

Successful Aging in People Living with HIV

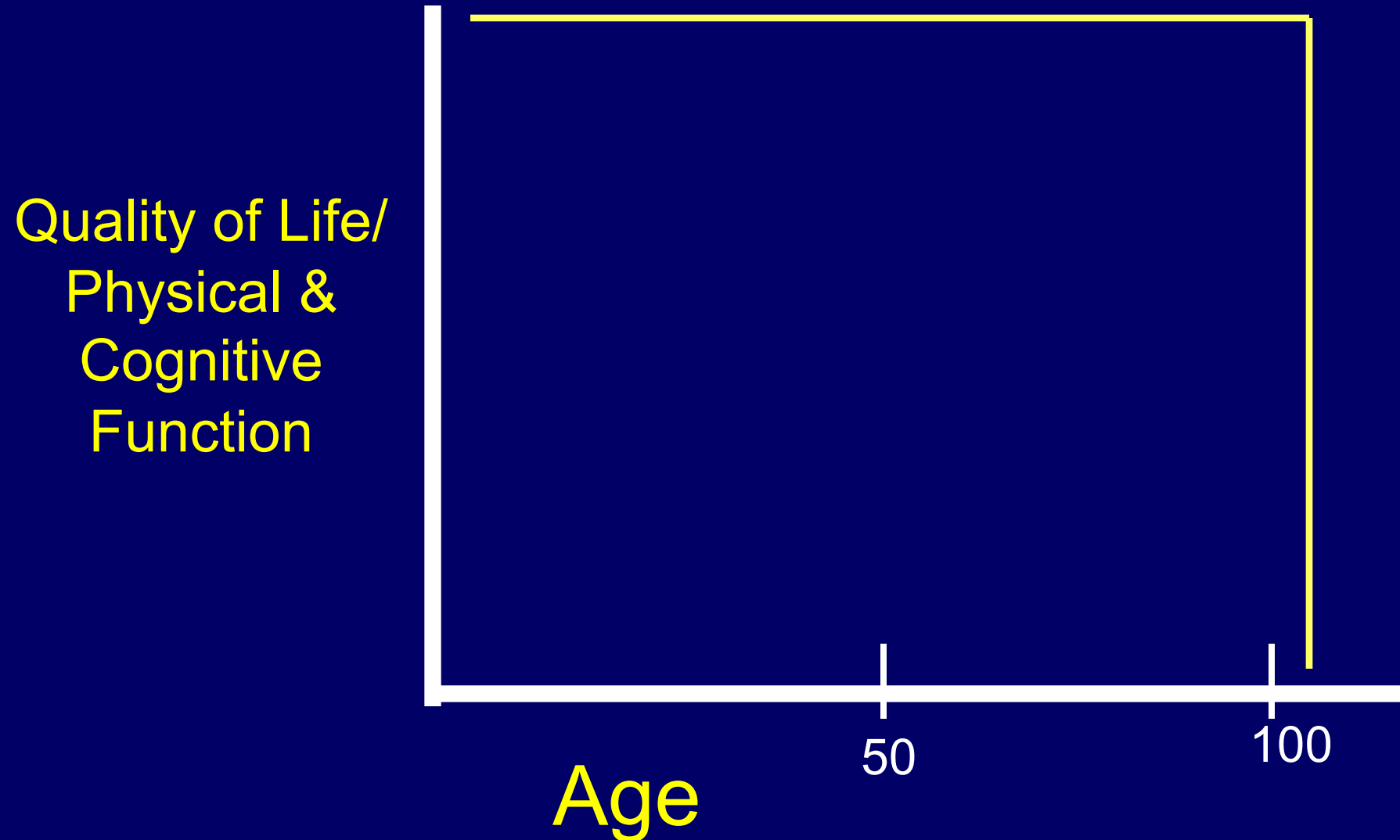


Kristine M. Erlandson, MD, MHS
Division of Infectious Diseases
University of Colorado

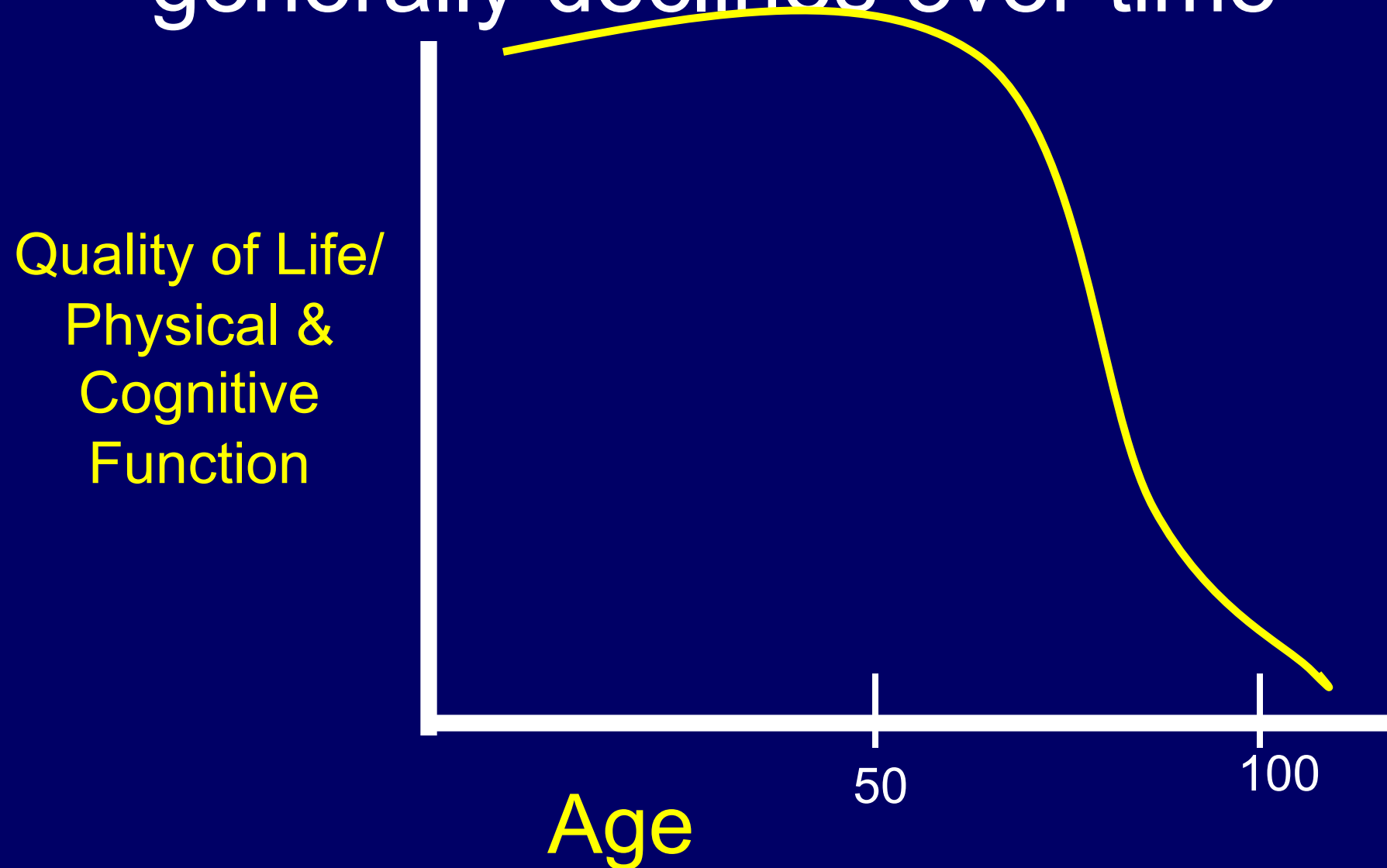


Todd T. Brown, MD, PhD
Division of Endocrinology, Diabetes, & Metabolism
Johns Hopkins University

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= Candles on your birthday cake
- 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

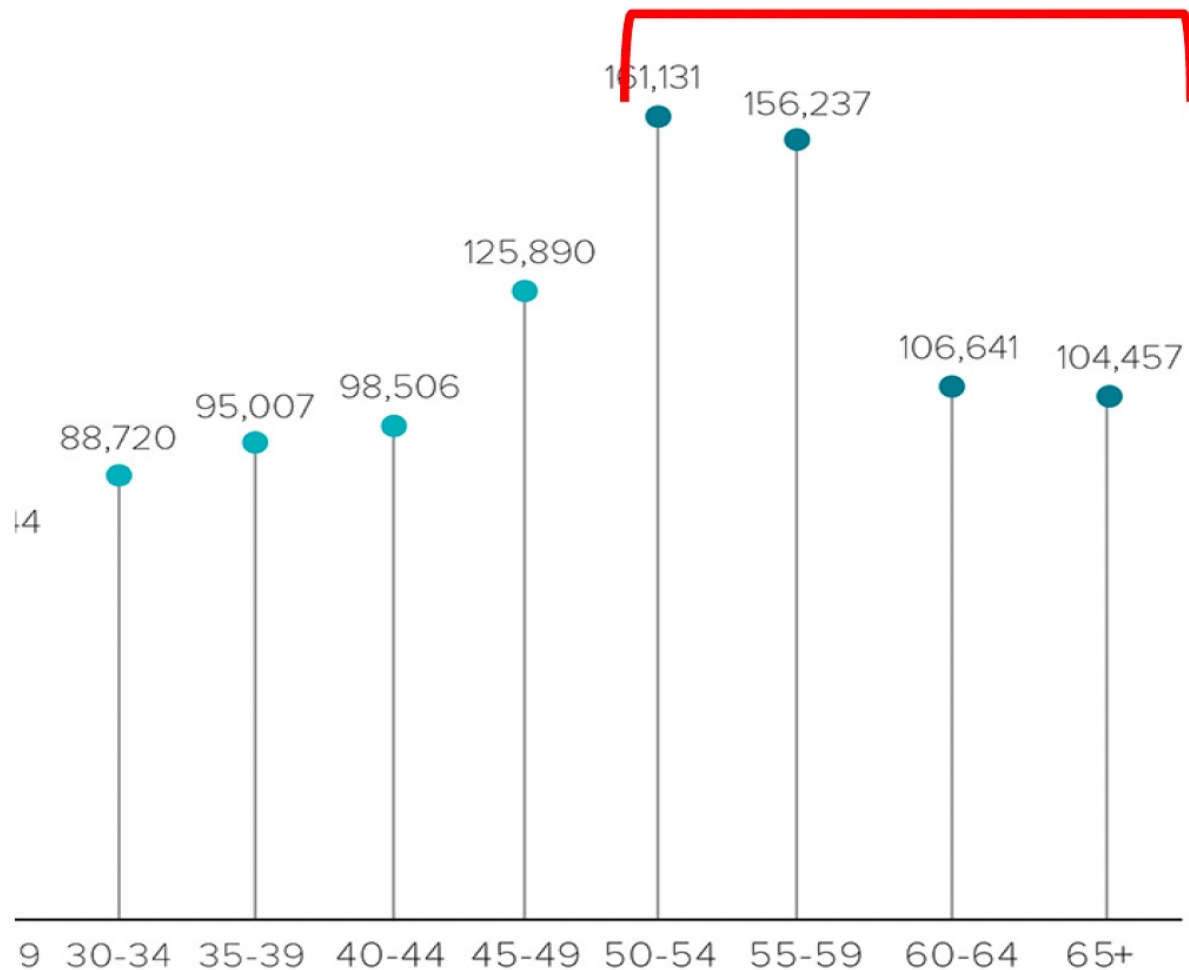
C.53

D.63

Aging & HIV: What do we know?

- People living with HIV are getting older

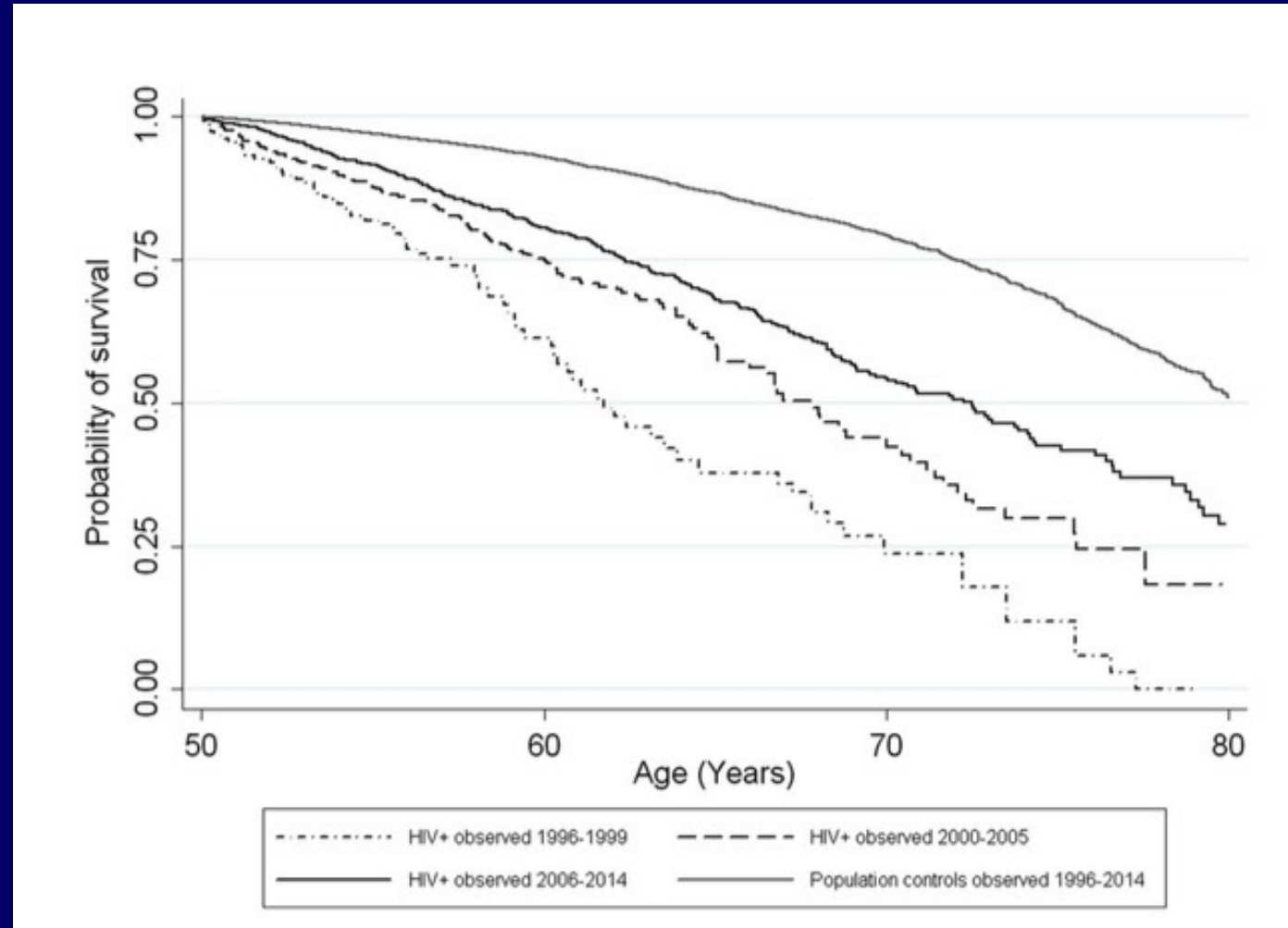
More than 50% of People with HIV in the US are Aged 50 or Older



- 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

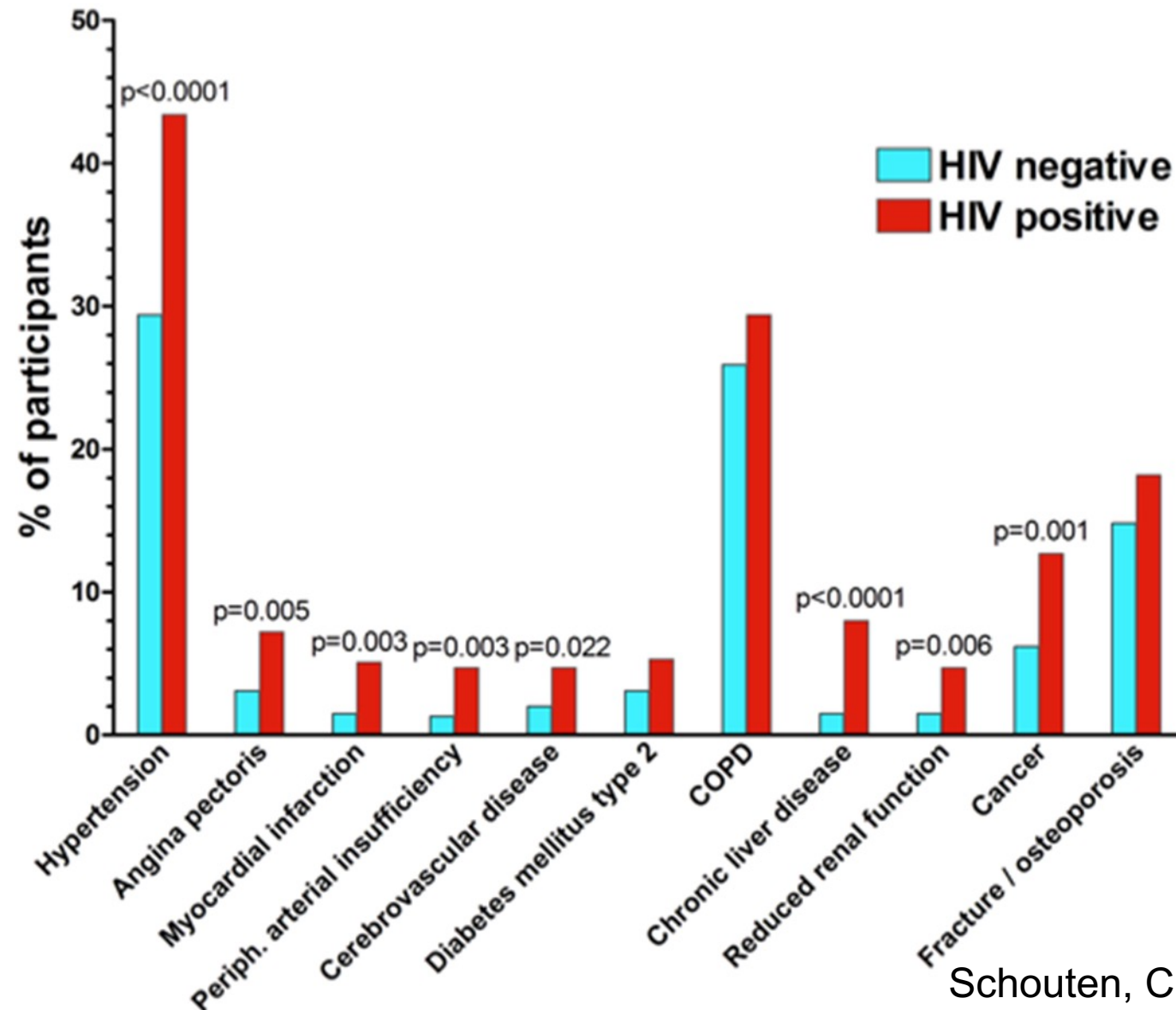
Slide 10



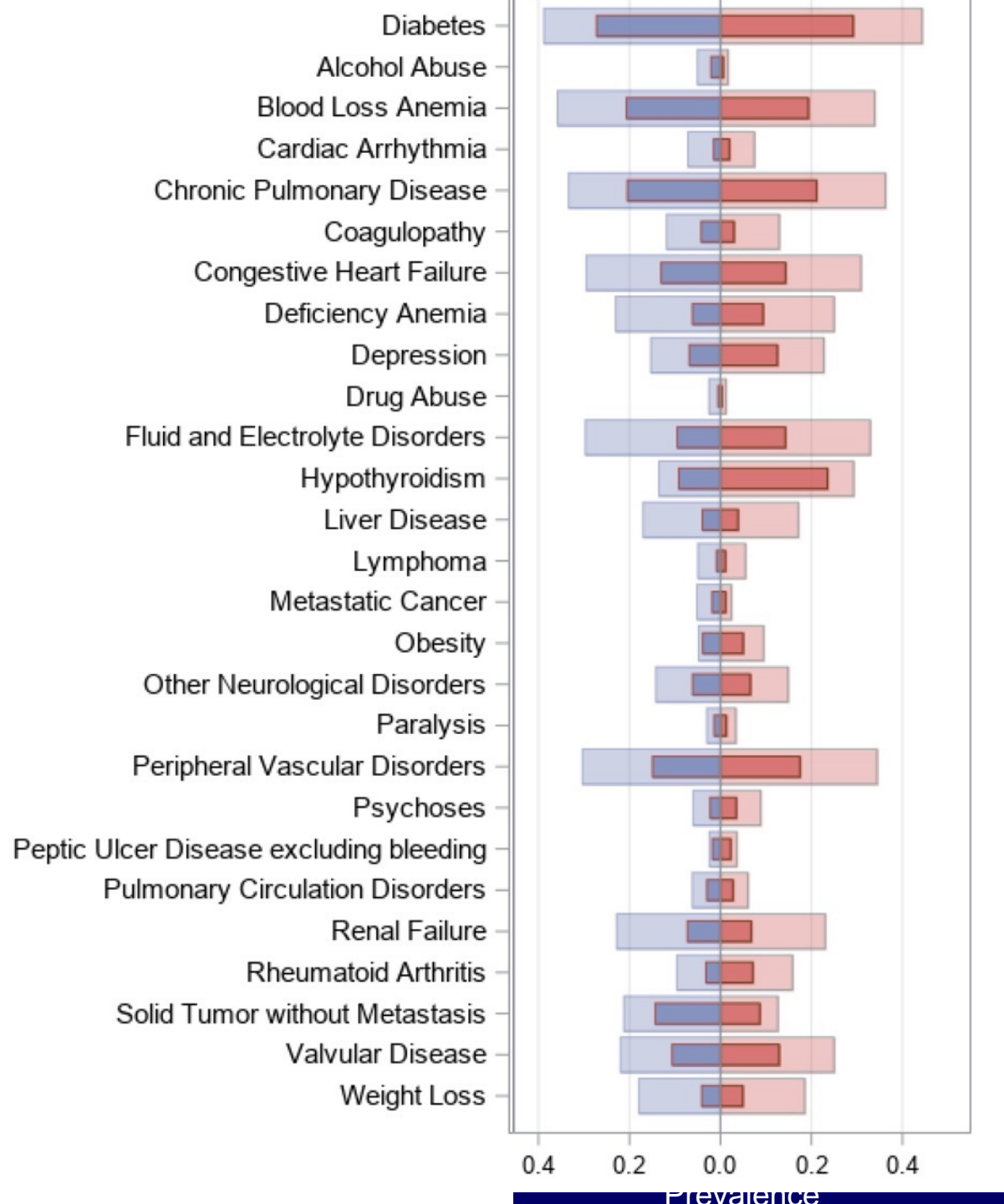
Aging & HIV: What do we know?

- 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



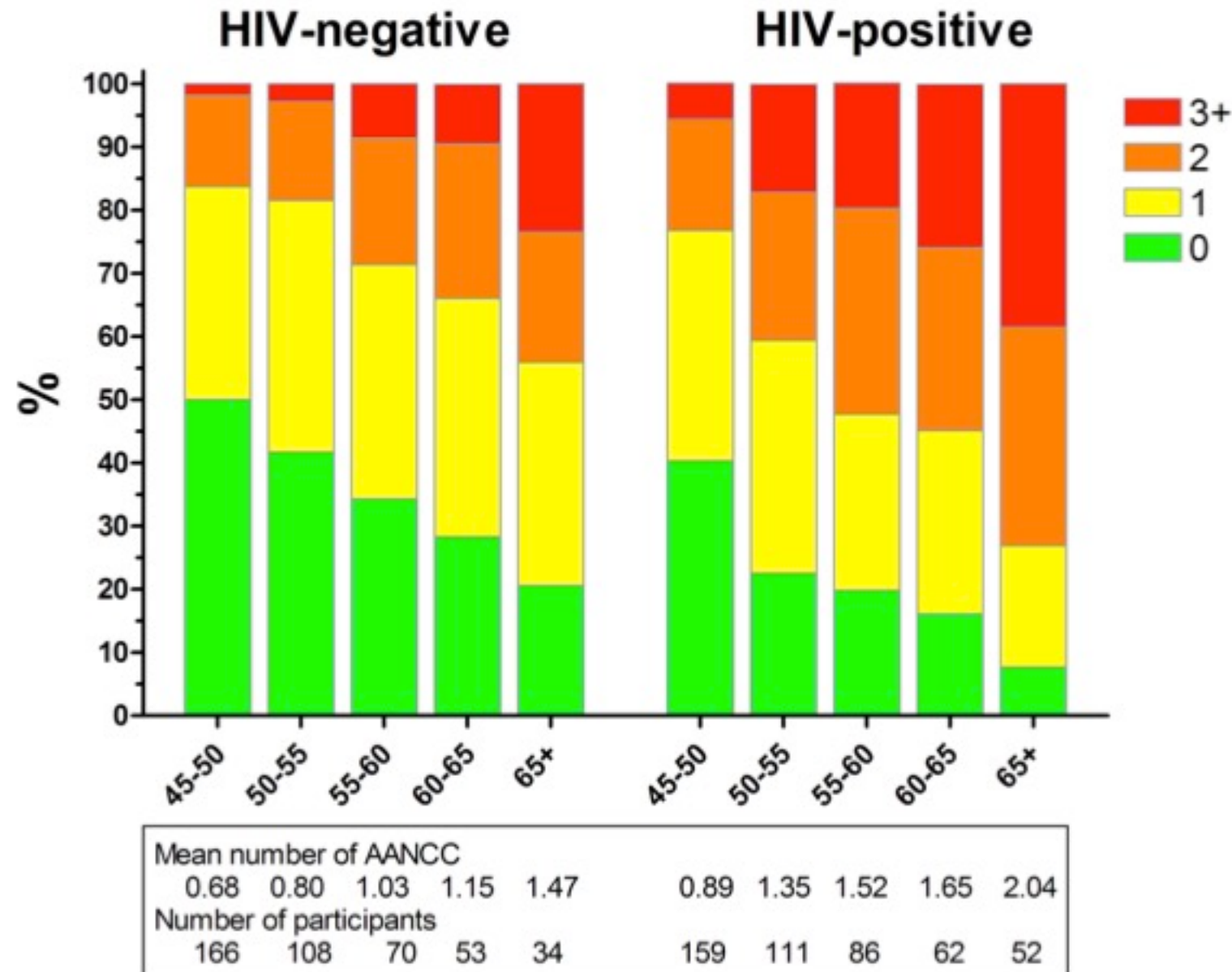
Prevalence of Essentially all Comorbidities is Greater among People with HIV compared to without HIV



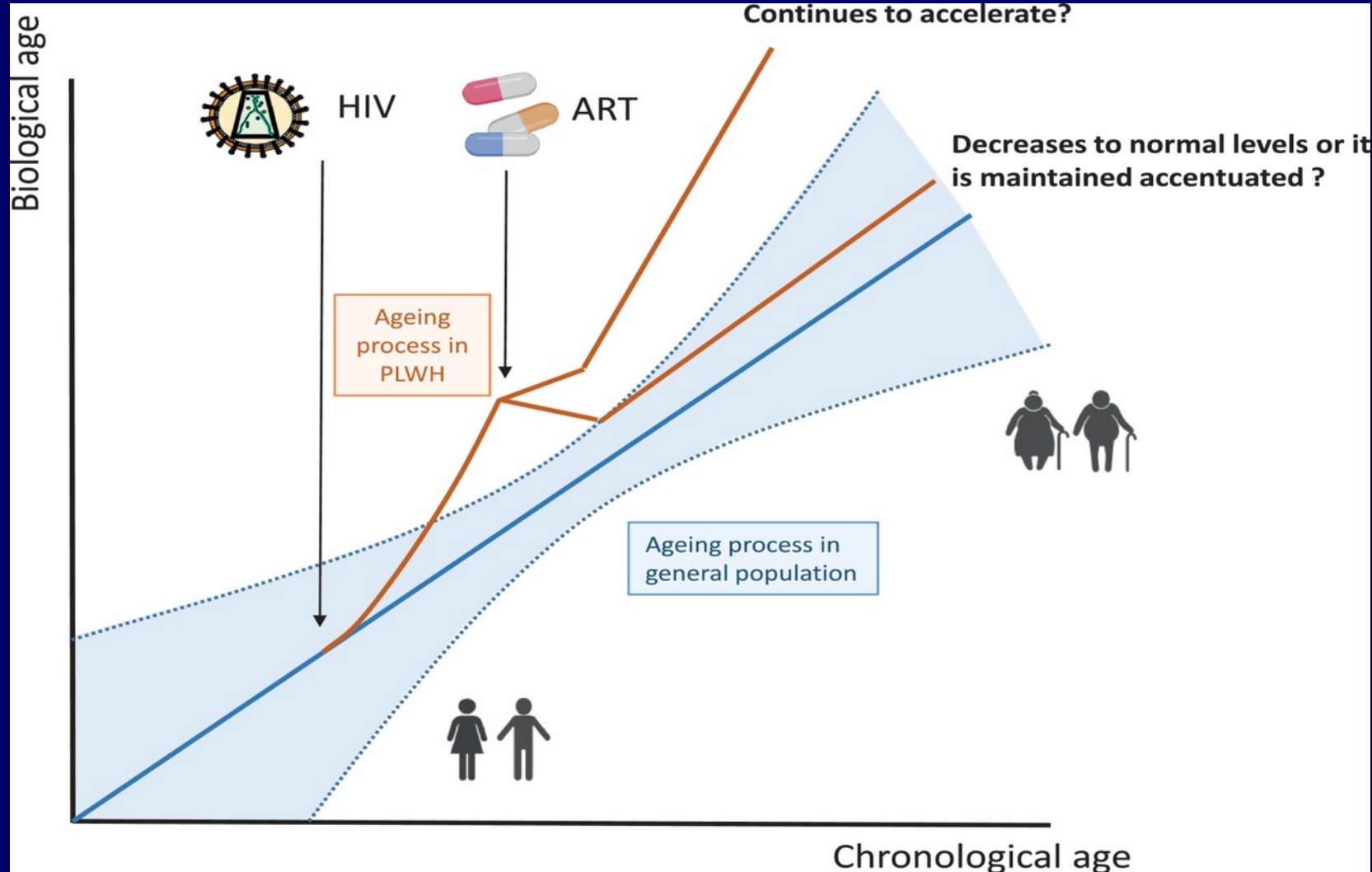
■ Males with HIV ■ Males without HIV

■ Females with HIV ■ Females without HIV

Comorbidity in relation to age

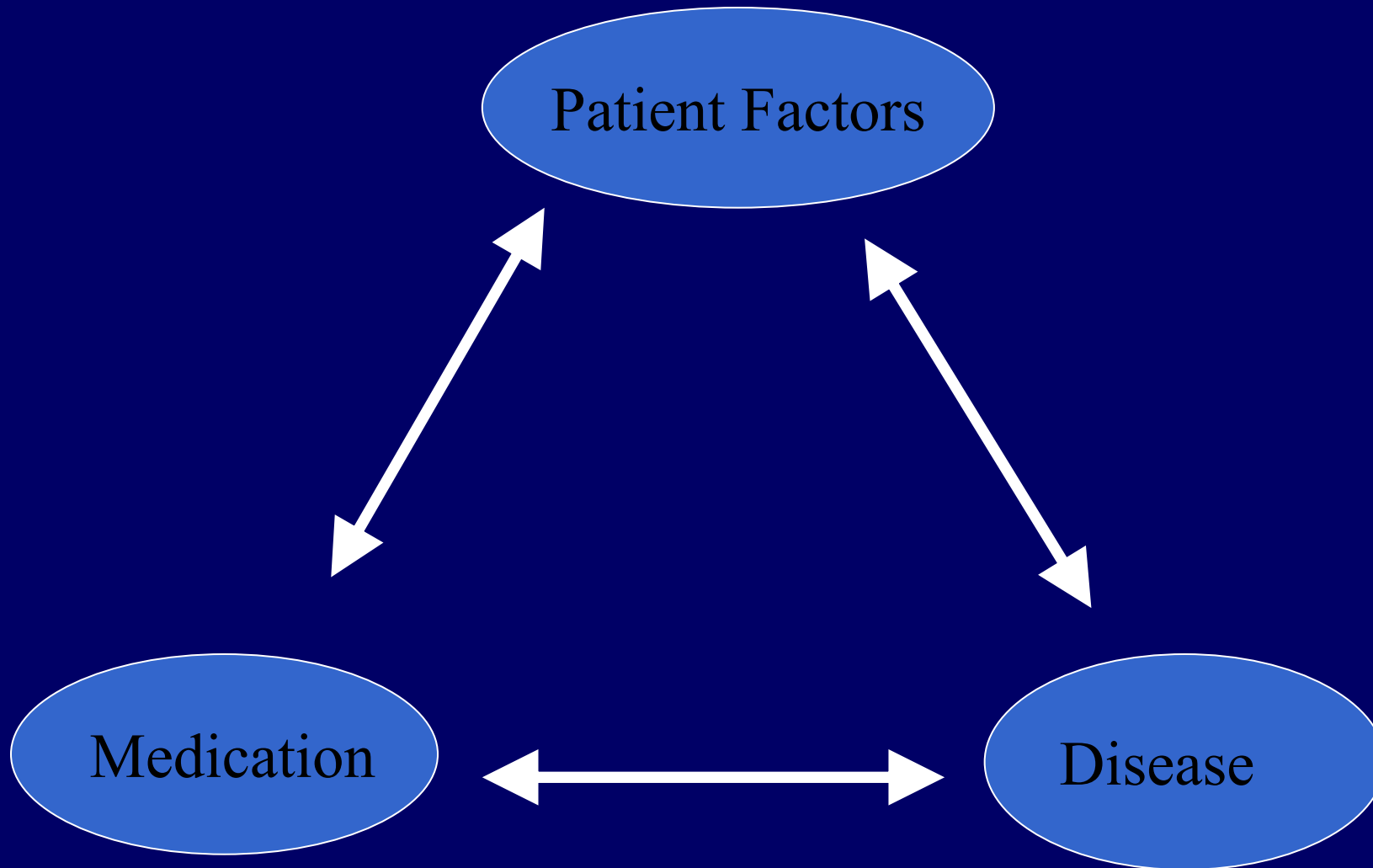


Does HIV Accelerate Aging: Disconnect Between the Biologic and Chronologic Age



Driven by
inflammation, low
level viremia,
immune activation,
dysbiosis,
co-infection?

Causes of Comorbid Diseases in HIV



The Legacy Effects of HIV and Antiretroviral Therapy

Slide 17

Erlandson et al. AIDS 2016;
The Globe; Nature Reviews

- Profound immune suppression, high viral load
- ART toxicity
- Low-level inflammation
- Obesity



Will we see the same impact of HIV on aging in 10 years, or globally?

HIV Medications & Comorbidities

Current Effects

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

Legacy Effects

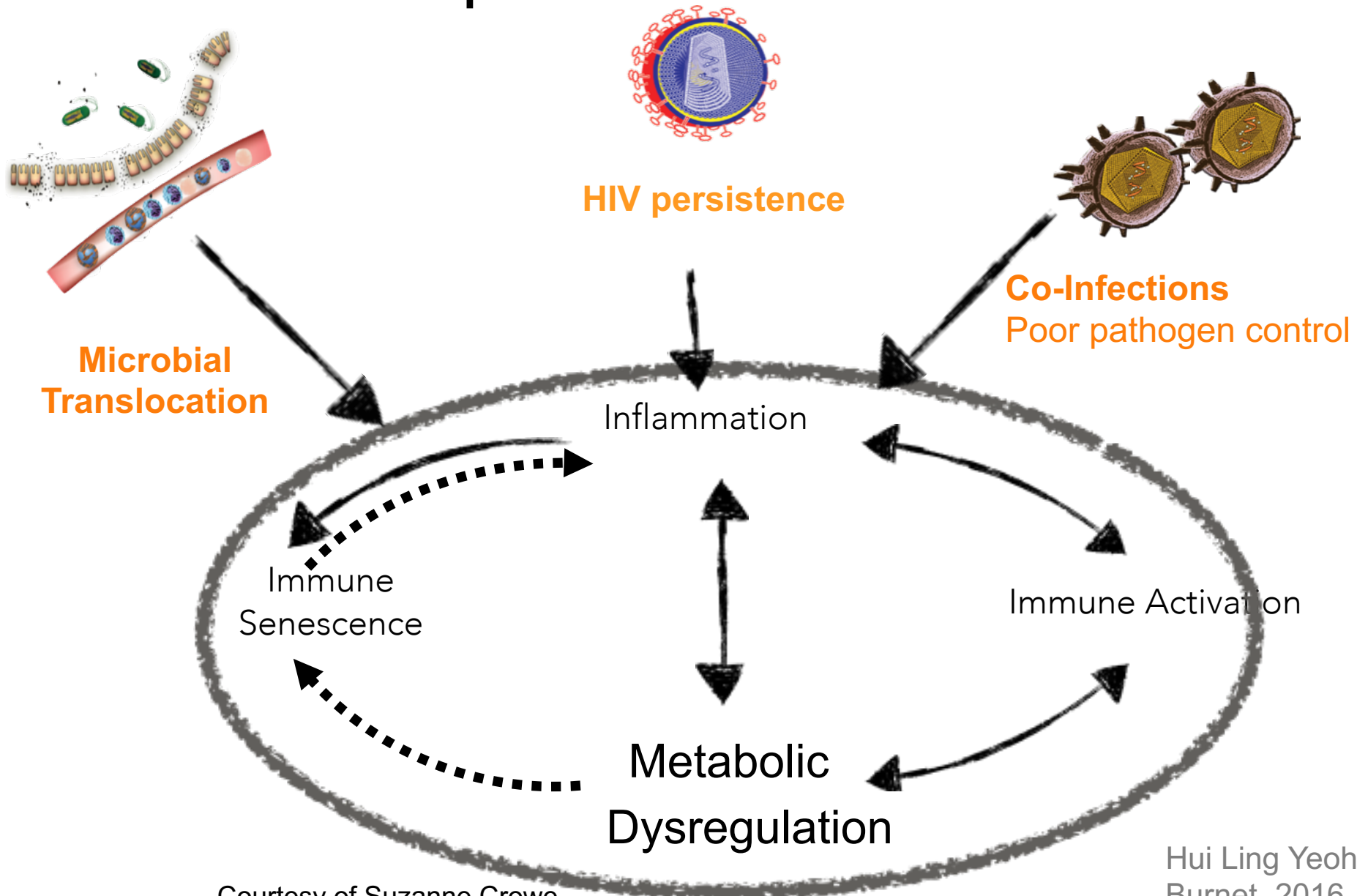
- Past use of stavudine (Zerit) can persist

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

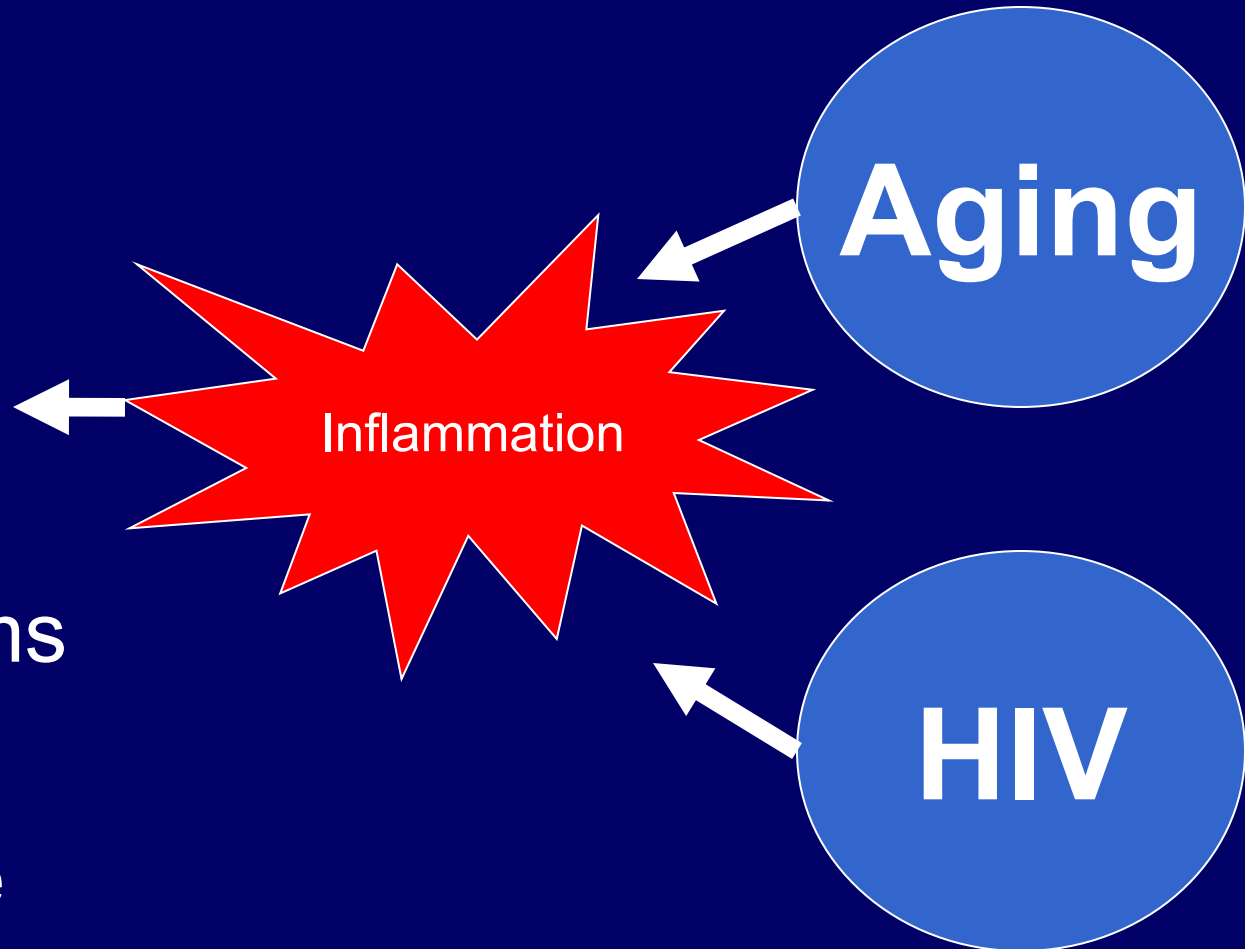


Courtesy of Suzanne Crowe

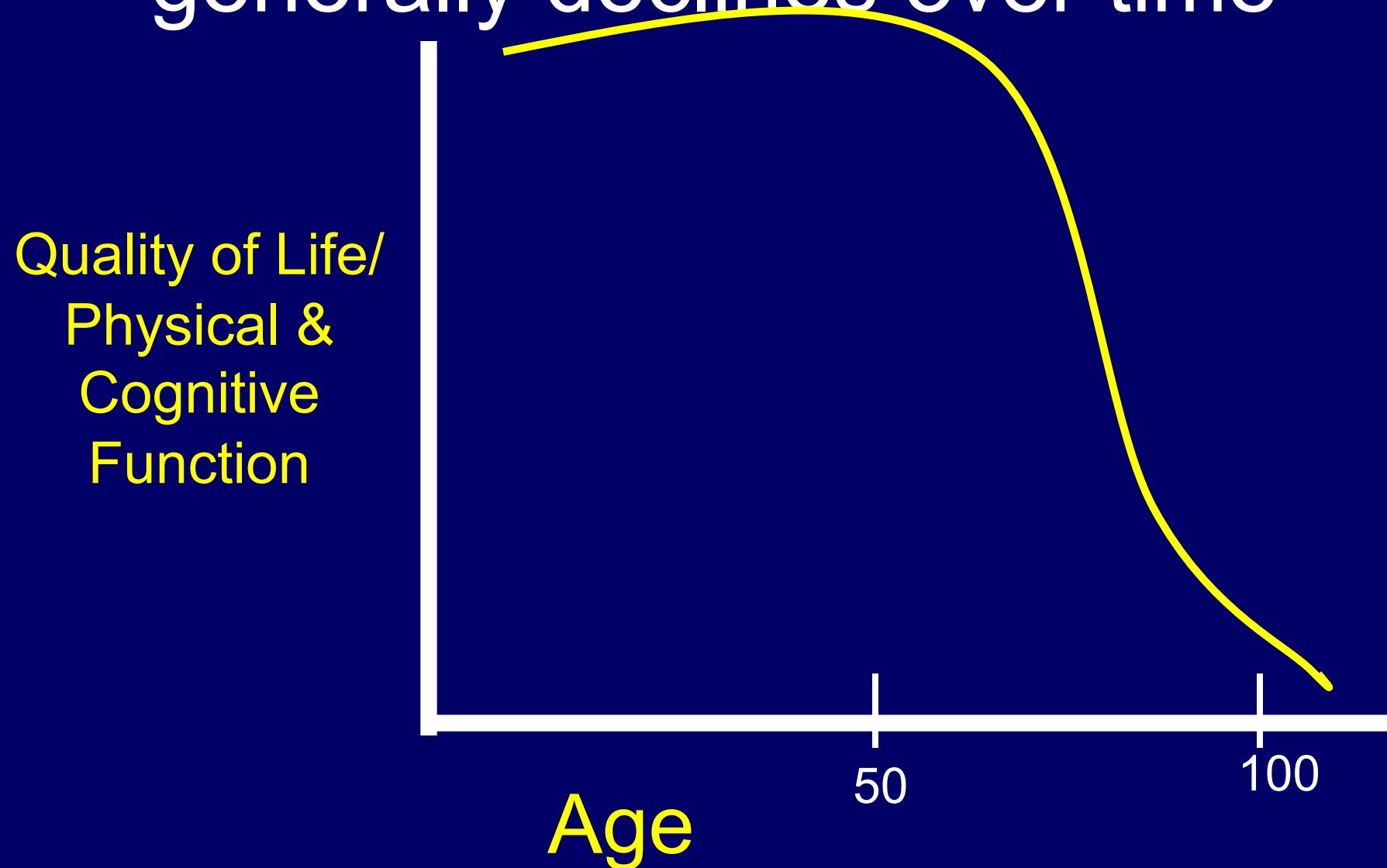
Hui Ling Yeoh,
Burnet, 2016

Aging and HIV: A Double Whammy of Inflammation

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

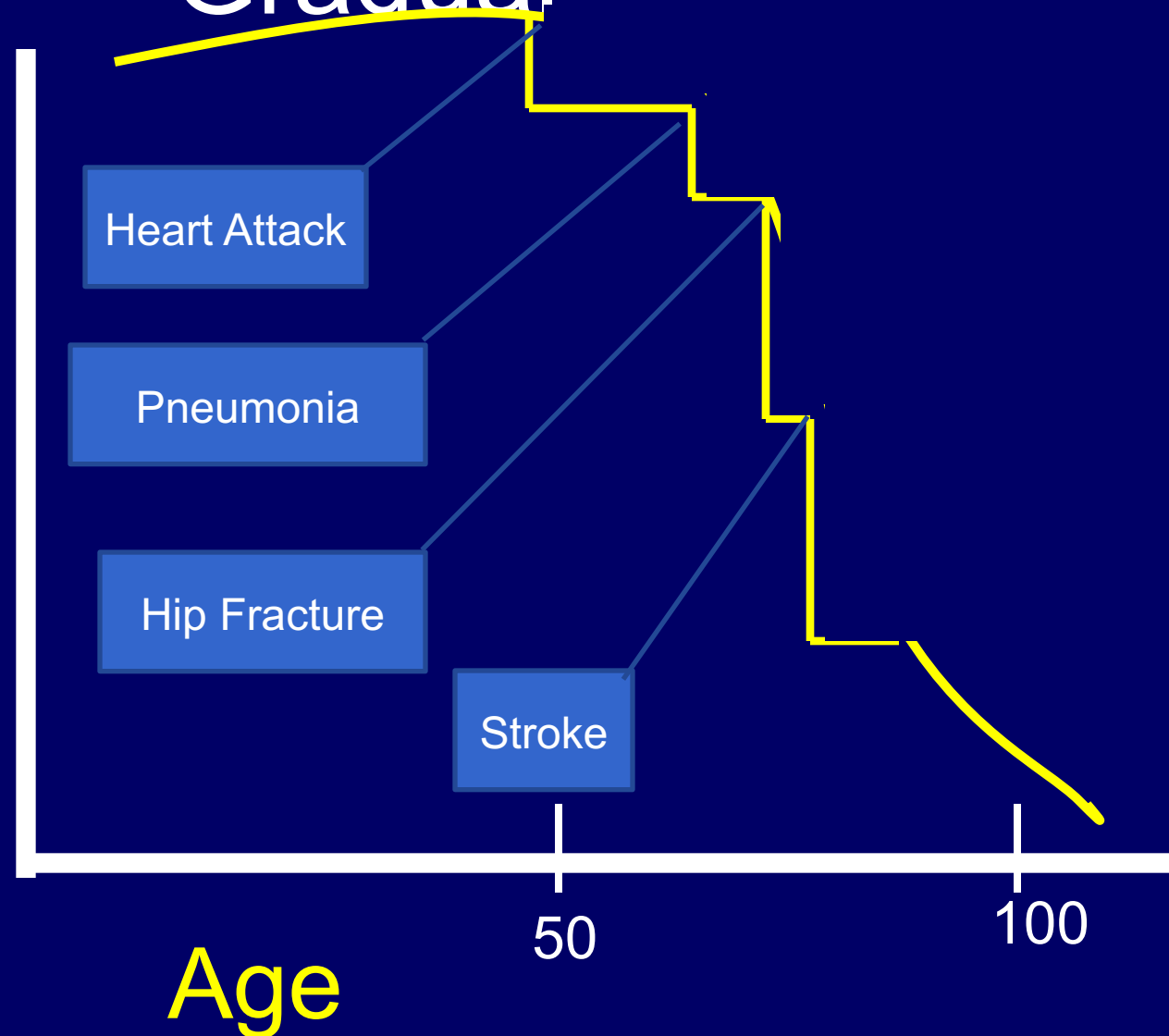


Physical & cognitive function generally declines over time



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

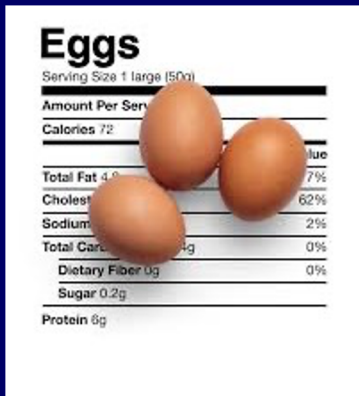
- Cutting 500 calories per day will decrease your weight by 1-2 lbs week
- Watch portion sizes
- Watch liquid calories (soda, juice, fruit drinks)
- Watch simple sugars and starches (white bread, white rice, bagels, potatoes, corn flakes)

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

Are Older PWH Getting Adequate *Protein*?

- Review protein intake
 - Recommended daily allowance (RDA) is 0.8 grams/kilogram
 - May need 1.6-2.2 grams if strength training or to overcome losses during obesity treatment
- How much protein is really needed in a day?



3 eggs =
18 g



8 oz milk =
8 g



Big Mac =
25 g



4 oz chicken =
36 g

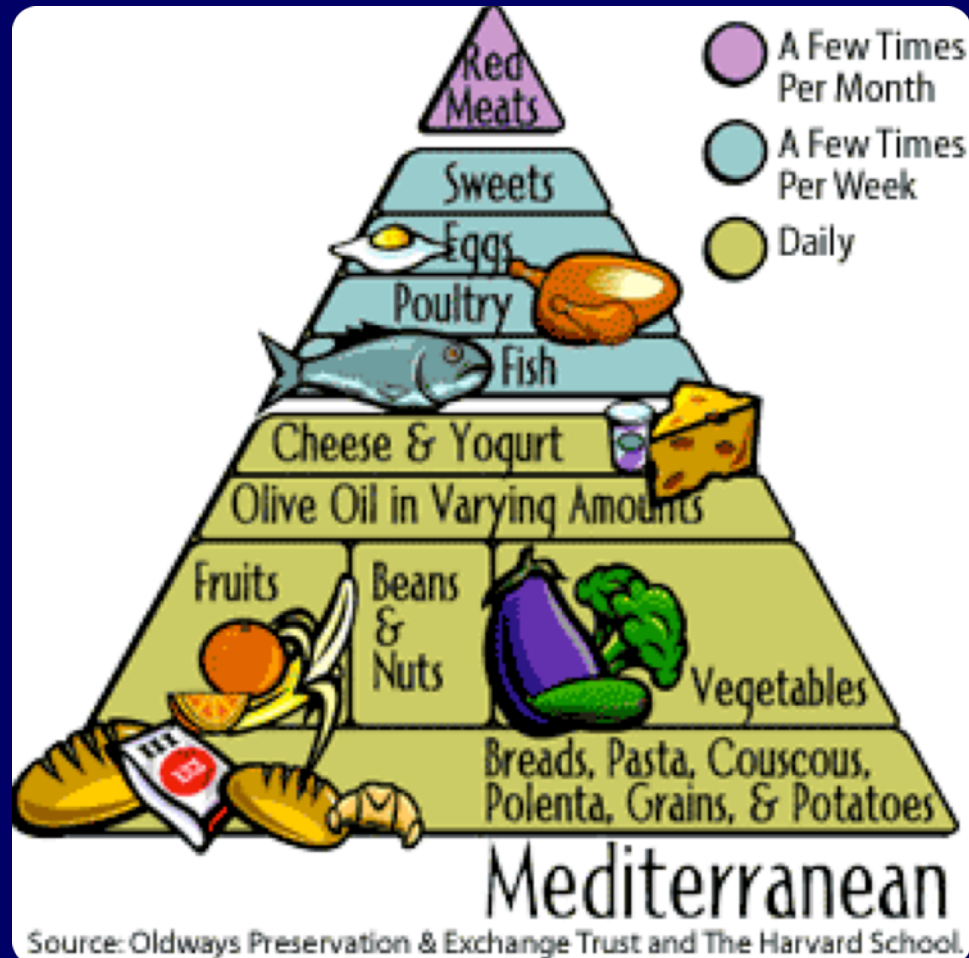


1 tablespoon
PB = 4 g

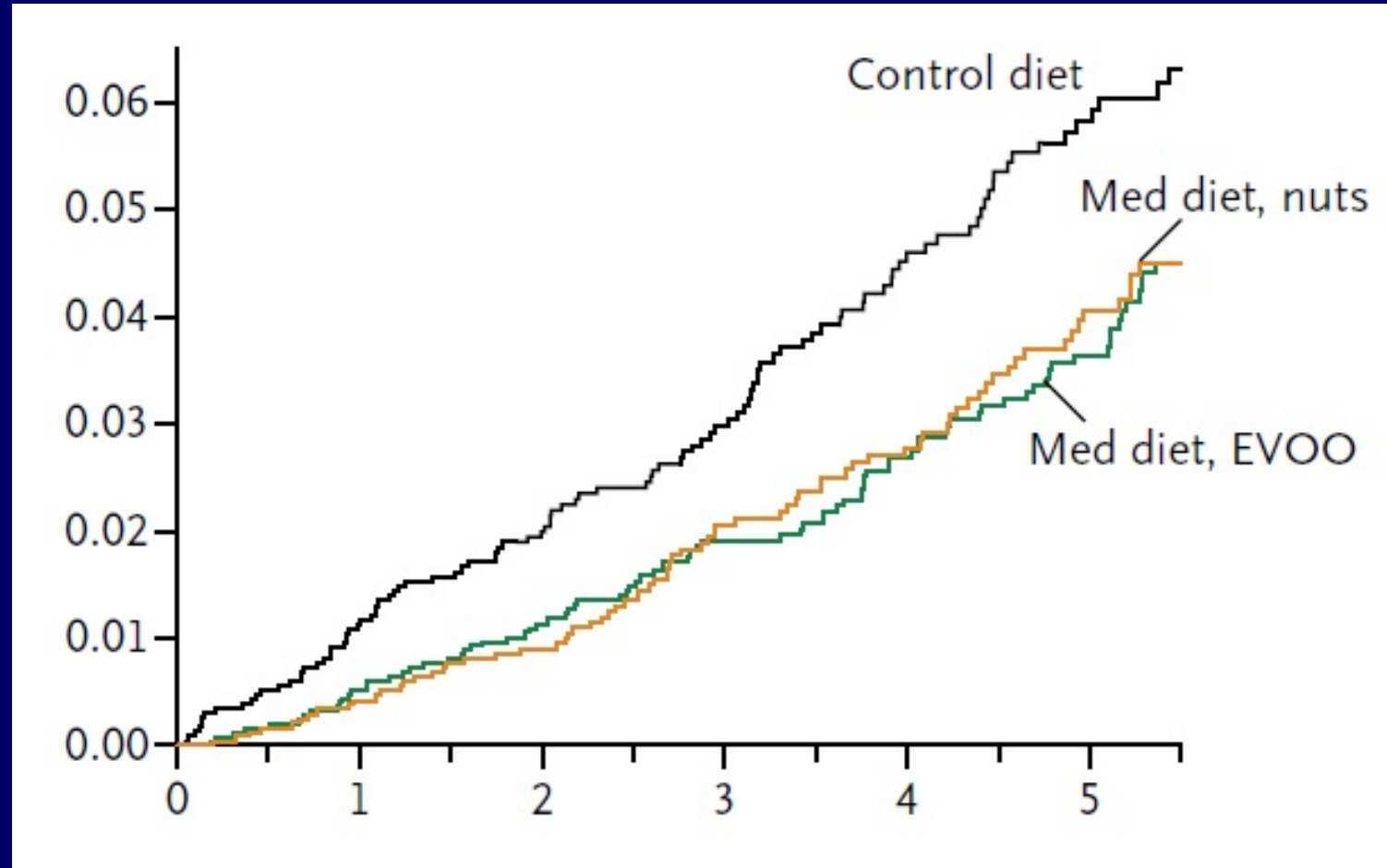
**200 pound adult = 91 kg
~ 91 grams of protein**

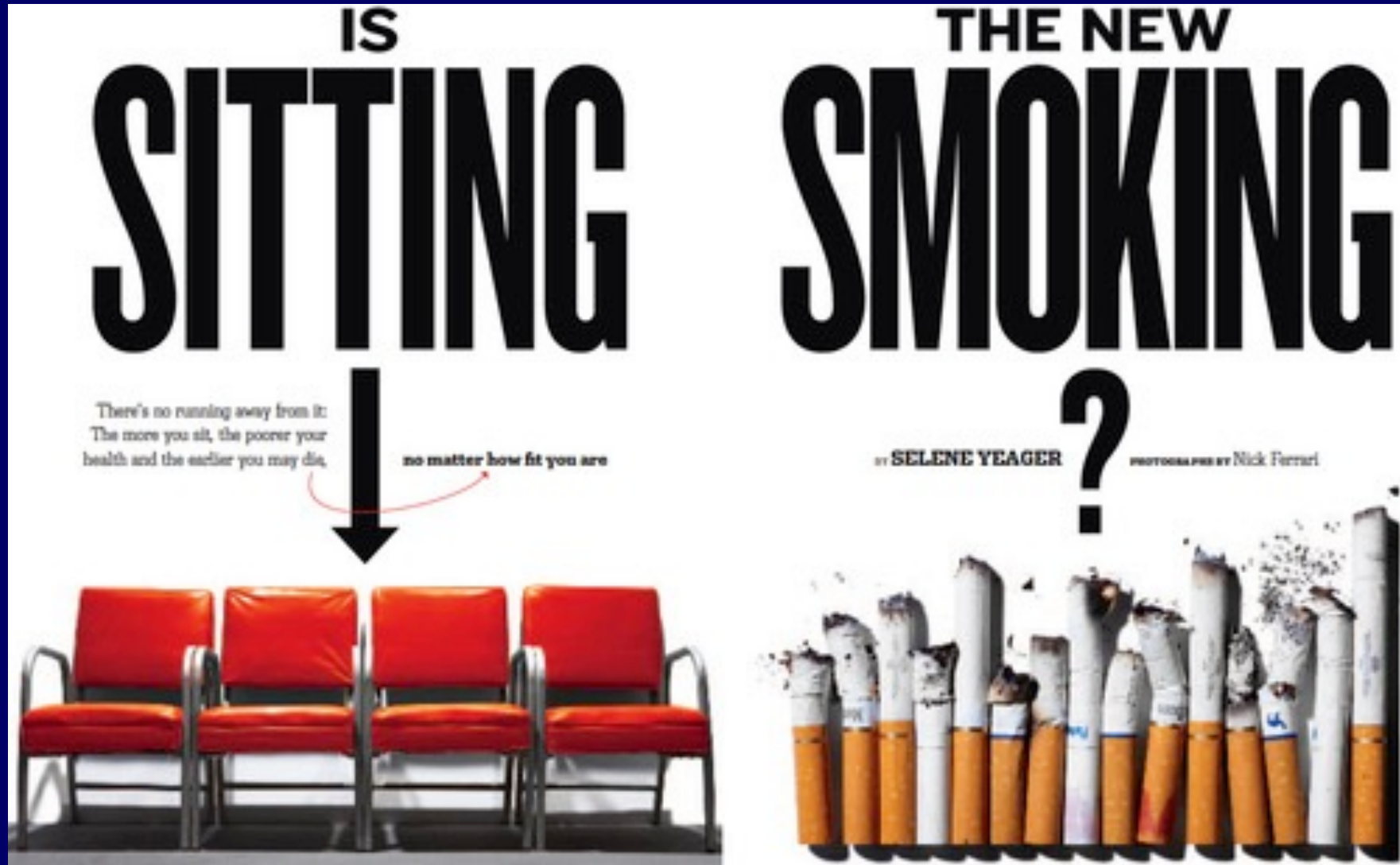
**Daily total = 91
grams of protein**

The Mediterranean Diet



Effect of Mediterranean Diet on Heart Attack and Stroke





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

These Screenings are Under-Used in Many HIV Clinics: Ask your provider!

Open Forum Infectious Diseases

BRIEF REPORT

Bone Mineral Density Screening Among People With HIV: A Population-Based Analysis in the United States

Morgan Birabaharan,¹ David C. Kaelber,^{2,3} and Maile Y. Karris¹

¹Department of Infectious Diseases and Global Public Health, Department of Medicine, University of California, San Diego, La Jolla, California, USA, ²Departments of Internal Medicine, Pediatrics, and Population and Quantitative Health Sciences, School of Medicine, Case Western Reserve University, Cleveland, Ohio, USA, and ³Center for Clinical Informatics Research and Education, The MetroHealth System, Cleveland, Ohio, USA

HIV infection is associated with premature bone loss. The potential impact of recently updated osteoporosis screening guidelines is unknown. In a population-based cohort, we found low adherence and sex differences among eligible people with HIV.

AIDS RESEARCH AND HUMAN RETROVIRUSES
Volume 38, Number 3, 2022
© Mary Ann Liebert, Inc.
DOI: 10.1089/aid.2021.0095

Open camera or QR reader and
scan code to access this article
and other resources online.



Evaluation of Adherence to Guideline-Based Bone Mineral Density Screening in Veterans with HIV

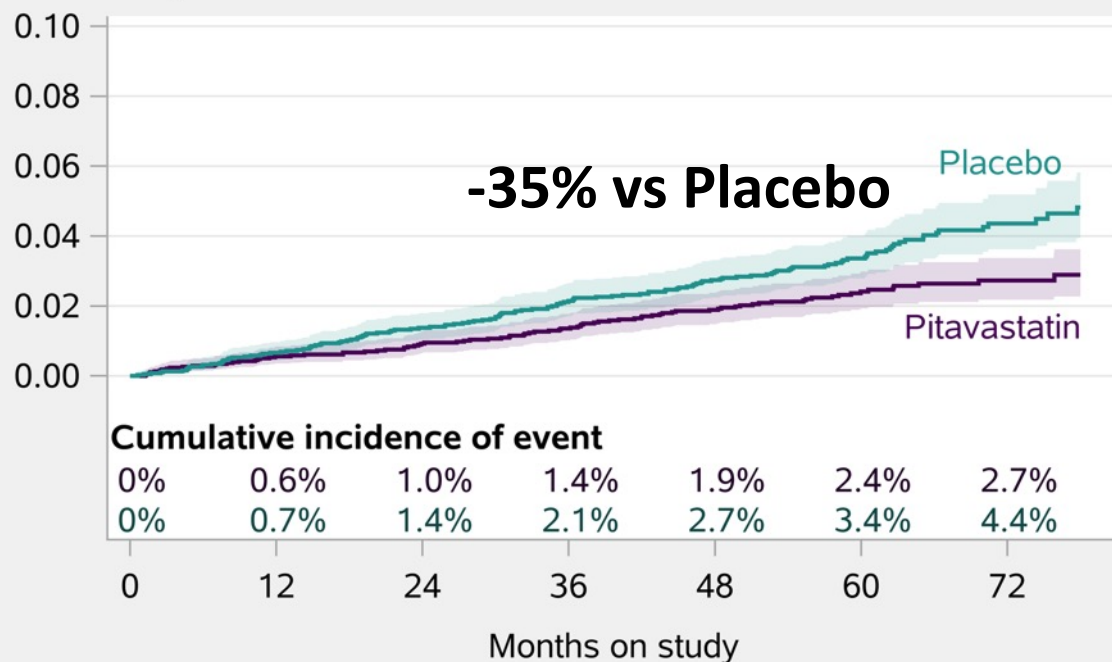
Christie G. Turin,^{1,i} Naveed Khanjee,¹ Katharine Breaux,^{1,2} Reina Armamento-Villareal,^{1,3}
Maria C. Rodriguez-Barradas,^{1,2} and Eva H. Clark^{1,4,5,ii}

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

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

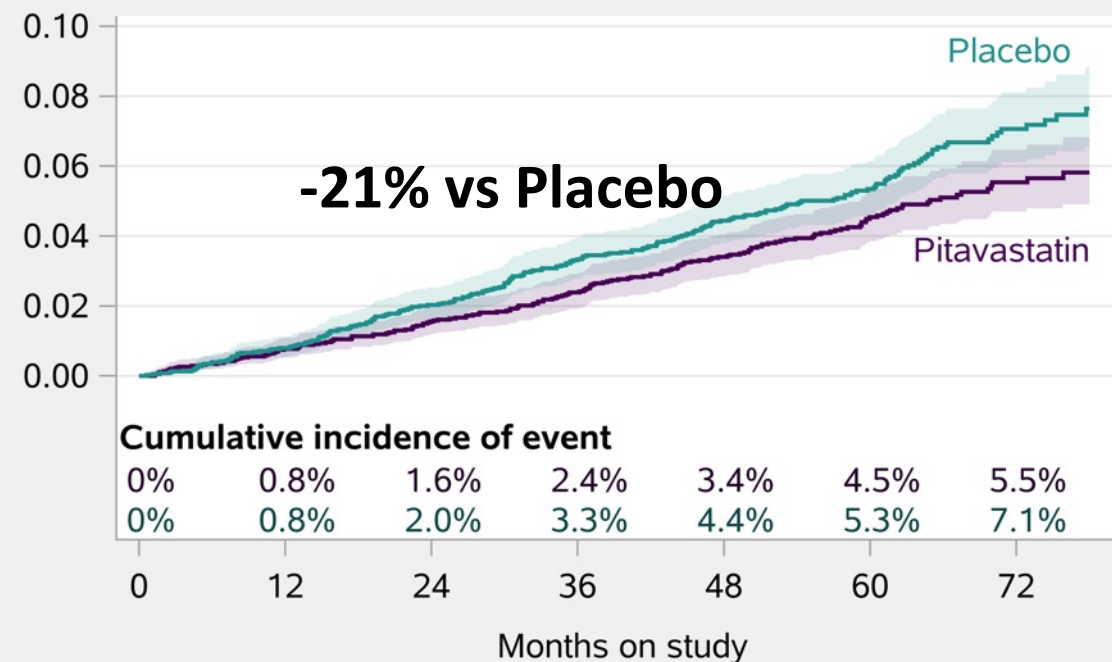
(a) First Primary MACE



Number at risk

	0	12	24	36	48	60	72
Pitavastatin	3888	3647	3475	3364	2997	1947	1052
Placebo	3881	3693	3506	3356	2997	2182	959

(b) First MACE or Death



Number at risk

	0	12	24	36	48	60	72
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

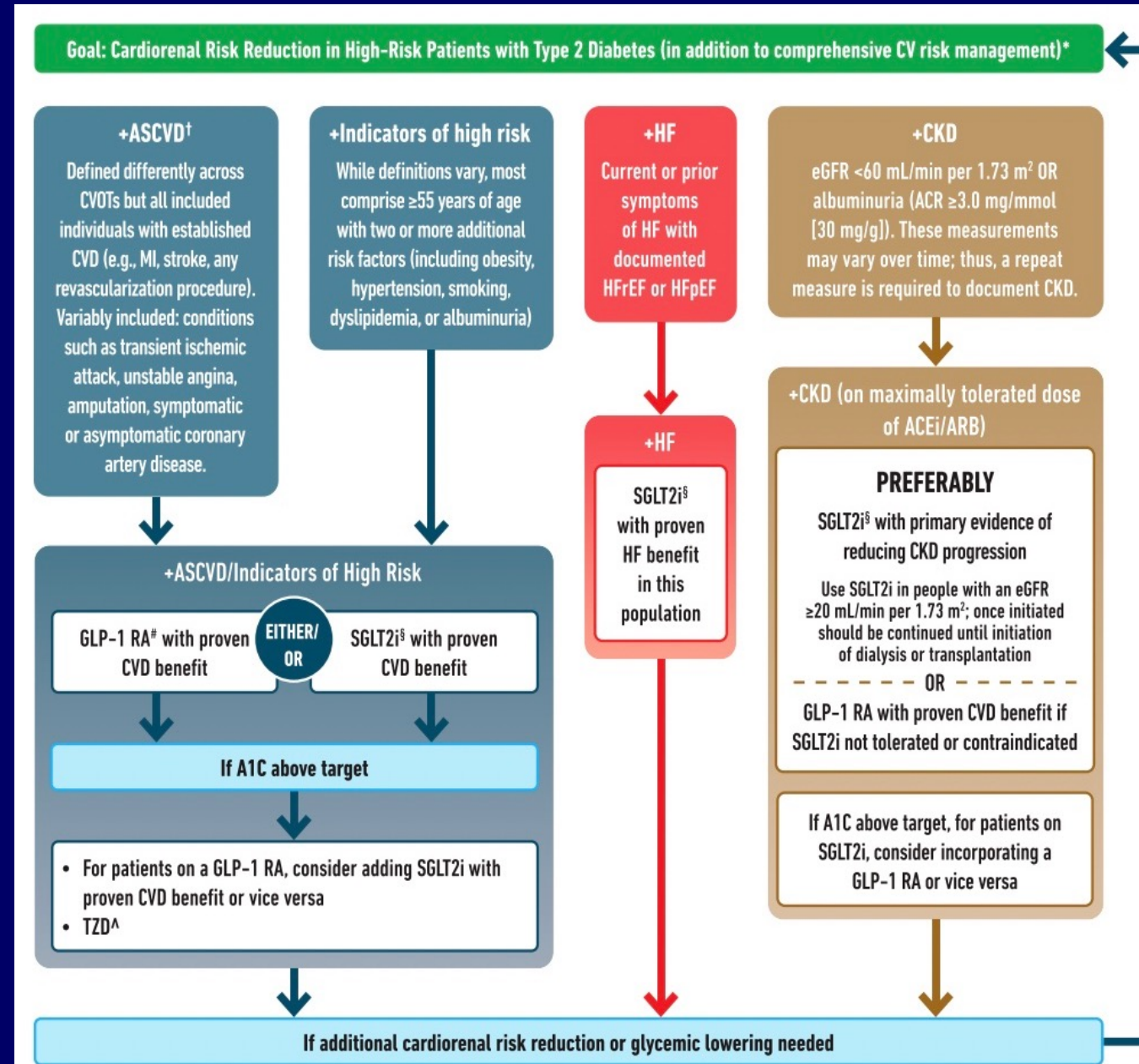
- Optimize a Healthy Lifestyle: Weight loss is key
- If you don't have diabetes, get screened with a fasting glucose yearly
- If you do have diabetes,
 - Keep blood sugars under control
 - Get on diabetes medications that prevent comorbid events
 - Get screened for kidney disease, eye disease, neuropathy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

What's first line therapy for DM?

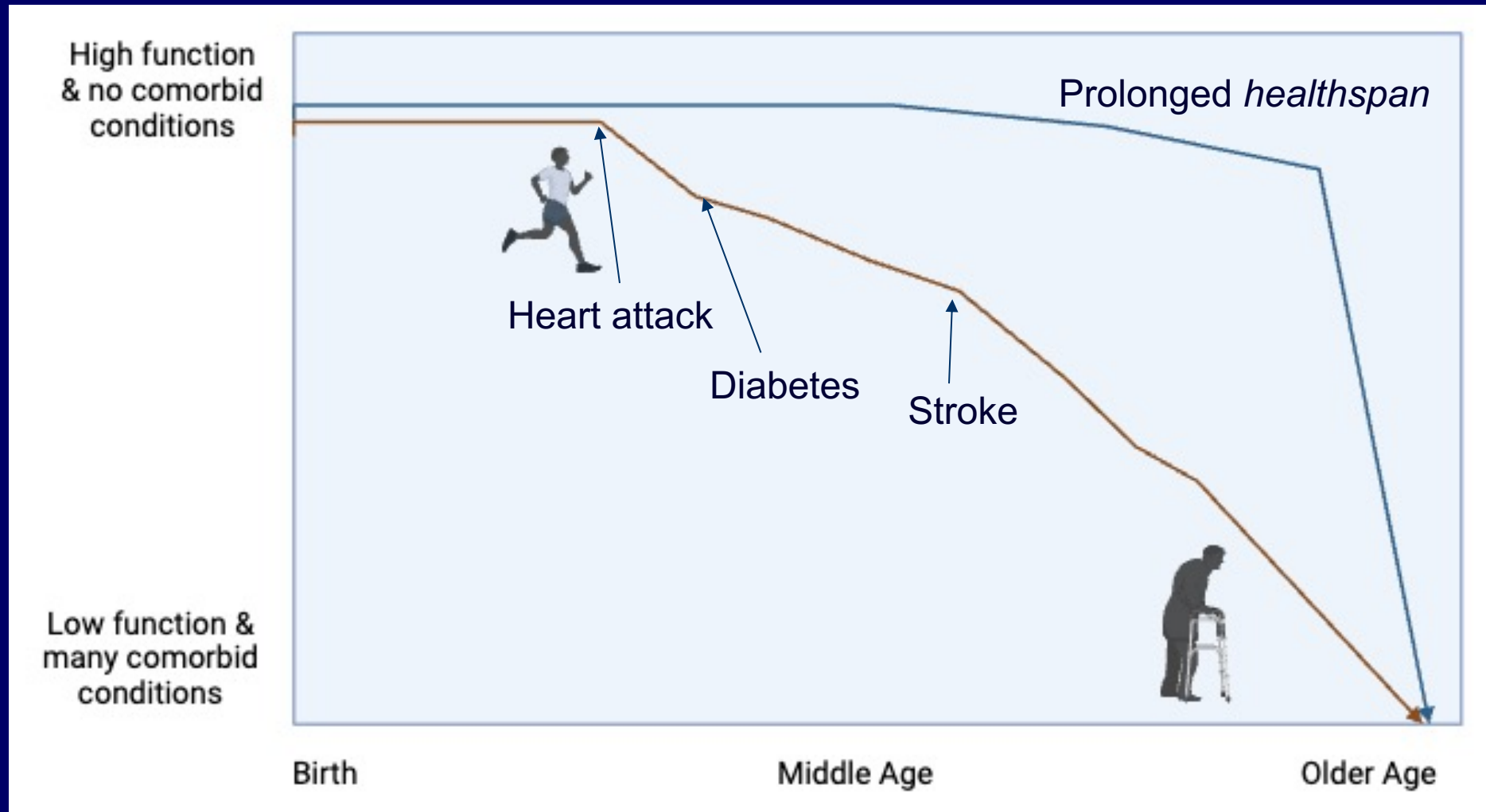
It depends...

- 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?



Health behaviors in MIDDLE age are important for long-term health!

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

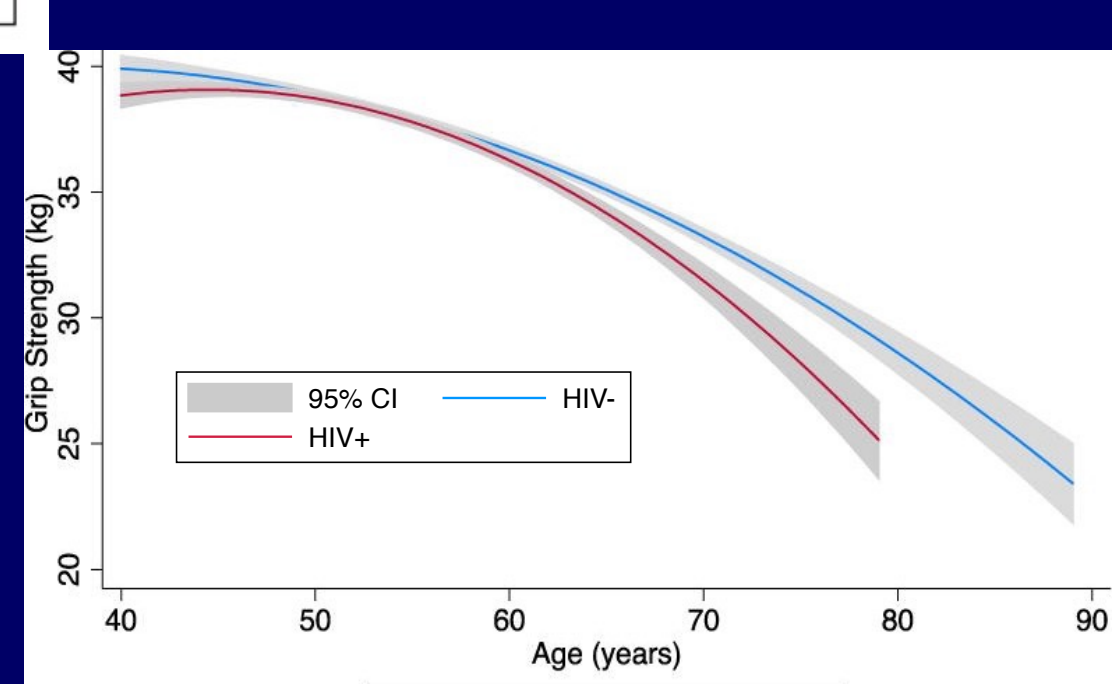
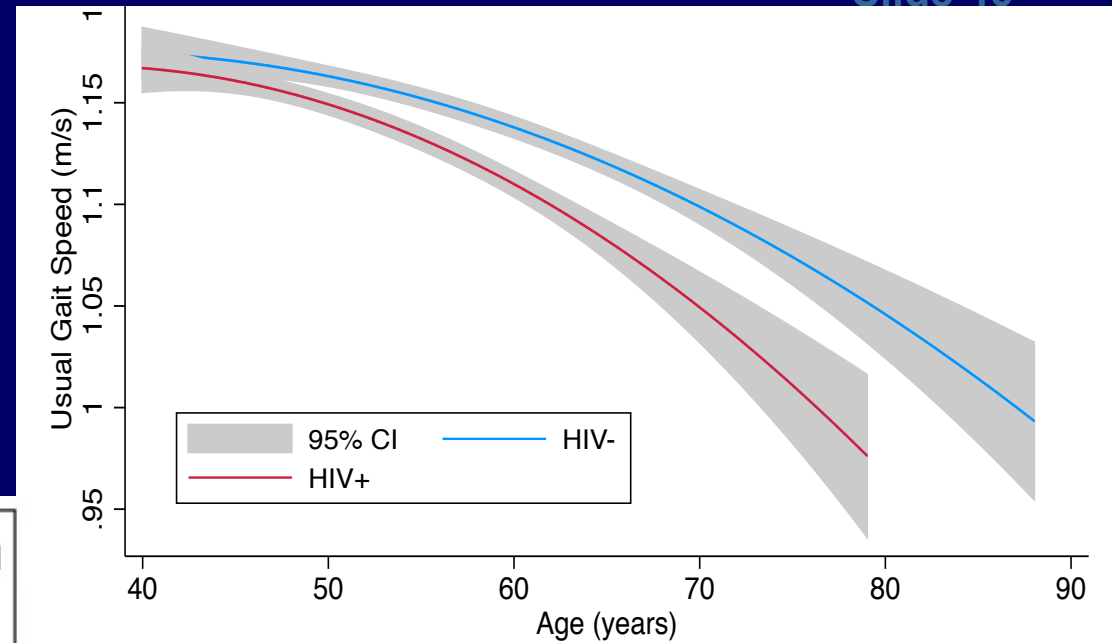
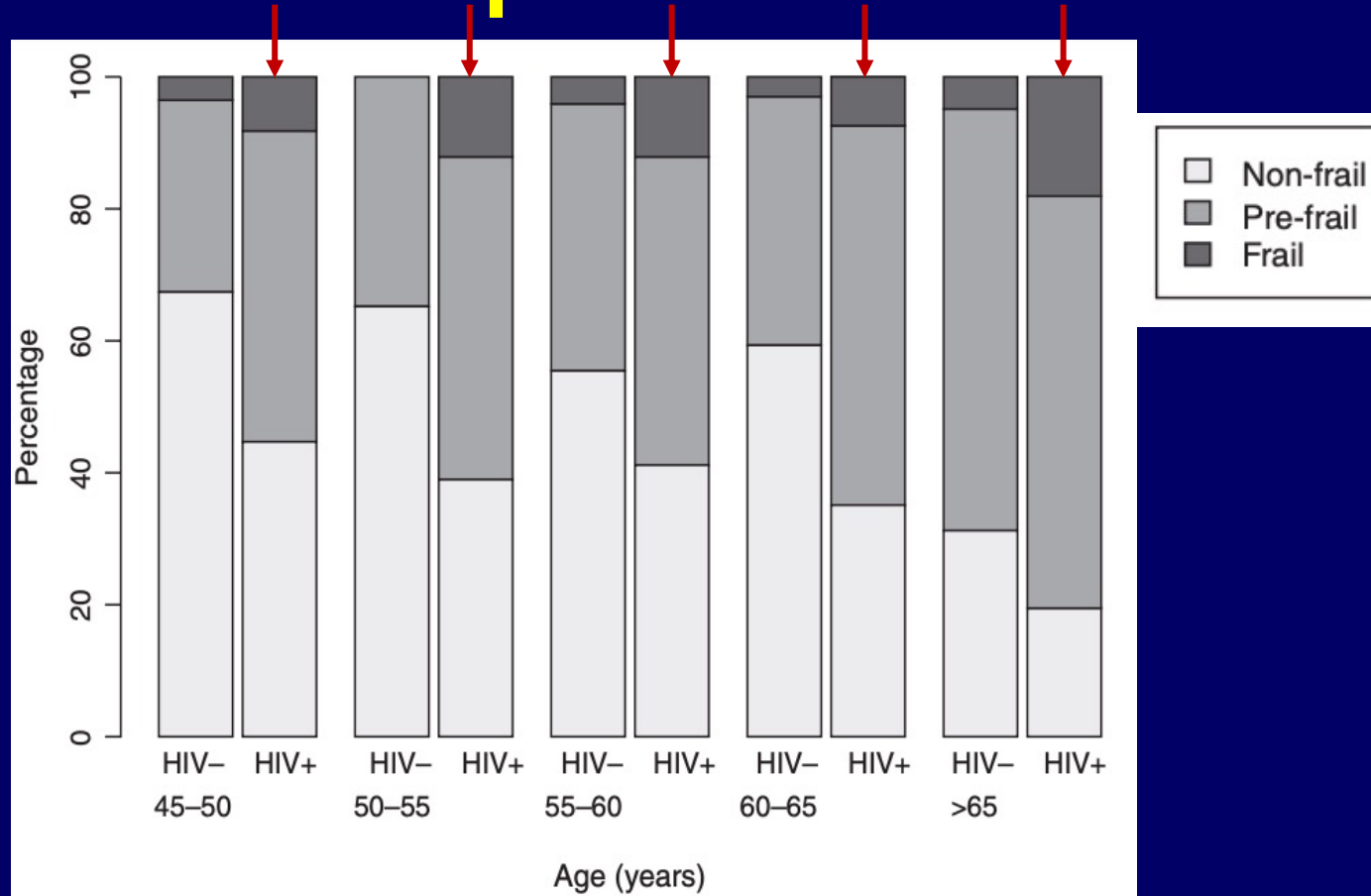
Muscle : A Major Component of Frailty

- Muscle mass declines $\sim 3\%$ 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 and 65% between 75-84 *cannot lift 10 pounds*

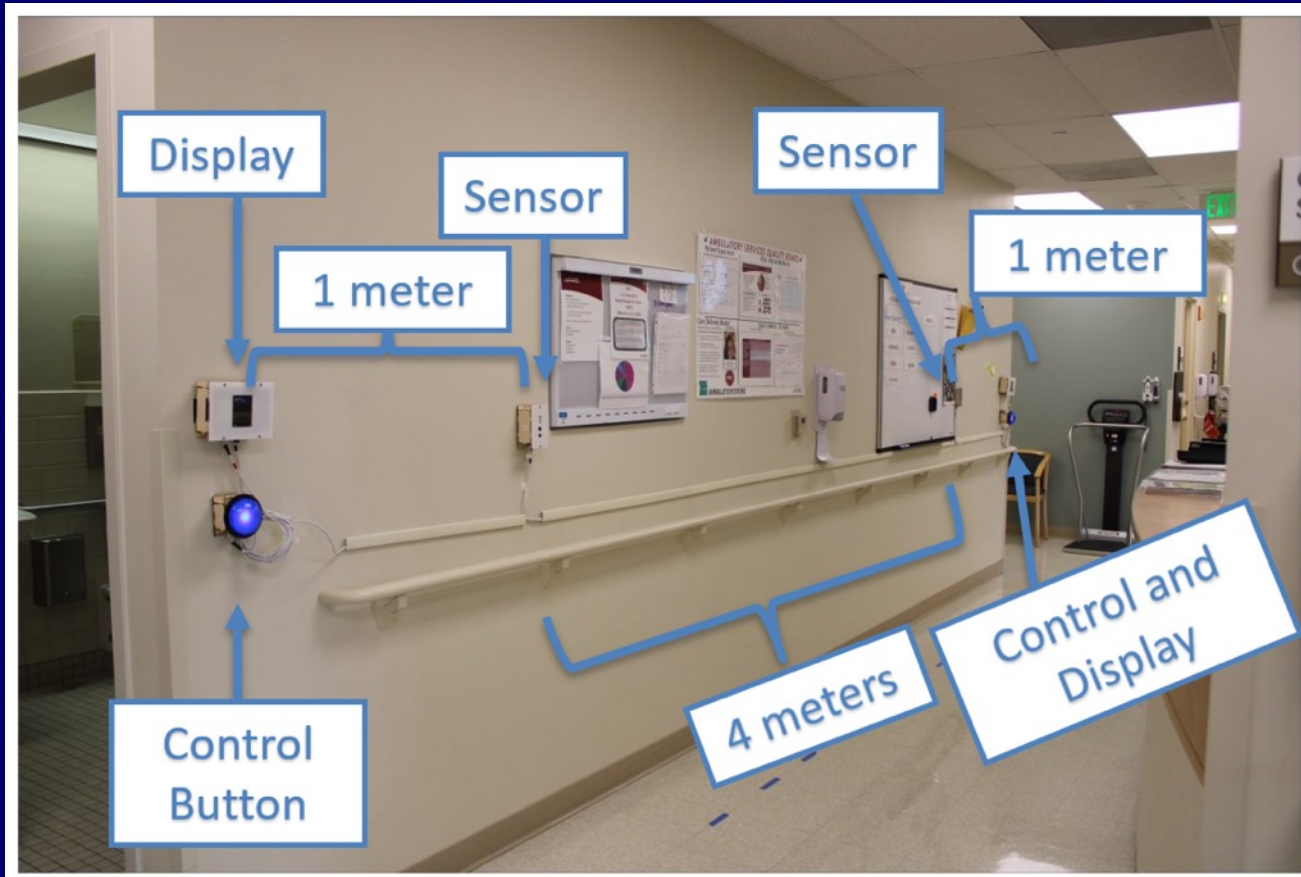
What is 10 pounds?



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



Can we incorporate frailty and function measures in the clinic?



GaitRate Gait Speed Assessment (<1 min)

“Walking Speed: the Sixth Vital Sign”

Stacy Fritz, PT, PhD;¹ Michelle Lusardi, PT, PhD²

		5/6/2025 10:00 AM
AMB - REVIEW FLOWSHEET - 4 METER WALK		
4 meter walk time (seconds)		6.8 Seconds
4 meter walk MPS		0.59 m/s ▼
Assisted Devices		None
Patient felt unsafe while walking?		No

	4/1/2025 10:00 AM	3/24/2025 10:00 AM	3/4/2025 10:00 AM	2/4/2025 11:00 AM
AMB - REVIEW FLOWSHEET - 4 METER WALK				
4 meter walk time (seconds)		3.53 Seconds	4.04 Seconds	3.94 Seconds
4 meter walk MPS		1.13 m/s	0.99 m/s	1.02 m/s

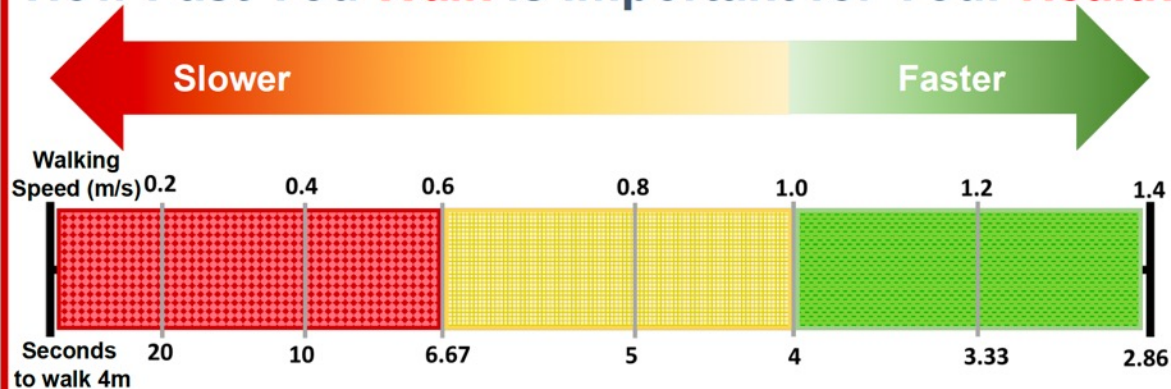
	Important to relevant parties	Low respondent and staff burden	Actionable	Sensitive to change
Frailty Phenotype (Fried)	If diagnosis is shared with clear, actionable plan	Time-consuming; has been reported to take between 15-25 minutes to complete; requires additional equipment	Can make objective improvements on grip strength and gait speed	Sensitive to change
Frailty Index (Rockwood)	If diagnosis is shared with clear, actionable plan	Can be considered low burden if electronically automated into medical record	Accumulation of deficits model; cannot act on previous diagnoses; however has been used to initiate further testing/treatment	Responsive to declines in health status and frailty, not as responsive to improvements from frailty
Clinical Frailty Scale	If diagnosis is shared with clear, actionable plan	< 2 minutes; subjective assessment	Subjective assessment of status may improve, but no specific outcomes to act on	Due to subjective assessment unlikely to be sensitive to change; cannot quantify or measure sensitivity
FRAIL Scale	If diagnosis is shared with clear, actionable plan	< 3 minutes; consists of 5 binary (yes/no) questions	Possible to act on physical function components of question (i.e., improve ability to walk one block)	Poor evidence for response to change

What measures are important to relevant parties (patients and providers), low burden, actionable, and sensitive to change?

Figure 1. Measures of select frailty measurements through the lens of Glasgow's pragmatic criteria. Green = considered to meet criteria; yellow = meets criteria partially and/or in certain occasions; red = not considered to meet criteria. Abbreviation: FRAIL, Fatigue, Resistance, Ambulation, Illness, Loss of Weight.

How can we incorporate function and frailty into the HIV clinic?

How Fast You **Walk** is Important for Your **Health**



You walked 4-meters in _____ seconds

Slower walking speed indicates increased risk for:

- Poor Health
- Falls
- Hospitalization
- Disability
- Decreased Independence

See the back of this sheet for ways you can improve your walking speed!

Improving YOUR WALKING SPEED can have a positive impact on YOUR HEALTH

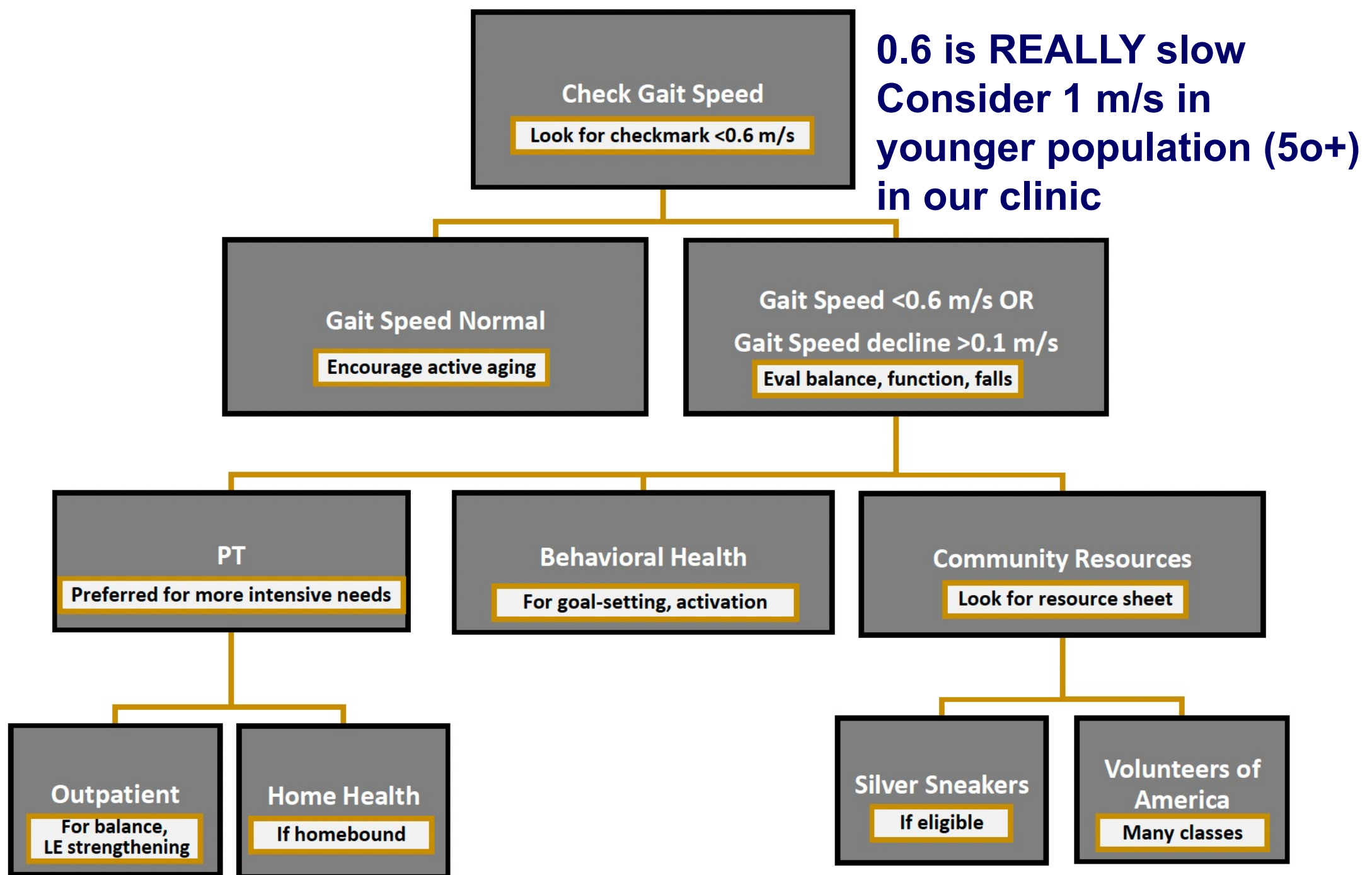
What steps can you take to improve your walking speed?

Talk with your provider about your walking speed

Ask if a referral to Physical Therapy would be helpful

Get recommendations on ways you can increase your physical activity

Learn about and engage with different area community exercise programs



Info sheet (in file cabinets in each room)

Can also use .EXERCISECLASSES

PI: Kristine Erlandson, MD - COMIRB: 24-1149- Version date: 08/23/2024



Exercise and Physical Therapy Resources

Jessica Elliott, PT, DPT, NCS Tyson Oberndorfer, MD, MS

COMMUNITY EXERCISE PROGRAMS

Appropriate for patients who are independent with minimal concerns for falling but who are beginning to experience functional decline or feel they are "slowing down."

Silver Sneakers

Website: www.silversneakers.com Free unlimited access to over 14,000 locations (gyms, recreational centers). Offers a wide variety of group exercise classes.

- Covered by Managed Medicare (Part C) plans and by some supplemental insurance plans (AARP, Aetna, Anthem, Bankerslife, Humana, Kaiser and United Healthcare)

Tai Chi Moving for Better Balance

Website: <https://tjcmmb.org> Evidence-based fall prevention program designed for community dwelling older adults and individuals with Parkinson disease. Designed to improve strength, mobility, flexibility, balance.

- Offered at YMCA, Colorado Department of Public Health & Environment
- Twelve-week instructor-led group exercise program; does not occur regularly

Stepping On

Contact: Laurie.Lovedale@uchealth.org, or call 720-848-4805 Evidence-based fall prevention workshop that includes a mix of classroom learning and exercise instruction. Led by a health professional and a peer leader; local guest experts provide information on exercise, vision, safety, and medication.

- Meets once weekly for seven weeks; does not occur regularly

MULTIDISCIPLINARY FALL PREVENTION CLINICS



Community and Occupational Therapy Resources for Seniors

Marie Andrews, MS OTR/L, BCG
Tyson Oberndorfer, MD, MS

IADL ASSISTANCE

Seniors' Resource Center

Contact: 303-238-8151; info@srcaging.org

Website: <https://www.srcaging.org>

Denver Area's largest nonprofit dedicated to services for older adults and those with developmental disabilities. Funded by grants, private pay, and medical insurance. Availability of services varies by county.

- Transportation (donations requested)
- In-home care
- Adult day programs
- Light handy-man services (e.g. installing grab bars, handrails)
- Deep cleaning, yard work (free service, 3 times per year)
- Care management (sliding scale payment)
- Hoarding program (e.g. pest control, removal of items, organization)
- Low vision program (e.g. counseling, material aids)
- 'Perfect Homecoming'
 - Helpful for vulnerable patients who fall in the gap of not qualifying for Medicaid non-skilled services, but otherwise needing assistance
 - Goal to improve quality of life after return home from the hospital, and avoid a hospital readmission.
 - Has a care manager assigned. Can provide a ride home from hospital. Assistance coordinating and getting to follow-up appointments, picking up medications.

HOW do 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:

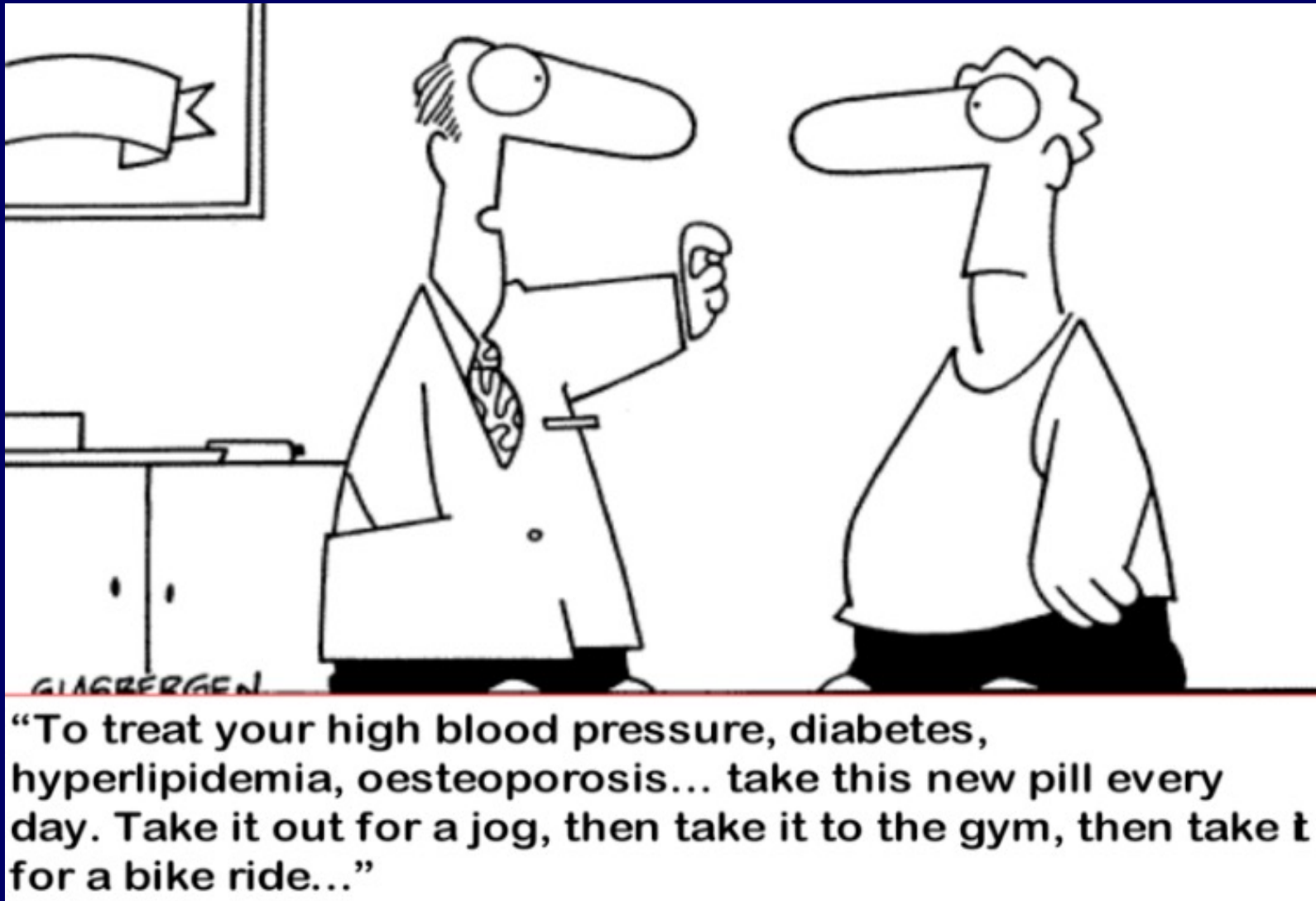
- Age
- Education
- Insurance
- Obesity
- Lower **physical activity**
- Initial randomized NNRTI
- Smoking
- Neurocognitive impairment

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.

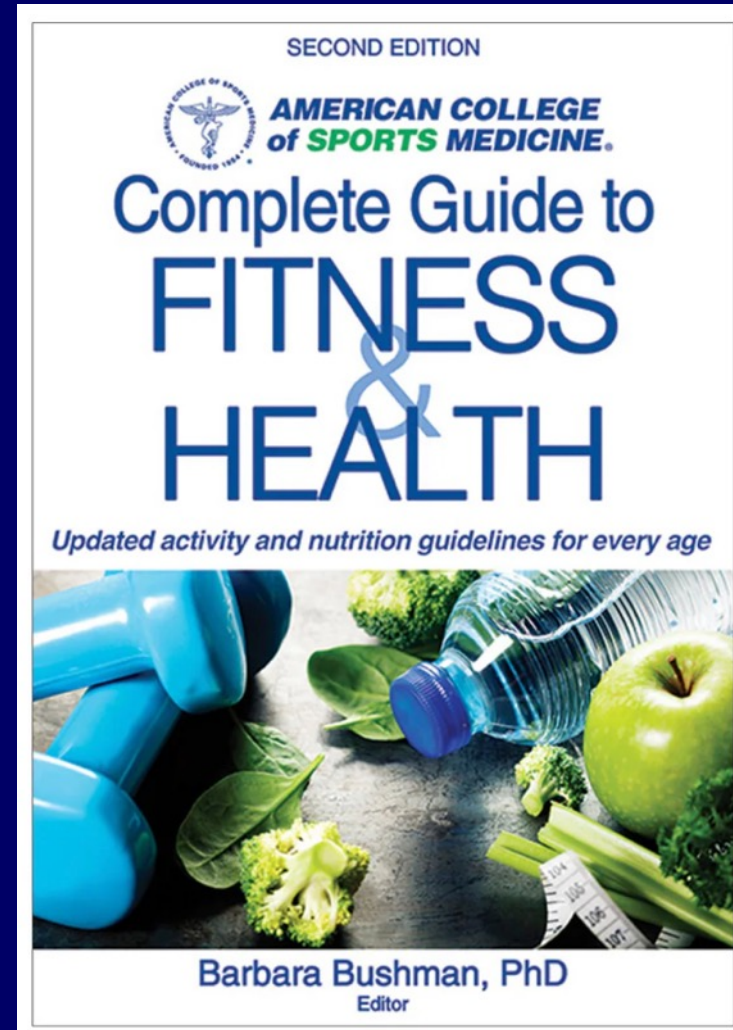


The Miracle Drug: Exercise is Medicine®

Exercise
is Medicine®

AMERICAN COLLEGE
of SPORTS MEDICINE®

Slide 55



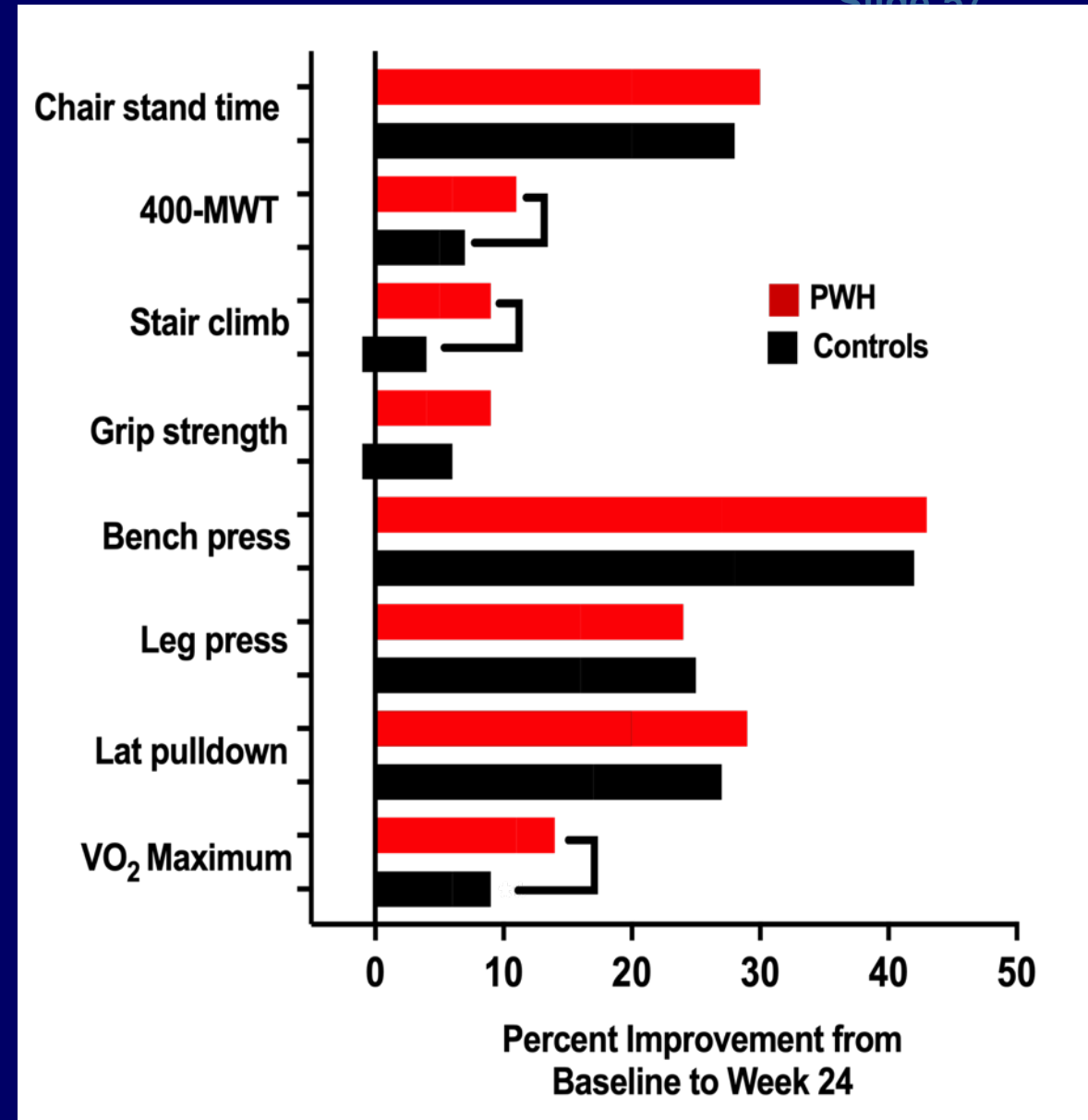
Should exercise recommendations differ for people with HIV?

- 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

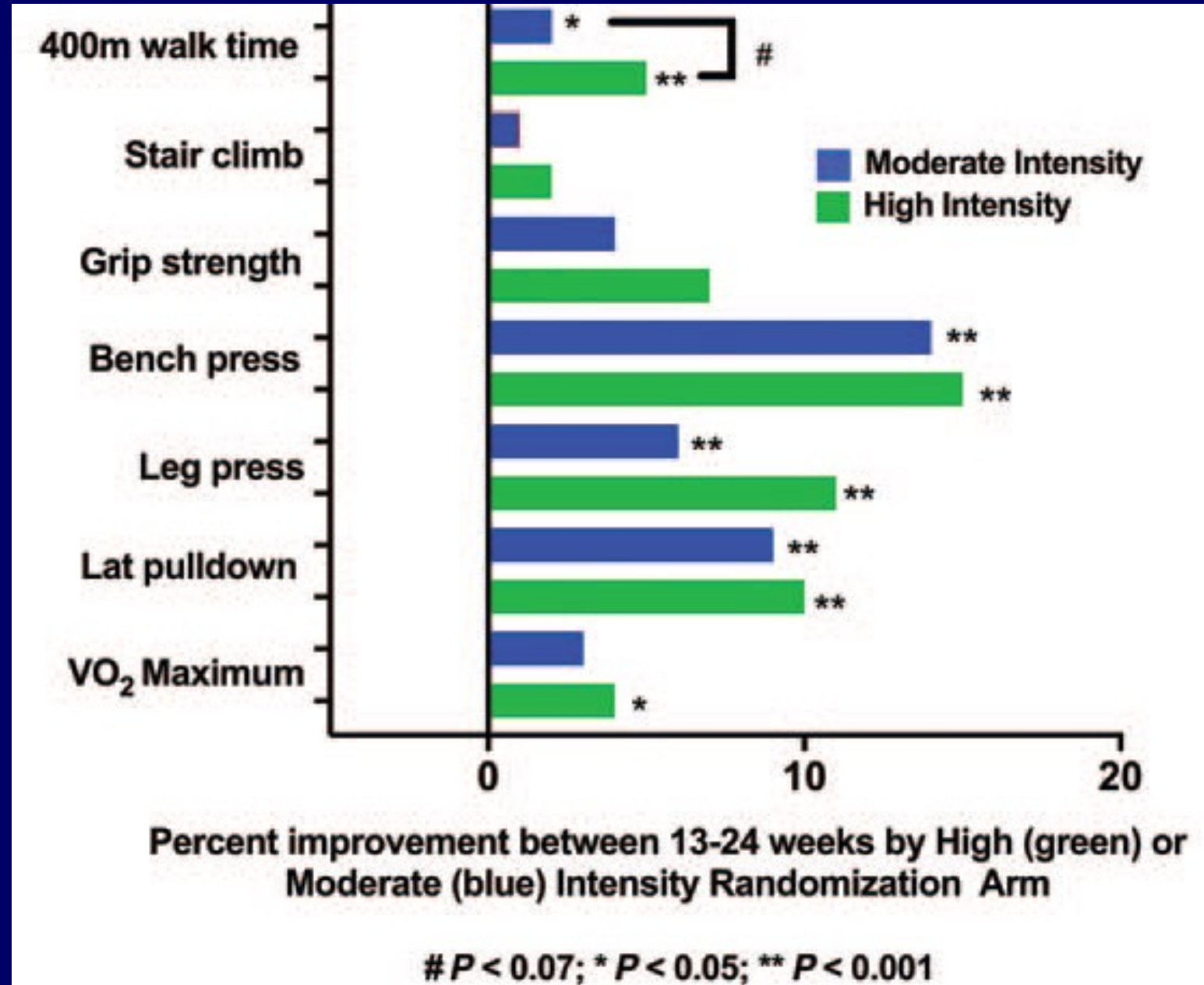
- 24 weeks mod to high intensity exercise (resistance + cardio)
- Between a 10-45% improvement in both groups
 - People with HIV experienced greater gains in 400-m walk time, stair climb, endurance



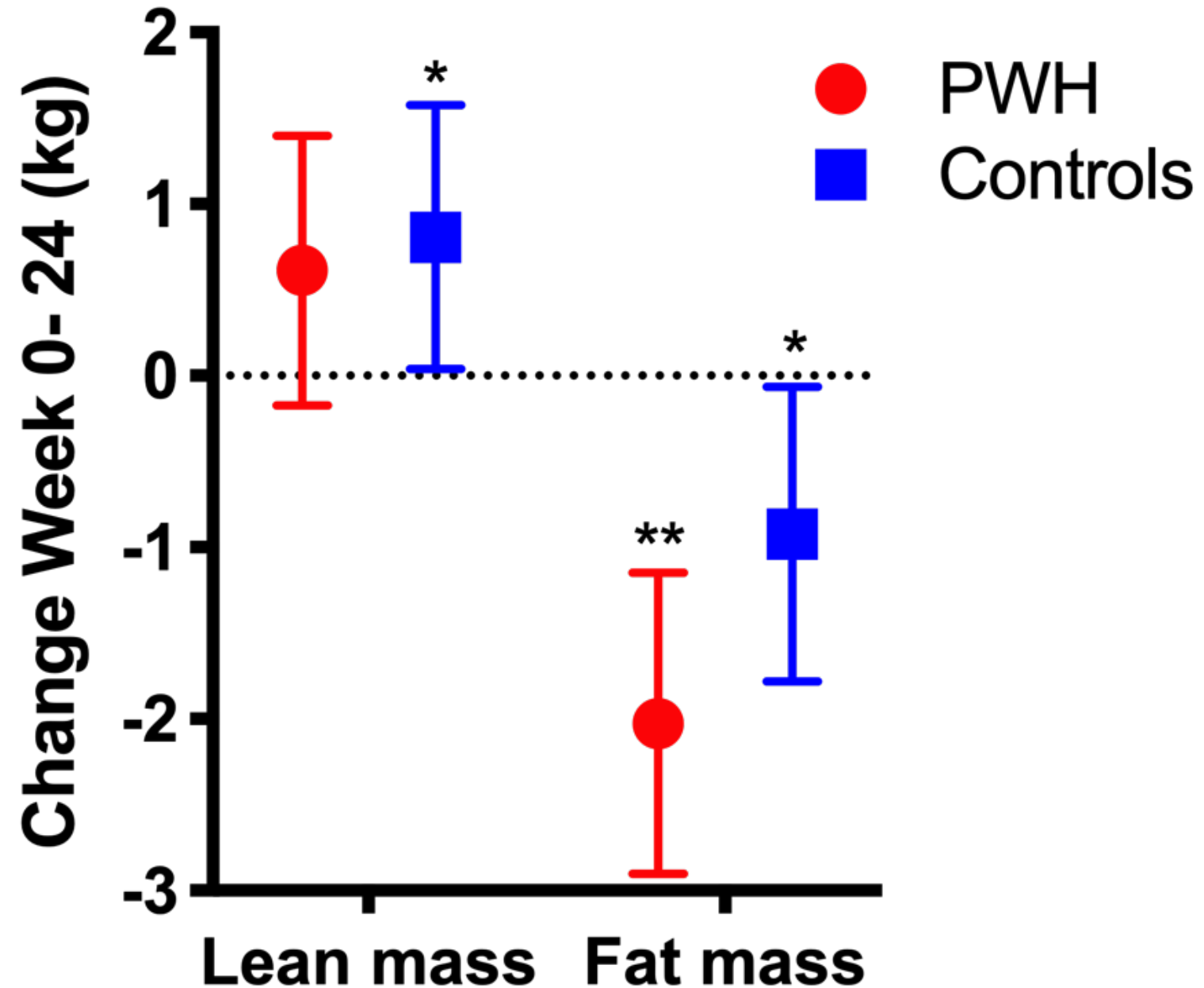
MORE is Better!

Slide 58

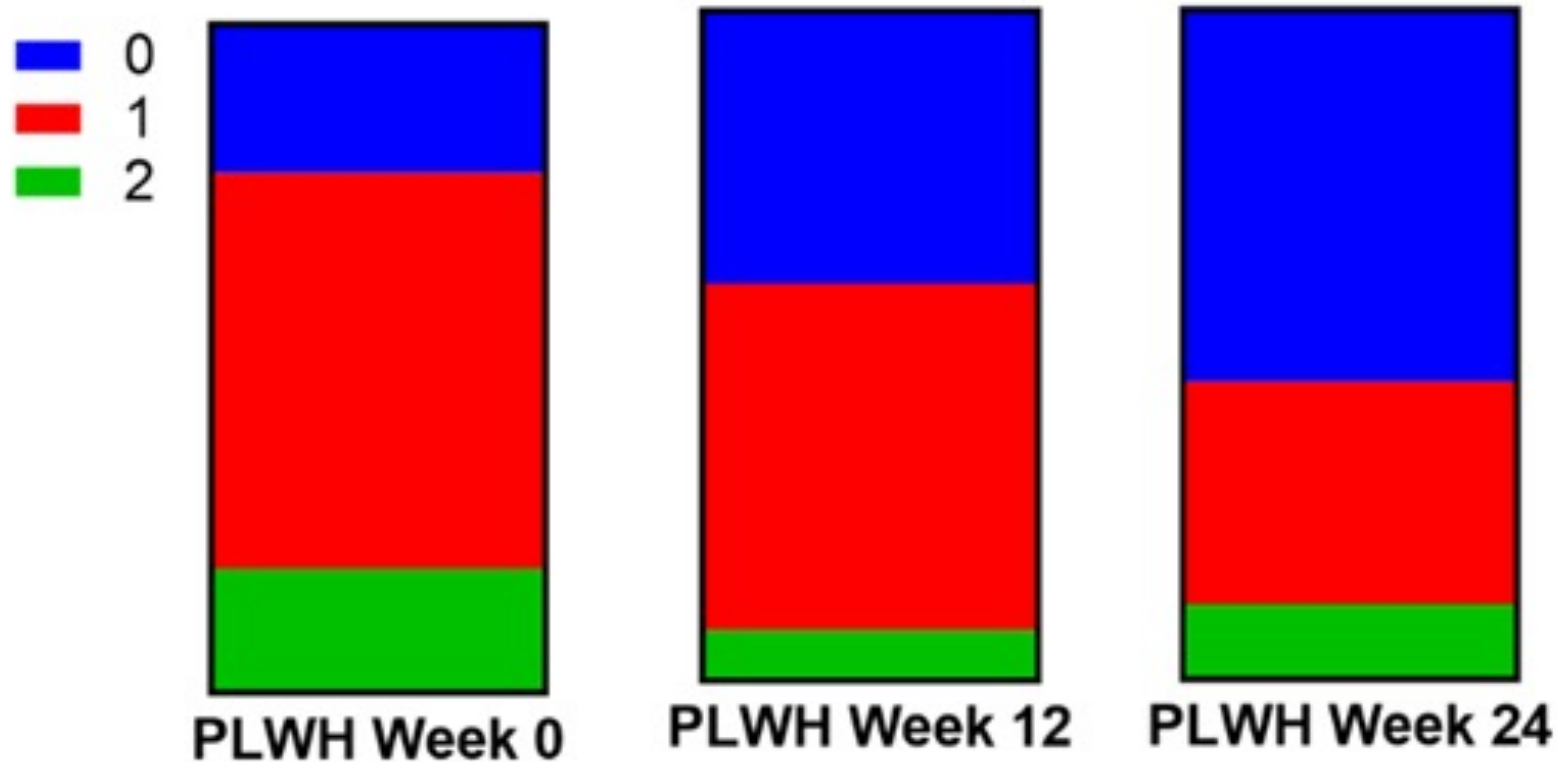
Higher “Dose” of
Exercise (**Green Bars**)
Leads to Greater
Improvements in
Strength and
Endurance



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

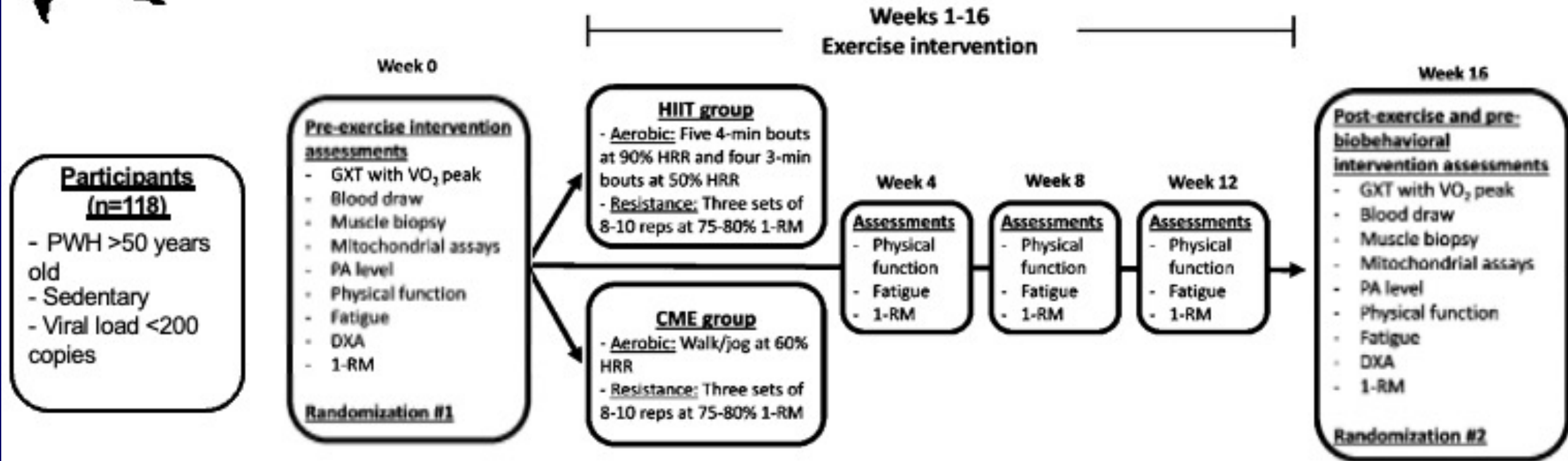
What other Benefits Are Achieved with Exercise?

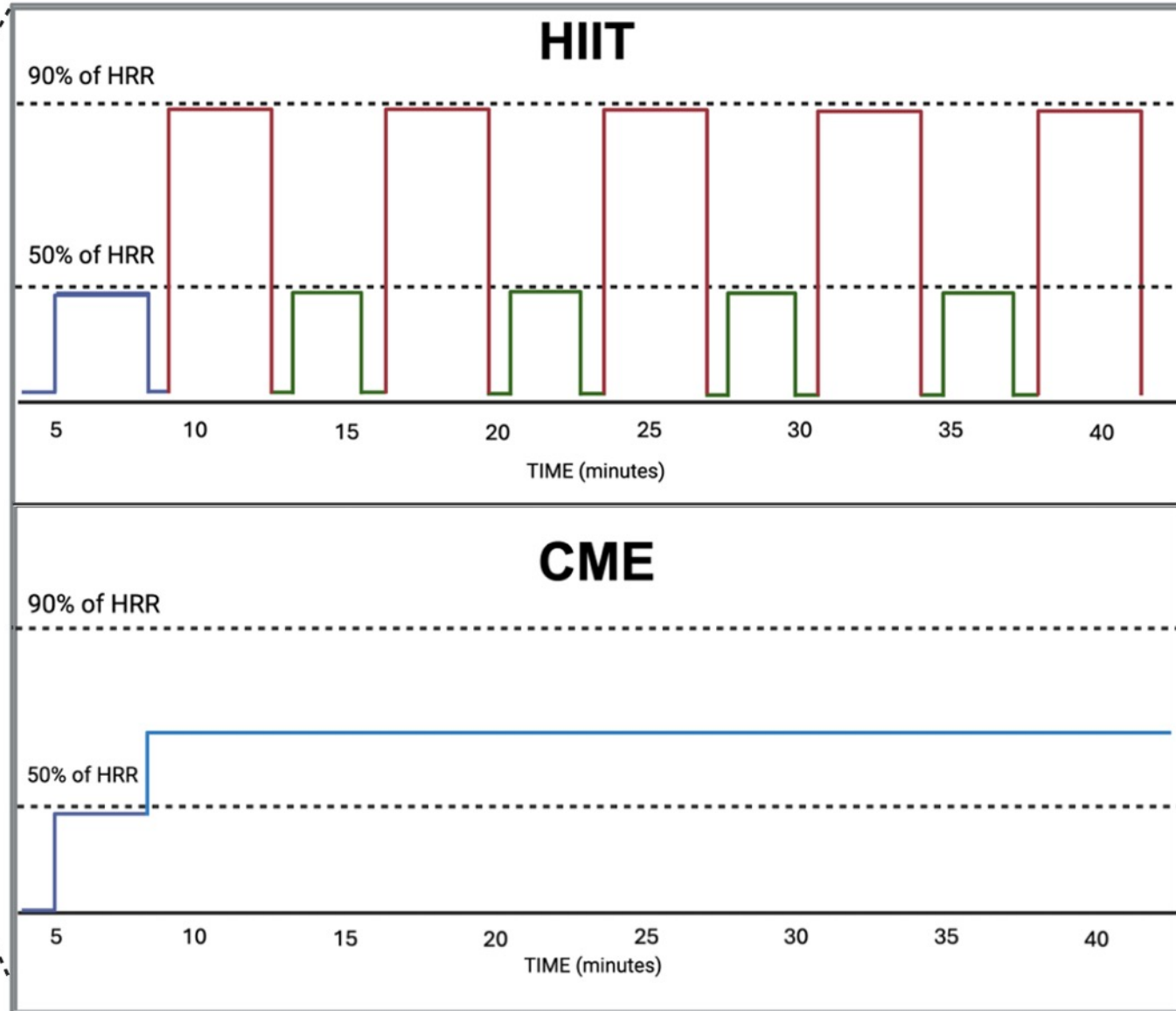
- “And the thing about exercise is as soon as you start doing it, **you start feeling good**”
- “In a very short period of time ...your mood changes and you start to feel like, my god, **I'm happier than I was.**”
- “And then when I started exercising, I learned to...use the exercise to help build inner 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?



The High-Intensity Exercise Study to Attenuate Limitations and Train Habits in Older Adults with HIV





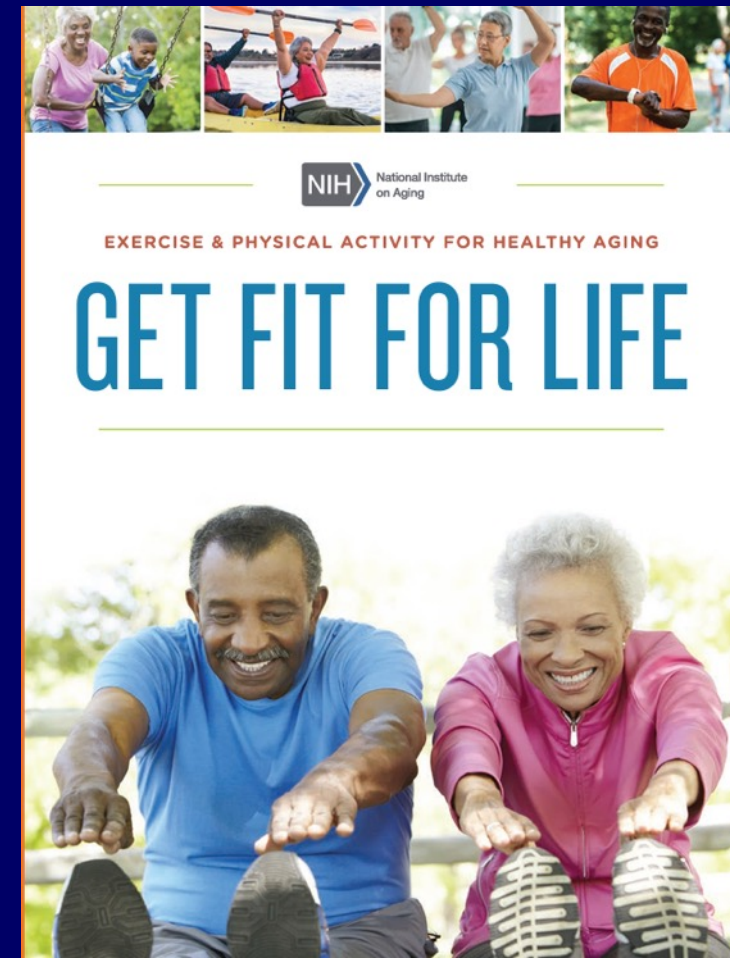
Results
coming
soon!

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



- ~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

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

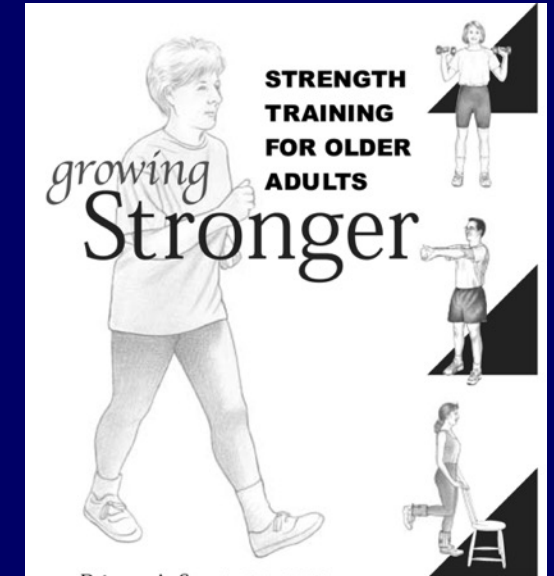
Amanda E. Paluch, PhD, FAHA, Chair; William R. Boyer, PhD; Barry A. Franklin, PhD, FAHA; Deepika Laddu, PhD, FAHA; Felipe Lobelo, MD, PhD, FAHA; Duck-chul Lee, PhD; Mary M. McDermott, MD, FAHA; Damon L. Swift, PhD, FAHA; Allison R. Webel, RN, PhD; Abbi Lane, PhD, FAHA, Vice Chair; on behalf the American 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)
- CDC “Strength Training for Older Adults”
 - 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)



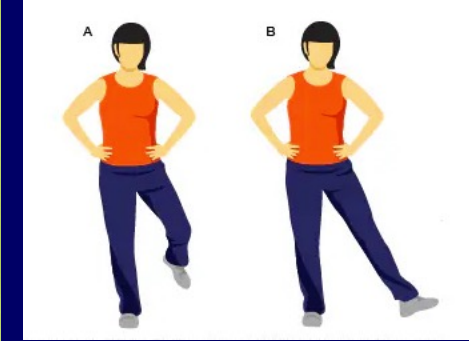
Balance & Flexibility

- 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	30	40	40	30	40	30	30

Virtual Fitness and Wellness Classes



Mon, September 16 [Functional Strength Training](#)

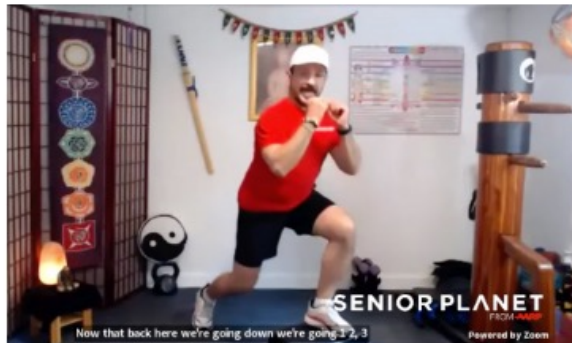
11:00AM EDT / 10:00AM CDT / 9:00AM MDT / 8:00AM PDT

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

Why Not Just Prescribe “Ozempic”?

- Numerous benefits:
 - *Very* effective weight loss for ~ 80% of people
 - Cardiometabolic effects
 - Potential benefits on numerous other endpoints (addiction, dementia, among others)
- Also negative:
 - Expensive, intermittent availability
 - Side-effects, may be greater among older adults
 - Long-term adherence somewhat low despite efficacy



Semaglutide (Ozempic) is Effective at Decreasing Fatty Liver in PWH

The Effect of Open-Label Semaglutide on Metabolic Dysfunction–Associated Steatotic Liver Disease in People With HIV

Authors: Jordan E. Lake, MD, MSCR, Douglas W. Kitch, MS, Amy Kantor, MS, Raja Muthupillai, PhD, Karin L. Klingman, MD , Christina Vernon, MPH, Pablo F. Belaunzaran-Zamudio, MD , ... [SHOW ALL](#) ..., and Kristine M. Erlandson, MD  | [AUTHOR, ARTICLE, & DISCLOSURE INFORMATION](#)

Publication: Annals of Internal Medicine • Volume 177, Number 6 • <https://doi.org/10.7326/M23-3354>

Clinical Infectious Diseases

MAJOR ARTICLE



OXFORD

Effects of Semaglutide on Muscle Structure and Function in the SLIM LIVER Study

Grace L. Ditzenberger,^{1,●} Jordan E. Lake,^{2,●} Douglas W. Kitch,³ Amy Kantor,³ Raja Muthupillai,^{4,●} Carlee Moser,^{3,●} Pablo F. Belaunzaran-Zamudio,⁵ Todd T. Brown,⁶ Kathleen Corey,⁷ Alan L. Landay,⁸ Anchalee Avihingsanon,⁹ Fred R. Sattler,¹⁰ and Kristine M. Erlandson^{1,●}



Weight loss is Associated with ~ 10% loss in Lean (Muscle) Mass in Other Studies

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

Need strength training to counteract these losses!

What is the Impact of Semaglutide on Muscle?

Parameter	Change, Baseline to Week 24	P Value
5 time chair rise, seconds	−0.66 (2.5) 95% CI, −1.4 to .07	.077
10 time chair rise, seconds	−1.27 (4.7) 95% CI, −2.7 to .10	.069
Gait speed, m/sec	0.05 (0.19) 95% CI, −.01 to .10	.078
Presence of slow gait, <1 m/sec	Risk ratio, 0.73 (0.55, 0.97)	.029

Trends towards improved function despite ~ 10% loss in muscle volume

Semaglutide at CROI

113 **Epigenetic Age Predictors of Semaglutide-Related Liver Fat Changes in People With HIV**

Michael J. Corley¹, Alina Pang¹, Doug Kitch², Amy Kantor², Fred R. Sattler³, Pablo Belaunzarán-Zamudio⁴, Todd Brown⁵, Alan Landay⁶, Kristine M. Erlandson⁷, Jordan Lake⁸

172 **Semaglutide Improves Cognitive Function in HIV, Effect Mediated by Decrease in Inflammation**

Ornina Atieh¹, Jhony Baissary¹, Qian Wu¹, Abdus Sattar¹, Danielle Labbato², Allison Ross Eckard³, Christian Mouchati⁴, Grace A. McComsey¹

181 **Semaglutide Stabilizes Epigenetic Aging in People With HIV-Associated Lipohypertrophy**

Michael J. Corley¹, Alina Pang¹, Danielle Labbato², Allison Ross Eckard³, Grace A. McComsey⁴

759 **Effects of Semaglutide on Gut Microbiota in People With HIV: The SLIM LIVER Study**

Stephanie M. Dillon¹, Daniel N. Frank¹, Charles E. Robertson¹, Jennifer M. Kofonow¹, Cara C. Wilson¹, Alan Landay², Todd Brown³, Fred R. Sattler⁴, Jordan E. Lake⁵, Kristine M. Erlandson¹

757 **Semaglutide Improves Steatohepatitis in People With HIV: The SLIM LIVER Study**

Jordan E. Lake¹, Doug Kitch², Amy Kantor², Rebeca Mayo³, Pablo Belaunzarán-Zamudio⁴, Carl Fichtenbaum⁵, Todd Brown⁶, Kathleen Corey⁷, Fred R. Sattler⁸, Kristine M. Erlandson⁹, for the ACTG A5371 Protocol Team

860 **Racial Inequity in Initiation of Semaglutide Therapy Among People With HIV in Care Across the US**

Stephanie A. Ruderman¹, Andrew W. Hahn¹, Lara Haidar², Sherif Eltonsy², Lydia N. Drumright¹, Jimmy Ma¹, Conall O'Cleirigh³, Sonia Napravnik⁴, Katerina Christopoulos⁵, Edward Cachay⁶, George Yendewa⁷, Amanda Willig⁸, Geetanjali Chander¹, Heidi M. Crane¹, Rob Fredericksen¹, for the Centers for AIDS Research

861 **Cardiometabolic Effects of Semaglutide in People With HIV: The SLIM LIVER Study**

Jordan E. Lake¹, Doug Kitch², Amy Kantor², Raja Muthupillai³, Pablo Belaunzarán-Zamudio⁴, Carl Fichtenbaum⁵, Hugo Perazzo⁶, Sonya L. Heath⁷, Todd Brown⁸, Alan Landay⁹, Jennifer Kinslow¹⁰, Fred R. Sattler¹¹, Kristine M. Erlandson¹², for the

862 **Durability of Semaglutide Effects After Drug Discontinuation in HIV-Associated Lipohypertrophy**

Allison Ross Eckard¹, Qian Wu², Abdus Sattar², Kianoush Ansari-Gilani³, Danielle Labbato⁴, Corri Lynn O. Hileman⁵, Aaron A. Fletcher³, Grace A. McComsey²

1152 **The Impact of Semaglutide on Alcohol Use Among People With HIV in Routine Clinical Care in the US**

Heidi M. Crane¹, Robin M. Nance¹, L. Sarah Mixson¹, Stephanie A. Ruderman¹, Bridget M. Whitney¹, Andrew W. Hahn¹, Mari Kitahata¹, Amanda Willig², Lara Haidar³, Kaitlin A. Zinsli¹, George Yendewa⁴, Allison Webel¹, Edward Cachay⁵, Joseph A. Delaney¹, Geetanjali Chander¹, for the Centers for AIDS Research

1298 **Trajectories of Weight Changes After GLP-1 Receptor Agonists Initiation Among Patients With HIV**

Jing Sun¹, Pooja Maheria², Carolyn Bramante³, Hsing-Yu Hsu¹, Eric G. Hurwitz⁴, Zachary Butzin-Dozier⁵, Jerrod Anzalone⁶, Todd Brown⁷, Rena C. Patel⁸, for the

Semaglutide CROI Take-Home Findings:

- Black PWH are significantly less likely to initiate semaglutide, despite greater indication
- Semaglutide:
 - Decreases metabolic syndrome, visceral fat, and CRP
 - Decreases steatohepatitis but not fibrosis markers
 - Stabilizes epigenetic markers of aging; alters the gut microbiome
 - Improved cognition, independent on changes in body fat
- In PWH with at-risk alcohol use, AUDIT-C scores decreased after initiating semaglutide
- **Weight loss reverses nearly completely after stopping semaglutide**

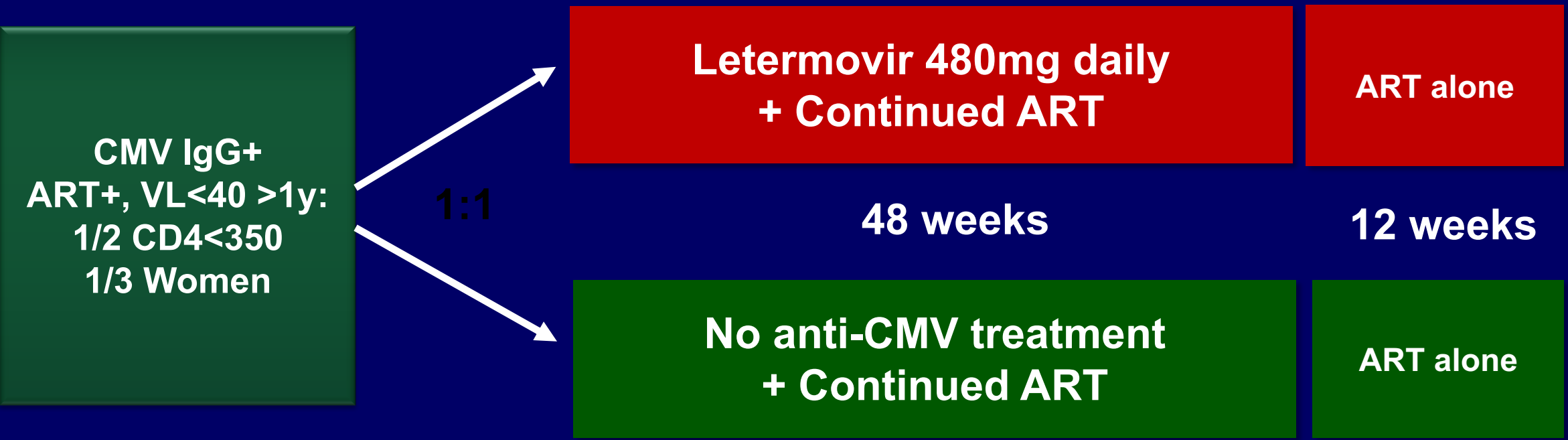
Other Interventions to Improve Frailty/Function?

- **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 next month in Denver & Boston!

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 (anticipate open to enrollment before end of 2025)

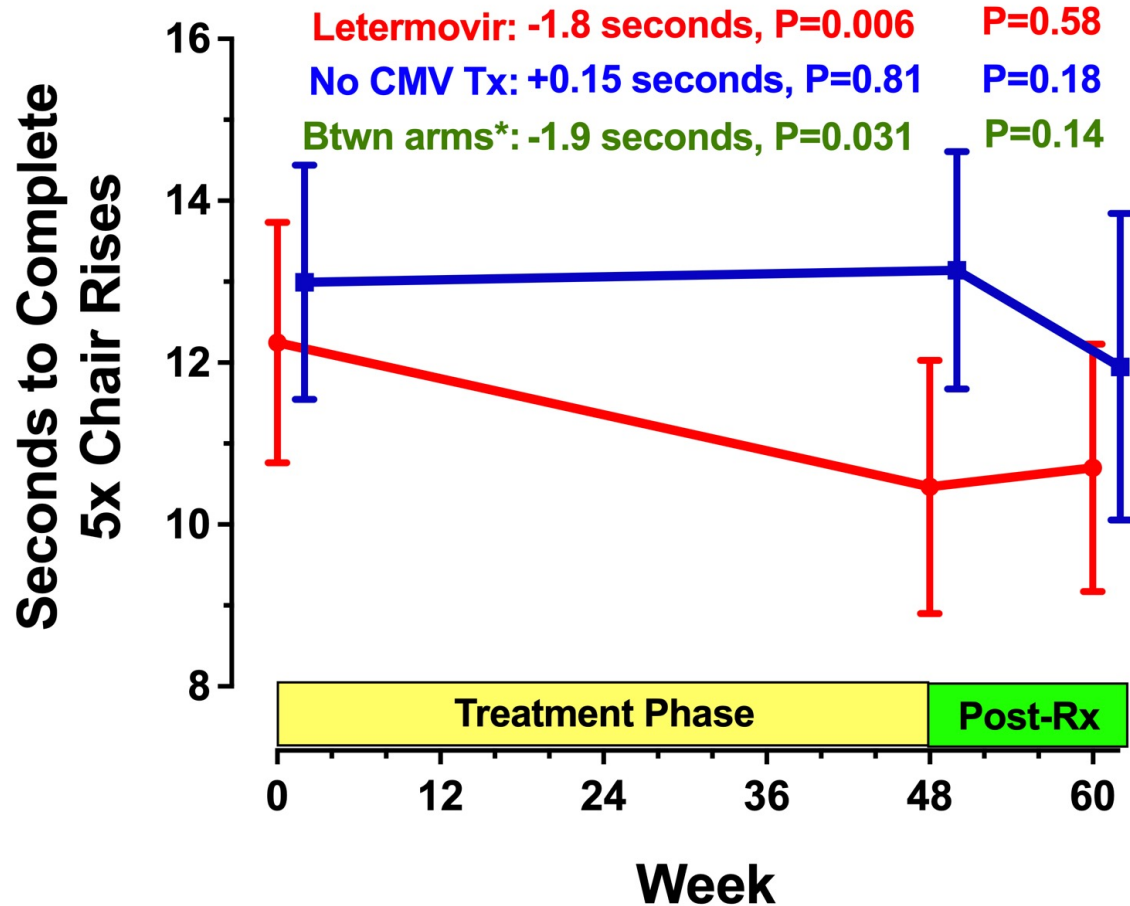
A5383: Letermovir (CMV terminase inhibitor) to Reduce Immune Activation in Treated HIV (n=40)



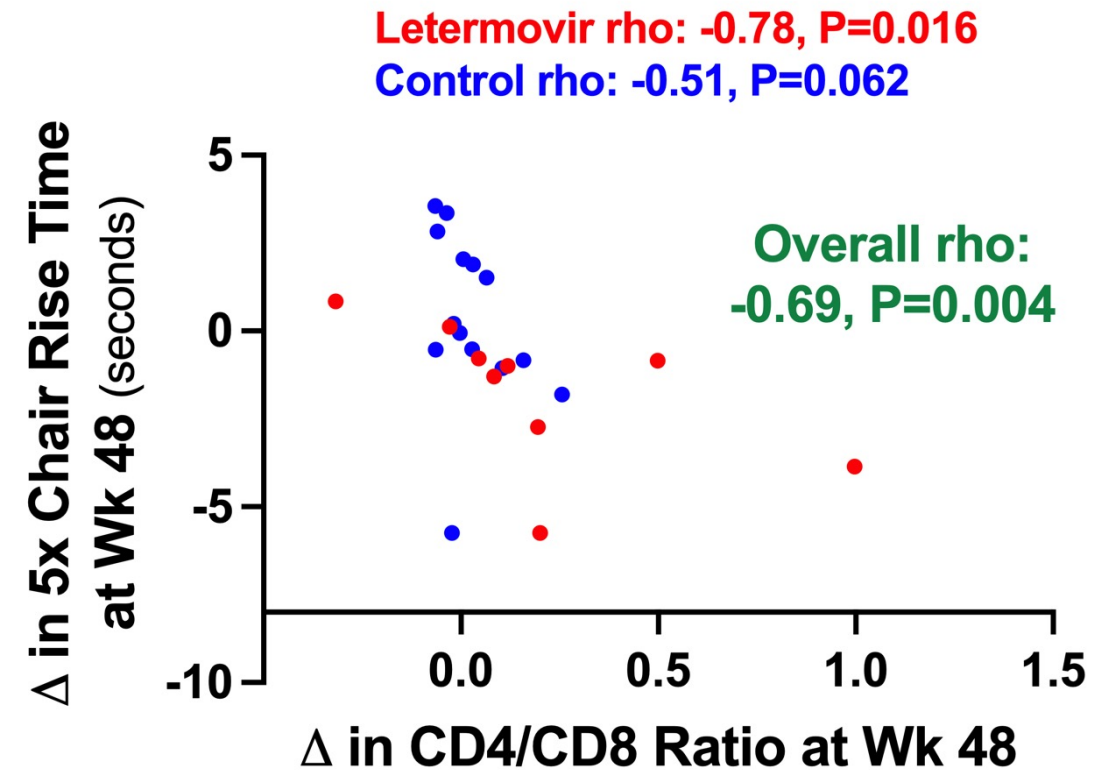
Letermovir Improved Chair Rise Time, which Correlated with Immunologic Improvement

Change in 5x Chair Rise Time

Slope Over 48 Weeks:



Change in Chair Rise Time by Change in CD4/CD8 Ratio

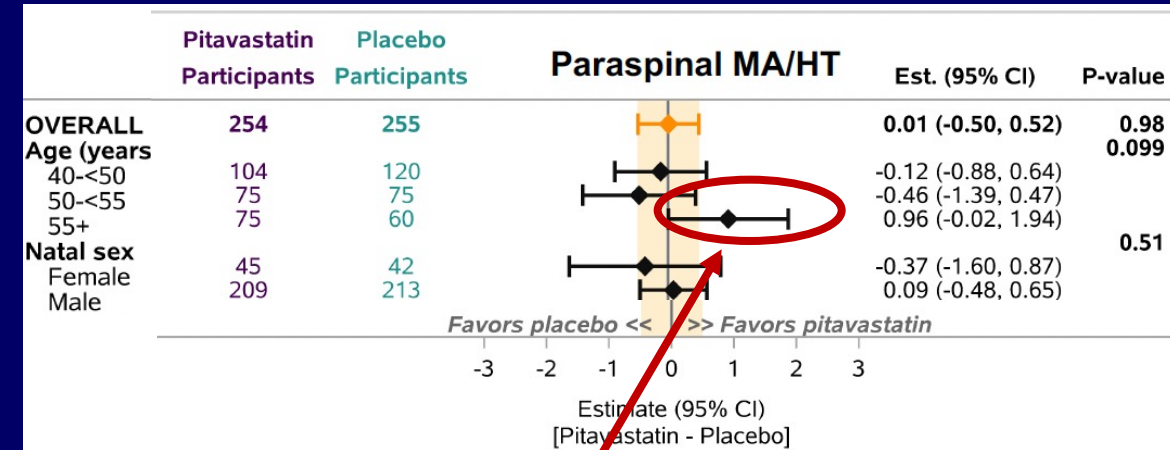
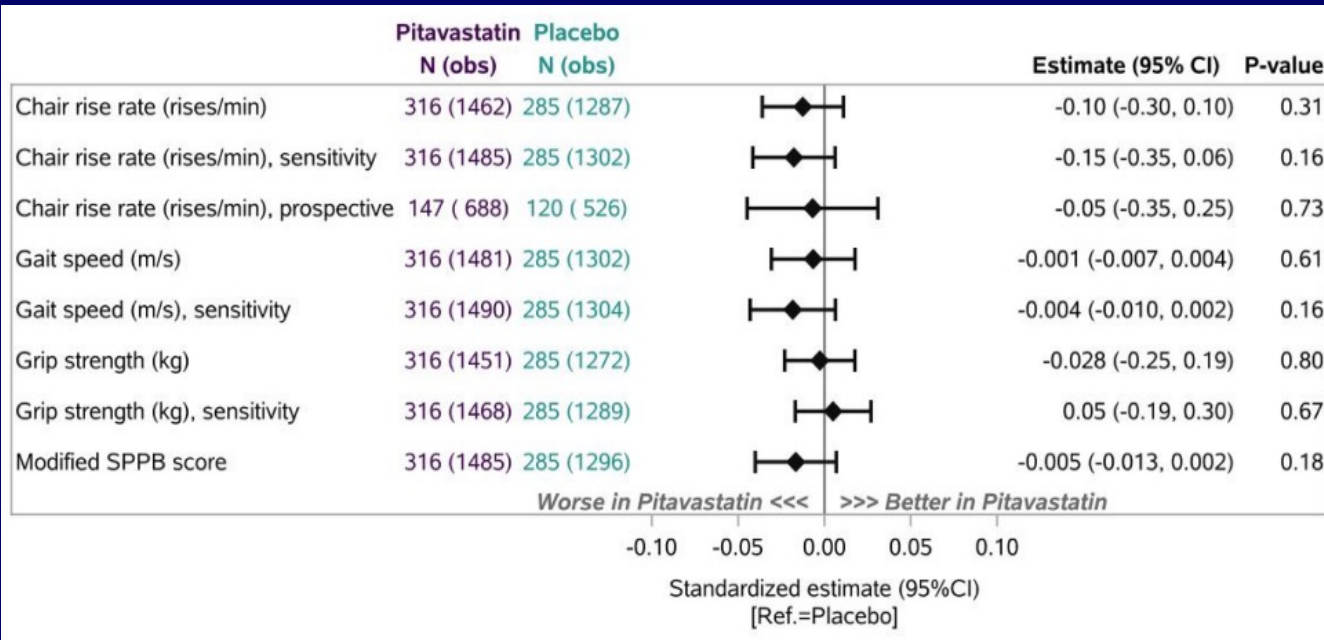


Significant correlations also for IL-6R and IL-1 β

**Are Any of Our Preventive
Medications Causing *Harm* to
Physical or Cognitive Function?**

Are Statins Harmful to Muscle and Function?

- In PREPARE substudy of REPRIEVE, we found no protective or detrimental effect of statins on frailty components or muscle area



**Trend towards protective effect
in those 55 or older**

Are Statins Harmful for Cognitive (Brain) Function?

- Among participants co-enrolled in REPRIEVE and in the HAILO (ACTG) observational study, looked at changes in neurocognitive function pre/post randomized pitavastatin

Table 2. Mean change per year in neurocognitive scores prior to REPRIEVE randomization (combined arms) and following REPRIEVE randomization (by randomized study arm).

Outcome	Pre-REPRIEVE	Post-REPRIEVE Randomization		<i>p</i> *
	Combined arms	Placebo	Pitavastatin	
NPZ4	0.050 (0.034, 0.065)	−0.006 (−0.030, 0.017)	−0.007 (−0.033, 0.020)	0.97
TrA	0.076 (0.053, 0.099)	−0.020 (−0.065, 0.024)	0.019 (−0.020, 0.058)	0.18
TrB	0.064 (0.039, 0.089)	0.033 (−0.006, 0.073)	0.014 (−0.026, 0.054)	0.46
DSY	0.041 (0.018, 0.064)	−0.003 (−0.043, 0.037)	−0.001 (−0.047, 0.045)	0.94
HVLT	0.017 (−0.011, 0.046)	−0.029 (−0.066, 0.008)	−0.062 (−0.115, −0.009)	0.27

NPZ4, the average Z-score of the combined tests of neurocognitive performance: Trailmaking Tests A and B (TrA, TrB), the Wechsler Adult Intelligence Scale-Revised Digit Symbol Test (DSY), and Hopkins Verbal Learning Test-Revised (HVLT).

*The *P* value compares the trajectories between treatment arms, post-REPRIEVE randomization.

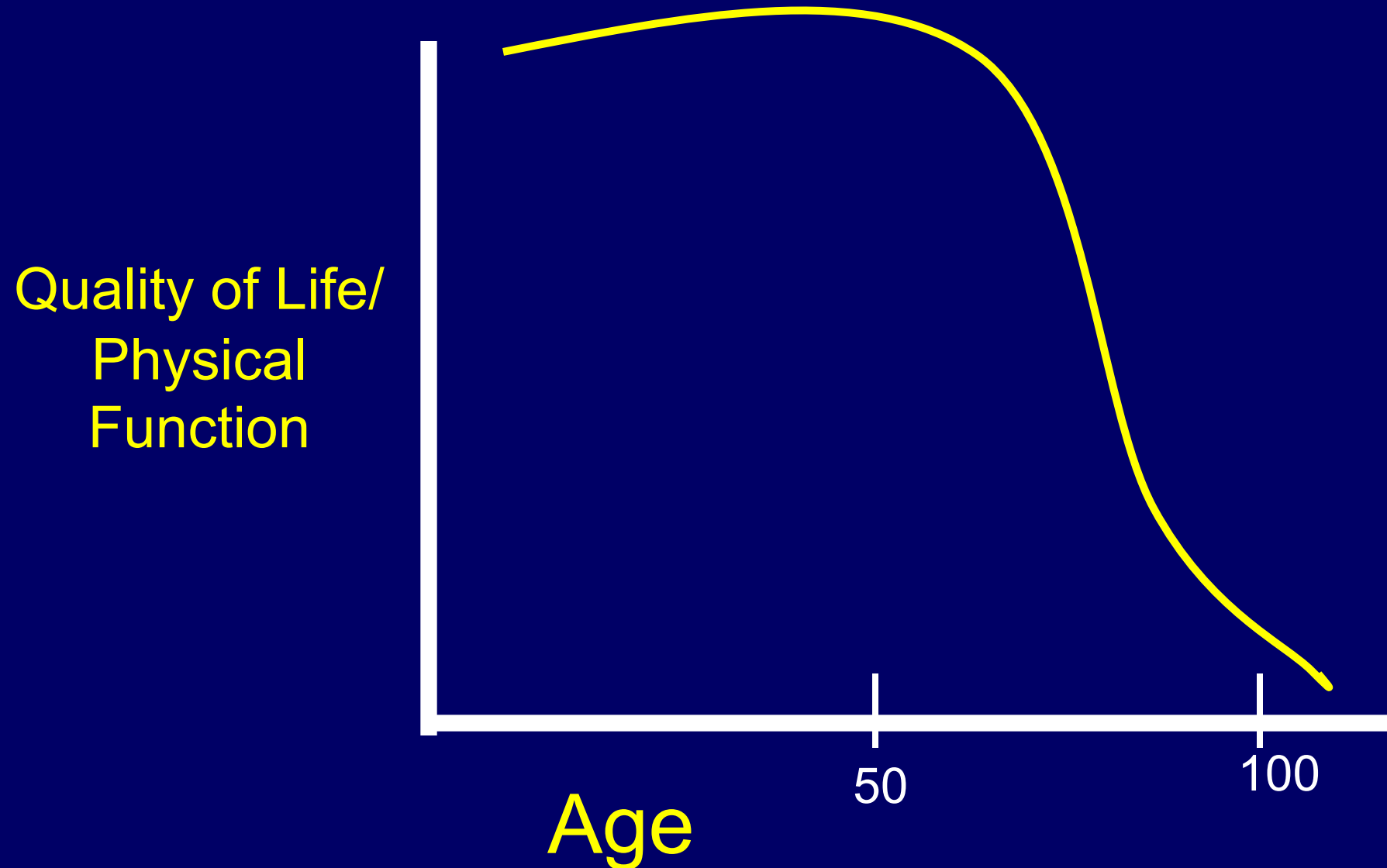
No findings to suggest detrimental effect with pitavastatin, even in those with baseline impairment



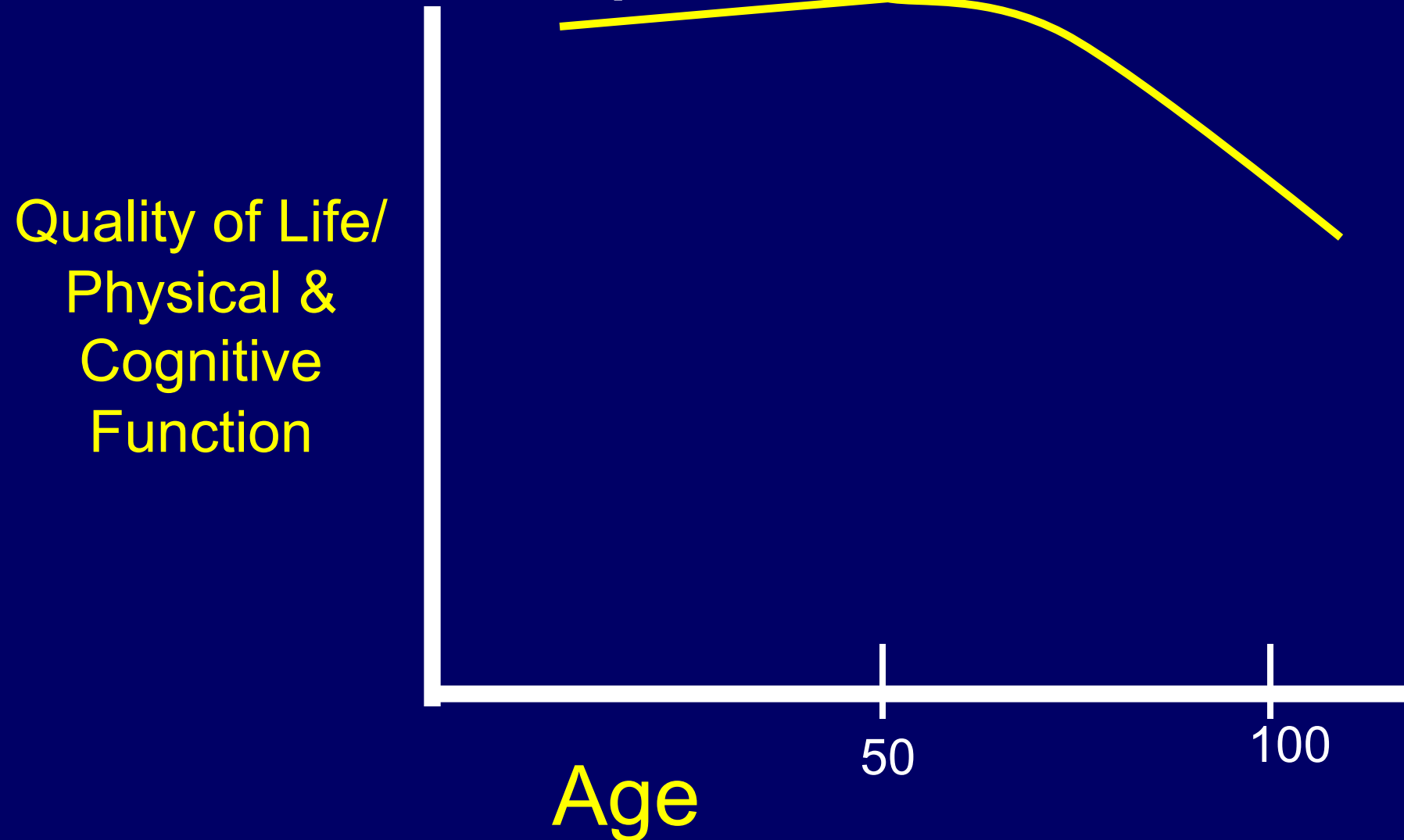
Conclusions

- 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



You can bend the aging curve upward

Slide 89

