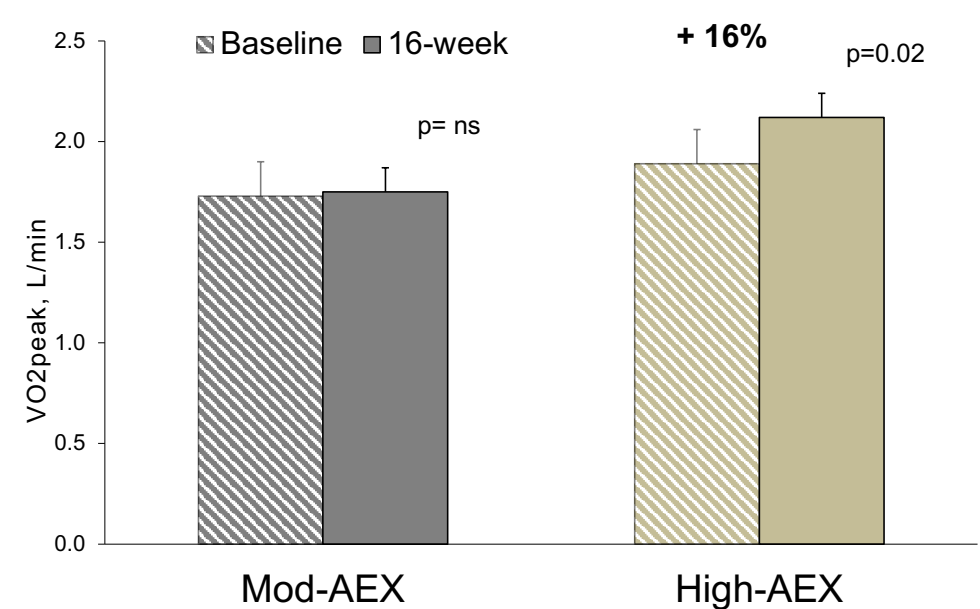
# How Much Exercise is Enough?

## Mod-AEX and High-AEX increase exercise endurance



Oursler et al, PLOS One 2018

## Only High-AEX increases VO<sub>2</sub>peak



Oursler et al, PLOS One 2018

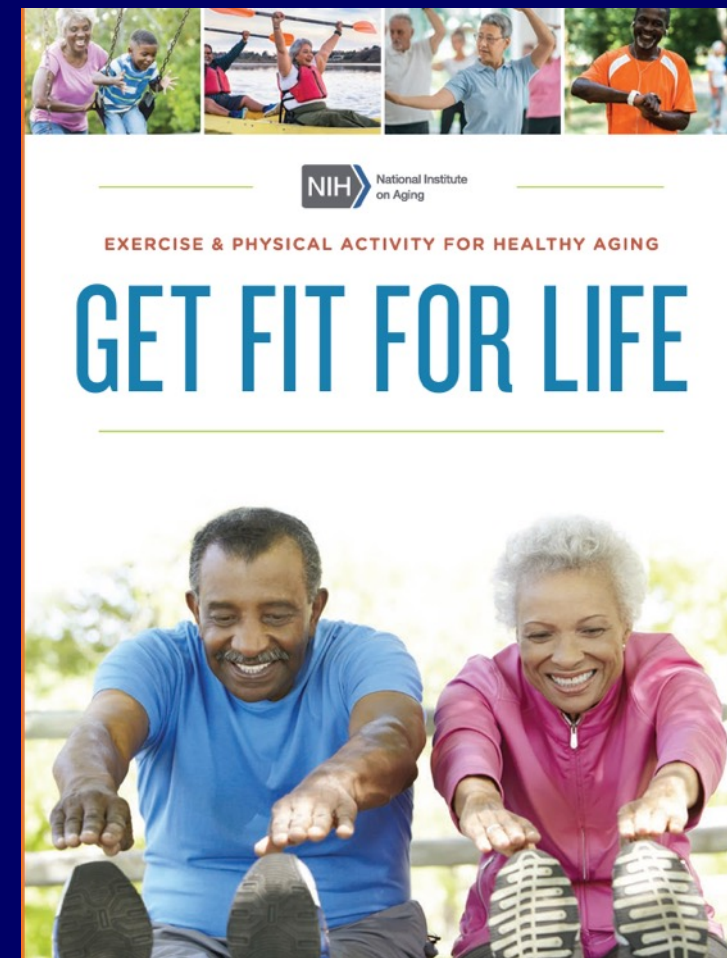
- HEALTH Study (High-Intensity Interval Training)
  - Results expected in Spring 2025

# Aerobic Exercise

- At least 150 min/week of moderate (or 75 min of more vigorous) activity
  - Raise heart rate so that you feel short of breath but can still converse
- NIA “Get Fit for Life”: example exercises, tracking logs, tips (124 color page booklet)

<https://order.nia.nih.gov/publication/get-fit-for-life-exercise-physical-activity-for-healthy-aging>

YouTube: Go4Life Fitness Classes, Silver Sneakers



# Strength Training

## Why strength training is key to your long-term health

By Melanie Radzicki McManus, CNN

🕒 5 minute read · Updated 7:55 AM EST, Mon January 15, 2024

- ~60% of adults do NO strength training
- *Any* strength training
  - Decreases CV mortality by 19%
  - Decreases blood pressure, stroke, and heart attack risk
  - Improves insulin sensitivity → decreases diabetes risk
  - Improves brain health
  - Decreases all-cause mortality up to 27%!



**AHA SCIENTIFIC STATEMENT**

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## Resistance Exercise Training in Individuals With and Without Cardiovascular Disease: 2023 Update: A Scientific Statement From the American Heart Association

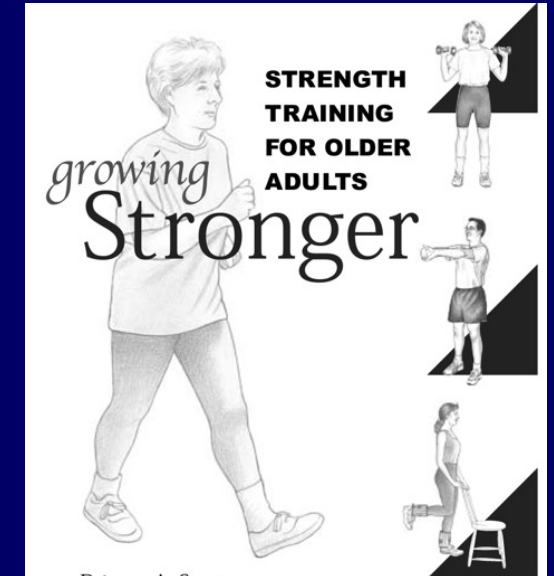
Amanda E. Paluch, PhD, FAHA, Chair; William R. Boyer, PhD; Barry A. Franklin, PhD, FAHA; Deepika Laddu, PhD, FAHA; Felipe Lobelo, MD, PhD, FAHA; Duck-chul Lee, PhD; Mary M. McDermott, MD, FAHA; Damon L. Swift, PhD, FAHA; Allison R. Weibel, RN, PhD; Abbi Lane, PhD, FAHA, Vice Chair; on behalf the American Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Clinical Cardiology; Council on Cardiovascular and Stroke Nursing; Council on Epidemiology and Prevention; and Council on Peripheral Vascular Disease

- *“Resistance training not only can improve or maintain muscle mass and strength, but also has favorable physiological and clinical effects on cardiovascular disease and risk factors.”*

# Strength Training

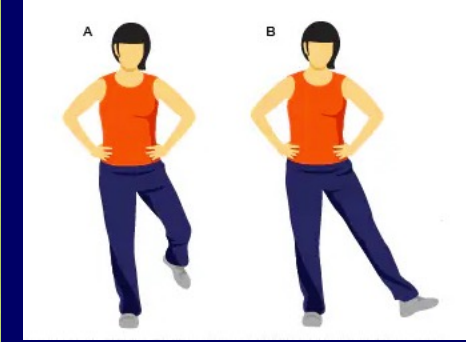


- Strength (2-3 days/week)
  - PWH have greater declines in muscle mass and strength compared to general population
- CDC “Strength Training for Older Adults”
  - [https://www.cdc.gov/physicalactivity/downloads/growing\\_stronger.pdf](https://www.cdc.gov/physicalactivity/downloads/growing_stronger.pdf)
  - Pictures of exercise, logs, recommendations on how to safely increase resistance exercise
- Resistance bands can provide inexpensive, space-limiting options (5 bands for \$8.99 on Amazon)



# Balance & Flexibility

- Balance/flexibility (for older adults)
  - 2-3 days/week
  - Tai chi, heel-to-toe walk, stand on one foot
  - Stretching, yoga



Youtube.com (Silver Sneakers):  
7-minute Yoga Workout for Older Adults

<https://www.unmc.edu/cctr/community/proactive/fourtypes>

Links to balance, flexibility, strength exercise with detailed instructions and pictures

- #1 Marching
- #2 Single Leg Stance
- #3 Heel Raises
- #4 Foot Taps on Cone or Step
- #5 Single Leg Side Hold
- #6 Semi-Tandem Stance
- #7 Lateral Stepping
- #8 Clock Reach
- #9 Tandem Stance
- #10 Same Side Single Leg & Arm Hold
- #11 3-Way Hip Kick
- #12 Heel to Toe Walk

# What Might A Week Look Like?

	Monday	Tuesday	Wednes	Thursday	Friday	Saturday	Sunday
Aerobic	30 min brisk walk/jog		30 min brisk bike	30 min brisk elliptical		30 min brisk walk	30 min hike
Strength		20 min upper body/core			20 min lower body/core		
Balance/ flexibility		20 min balance	10 min stretch		20 min Tai Chi		
Total minutes	<b>30</b>	<b>40</b>	<b>40</b>	<b>30</b>	<b>40</b>	<b>30</b>	<b>30</b>



# Virtual Fitness and Wellness Classes



Mon, September 16 [📅 Functional Strength Training](#)  
11:00AM EDT / 10:00AM CDT / 9:00AM MDT / 8:00AM PDT

## Functional Strength Training

Online / By Phone

Trainer: [Deb Gunn](#)

Use bodyweight, bands, and dumbbells to build your strength.



Mon, September 16 [📅 Fit Fusion Workout](#)  
12:00PM EDT / 11:00AM CDT / 10:00AM MDT / 9:00AM PDT

## Fit Fusion Workout

Online / By Phone

Trainer: [Cas Castro](#)

Get your heart pumping during this fun, high-energy workout!



Mon, September 16 [📅 Easy-to-Follow Tai Chi](#)  
2:00PM EDT / 1:00PM CDT / 12:00PM MDT / 11:00AM PDT

## Easy-to-Follow Tai Chi

Online / By Phone

Trainer: [Josy Delaney](#)

Move, breathe and flow during this gentle, slow, flowing form of exercise

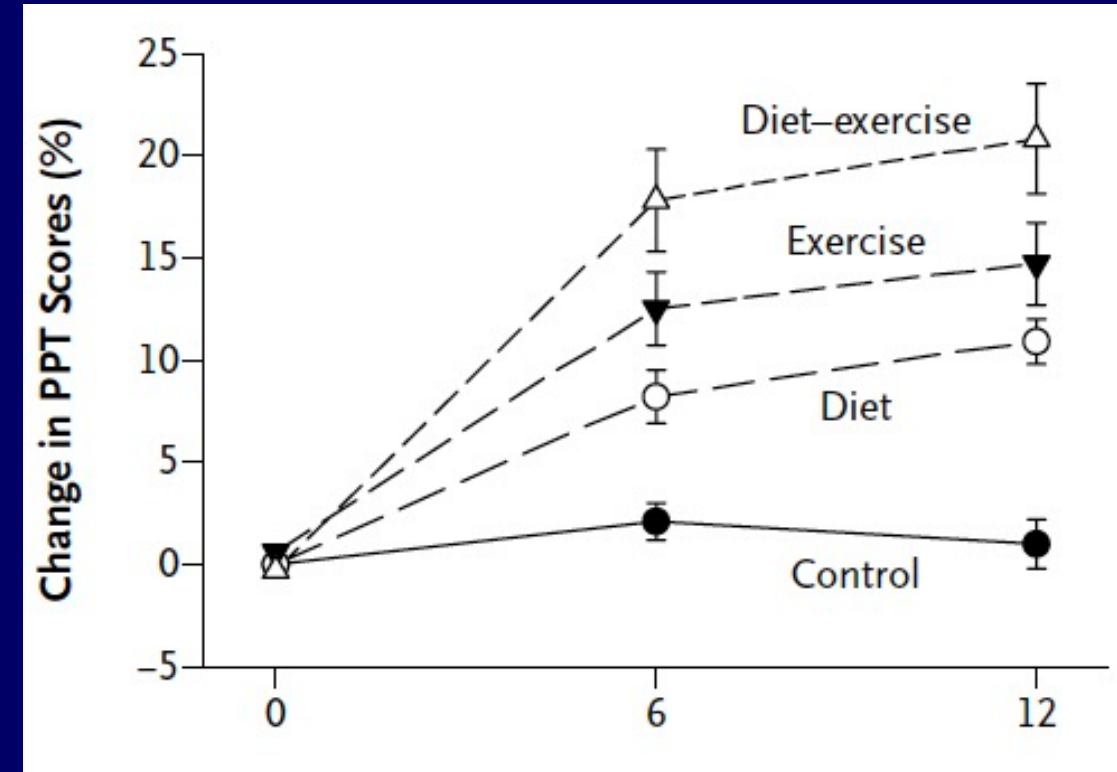
## Free AARP classes

- Classes that target strength and balance
- Done at home with minimal equipment

<https://local.aarp.org> >  
virtual events > exercise & health

# Can We Enhance the Exercise Response?

- Weight loss (dietary intervention) + exercise?
  - Among older obese adults (without HIV), greatest improvements in physical function are seen among those with both exercise + diet



# What about Weight Loss with Semaglutide?

Study	Population	Medication/ Dose	Weight change	Lean mass change
STEP 1	BMI $\geq 30$ kg/m <sup>2</sup> or $\geq 27$ kg/m <sup>2</sup> with comorbidity	Semaglutide 2.4mg SC vs placebo	-15.3 kg vs -2.6 kg	<b>-5.3 kg</b> vs -1.8 kg
McComsey	PWH with ART-associated weight gain	Semaglutide 1mg SC vs placebo	-8.3% vs +1.2%	<b>-5.4%</b> vs -0.6%

Need strength training to counteract these losses!

# Other Interventions to Improve Frailty/Function?

- **TRIUMPH Study (Led by Drs Fourman & Erlandson)**
  - **Tesamorelin (Egrifta) + resistance exercise**
  - Aging and HIV are associated with accumulation of fat in viscera & skeletal muscle
  - Skeletal muscle fat is associated with impaired function
  - Can a therapy that decreases visceral and muscle fat improve physical function, especially when combined with exercise?
  - Anticipate enrollment starting Spring 2025



# Other Interventions to Improve Frailty/Function?

- **Dasatinib/Quercetin (ACTG A5426)**
  - Aging is associated with accumulation of senescent (aging) cells
  - If we can eliminate senescent cells, can we reverse aging/frailty?
  - Preliminary data supports in other disease populations
  - Twice weekly D/Q in people with HIV and slow gait (open to enrollment Spring 2025)

# Importance of Purpose: Social Prescribing?

## When the Prescription Is for a Dance Class, not a Pill

Prescriptions for social activities, exercise and the arts — first popularized in Britain — are coming to America. But some experts say the U.S. health care system may get in the way.

*New York Times, April 2024*

From the World Health Organization:

“Social prescribing is a means of connecting patients to a range of non-clinical services in the community to improve their health and well-being.

It builds on the evidence that addressing social determinants of health such as socioeconomic status, social inclusion, housing, and education is key to improving health outcomes”

# Social Connections

- Volunteer opportunities
- Social groups at libraries, community centers, senior centers (many provide meals)
- "Memory Cafes": gathering places for people with dementia (activities from the Manhattan Teal Room)

<https://www.memorycafedirectory.com/>

- Or do something active!

<https://walkwithadoc.org/join-a-walk/faqs/>

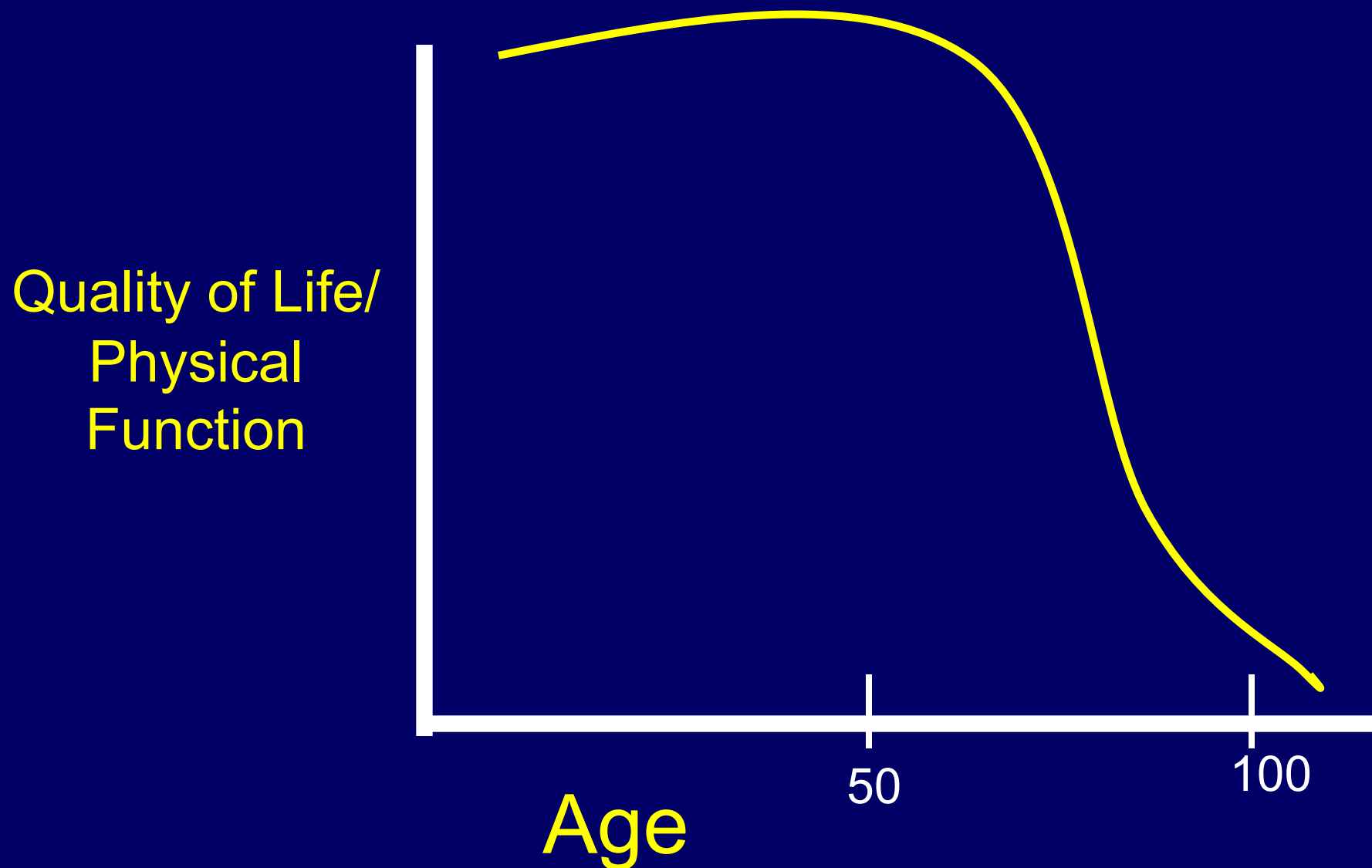




# Conclusions

- HIV medications work well, so people are living longer
- You have a big role in how you are going to age
- Modify your modifiable risk factors
- Find disease early and try to reverse it

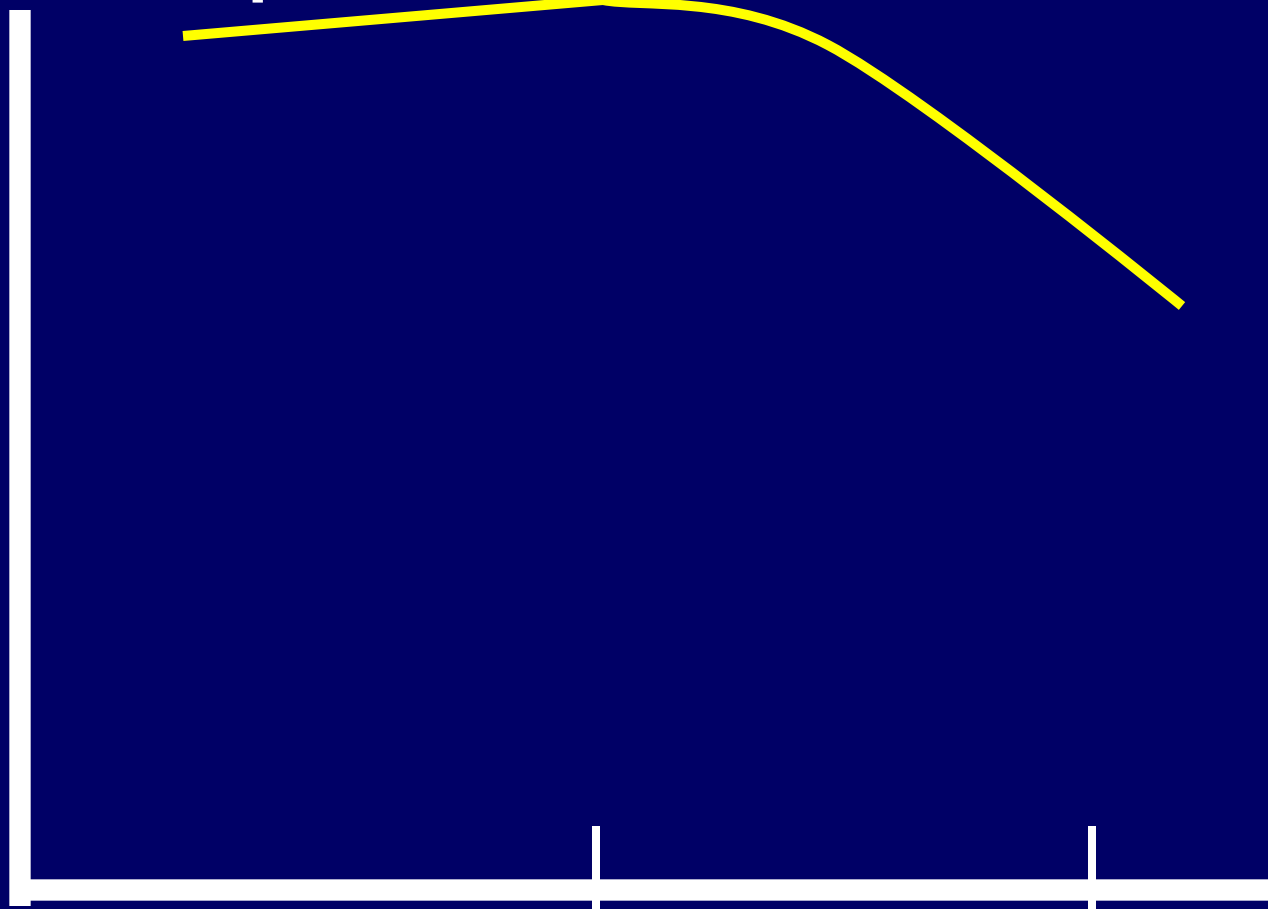
# You can bend the aging curve



# You can bend the aging curve

upward

Quality of Life/  
Physical &  
Cognitive  
Function



Age

50

100

# You can bend the aging curve upward

