

**Frailty: Screening, Preventing, Intervening**

Melanie Thompson, MD  
Principal Investigator  
AIDS Research Consortium of Atlanta  
Atlanta, Georgia



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**Financial Relationships With Ineligible Companies (Formerly Described as Commercial Interests by the ACCME) Within the Last 2 Years:**

Dr Thompson's institution has received research grants from Gilead Sciences, Inc, Merck Sharp Dohme, and ViiV Healthcare. She has served on advisory and data safety monitoring boards for Excision Biotherapeutics. (Updated 03/22/22)

Slide 2

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OMG More Screening!  
I Do NOT Have Time for This!



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## What is Frailty?

State of depleted reserve & high vulnerability to stressors, resulting in...

→ increased adverse outcomes  
dependency, disability  
hospitalization  
death

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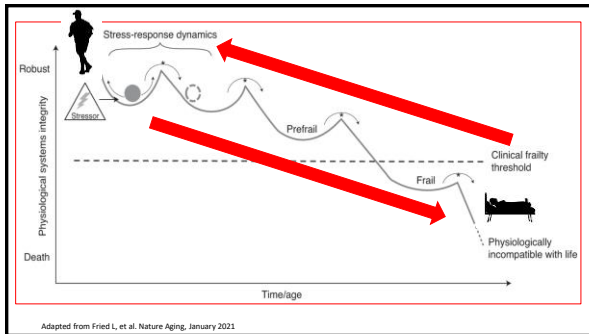
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Why Is “Frailty”  
the New Buzz Word in  
HIV Care?

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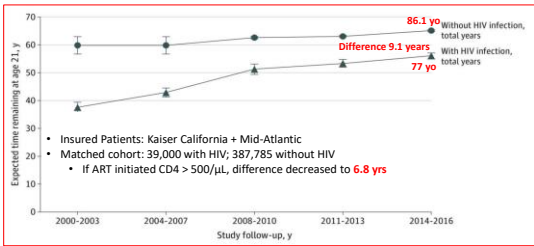
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### People with HIV are Living Longer... But NOT Without Comorbidities



Marcus et al. JAMA Network Open. 2020 Jun 13(6)

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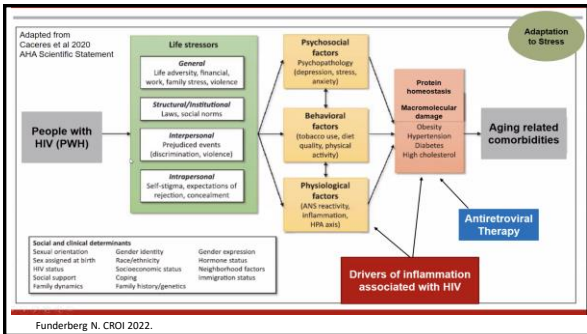
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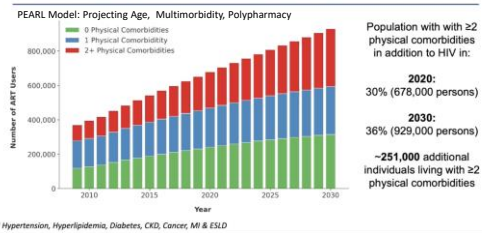
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### Projected burden of multimorbidity among people with HIV using ART in the US, 2009 – 2030



Kasale P et al. CROI 2021, Abstract 102.

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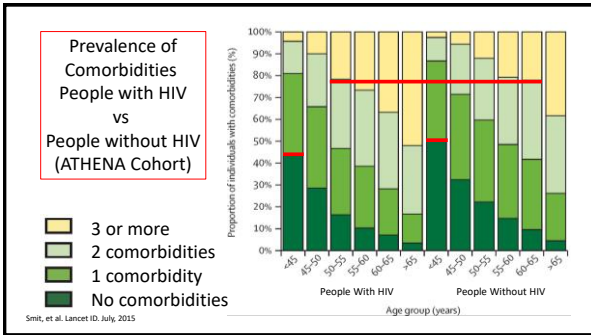
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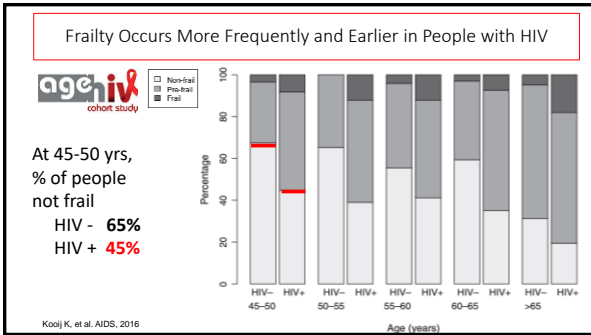
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### Frailty is Associated with Cardiovascular Risk by ACC/AHA 2013 Pooled Cohort Equation for Men & Women

- WIHS and MACS Cohorts
- Framingham Risk Score and ACC/AHA Pooled Cohort Equation for CVD risk
- Outcome: Fried's frailty phenotype

	Repeated measures logistic regression of cardiovascular risk scores with frailty			
	Women		Men	
	HIV- (3,526 visits)	HIV+ (8,889 visits)	HIV- (19,500 visits)	HIV+ (19,846 visits)
ATP-III FRS	OR	95% CI	OR	95% CI
Low risk (<10%)	Ref		Ref	
Moderate risk (10-20%)	NS		1.51, 1.32, 1.74	1.33, 1.18, 1.50
High risk (>20%)	NS		2.31, 1.74, 3.07	2.07, 1.65, 2.60
ACC/AHA PCE				
Low risk (<7.5%)	Ref		Ref	
High risk (>7.5%)	1.41, 1.11, 1.80	1.43, 1.20, 1.70	2.12, 1.78, 2.51	1.43, 1.25, 1.63

Adjusted for education, income, cholesterol medication use, HCV serostatus, and in HIV+ participants, CD4 count, ART therapy and suppressed HIV viral load

Source: Kunholm M. CROI 2021, Abstract 538

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*Clinical Infectious Diseases*  
**MAJOR ARTICLE**

**IDSA** **hivma**  
 Infectious Diseases Society of America | HIV Medicine Association

**Frailty Is an Independent Risk Factor for Mortality, Cardiovascular Disease, Bone Disease, and Diabetes Among Aging Adults With Human Immunodeficiency Virus**

Sean G. Kelly,<sup>1</sup> Kenling Wu,<sup>1</sup> Katherine Tassiopoulos,<sup>1</sup> Kristina M. Erlandson,<sup>1</sup> Susan L. Kalish,<sup>1</sup> and Frank J. Palella,<sup>1</sup> for the ACTG A5322 Study Team

Frailty at baseline: increased risk for

- CVD: IRR = **3.83** (1.59-9.23)
- Diabetes: IRR **2.29** (1.03-5.10)

Frailty change from BL to 48 wks: increased risk for

- Death: IRR = **3.78** (1.52-9.39)

Kelly S, et al. CID, 2019 (15 Oct)

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We've put more effort into helping folks reach old age than into helping them enjoy it.

— Frank Howard Clark

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Tools for Frailty Assessment

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Journal of Gerontology: MEDICAL SCIENCES  
2013, Vol. 68, No. 3, 303B-303E  
Copyright 2013 By The Gerontological Society of America

### Frailty in Older Adults: Evidence for a Phenotype

Linda P. Fried,<sup>1</sup> Catherine M. Tangen,<sup>2</sup> Jeremy Walston,<sup>1</sup> Anne B. Newman,<sup>3</sup> Calvin Hirsch,<sup>4</sup>  
John Gottdiner,<sup>2</sup> Teresa Seeman,<sup>5</sup> Russell Tracy,<sup>7</sup> Willem J. Kop,<sup>6</sup> Gregory Burke,<sup>2</sup>  
and Mary Ann McBurnie<sup>2</sup> for the Cardiovascular Health Study  
Collaborative Research Group

<b>Frailty indicator</b>		<b>Measure</b>
Weight loss		Unintentional weight loss of ≥ 5% per annum
Self-reported exhaustion		Physical Function score (3-4 days per week or most of the time)
Low energy expenditure		Energy expenditure (kcal/week) < 2700 (males) or < 2100 (females)
Slow gait speed		Walking speed (m/sec) stratified for sex and height
Weak grip strength		<b>Requires dynamometer</b>
Key: CES-D, Center for Epidemiologic Studies Depression Scale; SPPB, Short Physical Performance Battery		Body mass index.

\$436.89 (+ tax)

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### Short Physical Performance Battery (SPPB)




3 physical tasks:

- 5 chair stands (sit then stand)
- Timed 3 or 4-meter walk
- 3 balance tests

Score < 10 associated with higher risk of death

geriatrictoolkit.missouri.edu/SPPB-Score-Tool.pdf; Greene M. AIDS, 2014

Balance: timed for 10 sec

- Side-by-side 
- Semi-tandem 
- Tandem 

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Research article

### A standard procedure for creating a frailty index

Samuel D Searle<sup>1</sup>, Arnold Mitnitski<sup>1,2,3</sup>, Evelyne A Gahbauer<sup>1</sup>,  
Thomas M Gill<sup>4</sup> and Kenneth Rockwood<sup>1,2,5</sup>

- Frailty indices relate “deficit accumulation” to risk of death
- 40 variables (previously 70!)
  - Physical:
    - Self-report: walk outside < 3d/wk; wt loss > 10 lbs/yr
    - Presence of comorbid diseases, without regard to severity
    - BMI, walk time, grip strength, shoulder strength
  - Psychological: feel depressed, happy, lonely, etc.; MSSE
  - Social/Functional: help bathing, dressing, eating, etc.
- Scored between 0-1 = deficits/variables
  - < 0.08 = robust; ≥ 0.25 = frail

Searle SD, et al. BMC Geriatrics 2008

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### A "clinical judgement" tool for people ≥ 65 yo

**Living with very mild frailty = 4**

- Not dependent on others for daily help
- Often symptoms limit activities
- "Slowing down"
- Daytime tiredness

**Frailty = CFS ≥ 4**

Validated using the Canadian Study of Health and Aging Cohort

**CLINICAL FRAILTY SCALE**

**1 VERY FIT** People who are robust, active, energetic and resilient. They tend to exercise regularly and are among the fittest for their age.

**2 FIT** People who have no acute disease symptoms but are not in the category 1. Often, they exercise or are very active occasionally, e.g., occasionally.

**3 BOUNCING** People whose medical problems are well contained, even if occasionally symptomatic, but either do not regularly exercise beyond routine walking.

**4 VERY MILD FRAILITY** Previously "robust" in this category, but each occasion has complete independence. Will not depend on others for daily help, often symptoms limit activities. A common complaint is being "slowed up" or not being "fit" during the day.

**5 MILD FRAILITY** People who often have more evident slowing and need help with high order instrumental activities of daily living (bathing, transportation, housework). Typically, mild frailty progressively requires dressing and walking with a cane, most prescriptions, medications and begins to expect light housework.

**6** People who need help with all available activities but each having Reserve. Usually, they often have problems with tasks that require walking and might need medical assistance (using a walker) with driving.

**7 MODERATE FRAILITY** Completely dependent for personal care. Not ambulatory (unable to get in/out of bed, bathroom, etc.).

**8 SEVERE FRAILITY** Completely dependent for personal care and dependent care of life. Typically, they could not recover even from a minor illness.

**9 TERMINALLY ILL** Approaching the end of life. This category applies to people with a life expectancy of months. Who are not otherwise living with severe frailty. Many have health conditions that will become still very close to death?

**SCORING FRAILITY IN PEOPLE WITH DEMENTIA**

The degree of frailty generally comparable to the degree of dementia. Frailty scores range from 0 (robust) to 9 (terminally ill) in increments of one. The degree of frailty is not directly proportional to the degree of dementia. For example, a person with mild dementia and mild frailty may have more difficulties with attention and memory than a person with moderate dementia and moderate frailty. The score is based on the degree of frailty, not the degree of dementia.

DALHOUSIE UNIVERSITY  
www.geriatrystudies.dal.ca

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### Veterans Aging Cohort Study Index, 2.0

- Predicts 5 year mortality in ppl w HIV
- 13 variables
  - Age, sex, BMI
  - Hepatitis C (yes/no)
  - HIV RNA, CD4
  - WBC, hemoglobin, platelets
  - Estimated GFR
  - AST, ALT
  - Albumin

**Veterans Aging Cohort Study (VACS) 2.0 Index**

Estimated risk of 5-year all-cause mortality in patients with HIV is updated to the VACS 2.0 Index from the Veterans Aging Cohort Study (VACS) 2.0 Index.

When to Use: Why Use:

Age: 56 years  
Sex: Male  
BMI: 23 kg/m²  
CD4 count: 800 cells/mm³ (> 300 cells/mm³)

**30 points**  
→ 1.7% predicted 5-year mortality

<https://www.mdcalc.com/veterans-aging-cohort-study-vacs-2.0-index>  
McGinnis KA, et al. Discrimination And Calibration Of The Vacs Index 2.0 For Predicting Mortality Among People With HIV In North America. CIO, 2021 Oct 5; doi:10.1093/cio/ciab055, doi: 10.1093/cio/ciab055.

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### Gait Speed as a Single-Item Assessment Tool

- Time gait at usual pace over 4 meters
- Calculate gait speed in m/sec
- Predicts disability, cognitive impairment, institutionalization, falls, mortality
- Identifies older people at risk of adverse outcomes
- Can be used as a **single-item assessment tool**
- "a quick, safe, inexpensive and highly reliable instrument to be implemented."

van Kan A, et al. International Academy of Nutrition and Aging Task Force. Journal of Nutrition, Health & Aging, 2009.

**Extremely fit [14]** (> 1.3 m/s)

**Healthy older population** (Lower risk of health events and better survival [19, 26, 32]) (> 1.0 m/s)

**Cognitive decline within 5 years [30]** (< 1.05 m/s)

**Death and hospitalization within 1 year [24]** (< 1.0 m/s)

**Mobility and ADL disability at 2 years** (Monthly at 2 years and 3.9 rates [16]) (< 0.8 m/s)

**Death, hospitalization, institutionalization, and falls [43]** (< 0.7 m/s)

**Functional or cognitive decline, institutionalization, and mortality [24, 26]** (< 0.6 m/s)

**Functional dependence and severe walking disability [17, 51]** (< 0.47 m/s)

**Extremely frail [24]** (< 0.2 m/s)

**Institutionalization, identifies highly dependent older people [19]** (< 0.15 m/s)

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## Frailty: Prevention & Intervention




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## Principles of Frailty Prevention and Intervention

### Minimize aggregating factors

- Screen for, prevent, & manage **comorbidities**
  - Including mental health & substance use!
- Address **polypharmacy**
- Prevent **falls**
- Maintain access to **routine healthcare**
  - Address age-related deficits: vision, hearing, dentition
  - Routine cancer screening, vaccinations, STI screening

### Increase factors promoting health and resiliency

- Physical **activity**
- Social **interaction**

Fried L, et al. Nature Aging, January 2021

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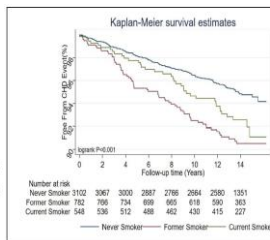
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**JAHA**

Journal of the American Heart Association

### Cigarette Smoking, Incident Coronary Heart Disease, and Coronary Artery Calcification in Black Adults: The Jackson Heart Study

Adesamike A. Oshunbade, Wordwosen Kassahun-Yimer, Karen A. Valle, Arsalan Hamid, Rodney K. Kipchumba, Daisuke Kamimura, Donald ClarkIII, Wendy B. White, Andrew P. DeFilippis, Michael J. Blaha, Emelia J. Benjamin, Emily C. O'Brien, Robert J. Mentz, Carlos J. Rodriguez, Ervin R. Fox, Javed Butler, Rachel J. Keith, Aruni Bhatnagar, Rose Marie Robertson, Adolfo Correa, and Michael E. Hall



**CONCLUSIONS:** In a large prospective cohort of Black adults, current smoking was associated with a >2-fold increased risk of CHD over a median follow-up of greater than a decade.

Oshunbade, et al, JAHA, March 23, 2021

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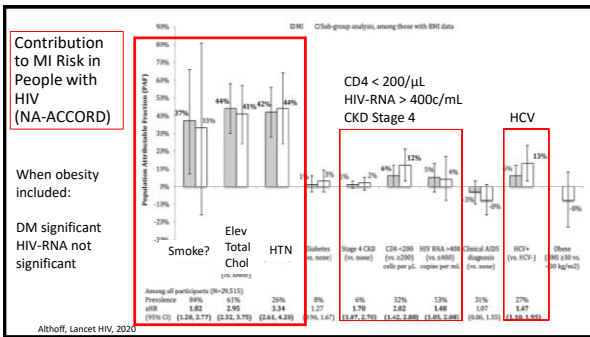
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**AHA SCIENTIFIC STATEMENT**

**Characteristics, Prevention, and Management of Cardiovascular Disease in People Living With HIV**  
A Scientific Statement From the American Heart Association

- Recognizes increased ASCVD risk in persons with HIV
  - 1.5-2x increase in MI, stroke, heart failure
  - Increased pulmonary HTN, blood clots, sudden death

**HIV-Related CVD Risk-Enhancing Factors?**  
Any of the following:

- History of prolonged HIV viremia and/or delay in ART initiation
  - Low current or nadir CD4 count (<350 cells/mm<sup>3</sup>)
  - HIV treatment failure or non-adherence
- Metabolic syndrome, lipodystrophy/lipoatrophy, fatty liver disease
  - Hepatitis C Virus Co-infection

If YES: Consider adjusting risk upward; may be 1.5-2x higher

Feinstein, Circulation, 2019

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**Systolic Blood Pressure and Mortality in Community-Dwelling Older Adults: Frailty as an Effect Modifier**

Kaj-Marko Kremer, Ulrike Bralsch, Dietrich Rothenbacher, Michael Denckinger, Dhayana Dallmeyer and for the ActiFE Study Group  
Originally published 25 Oct 2021 | <https://doi.org/10.1161/HYPERTENSIONAHA.121.17530> | Hypertension. 2021;79:24-32

“Our data based on an observational cohort suggest effect modification by frailty indicating a possible protective effect of elevated systolic blood pressure in frail older adults with respect to 8-year all-cause mortality”

\*adjusted for age, sex, education, smoking, diastolic blood pressure, sleep disturbance and antihypertensive medication.

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## Cardiovascular Disease: Screen and Intervene

- Screen for and manage modifiable risk factors
  - **SMOKING!** HTN, dyslipidemia, DM2 (diagnose using plasma glucose, not A1c)
- Screening tools
  - Increased BMI -> risk of increased BP, dyslipidemia, DM2, NAFLD
  - Waist circumference: associated with visceral fat; predicts DM2, MI, frailty, death\*

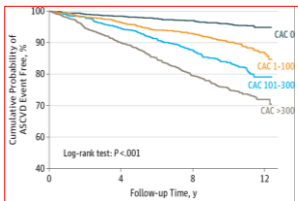
BMI Category kg/m <sup>2</sup>	Waist Circ (cm)	
	Women	Men
Normal (18.5-24.9)	≥ 80	≥ 90
Overweight (25.0-29.9)	≥ 90	≥ 100
Obese I (30.0-34.9)	≥ 105	≥ 110
Obese II-III (≥ 35.0)	≥ 115	≥ 125

- Coronary Artery Calcium (CAC) score by CT scan

\*Ross, et al. Waist circumference as a vital sign in clinical practice: a Consensus Statement from the IAS and ICCR Working Group on Visceral Obesity. *Nature Reviews Endocrinology*. March 2020.

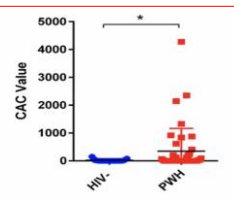


### Coronary Artery Calcium Categories Predict Time to ASCVD Event



JAMA Cardiol. 2017;7(9):886-894. doi:10.1001/jamacardio.2017.2498

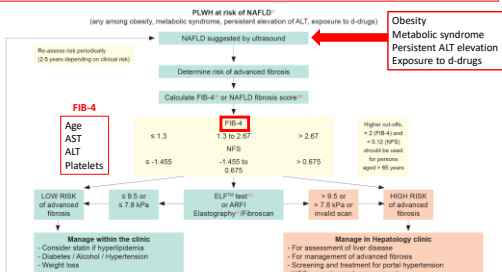
### People with HIV Have Higher CAC Scores Than Age-Matched People without HIV



Endocrine N. 2020



## Nonalcoholic Fatty Liver Disease (NAFLD): EACS Guidelines



## Common Comorbidities: Screen and Intervene

- Liver disease: hepatitis B or C, NAFLD
- Osteopenia, osteoporosis
  - Assess bone density in those at risk using DEXA; treat as appropriate
  - Address modifiable risk factors: smoking, alcohol consumption, sedentary lifestyle
  - Assess for secondary causes: thyroid and parathyroid disease, steroids, tenofovir DF, vitamin D deficiency, rheumatoid arthritis
- Depression: PHQ-2 or PHQ-9
- Substance use: alcohol, pain meds, non-prescription drugs
- Neurocognitive disorders: inadequate screening tools for mild disorders

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JAMA | US Preventive Services Task Force | RECOMMENDATION STATEMENT

## Screening for Cognitive Impairment in Older Adults US Preventive Services Task Force Recommendation Statement

- Mini Mental Status Exam = most evaluated instrument (30 studies)
- MMSE for detection of dementia: sensitivity 0.89 (95% CI, 0.85 to 0.92) specificity 0.90 (95% CI, 0.86 to 0.93)
- Across all instruments, sensitivity and specificity were higher to detect dementia compared with Mild Cognitive Impairment. No single tool excels to detect MCI.

### Recommendation Summary

Population	Recommendation	Grade
Older adults	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for cognitive impairment in older adults.	I

USPSTF. JAMA. 2020;323(8):757-763. doi:10.1001/jama.2020.0435

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JAMA Network | Open.



Original Investigation | Infectious Diseases

## Evaluation of Computerized Cognitive Training and Cognitive and Daily Function in Patients Living With HIV A Meta-analysis

### 12 RCTs with CCT Interventions

- BrainHQ.com
- GT Racing 2
- Luminosity
- Cogmed
- Captain's Log MindPower Builder
- InSight

Significant improvement in 6 of 8 domains: (Standardized Mean Difference)

- Abstraction and executive function (SMD 0.58; 95%CI, 0.26-0.91; P < .001)
- Attention and working memory (SMD, 0.62; 95%CI, 0.33-0.91; P < .001)
- Memory (SMD, 0.59; 95% CI, 0.20-0.97; P = .003)
- Motor skills (SMD, 0.50; 95%CI, 0.24-0.77; P < .001)
- Speed of information processing (SMD, 0.65; 95%CI, 0.37-0.94; P < .001)
- Daily function (SMD, 0.44; 95%CI, 0.02-0.86; P = .04)

No improvement: Sensory and perceptual skills & verbal and language skills

Wei et al. JAMA Network Open. 2022;5(3):e220970. doi:10.1001/jamanetworkopen.2022.0970

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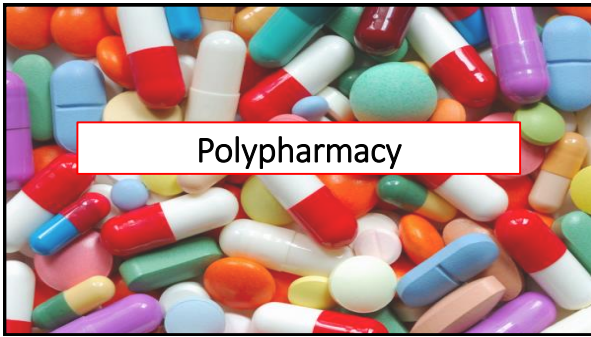
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### What is Polypharmacy and Why is it Bad?

- Polypharmacy = 5+ drugs; hyperpolypharmacy = 10+ drugs
- Polypharmacy is driven by multimorbidity
- In a mouse model, polypharmacy alone causes adverse effects in older - but not younger - mice
- Associated with polypharmacy:
  - Increased drug-associated adverse effects
  - Increased drug interactions
  - Potentially inappropriate meds
  - Prescribing "cascades"
  - Missed doses, missed refills
  - Increased cost

Category	Percentage of Participants
Polypharmacy (5+ medications)	~95
Polypharmacy (5+ with potential adverse effects)	~75
Drug-Drug Interactions	~65
Potentially Inappropriate Medication	~50
Medication With Long Half-life	~15

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### Management of Polypharmacy

- Go through the drug list EVERY visit (🕒)(esp after hospitalizations)
- **5s** for **new** drugs, **unnecessary** drugs, **wrong doses & duration**
- **5s** for drugs treating adverse effects of other drugs (**prescribing cascades**)
- **5s** for drugs with **overlapping toxicities**, drug-disease interactions
- **5s** for drugs with **intrinsic toxicity** (anticholinergics; sedatives)
- **5s** for **drug-drug interactions**, esp ART (DON'T GUESS – LOOK IT UP!)
- Remember **alcohol, marijuana, cocaine**, other non-prescription substances

**Simplify, simplify, simplify!**

**Fewer pills – right drugs – simple dosing – minimize costs**

Shah B et al. Clin Geriatr Med 2012; Edelman E et al. Drugs Aging 2013; O'Mahony D et al. Age and Ageing 2015; Am Geriatrics Society. J Am Geriatr Soc 2015

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*Journal of Clinical Pharmacy and Therapeutics*, Vol. 40, No. 2008 (7:45)

### STOPP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment). Consensus validation

P. Gallagher\*, C. Ryan\*, S. Byrne\*, J. Kennedy\* and D. O'Mahony\*

\*Department of Geriatric Medicine, Cork University Hospital, Wilton, Cork, †School of Pharmacy and ‡Department of Medicine, University College Cork, Cork, Ireland

**Original Investigation | Less is More** **JAMA Network**

June 13, 2011

## Potentially Inappropriate Medications Defined by STOPP Criteria and the Risk of Adverse Drug Events in Older Hospitalized Patients

<https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/227481>  
[http://files.hqdtbuilder.com/hostgator25222/files/aps\\_2019\\_beersPocket\\_printable\\_rh.pdf](http://files.hqdtbuilder.com/hostgator25222/files/aps_2019_beersPocket_printable_rh.pdf)

### POPPY: A POCKET GUIDE TO THE 2019 AGS BEERS CRITERIA\*

The guide has been developed in order to assist healthcare providers in improving medication safety for older people. The guide is based on the 2019 American Geriatrics Society (AGS) Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. The guide is available for free on the AGS website at <https://www.ags.edu/2019-beers-criteria/>.

Original conceived in 1989 by the late Mark Beers, MD, geriatrician, the Beers Criteria are a list of medications that are potentially inappropriate for older adults. The criteria are based on the AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. The criteria are based on the AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. The criteria are based on the AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults.

**INTRODUCTION**

The goal of this guide is to assist healthcare providers in identifying medications to avoid in older adults. The guide is based on the 2019 American Geriatrics Society (AGS) Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. The guide is available for free on the AGS website at <https://www.ags.edu/2019-beers-criteria/>.



### ANTICHOLINERGIC MEDICATIONS ASSOCIATED WITH FALLS AND FRAILTY IN PEOPLE WITH HIV (PWH)

Jessica Doctor  
 Department of Geriatric Medicine, University of California, San Francisco, CA

**Demographics of PWH ≥ 50**

Variable	N=699
Age, median (IQR), years	57 (53-63)
Male, n (%)	617 (88)
White, n (%)	628 (90)
Unemployed, n (%)	99 (14)
High education, n (%)	479 (69)
Rec. drugs last 6 months, n (%)	377 (54)

**Commonest ACM prescribed**

ACM	Frequency n (%)
Codeine	36 (12)
Citalopram	34 (12)
Loperamide	25 (9)
Amitriptyline	21 (7)
Diazepam	17 (6)
Cetirizine	16 (5)

9% (63/673) reported recurrent falls  
 32% (126/609) met frailty criteria

Doctor J, et al. CROI 2022



### POPPY: Anticholinergic Meds - Recurrent Falls and Frailty

**Recurrent Falls**

Number of ACMs	Adjustment	OR (95% CI)	p-value
0 (reference)	Unadjusted	1 (1-1)	
1	Unadjusted	2.1 (1.4-3.2)	0.04
	Demographic/lifestyle factors plus clinical factors [1]	1.7 (0.8-3.0)	0.18
2 or more	Unadjusted	8.8 (3.3-14.1)	<0.001
	Demographic/lifestyle factors plus clinical factors [2]	4.5 (2.1-10)	<0.001

**Frailty**

Number of ACMs	Adjustment	OR (95% CI)	p-value
0 (reference)	Unadjusted	1 (1-1)	
1	Unadjusted	1.9 (1.2-3.2)	0.011
	Demographic/lifestyle factors plus clinical factors [1]	1.6 (0.9-2.8)	0.09
2 or more	Unadjusted	3.3 (1.7-6.5)	<0.001
	Demographic/lifestyle factors plus clinical factors [2]	2.3 (1.1-4.7)	0.03

[1] age, work, marital status and recent recreational drug use  
 [2] additionally adjusted for number of non-ACM co-medications, number of comorbidities and PHQ-9 score

Doctor J, et al. CROI 2022






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## Fall Prevention: Balance Exercises

Spine Med (2017) 47:101-112  
DOI 10.1007/s00274-016-0209-4

CrossMark

SYSTEMATIC REVIEW

### Effectiveness of Exercise Interventions to Improve Postural Control in Older Adults: A Systematic Review and Meta-Analysis of Centre of Pressure Measurements

Daniel C. Low<sup>1</sup> · Gregory S. Walsh<sup>2</sup> · Marco Arkesteijn<sup>1</sup>

- Only **balance exercise** can improve total and AP sway with eyes open and closed in community-dwelling older adults.
- Postural control is altered by **specific, targeted exercise** interventions, but not by resistance or multi exercises.

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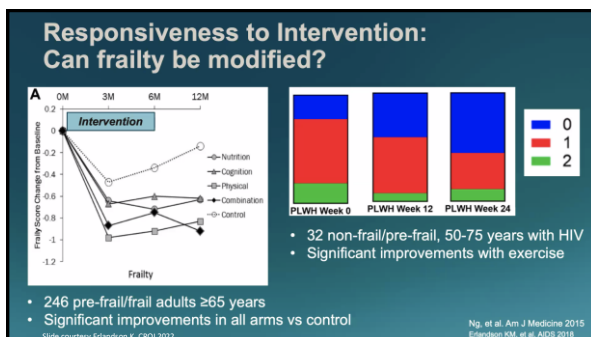
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### Does Social Isolation Predict Hospitalization and Mortality Among HIV+ and Uninfected Older Veterans?

S. Ryan Greyson, MD, MHS, MA,\* Leona I. Horowitz, MD, MHS,<sup>†</sup> Kenneth E. Covinsky, MD, MPH,<sup>‡</sup> Kiraha Gordon, MS,<sup>§</sup> Michael E. Ohl, MD, MSPH,<sup>||</sup> and Amy C. Justice, MD, PhD\*<sup>¶</sup>

**The Social Isolation Score (SIS)**

- Living alone
- Relationship status
- Visits from close family
- Visits from close friends
- Number of close family/friends
- Frequency of attendance to religious events
- Use of self-help or support group in last year
- Volunteer work or involvement in community organization

\*Older veterans are hospitalized and demonstrate the likelihood of isolation (SIS ≤ 4) for HIV+ vs. uninfected patients in each age bracket

Greyson et al., Journal of American Geriatrics Society, 2013

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### Will Technology Simplify Frailty Assessment?

JOURNAL OF MEDICAL INTERNET RESEARCH Kim et al.

**Original Paper**

Consumer-Grade Wearable Device for Predicting Frailty in Canadian Home Care Service Clients: Prospective Observational Proof-of-Concept Study

**Protocol**

A Technological-Based Platform for Risk Assessment, Detection, and Prevention of Falls Among Home-Dwelling Older Adults: Protocol for a Quasi-Experimental Study

JAMA Network **Open.**

Research Letter | Health Informatics

Universal Screening in Primary Care Practices by Self-administered Tablet vs Nursing Staff

David P. Miller Jr, MD, MS, Kristin L. Foley, PhD, MS, Richa Bandy, MPH, Ajay Dhanoo, MD, Elna Wright, MS, Mark Dignan, PhD, MPH, Ansa C. Snavely, PhD

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### Understanding Walking Steadiness

What it is and why you should pay attention to it.

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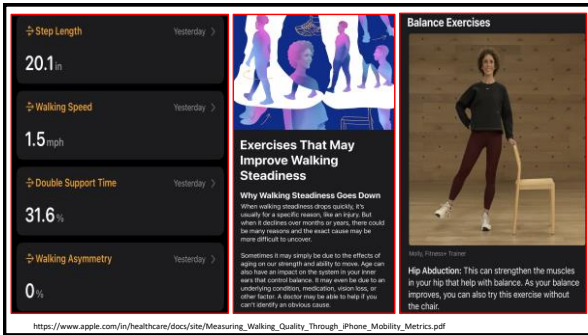
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Frailty is Dynamic! Interventions Can Prevent, and – Sometimes – Reverse Frailty

- Think about frailty – screen when indicated
- Comorbidities: screen & intervene
- Prevent polypharmacy & falls
- Preventative health care: vaccines, cancer screening, smoking cessation
- Encourage exercise: including for balance
- Encourage COVID-safe social interaction

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Acknowledgements

- People with and without HIV who contributed to the data presented today
- Colleagues who shared their research, slides, and insights for this talk
- My patients – some of whom have allowed me to follow them for 35 years - who have taught me about growing older with resilience and grace

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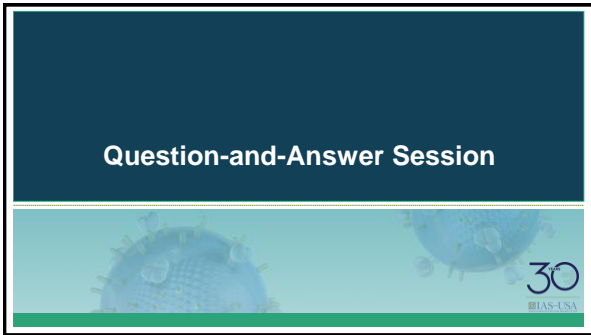
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