Frailty in Older People with HIV

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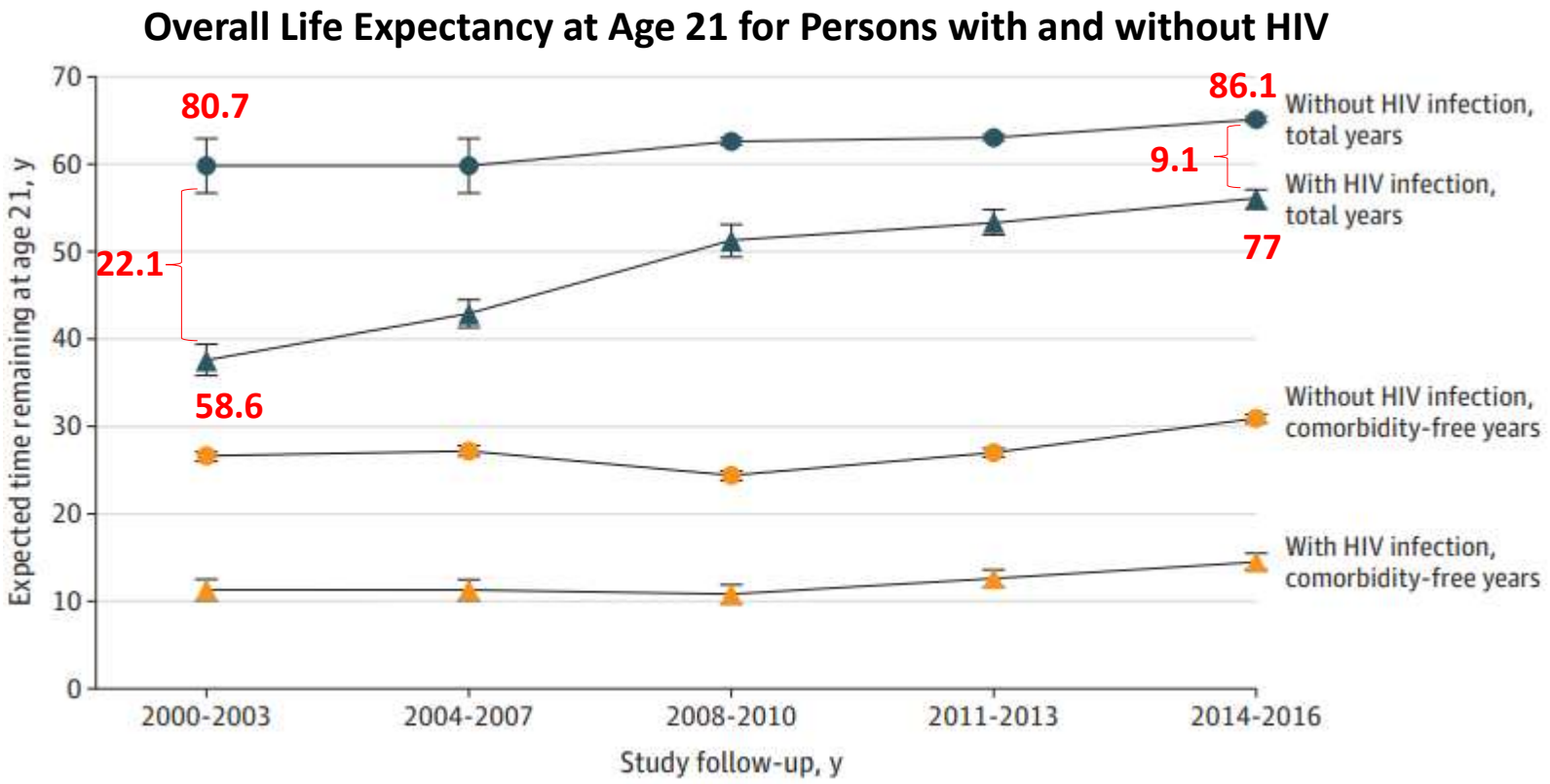
Disclosures

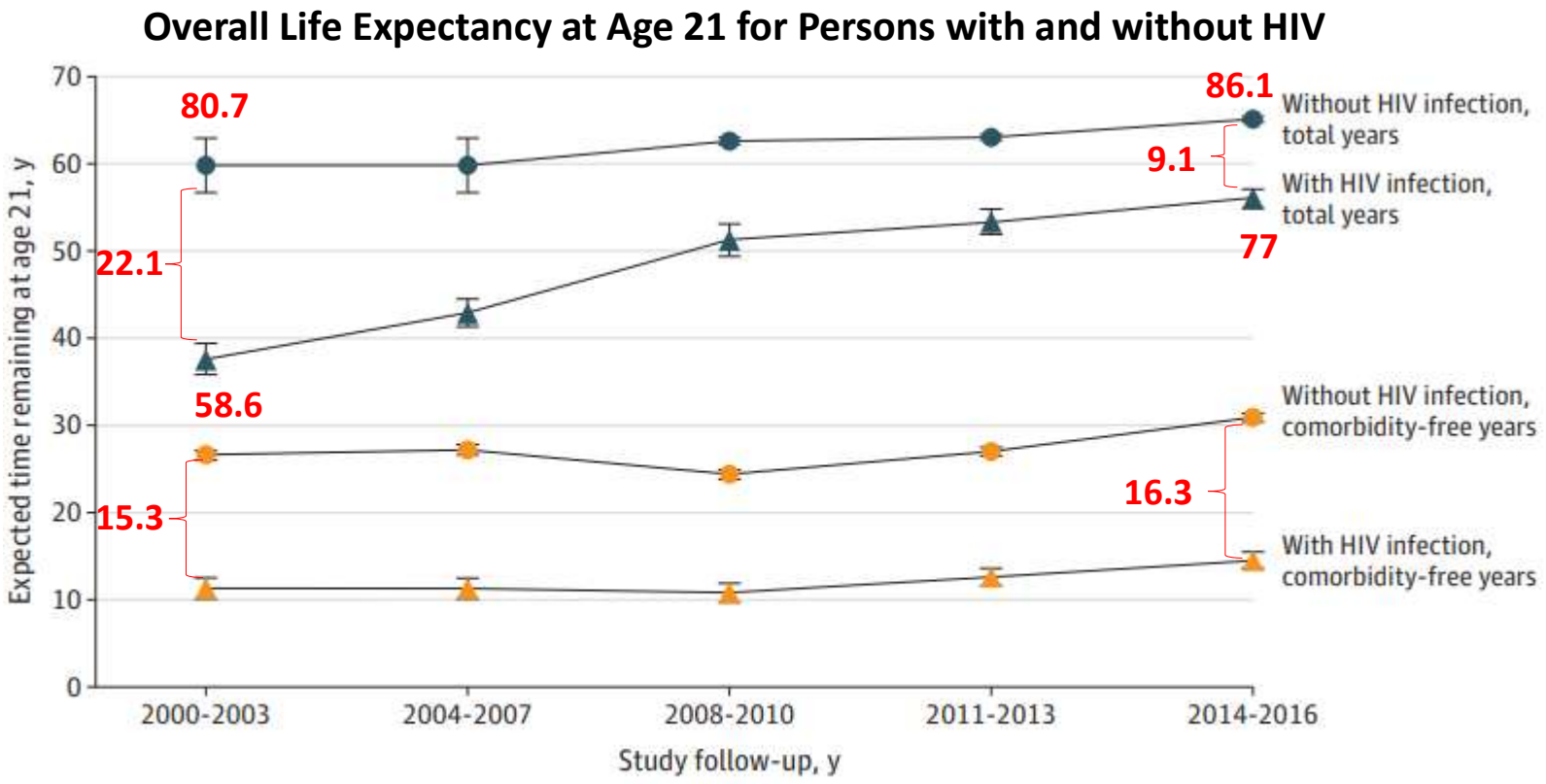
Nothing to disclose

People with HIV now have longer lifespan…



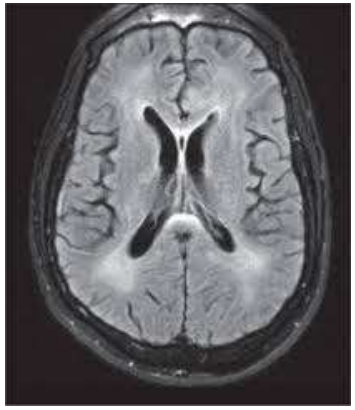
Marcus et al. JAMA Network Open. 2020.

But the gap in healthspan persists



Marcus et al. JAMA Network Open. 2020.

Increased non-infectious comorbidities in HIV



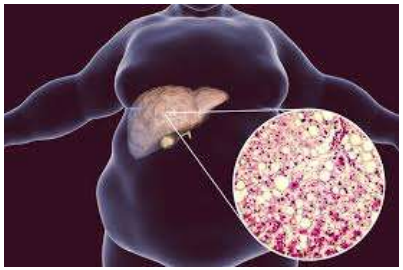
Cognitive Impairment

Diabetes

Non-AIDS Defining Malignancy

COPD

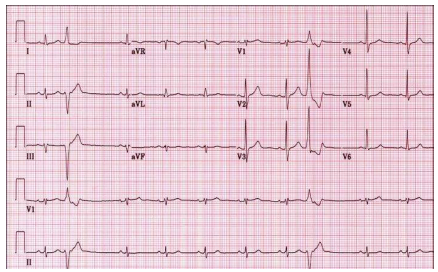
Kidney Disease



NAFLD

Bone disease

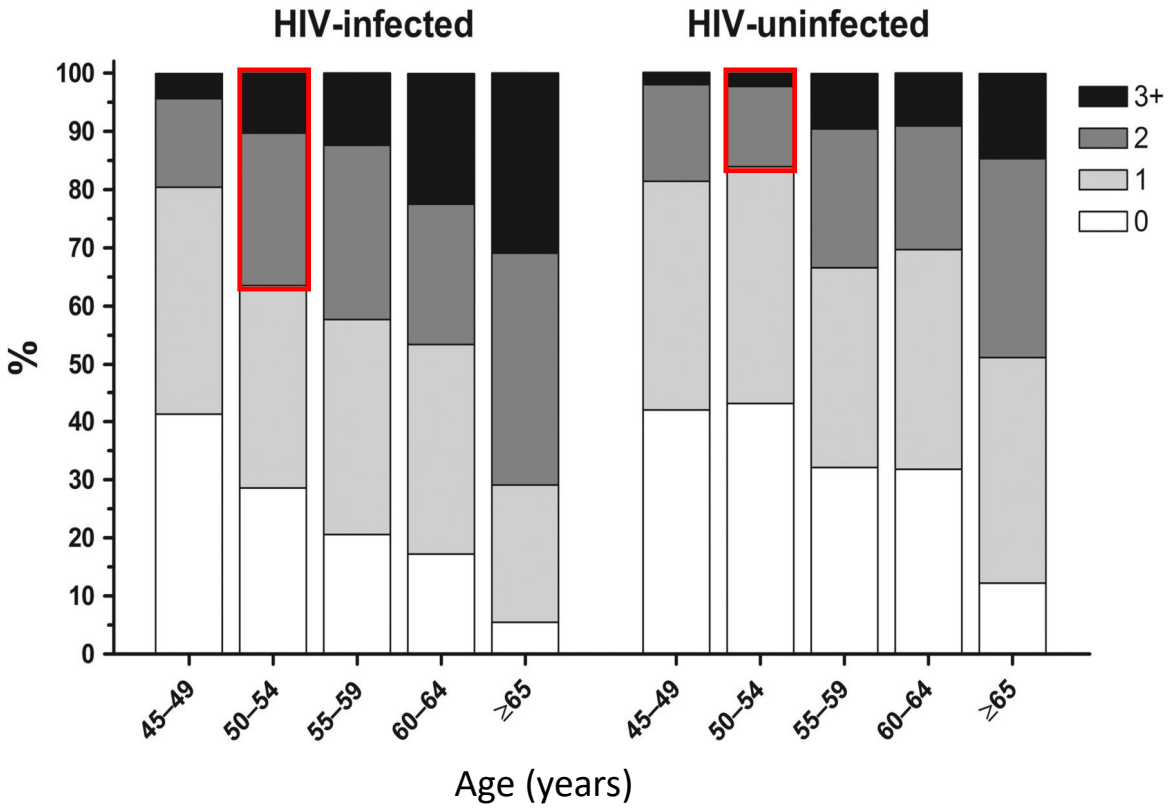
Frailty



Cardiovascular disease

Multimorbidity is also increased in HIV

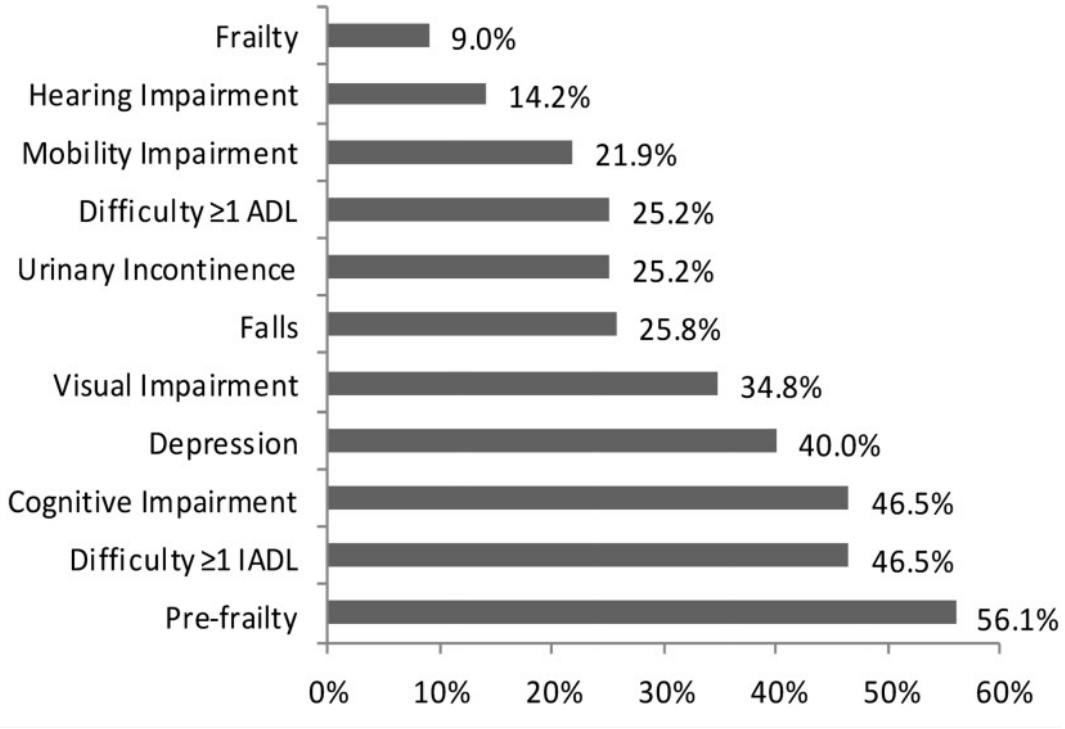
Distribution of the number of non-infectious comorbidities



Multi-morbidity (≥2 chronic conditions) is increased in PWH compared to those without HIV

Schouten et al. *CID* 2014

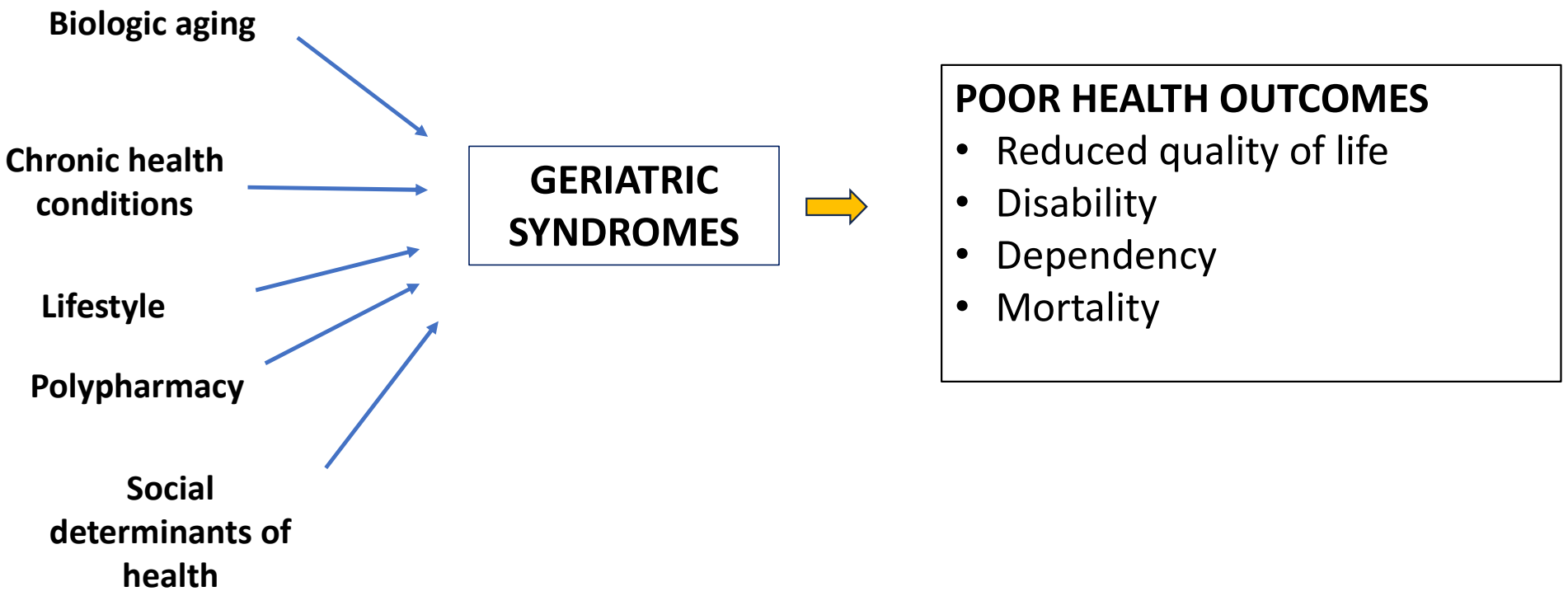
Geriatric syndromes are common in PWH at younger than expected ages



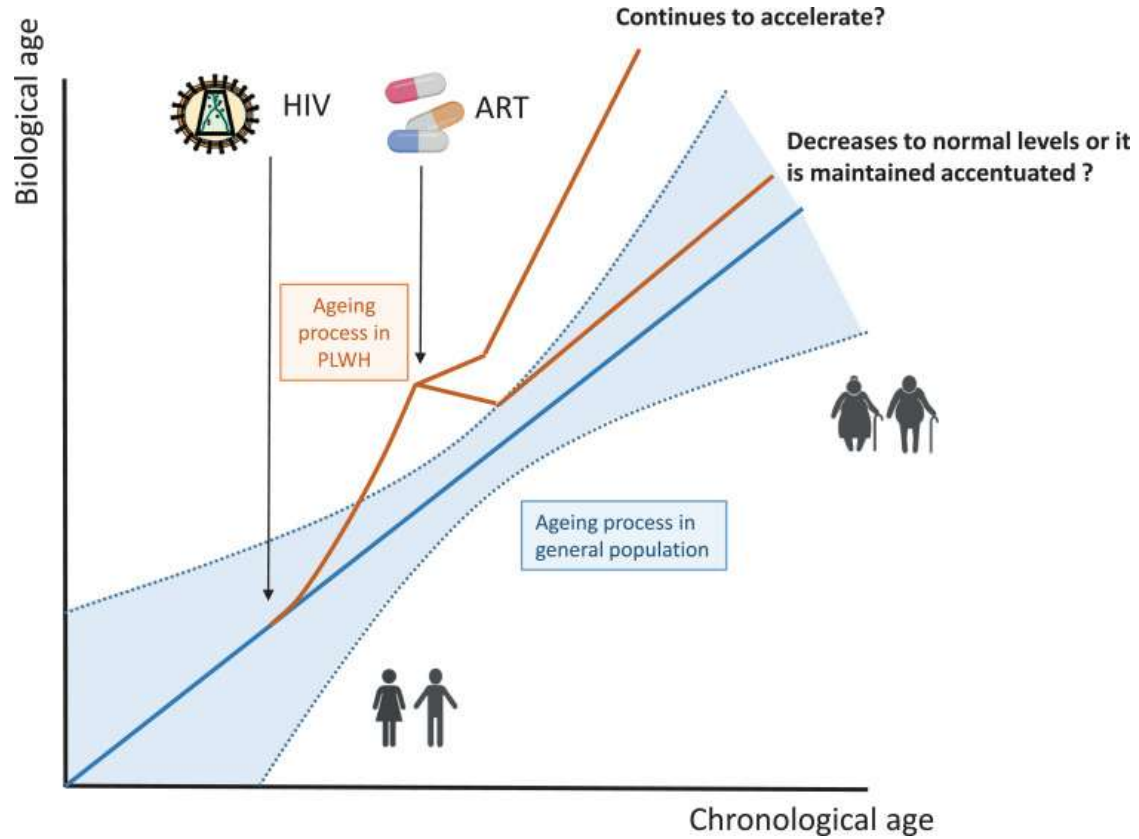
Nearly 2/3 of these individuals were under age 60 years.

Greene et al. *JAIDS*. 2015.

Geriatric syndromes impact function and quality of life

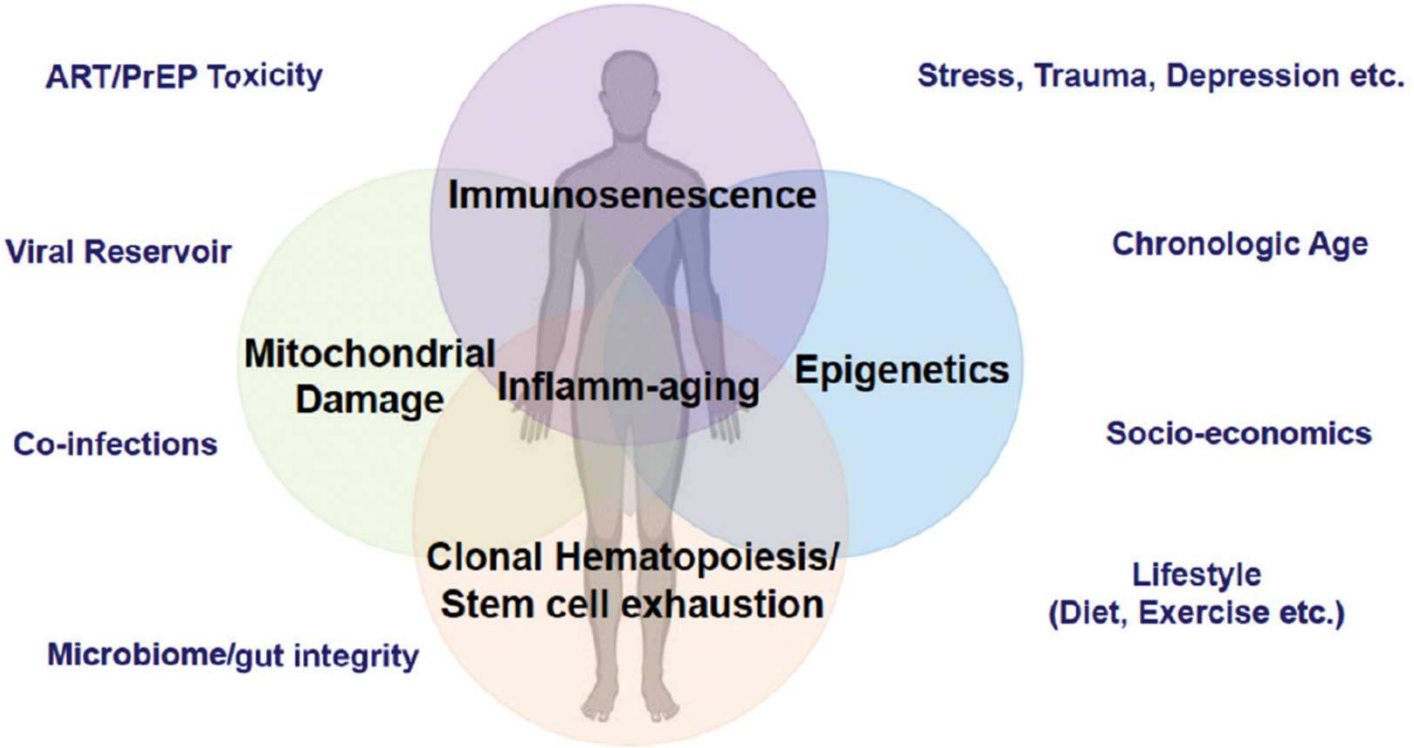


Accelerated versus accentuated aging in HIV



Rodes B et al. eBioMedicine, 2022.

Drivers and mechanisms of aging in HIV



Gabuzda, *Pathogens and Immunity*, 2020

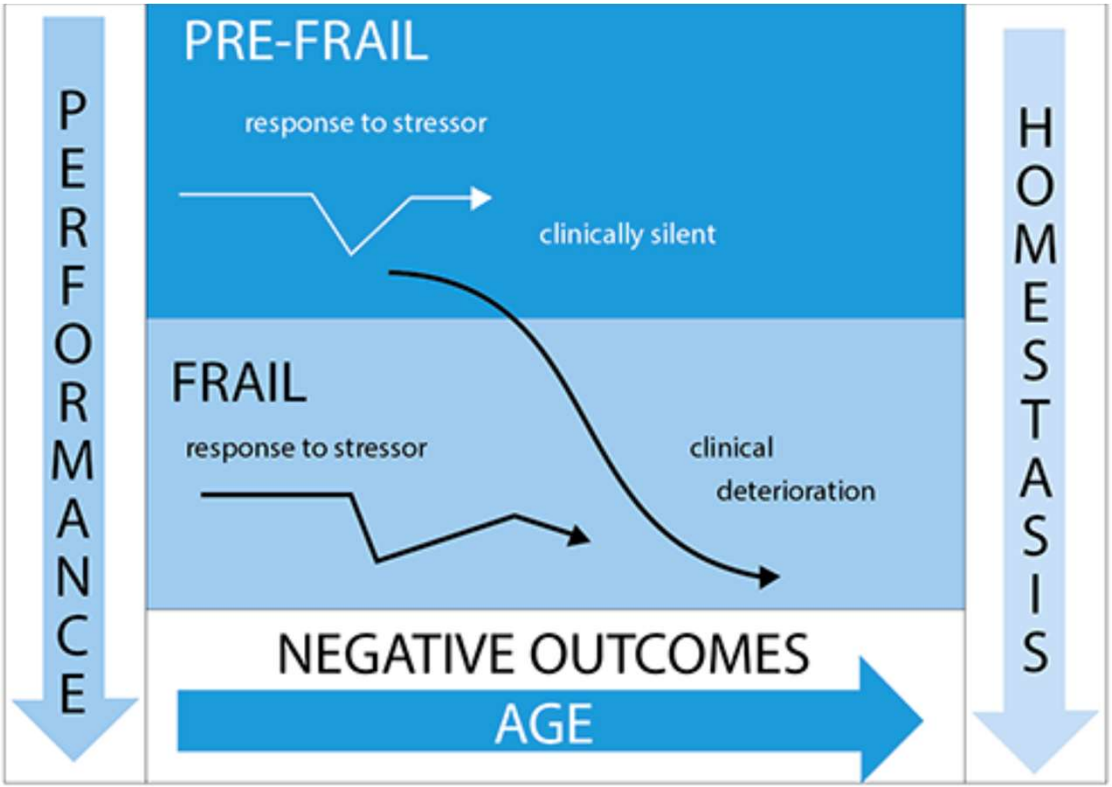
How do we capture these differences in the clinic?

75 years

Versus

75 years

Frailty is a measure of vulnerability



Prevalence of frailty among PWH ranges from 5-29%

Levett TJ et al. *J Am Geriatr Soc,* 2016.

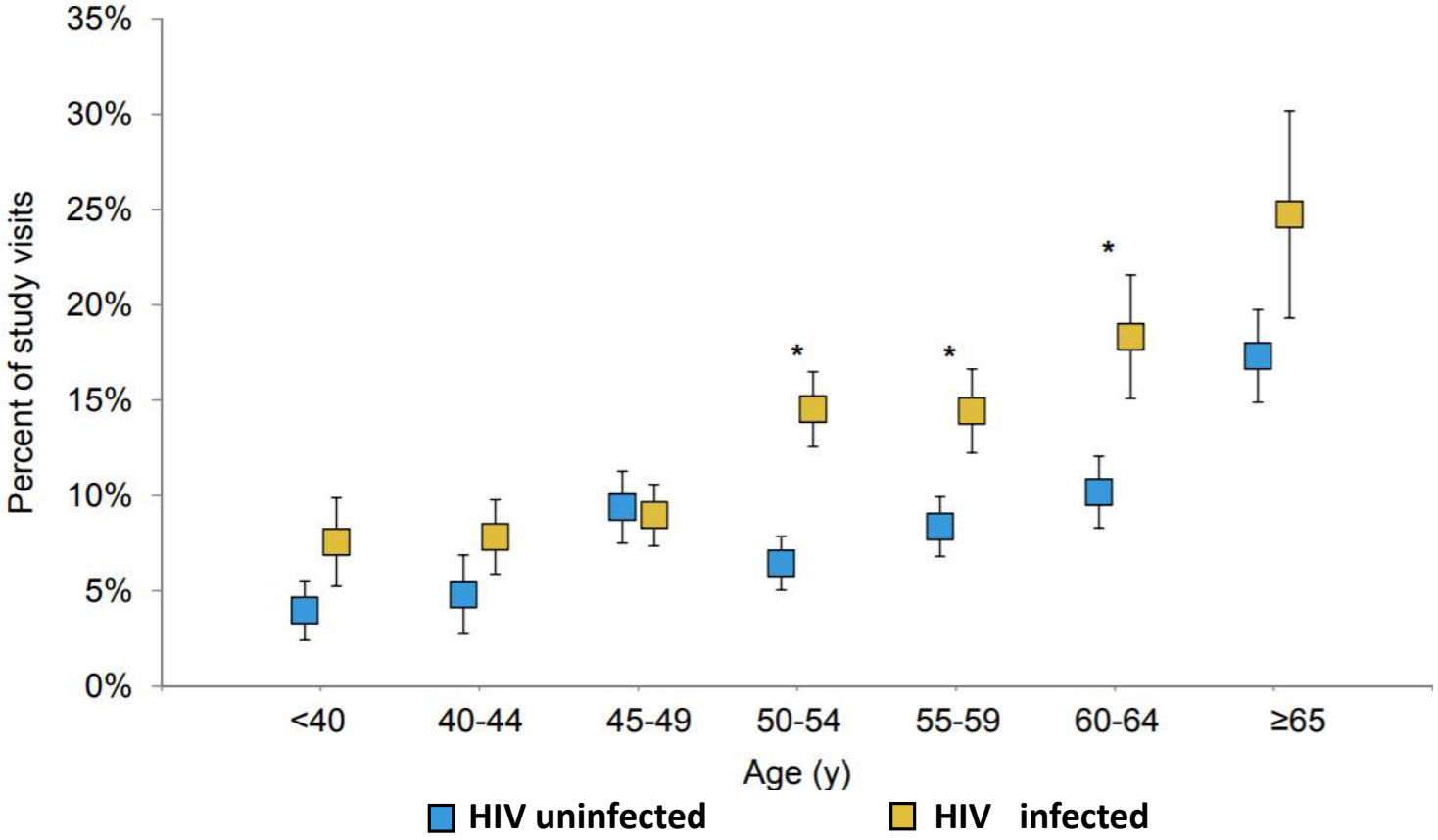
Defining frailty

1. Physical frailty syndrome
   - Fried Frailty Phenotype:
     - Slow gait
     - Weak grip
     - Unintentional weight loss
     - Exhaustion
     - Reduction in usual activities

2. State of deficit accumulation
   - Frailty Index

Both approaches classify people at increased risk of adverse outcomes and frailty as rooted in aging.

Increased frailty with age in men with HIV

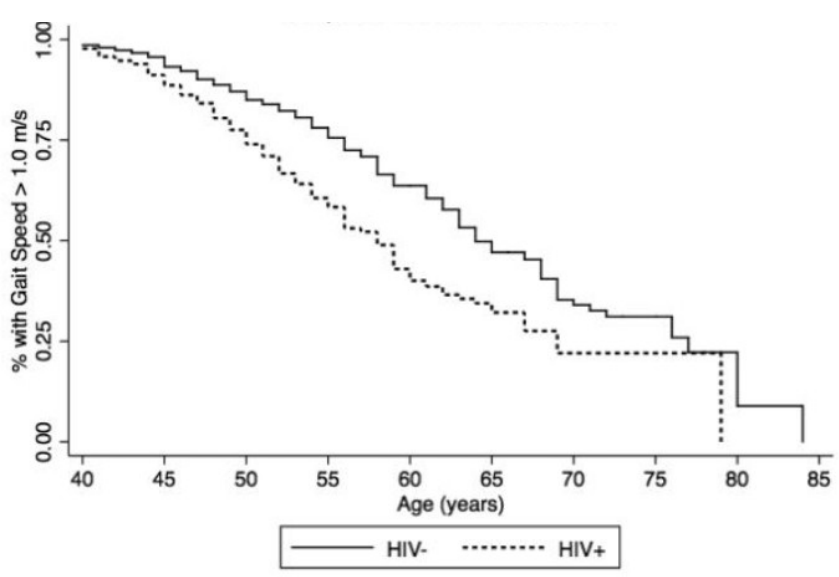


- The proportion of men with frailty increases with age regardless of HIV status.
- Above age 50, frailty is significantly greater among PWH compared to those without HIV.

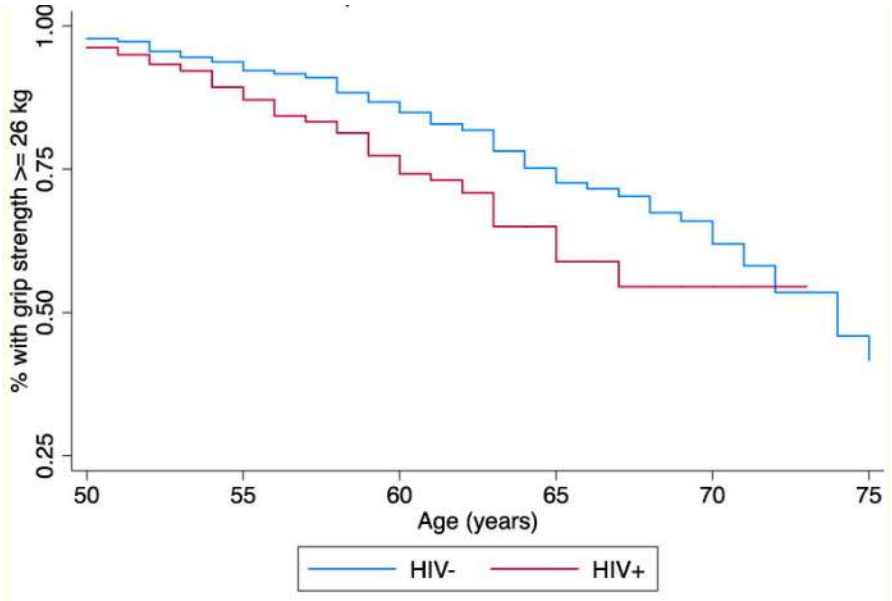
Althoff et al. *Journal of Gerontology,* 2014.

Physical function decline in men living with HIV compared to men without HIV

Gait Speed

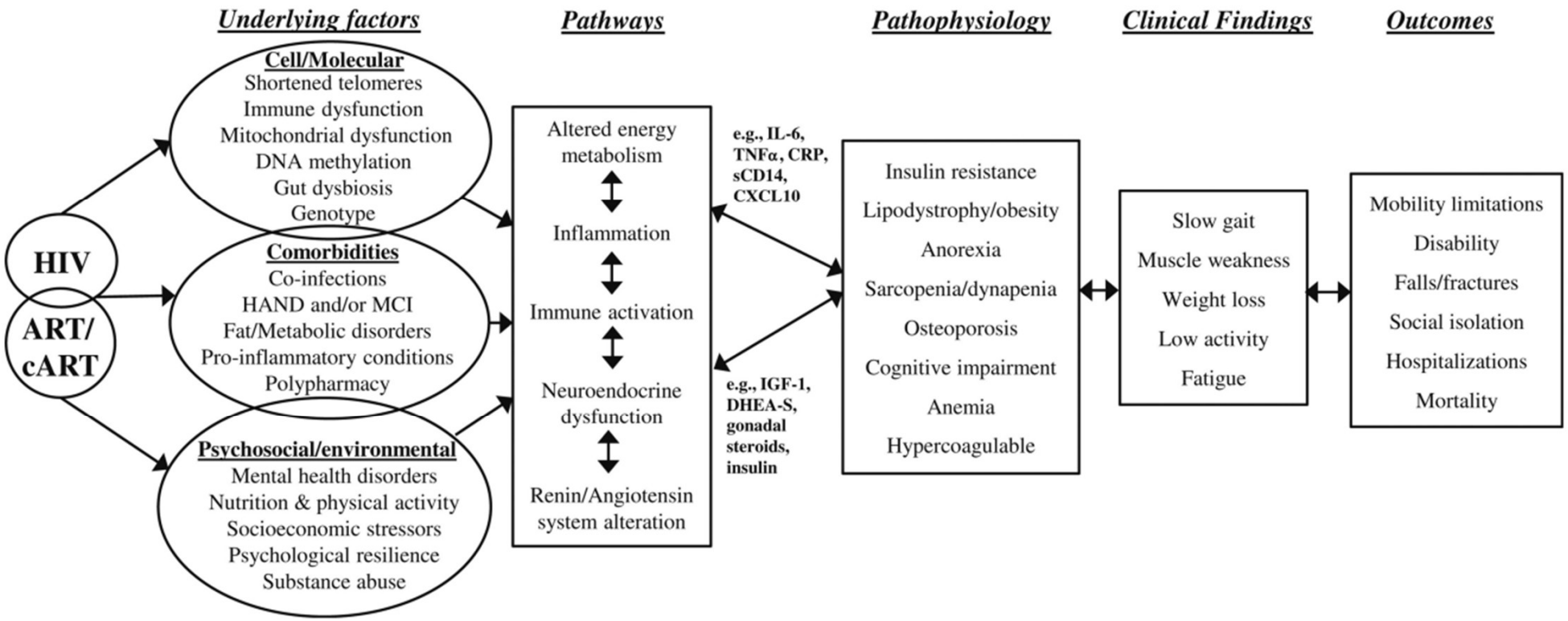


Grip Strength



Schrack et al. *AIDS*. 2016
Schrack et al. J Acquir Immune Defic Syndr. 2015

Biology of frailty in HIV



Piggott et al. *Curr HIV/AIDS Rep*. 2016

Case

- 64 year-old woman with treated HIV (UD on B/FTC/TAF, CD4 count 420), HTN, CKD, R knee osteoarthritis, depression, obesity (BMI 31) and prediabetes presents for a visit.
- Takes 8 medications including diphenhydramine as needed for sleep.
- Lives alone. Retired from job as an office secretary.
- When you call her from the waiting room, you notice she has some trouble rising from her chair and it takes her awhile to the exam room.

What is the best way to assess her function today?

HIV clinical guidelines recommend assessment of frailty

Clinical Infectious Diseases

IDSA GUIDELINES

Primary Care Guidance for Providers Who Care for Persons With Human Immunodeficiency Virus: 2024 Update by the HIV Medicine Association of the Infectious Diseases Society of America

Michael Horberg,[1,a] Melanie Thompson,[2,a,©] Allison Agwu,[3] Jonathan Colasanti,[4] Marwan Haddad,[5] Mamta Jain,[6] Grace McComsey,[7] Asa Radix,[8] Natella Rakhmanina,[9] William R. Short,[10] Tulika Singh,[11] and Hansel Tookes[12]

"Annual screening for frailty should be considered in people with HIV aged >50 years"

Assessing frailty versus physical function

Clinical Infectious Diseases
VIEWPOINTS

Application of Pragmatic Criteria to Assessments of Frailty and Physical Function Among People With HIV

Grace L. Kulik,[1] Duncan C. Mollner,[2] Lauren Barbera,[3] Jacob Walker,[4] Sarah Gorvetzian,[3] Dan Matlock,[4] and Kristine M. Erlandson[1]

- Frailty assessment can be time consuming, results are not always directly actionable
- Physical function measures can be less burdensome, directly actionable, and more responsive to change over time

Kulik et al, *CID,* 2025.

Physical function and frailty assessment in PWH

Syndrome	Implication	Assessment Tool
Frailty	• Vulnerability to stressors	Frailty Phenotype Frailty Scale Frailty Index
Impaired physical function	• High risk for frailty • Identify earlier impairments • May be a more reversible condition	Short Physical Performance Battery (SPPB) 4-m gait speed Timed chair stands

Fried LP, et al. *J Gerontol Med Sci* 2004; Adapted from Erlandson

Fried Frailty Phenotype

Criteria	Measure
Unintentional weight loss	>5% or 10 pounds unintentional weight loss in 12 months
Exhaustion	Self-report, ≥3 days per week
Low physical activity	Self-reported
Weakness	Grip strength
Slowness	Gait speed

- Frailty ≥ 3 criteria
- Prefrail 1-2 criteria
- Robust 0 criteria

PROS:
- Well-validated in HIV and geriatrics literature

CONS:
- Need special equipment (dynamometer)
- Subjective components
- 10 min to complete
- Cognition or depression may confound results
- Ceiling effect

FRAIL Scale

- **F**atigue: Are you fatigued?
- **R**esistance: Cannot walk up 1 flight of stairs?
- **A**erobic: Cannot walk 1 block?
- **I**llnesses: Do you have more than 5 illnesses?
- Weight **L**oss: Have you lost more than 5% of your weight in the past 6 months?

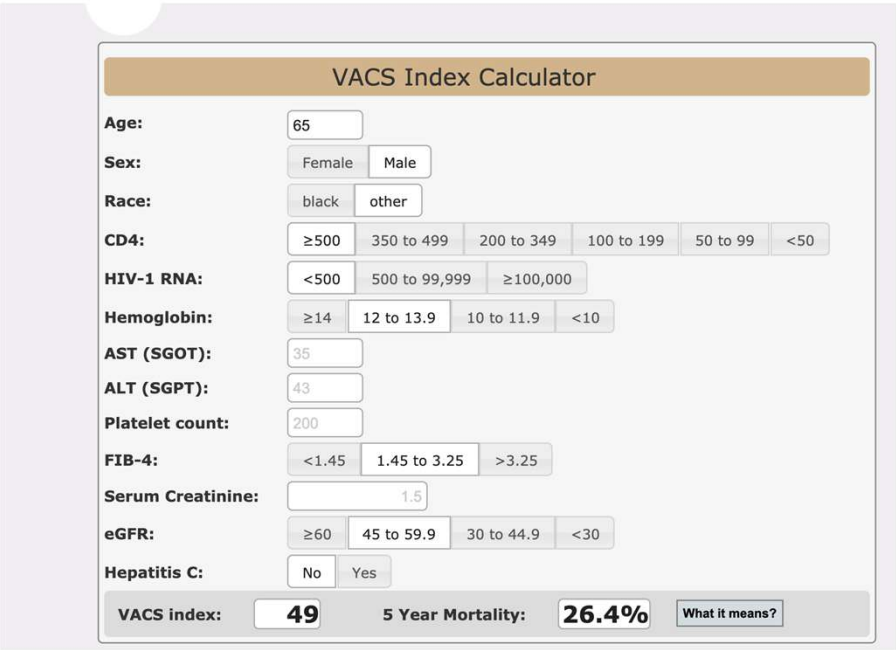
- Frailty $\geq$ 3 criteria
- Prefrail 1-2 criteria
- Robust 0 criteria

PROS:
- Quick
- Correlates relatively well with the Frailty Phenotype and Frailty Index
- No equipment

CONS:
- Subjective
- Limited data in HIV

Morley et al. *J Nutr Health Aging*. 2012

Frailty Indices



PRO:

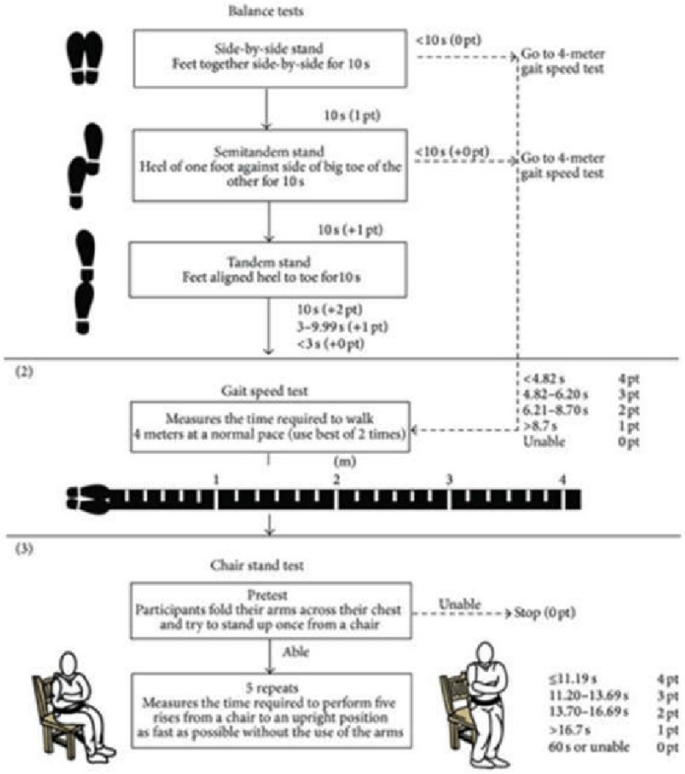
- Easy to derive from labs and EMR data variables

CONs:

- Doesn't measure physical function
- Measure of comorbidity burden rather than a unique phenotype of aging
- Integration in the EMR can be a challenge

https://vacs.med.yale.edu/calculator/IC

Short Physical Performance Battery (SPPB)



PROS:

- Well-validated
- Objective outcomes
- Only requires chair and 4-m space

CONs:

- Takes 5-10 min
- Ceiling effects

https://www.nia.nih.gov/research/labs/leps/short-physical-performance-battery-sppb

How we talk about frailty with PWH matters

"I suppose if I was in my 80s or 90s I would expect to be frail, and I'd probably say "Yeah, I am frail now and I accept that," but I'm only in my 60s, and my mind's saying no. Okay, I have issues but I don't think of myself as being frail."

age 63, living with HIV for 37 years

Clair-Sullivan et al, *HIV Med,* 2024.

How we talk about frailty with PWH matters

"I think it was a bit of a shock to be perfectly honest, at the beginning … now I understand it and the factors and you know, all the elements, it makes sense to me now … I understand it now, which I didn't … so that was difficult at first, but then as soon as I found out, I accept it now."

age 55, living with HIV for 19 years

Clair-Sullivan et al, *HIV Med,* 2024.

Priority outcomes among PWH with frailty

- Slowing progression of frailty
- Maintaining independence
- Holistic care

When discussing frailty, providers must:

- balance honesty and sensitivity
- Offer clear information about what it means and the impact for the individual

Clair-Sullivan et al, *HIV Med,* 2024.

Case continued

- FRAIL scale administered
  - Answered yes to fatigue, unable to walk up flight of stairs, and more than 5 illnesses
  - Score of 3, which meets criteria for frailty

- 4-meter gait speed took 5 seconds to complete
  - 0.73 m/s, which is reduced
  - Reduced gait speed

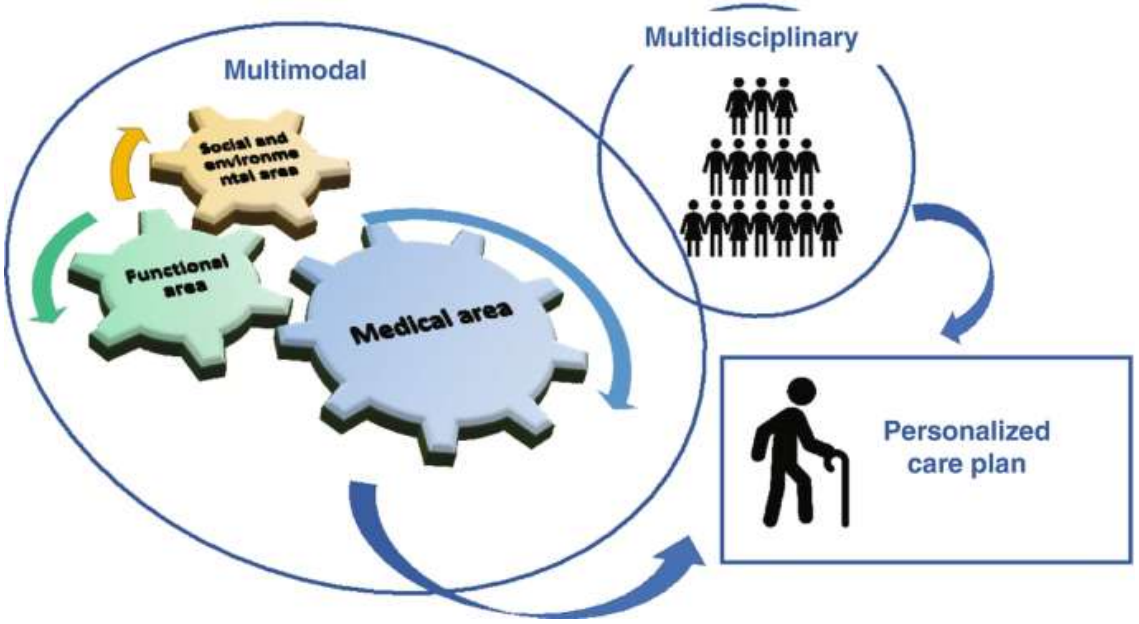
What are your next steps in management?

Approach to care by degree of frailty

Frailty status	Robust	Prefrail	Frail
Goal	Increase reserve		Preserve reserve, avoid stressors
Lifestyle	Exercise and physical activity		
	High-quality diet		
	Social engagement		
Disease management and preventive care	Apply disease-based guidelines		Disease vs treatment burden
	ART, vaccinations		
	Cancer screening		Individualize cancer screening
Interventions for frailty		Treat reversible causes	
		Nutrition counseling and supplementation	
		Multidisciplinary intervention, comprehensive geriatric assessment	
		Comprehensive medication review	
		Exercise and physical activity	Rehab (PT, OT)
Patient engagement & social support	Patient-centered goals		
	Social support		

Adapted from Kim and Rockwood, N Eng J Med, 2024.

Comprehensive geriatric assessment (CGA)



CGA is a multidisciplinary process to assess medical, functional, and psychosocial capabilities in order to coordinate a care plan to maximize overall health with aging for an older adult.

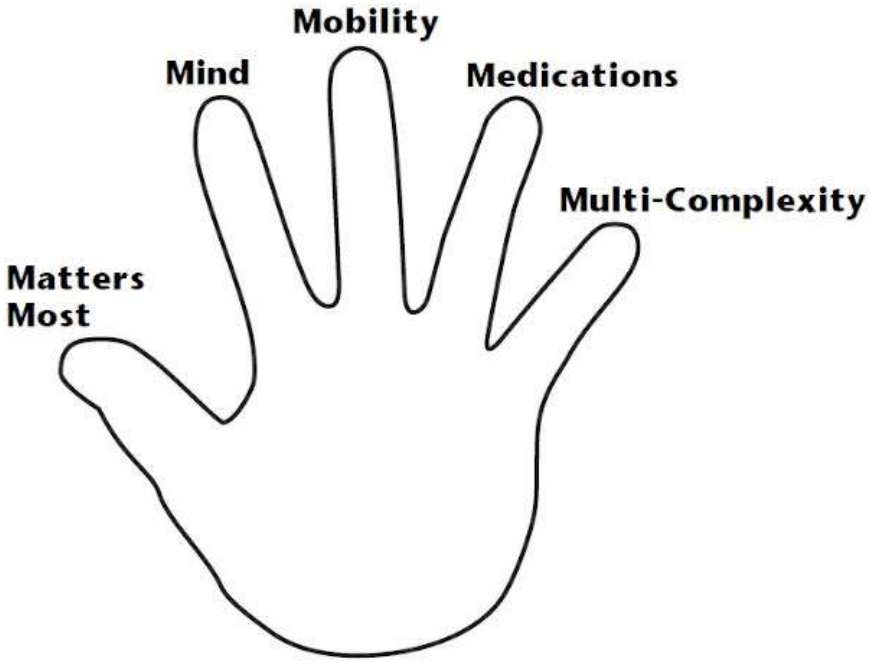
Vallet et al. 2022

Models of geriatric consultation for PWH

Model Type	Overall Description	Institution Name	Location
Model 1: Outpatient referral/ consultation	Referral to a geriatrician for recommendations to enhance a patient's care plan; HIV provider remains as primary provider	Positive Aging Consultation, University of Colorado	Aurora, Colorado
Model 2: Combined HIV/geriatric multidisciplinary clinic	A multidisciplinary team is incorporated into existing HIV/infectious disease clinics to provide a comprehensive assessment and evaluation of each patient; primary care providers are provided with full evaluation and recommendations from the multidisciplinary team	The THRIVE Program	Baltimore, Maryland
		Comprehensive HIV and Aging Initiative of the Chronic Viral Illness Service, McGill University Hospital Center	Montreal, Quebec, Canada
		Chelsea and Westminster Hospital [11]	London, United Kingdom
		Silver Clinic [12]	Brighton, United Kingdom
		Golden Compass Program, University of California; San Francisco/Zuckerberg San Francisco General Hospital [14, 16]	San Francisco, California
		Center for Special Studies, New York Presbyterian/Weill Cornell Medical Center [13, 15]	New York City, New York
Model 3: Dually trained providers	An HIV provider with an invested interest in geriatric care performs assessments and provides recommendations	Age Positively Program, Massachusetts General Hospital	Boston, Massachusetts
	Dually boarded provider: a single provider with both geriatric and HIV expertise in 1 clinical home	Penn Community Practice and Penn Geriatrics, University of Pennsylvania Medical Center	Philadelphia, Pennsylvania

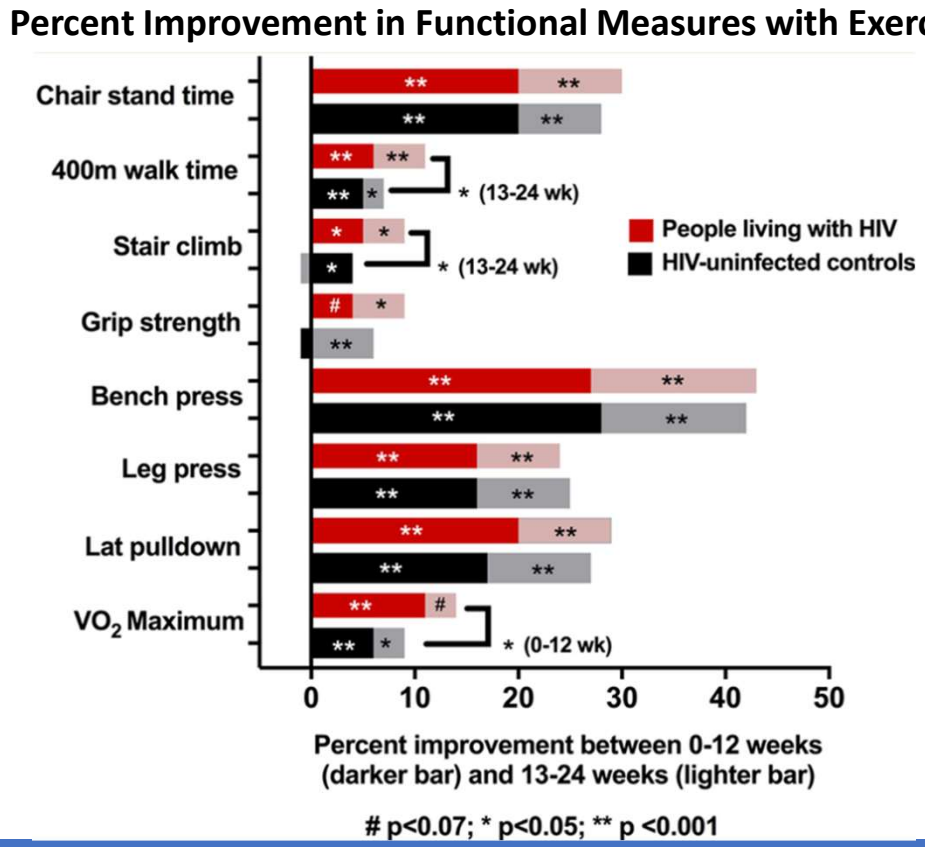
Davis et al. *Clinical Infectious Diseases,* 2021.

The 5Ms of geriatrics



M	Component
Mind	Cognition Mood
Mobility	Physical function Falls
Medications	Polypharmacy Drug-drug interactions
Multi-complexity	Consider comorbidities within complex social circumstances
Matters most	Individual's health goals and care preferences

Exercise improves physical function, particularly among PWH



- Improvement over 24 weeks in both PWH and controls
- PWH had greater improvements in many outcomes
- Pre-frailty decreased among PWH with exercise intervention

Erlandson et al. AIDS, 2018

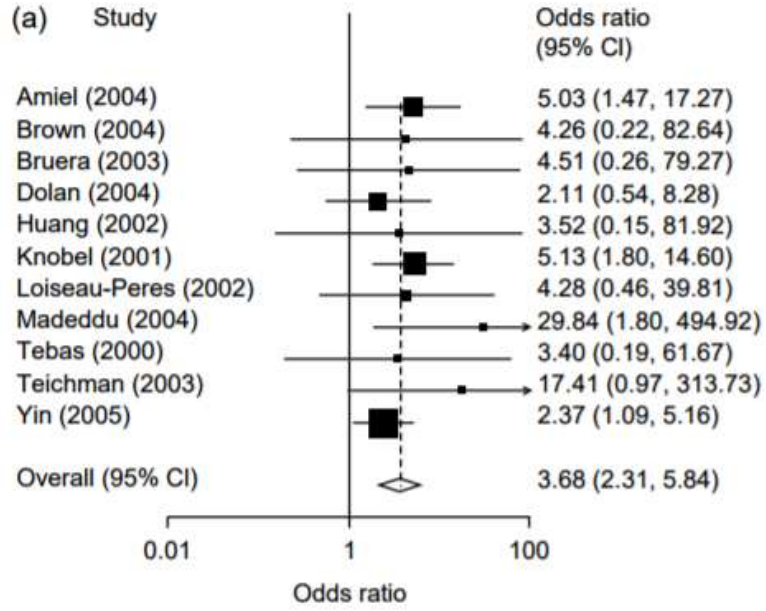
Case continued

- She is referred to geriatrics for CGA:

M	Intervention
Mind	Symptoms of depression reassessed and treated
Mobility	Referred to PT, ortho for knee injection
Medications	Clinical pharmacist reviewed medications, stopped diphenhydramine
Multi-complexity	-Evaluated by social worker, connected to local senior center -Met with nutritionist for diet education
Matters most	Completed POA and advance directives documentation

She reports 2 falls at home in the last 6 month. On chart review, you note that she has never had bone mineral density screening.

Higher prevalence of osteoporosis in PWH



2024 HIVMA/IDSA guidelines recommend bone density screening using DEXA for:

- Postmenopausal women (any age)
- Men ≥50 years

Brown and Qaqish. *AIDS* 2006

Risk factors for low bone mineral density in HIV

More common in PWH

- Poor nutrition
- Low weight
- Smoking
- Alcohol use (>3 drinks/d)
- Opioid use
- Reduce physical activity
- Low vitamin D level
- Glucocorticoid use
- Hypogonadism
- Chronic kidney disease
- Chronic liver disease
- Lipodystrophy

HIV-specific

- HIV effects on bone cells
- Untreated HIV infection
- Immune activation/inflammation
- Antiretroviral therapy
  - ART initiation
  - Tenofovir (TDF) use

Maintaining bone health in PWH

Optimize	Optimize calcium and vitamin D intake
Encourage	Encourage behavioral modification (smoking cessation, limit alcohol intake, increase physical activity)
Consider	Consider bisphosphonates if 10 yr risk of major fragility fracture ≥20%, 10 yr ≥3% hip fracture risk by FRAX, prior fragility fracture, or osteoporosis based on DEXA

Slide credit Anjali Sharma

Case continued

- Referred for home OT assessment for fall safety
- Continued with PT for gait training and balance
- DEXA consistent with osteopenia.
- Found to have vitamin D deficiency. Started on vitamin D supplementation.
- 6 month follow-up in clinic, she remains frail (FRAIL scale score 3) but independent at home. Her gait speed has improved to 0.8 m/s.

Key takeaways

- Despite improvements in lifespan, healthspan is reduced and aging appears accelerated in HIV
- Frailty and physical function testing gives us insight into how someone is really doing.
- Guidelines currently recommend frailty assessment among older PWH.
- Performing and addressing frailty assessments can be a challenge in routine HIV care. Physical function assessment may be more pragmatic in some situations.
- Prevention and treatment of frailty requires holistic, patient-centered care aimed at increasing physiologic reserve and mitigating stress. The geriatric 5Ms offer a framework for this type of care.
- Exercise is the most effective therapy for frailty and physical function impairments
- The most successful frailty interventions, like exercise, target multiple physiologic systems. Further studies are needed to evaluate the role of novel therapies, including pharmacologic interventions, in the prevention or treatment of frailty.