Geriatric Syndromes in HIV

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Talk outline

- Geriatric syndromes
- Frailty/frailty measures
- Falls
- Fragility fractures/osteoporosis

Geriatric Syndromes

"Multifactorial conditions that result from deficits in multiple domains including clinical, psychosocial and environmental vulnerabilities. They provide 'evidence' of aging and predict clinically important outcomes such as health utilization and mortality"

- Frailty
- Gait Instability/Falls
- Cognitive impairment/dementia
- Pressure injuries
- Delirium
- Urinary incontinence
- Polypharmacy (≥ 5 pills)
- Functional impairment

Inouye SK et al. JAGS. 2007. 55(5):780-791; Greene M et al. JAIDS. 2015: 69: 161-167

Functional Impairment

Inability to independently perform Basic and Instrumental Activities of Daily Living

Independent > needs assistance > fully dependent

ADL

- Ambulation
- Bathing
- Eating
- Dressing
- Grooming
- Toilet

IADL

- Finances
- Food Preparation
- Housekeeping
- Laundry
- Medication
- Shopping
- Telephone
- Transportation

Why do we care about function?

- In older adults ADL impairment predicts
  - Falls
  - Depression
  - Perioperative outcomes
  - Need for long term care/nursing home placement
  - Death
    - 27% two-year mortality rate if complete dependence on ADLs
    - > 40% two-year mortality rate if institutionalized

- A functional assessment in patients can uncover potentially fixable problem areas

Reuben DB et al. Functional status as predictor of mortality. Am J Med 1992.

Uncovering vulnerabilities in people aging with HIV

- The "Silver Project", San Francisco
  - Demonstration project (2012–2014) to enhance routine care of HIV infected adults 50 years and older
  - 2 outpatient clinical sites (UCSF)

- Objectives
  - To perform a "comprehensive assessment of the physical, cognitive, psychological, social and behavioral health"
  - To look for associations between age and other geriatric conditions

John M, Greene M, Hessol N et al. Geriatric Assessments and Association with VACS Index Among HIV-infected Older Adults in San Francisco. JAIDS. 2015: 72:534-541.

Uncovering vulnerabilities in people aging with HIV

- Participants (N=359)
  - Median age 57 (37.7% ≥ 60 years)
  - 85% male; 65.6% MSM; 57% white
  - 52% CD4 ≥ 500; 82% VL < 40
  - 85% HIV-infected ≥ 10 yrs

- 72% with college/some college or higher
  - 65.4% with annual income ≤ $20,000
  - 50% receiving disability

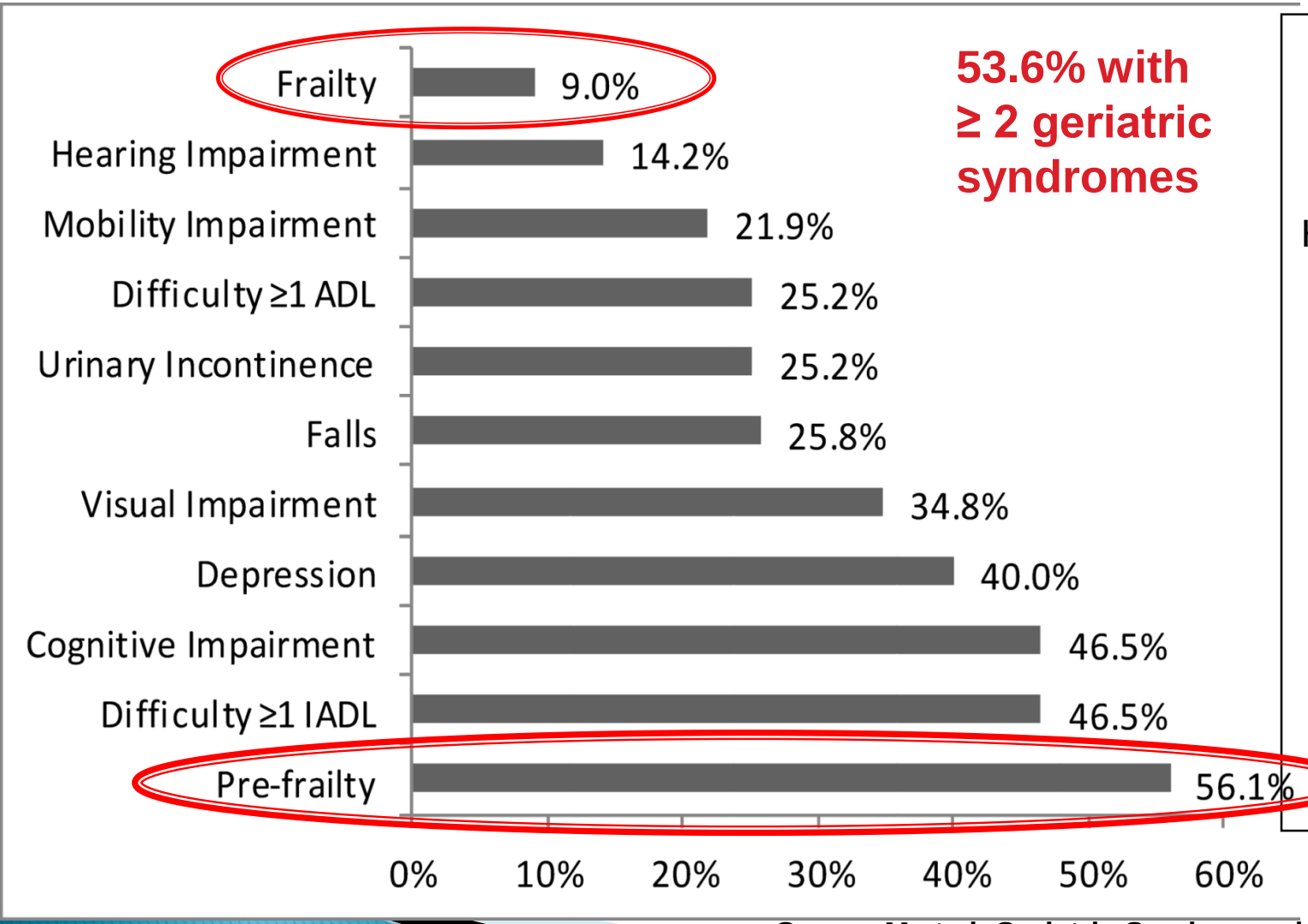
John M, Greene M, Hessol N et al. Geriatric Assessments and Association with VACS Index Among HIV-infected Older Adults in San Francisco. JAIDS. 2015: 72:534-541.

Vulnerabilities seen in people aging with HIV

- 41% had **fallen** in the past year
- 34% with **cognitive impairment** (MoCA <26)
- 34% moderate to severely **lonely**
- 27% moderate to severely **depressed**
- Taking a median of **11 meds** [range, 8–15]
- 12% dependent in ≥ **1 ADL**
- **Only 50% perceived having normal social supports**

MoCA = Montreal Cognitive Assessment. ADL = Activities of daily living. John M, Greene M, Hessol N et al. Geriatric Assessments and Association with VACS Index Among HIV-infected Older Adults in San Francisco. JAIDS. 2015: 72:534-541.

Geriatric Syndromes in an older HIV-infected San Francisco cohort



53.6% with ≥ 2 geriatric syndromes

N=155
Median:
Age 57
CD4 577
HIV < 400 (100%)
CD4 nadir 172
HIV infected
21 years

Age in quartiles

50-54	25.8%
55-59	39.4%
60-64	15.5%
65+	19.4%

Greene M et al. Geriatric Syndromes in Older HIV-Infected Adults. JAIDS. 2015: 69: 161-167.

Frailty/Frailty measures

"You know it when you see it"

Frailty

- Consensus definition:

"A medical syndrome with multiple causes and contributors that is characterized by diminished strength, endurance and reduced physiological function that increases an individual's vulnerability for developing increased dependency or death"

Morley J.E.; Vellas B; van Kan G.A. et al. Frailty Consensus: A Call to Action. JAMDA 14(2013)392-397.

Demonstration of the Frailty Phenotype (HIV negative)

- Using data from the Cardiovascular Health Study
  - prospective observational cohort study enrolling community dwelling adults ≥ 65 yrs (1989-1993)
  - Four states (CA, MD, NC, PA)
  - Excluded if h/o parkinson's, CVA, dementia, antidepressants
  - Baseline/annual evaluations; q 6 month phone calls with 7 years of follow up
  - Outcomes: incident disease; hospitalizations; falls; disability; mortality

Fried LP et al. Frailty in order adults: evidence for a phenotype. J Gerontol A Biol Sci Med Sci. 2001 Mar;56(3)M146-56.

Demonstration of the Frailty Phenotype (Definition)

Presence of 3 or more of the following components:

1. **Shrinking**
   - unintentional ≥ 10 lbs weight loss in past year
   - ≥ 5% weight loss at a one year f/u visit

2. **Weakness**
   - Lowest quartile of grip strength (stratified by gender and BMI)

3. **Slowness**
   - Walking 15 feet in ≥ 6 or 7 seconds (stratified by gender and height)

Fried LP et al. Frailty in order adults: evidence for a phenotype. J Gerontol A Biol Sci Med Sci. 2001 Mar;56(3)M146-56.

Demonstration of the Frailty Phenotype (Definition)

Presence of 3 or more of the following components

4. **Poor endurance and energy**
   - Self-reported exhaustion (CES-D scale)
   - "How often in the last week did you feel that….
     ..everything you did was an effort?"
     ..you could not get going?"

5. **Low physical activity**
   - Self report of activity/kilocalories expended per week (MN Leisure Time Activities Questionnaire)
   - Lowest quintile identified for each gender

…ell LP et al. Frailty in order adults: evidence for a phenotype. J Gerontol A Biol Sci Med Sci. 2001 Mar;56(3)M146-56. (CES-D) …enter for Epidemiological Studies-Depression Scales;

Demonstration of the Frailty Phenotype (Results)

- N=5317; 65 – 101 years; 58% F; 85% white
- Baseline frailty prevalence of 6%
  - 47% pre-frail (1 or 2 components)
  - 46% robust (0 components)
- Frailty incidence of 7.2%, seen more in
  - Increases in 5-year age groups
  - Women vs men (2-fold)
  - African Americans
  - People with lower cognition
  - People with depression
  - Those with higher rates of comorbidities
  - Those with higher rates of disability

Fried LP et al. Frailty in older adults: evidence for a phenotype. J Gerontol A Biol Sci Med Sci. 2001 Mar;56(3)M146-56.

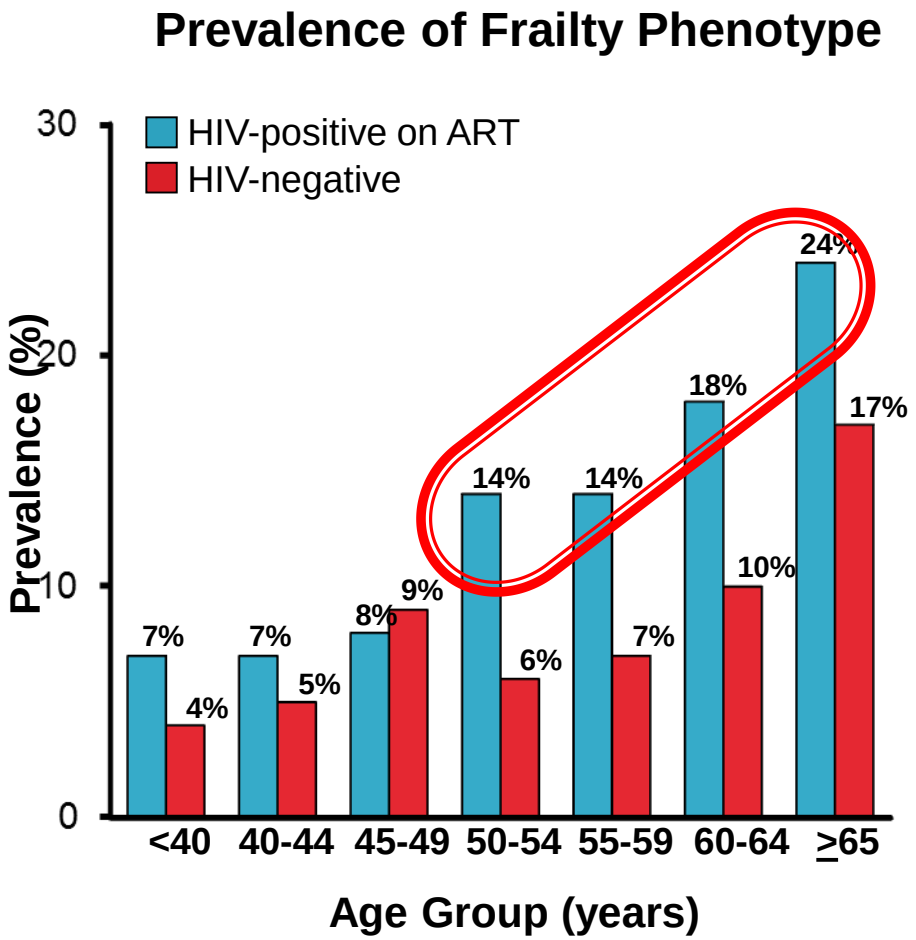
Demonstration of the Frailty Phenotype (Results)

- Frailty independently predicted
  - At 3 years:
    - Worsening mobility (HR 1.50; $p < .0001$)
    - Worsening ADL disability (HR 1.98; $p < .0001$)
    - Incident falls (HR 1.29; $p = 0.54$)
    - Incident hospitalizations (HR 1.29; $p = .004$)
    - Death (HR 2.24; $p = .0001$)
  - All findings (except falls) remained significant at 7 years (HR ranged 1.92–4.46)
- 2.63 odds of transitioning to "Frail" from "Pre-frail" (1 or 2 components) over 3 years

Fried LP et al. Frailty in order adults: evidence for a phenotype. J Gerontol A Biol Sci Med Sci. 2001 Mar;56(3)M146-56.

Frailty phenotype (Fried) in HIV-infected MSM during the HAART era (MACS)

- Prospective multicenter cohort of MSM (HIV+ and HIV–)
  - study visits 10/2007–09/2011
  - HIV + (n=1946); HIV – (n=1048)
- Men with frailty conversion (n=477)
  - 84% on HAART (median 10.7 yrs)
  - median CD4 512; 71% < 400
- Independent predictors of frailty
  - Age ≥ 65 aOR 3.47
  - Depressive symptoms aOR 2.94
  - Hx AIDS aOR 2.26
  - *Hx HIV without history of AIDS, NS*



Althoff KN, et al. *J Gerontol A Biol Sci Med Sci*. 2014;69:189-198.

Rockwood Frailty Index in Geriatrics (HIV negative)

Frailty Index = accumulated deficits/number of deficits (40) Frail ≥ 0.20

List of 40 Variables included in the frailty index	Cut Point
Help Bathing	Yes = 1, No = 0
Help Dressing	Yes = 1, No = 0
Help getting in/out of Chair	Yes = 1, No = 0
Help Walking around house	Yes = 1, No = 0
Help Eating	Yes = 1, No = 0
Help Grooming	Yes = 1, No = 0
Help Using Toilet	Yes = 1, No = 0
Help up/down Stairs	Yes = 1, No = 0
Help lifting 10 lbs	Yes = 1, No = 0
Help Shopping	Yes = 1, No = 0
Help with Housework	Yes = 1, No = 0
Help with meal Preparations	Yes = 1, No = 0
Help taking Medication	Yes = 1, No = 0
Help with Finances	Yes = 1, No = 0
Lost more than 10 lbs in last year	Yes = 1, No = 0
Self Rating of Health	Poor = 1, Fair = 0.75, Good = 0.5, V. Good = 0.25, Excellent = 0
How Health has changed in last year	Worse = 1, Better/Same = 0
Stayed in Bed at least half the day due to health (in last month)	Yes = 1, No = 0
Cut down on Usual Activity (in last month)	Yes = 1, No = 0
Walk outside	<3 days = 1, ≤ 3 days = 0
Feel Everything is an Effort	Most of time = 1, Some time = 0.5, Rarely = 0
Feel Depressed	Most of time = 1, Some time = 0.5, Rarely = 0

Frailty index ≥ 0.20 found to be independent predictor of mortality in 754 HIV negative Americans ≥ 70

Searle SD, Frailty; BMC Ger 2008; Mitnitski A.B. Accumulation of deficits. The Scientific World. 2001.

Guaraldi/Rockwood Frailty Index (PLWH)

Frailty Index = accumulated deficits/total deficits (37 non HIV-related)

Frail ≥ 0.25 ***Pre-frail 0.08-0.24*** ***Robust < 0.08***

37-item frailty index		
1	Lipoatrophy	Multicenter AIDS Cohort Study (MACS) criteria [39]
2	Lipohypertrophy	MACS criteria [40]
3	Nonalcoholic fatty liver disease	Liver/spleen ratio <1.1
4	Menopause or male hypogonadism	If female: FSH > 30 IU/l and LH < 30 IU/l and/or absence of menstruation >1 year If male: testosterone < 300 ng/dl
5	High or low BMI	<18 or >25 kg/m^2
6	High waist circumference	If female: >88 cm If male: >102 cm
7	High visceral adipose tissue	VAT > 130 cm^2 or VAT/TAT ratio >0.5
8	Sarcopenia or presarcopenia	Fat-free mass index <−1 SD
9	Insulin resistance	Homeostasis Model Assessment – Insulin Resistance [41] > 2.8
10	High total cholesterol	>200 mg/dl
11	High low-density lipoprotein	>100 mg/dl
12	Low high-density lipoprotein	<40 mg/dl
13	High triglycerides	>150 mg/dl
14	High homocysteine	If female: >10 μmol/l If male: >15 μmol/l
15	Abnormal white blood cell counts	<4000 cells/μl
16	Anemia	If female: <10 g/dl If male: <12 g/dl
17	Hepatitis C coinfection	Positive
18	Hepatitis B coinfection	Hepatitis B antigen positive

Frailty index increments of 0.1 found to be independent predictor of mortality (aHR 1.63) in 2720 HIV + Italians (mean age 46; 68% male; CD4 588)

Guaraldi G. AIDS. 2015

The Edmonton Frail Scale (HIV negative)

Validated to be used in clinical settings by providers who have no geriatric training

Frail ≥ 7 ***Pre-frail 5-6*** ***Robust 0-4***

The Edmonton Frail Scale: Score: ___/17

Frailty domain	Item	0 point	1 point	2 points
Cognition	Please imagine that this pre-drawn circle is a clock. I would like you to place the numbers in the correct positions then place the hands to indicate a time of 'ten after eleven'	No errors	Minor spacing errors	Other errors
General health status	In the past year, how many times have you been admitted to a hospital?	0	1–2	≥2
	In general, how would you describe your health?	'Excellent', 'Very good', 'Good'	'Fair'	'Poor'
Functional independence	With how many of the following activities do you require help? (meal preparation, shopping, transportation, telephone, housekeeping, laundry, managing money, taking medications)	0–1	2–4	5–8
Social support	When you need help, can you count on someone who is willing and able to meet your needs?	Always	Sometimes	Never
Medication use	Do you use five or more different prescription medications on a regular basis?	No	Yes	
	At times, do you forget to take your prescription medications?	No	Yes	

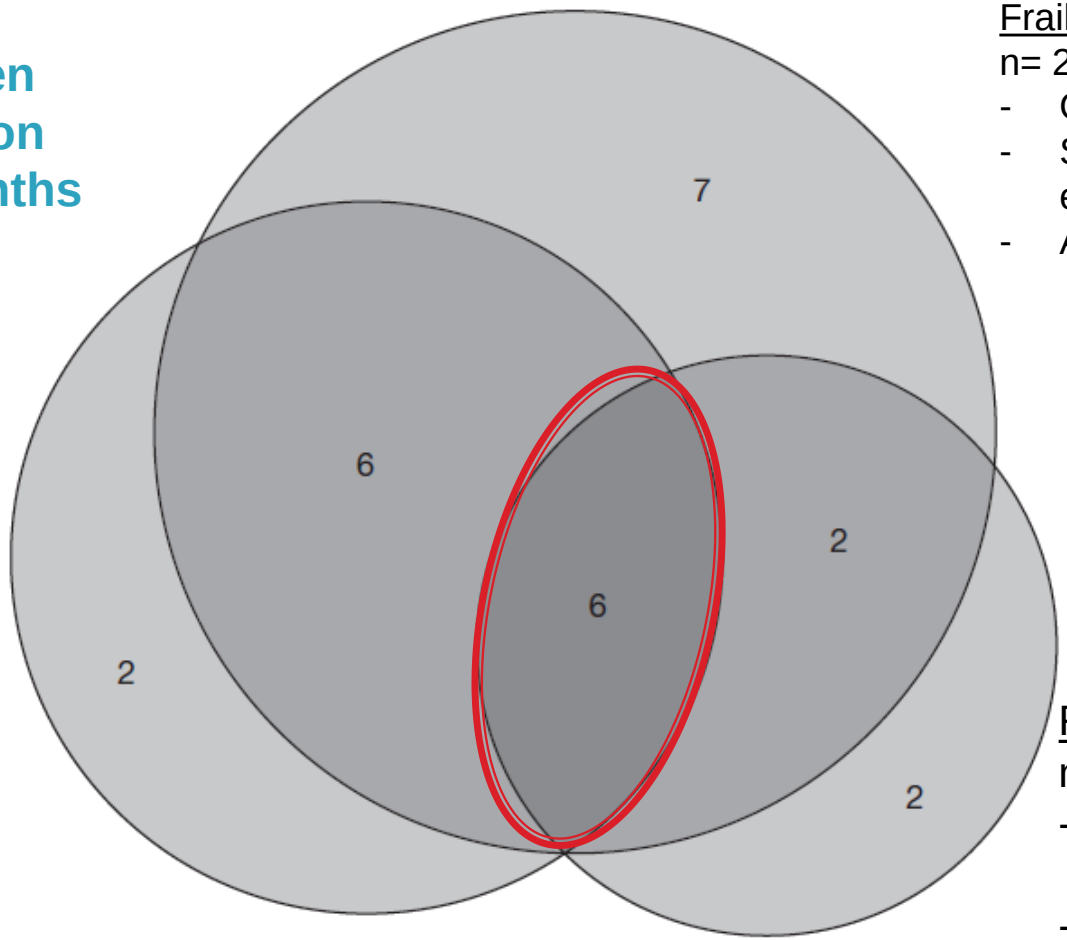
EFS validated against a comprehensive geriatric assessment and clinician impression of frailty in 158 Canadians ≥ 65 years (mean age 80.4; 47% male)

Rolfson D. Validation and reliability of the Edmonton Frail Scale. Age and Aging 2006

Comparing frailty instruments in PLWH

While significant associations differed according to the instrument used, frailty was associated with poorer quality of life on all three

Australian men 50+ with HIV on cART > 6 months (N=93)



Frailty index (Rockwood)
n= 21 (22.6%)
- Osteoporosis (OR 4.84)
- Serious non-AIDS events (OR 4.27)
- AIDS (4.62)

Edmonton Frail Scale
n=14 (15.1%)
- Osteoporosis (OR 7.51)
- Serious non-AIDS events (OR 7.71)
- AIDS (8.53)

Frailty phenotype (Fried)
n=10 (10.8%)
- pre-1996 ART initiation(OR 3.56)
- Depression (OR 3.74)

Yeoh HL. Antiviral Therapy 2017

Veterans Aging Cohort Study (VACS) Index

- Clinically feasible measure originally created for HIV positive veteran populations

- Demonstrated generalizable predictive accuracy
  - All cause mortality (Justice at al. 2013)
  - Cause-specific mortality (Tate et al., 2013)
  - Hospitalization (Akgun et al., 2013)
  - MICU admits (Akgun et al., 2013)
  - Fragility fractures (Womack et al., 2013)

- Associated with:
  - Cognitive performance (Franklin et al, 2013)
  - Functional performance (Erlandson et al., 2013)

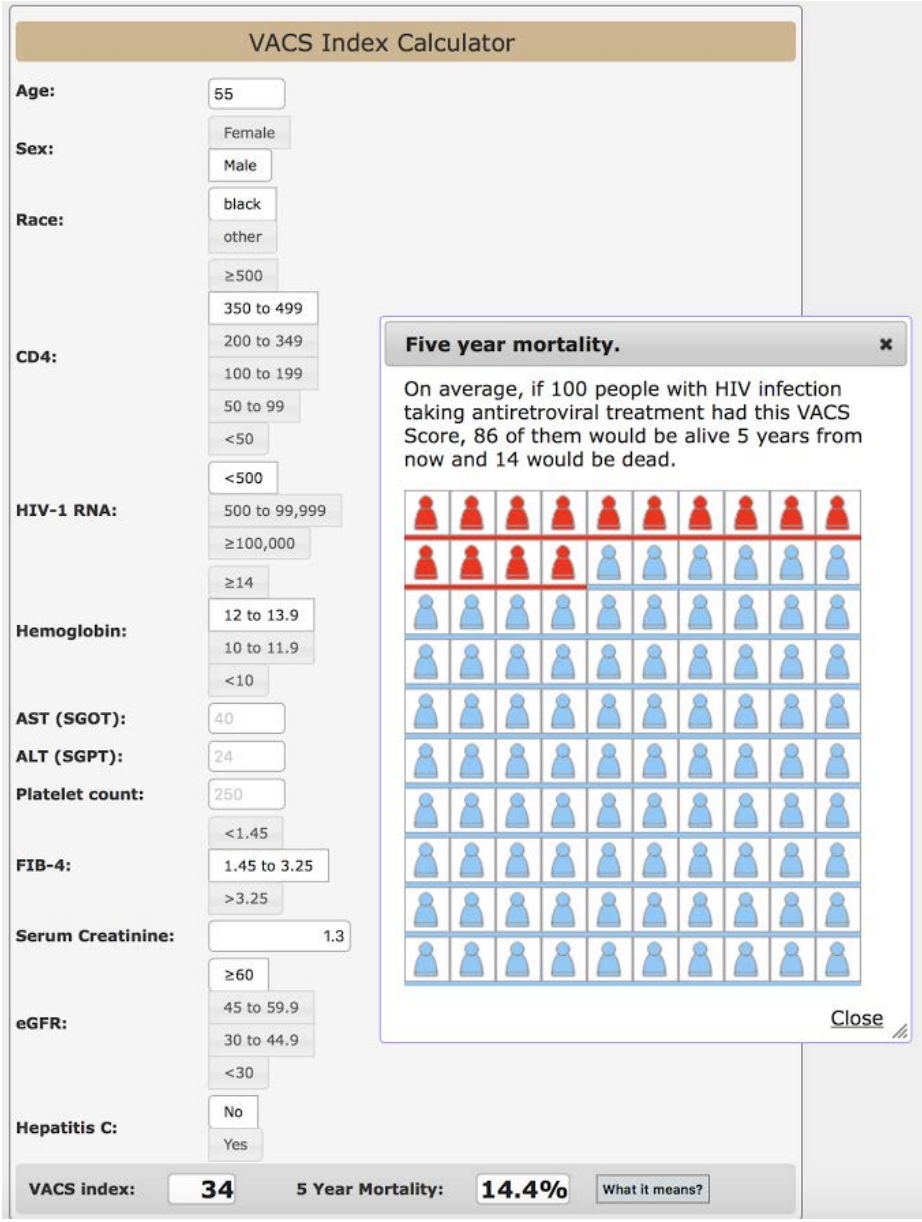
http://vacs.med.yale.edu/IC/; http://hiv-age.org/2014/05/17/assessing-frailty-functional-capacity/

VACS Index

Creates a score by summing pre-assigned points for

- Age
- HIV parameters
  - CD4/HIV VL
- Hemoglobin
- End organ damage
  - Kidney disease (eGFR)
  - Advanced liver fibrosis (FIB-4)
- HCV co-infection (ever)

FIB-4 = age [yr] x AST/platelet x ALT
eGFR = 186.3 x (Cr) $^{-1.154}$ x (age) $^{-0.203}$ x (0.742 for woman) x (1.21 if black)



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

Last comments on Frailty

- Fried's Phenotype; Frailty Index; VACS are the most commonly used frailty instruments in research
- There are a multitude of shorter frailty instruments for clinicians (FRAIL Scale; Edmonton; Gérontopôle Frailty Screening Tool)
- No matter what instrument used, the presence of frailty predicts poor outcomes in both HIV infected and uninfected
- Individual clinicians are left to decide which frailty instrument they want to incorporate in their daily practice, and how it will affect their patient's treatment plan

Falls, Fractures and Osteoporosis

Falls in HIV-infected Older Adults

- "A fall is an event which results in a person coming to rest inadvertently on the ground or floor or other lower level."
- Falls are the most common cause of functional decline and inability to care for oneself, thus leading to institutionalization (e.g. SNF/LTC care)
- For a small group of HIV+ women, the experience of falling signified " '*the beginning of the end*' and a source of social isolation, changing family roles, diminished sense of self, and stigma."

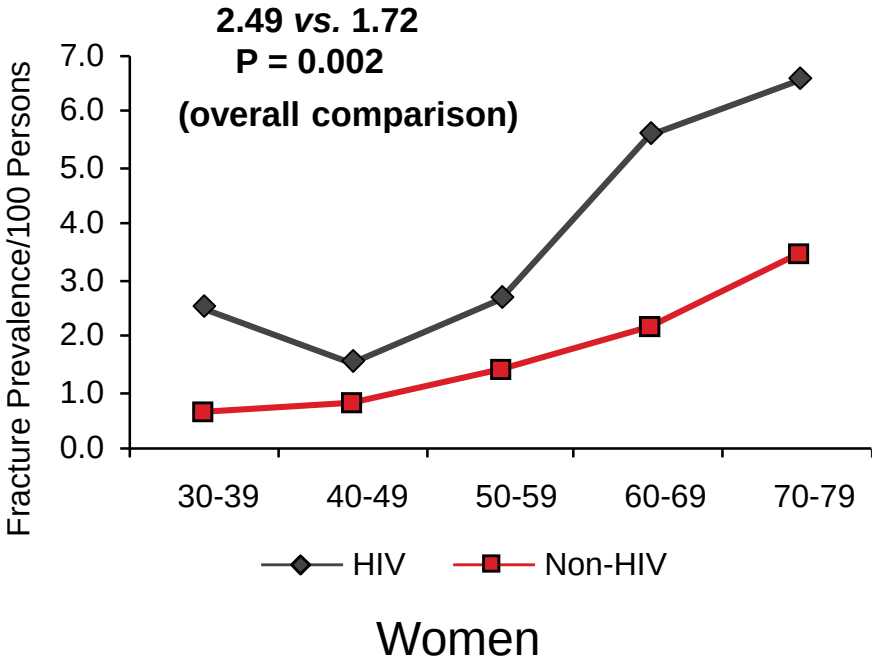
WHO definition of falls; Womack J et al. PLOS one 2018. Sharma A; Antivir Ther 2016.

Falls in HIV-infected Older Adults

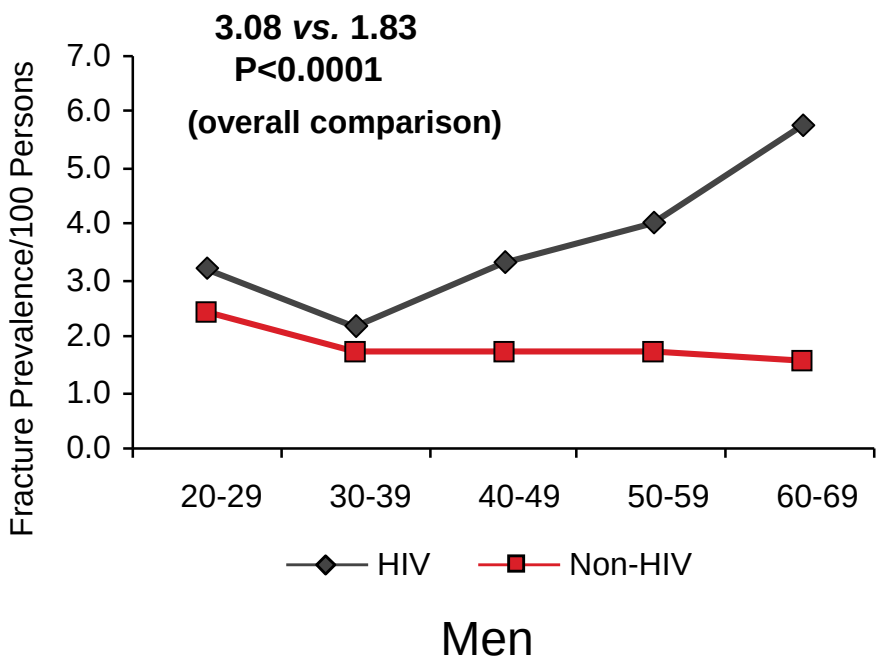
- HIV infected older adults are more likely to have conditions associated with falls then HIV uninfected (cognitive impairment, frailty, polypharmacy)
- Slow gait speed and poor physical performance in older HIV+ men suggests increase risk of falls and functional decline
- Predictors of falls in HIV+ women include depression (OR 2.63), peripheral neuropathy (OR 2.37), illicit drugs (OR 2.70), ≥ 3 CNS active agents (OR 3.74), frailty (OR 17.3, recurrent falls*)

Sharma A; Antivir Ther 2016; *Tassiopoulos, K. AIDS 2017.

Fracture Prevalence in People with and without HIV in MGH/Partners Healthcare System: 1996–2008



Women



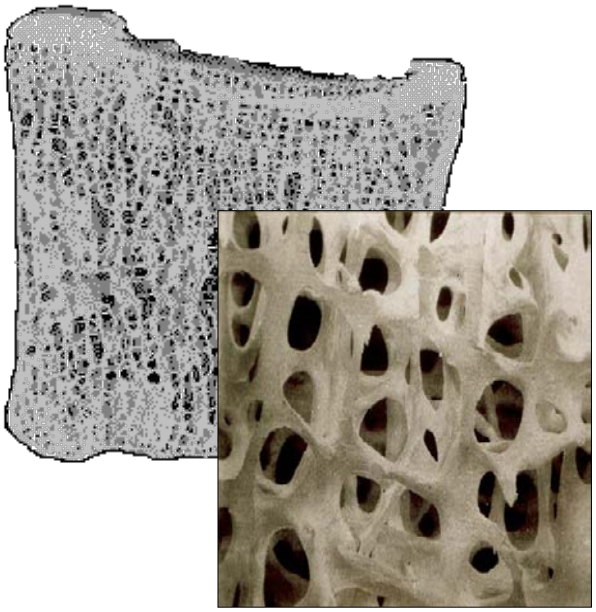
Men

8,525 HIV-infected
2,208,792 non HIV-infected patients

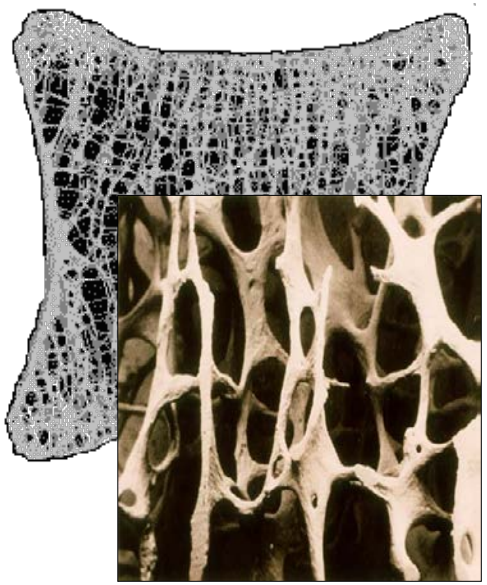
Triant, *JCEM*, 2008

Osteoporosis (definition)

"systemic skeletal disorder characterized by low bone mass and microarchitectural deterioration of bone tissue, with a consequent increase in bone fragility and fracture."



Normal vertebral body



Osteoporotic vertebral body

Osteoporosis diagnosis (WHO)

- DEXA (Dual-energy x-ray absorptiometry)
  - Normal: T-score > -1.0
  - Osteopenia: T-score = -1.0 to -2.5
  - Osteoporosis: T-score ≤ -2.5
  - Severe osteoporosis: T-score ≤ -2.5 & fragility fracture

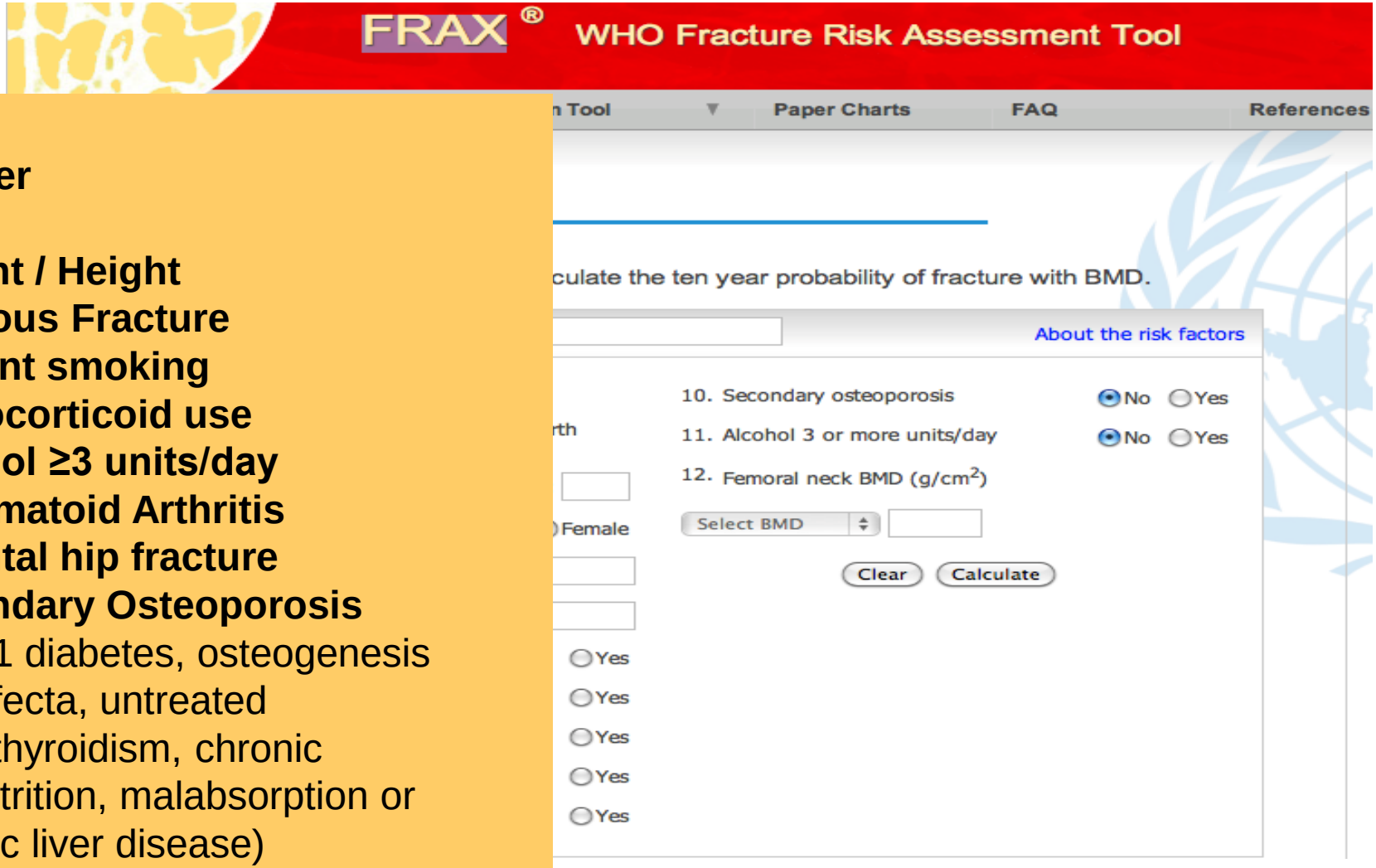
- Fragility fracture
  - a fracture caused by an injury that would be insufficient to fracture normal bone. *i.e. a fracture resulting from a fall from a standing height or less, or presenting in the absence of obvious trauma.*

- Elderly (HIV-) sustaining fragility hip fractures
  - 12 month mortality rates ranges from 12 to 37 % (> 90 % if not repaired)
  - **50% of patients are unable to regain their ability to live independently**

T score = patient's bone mineral density (BMD) c/w that of a young-adult female reference population;
https://www.who.int/chp/topics/Osteoporosis.pdf

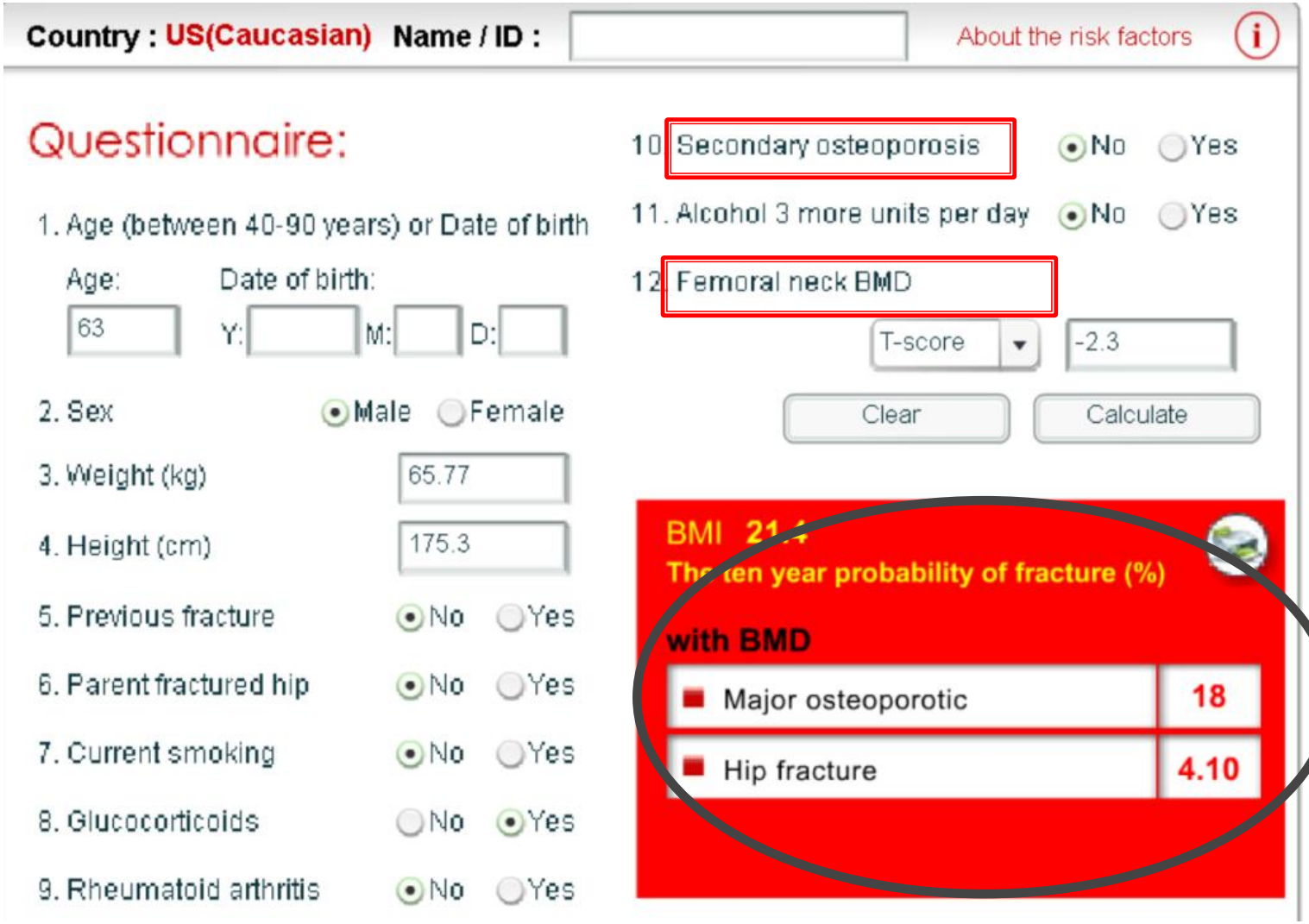
FRAX (WHO 2008)

Age
Gender
Race
Weight / Height
Previous Fracture
Current smoking
Glucocorticoid use
Alcohol ≥3 units/day
Rheumatoid Arthritis
Parental hip fracture
Secondary Osteoporosis (type 1 diabetes, osteogenesis imperfecta, untreated hyperthyroidism, chronic malnutrition, malabsorption or chronic liver disease)
Femoral Neck Bone Mineral Density (BMD) (optional)



https://www.sheffield.ac.uk/FRAX/tool.jsp

FRAX



Major osteoporotic fracture – fracture of the spine, forearm, proximal humerus or hip

BMD = bone mineral density; https://www.sheffield.ac.uk/FRAX/tool.jsp;
Yang J et al AIDS 2018, 32:1699-1706.

Osteoporosis Risk Factors in HIV

- **Patient risk factors**
  - All variables included in FRAX score
    PLUS
  - Opiate Use
  - Physical Inactivity
  - Hypogonadism/menopause
  - Low Vitamin D
  - Hepatitis C
  - Frailty

- **HIV-related risk factors**
  - Inflammation and viral proteins causing low BMD
    - ↑bone resorption
    - ↓ bone formation
  - ART toxicities
    - At ARV initiation (↓ BMD by 2-6% over 96 weeks)
    - TDF > boosted PI > Integrase inhibitors

Erlandson et al 2018. JAIDS. Brown et al CROI 2017, poster 683. Brown T. CID 2015;60(8)1242-51. McComsey GA. CID 2010; 51:937-46. Biver et al. Osteoporosis Int 2019.

What to Do to Prevent Bone Loss with ART Initiation?

- Calcium and vitamin D supplementation
- Avoid TDF (instead ABC, TAF, Nuke-sparing) [1]
  - 2-3% increase in BMD over 2-3-yrs PLWH who switch from TDF to tenofovir alafenamide (TAF)
- Avoid PIs (instead, INSTI, RPV, EFV)[2]
- Start ART at a higher CD4 cell count
- ? Pre-ART Bisphosphonate (ZOL 57% reduction bone loss at week 48 in ATV/r/TDF/FTC)[3]

[1]McComsey G. AIDS 2018,32:477-485; [2] Brown T. JID 2015;212:1241-9; [3] Ofotokun I. CID 2016:63(5):663-71.

Who to Screen?
Guidelines for Osteoporosis Screening with DEXA

HIV UNINFECTED *National Osteoporosis Foundation (NOF) Guidelines (2014)*	
DEXA indicated	✓ Women ≥ 65 years ✓ Men ≥ 70 years ✓ History of fragility fracture > 50
DEXA indicated with following risk factors *(partial list)*	Post-menopausal women OR men 50-69 with history of rheumatoid arthritis hypo-gonadal Low BMI (< 19) Alcohol High risk medications (AED) Current/prior excessive glucocorticoid use (≥ 5 mg x 3 months)

HIV INFECTED *IDSA/HIV Medicine Association (2015)*	
DEXA indicated	✓ All post-menopausal women (PM) ✓ Men > 50
DEXA indicated with following risk factors *(partial list)*	History of fragility fracture Current/prior excessive glucocorticoid use (≥ 5 mg x 3 months) High risk of falls at any age Age 40-50 years with FRAX score > 10% for any osteoporotic fracture ("secondary cause" checked)

Cosman F et al, Osteoporosis Int 2014. Brown TT et al. Recommendations for Evaluation and Management of Bone Disease in HIV Clin Infect Dis. 2015;60(8):1242-1251

Who to Treat?
National Osteoporosis Foundation Guidelines (2014) *

- ✓ Those with hip or vertebral fragility fractures
- ✓ Those with osteoporosis by DEXA (T-score ≤ -2.5 at femoral neck, hip, or spine)
- ✓ Those with osteopenia by DEXA (T-score = -1 and -2.5 at hip or vertebrae)

AND

a FRAX score of ≥ 3% for hip OR ≥ 20% for "all major osteoporosis-related fractures"

Cosman F et al, Osteoporosis Int 2014.
*applies to post-menopausal women and men ≥ 50 years

Osteoporosis treatment with Bisphosphonates

- Bisphosphonates encompass the majority of prescriptions for osteoporosis
  - Alendronate 70 mg once/weekly
  - Zolendronic acid (ZOL) 5mg IV once/yearly
- Bisphosphonates reduce incidence of vertebral & non-vertebral fractures by 25-50% in HIV neg (ZOL 70% reduction vertebral fxs)
- Avoid if CrCl <35 and/or clinically significant esophageal disease (risk of pill esophagitis with alendronate)
- Severe adverse effects
  - atypical (sub trochanteric) femur fractures (1/100K to 5/10K)
  - osteonecrosis of jaw: exposed bone in the maxillofacial region that does not heal within 8 weeks (< 1/10K)

Osteoporosis treatment w/ Bisphosphonates in HIV

- 1st-line treatment to prevent BMD loss in HIV+
  - Increases in lumbar spine BMD by 8%
  - Increases in total hip BMD by ~4%
- There is no data on fracture outcomes for PLWH on bisphosphonates
- No significant drug interactions w/ ART

6 RCT in HIV+ subjects in combination with calcium/vit D

Author, year (N)	T-score	Medication (duration)	Spine	Hip
Guaraldi, 2004 (N=41)	< -1.0	Alendronate 70 mg/wk (1 yr)	NS	NS
Mondy, 2005 (N=31)	< -1.0	Alendronate 70 mg/wk (1 yr)	+5.2% vs +1.3%*	NS
McComsey, 2007 (N=82)	< -1.5	Alendronate 70 mg/wk (1 yr)	+3.1% vs +1.1%*	+4.0% vs +1.4%†
Rozenberg, 2012 (N=44)	< -2.5	Alendronate 70 mg/wk (2 yrs)	+7.4% vs +4.1%	NS
Bolland, 2007 (N=43)	< -0.5	Zoledronic acid 4 mg/year (2 yrs)	+8.9% vs +2.6%†	+3.8% vs -0.8%†
Huang, 2009 (N=30)	< -1.5	Zoledronic acid 5 mg/year (1 yr)	+3.7% vs +0.7%*	+3.2% vs -1.8%*

*P < 0.05; †P < 0.001; NS = not significant

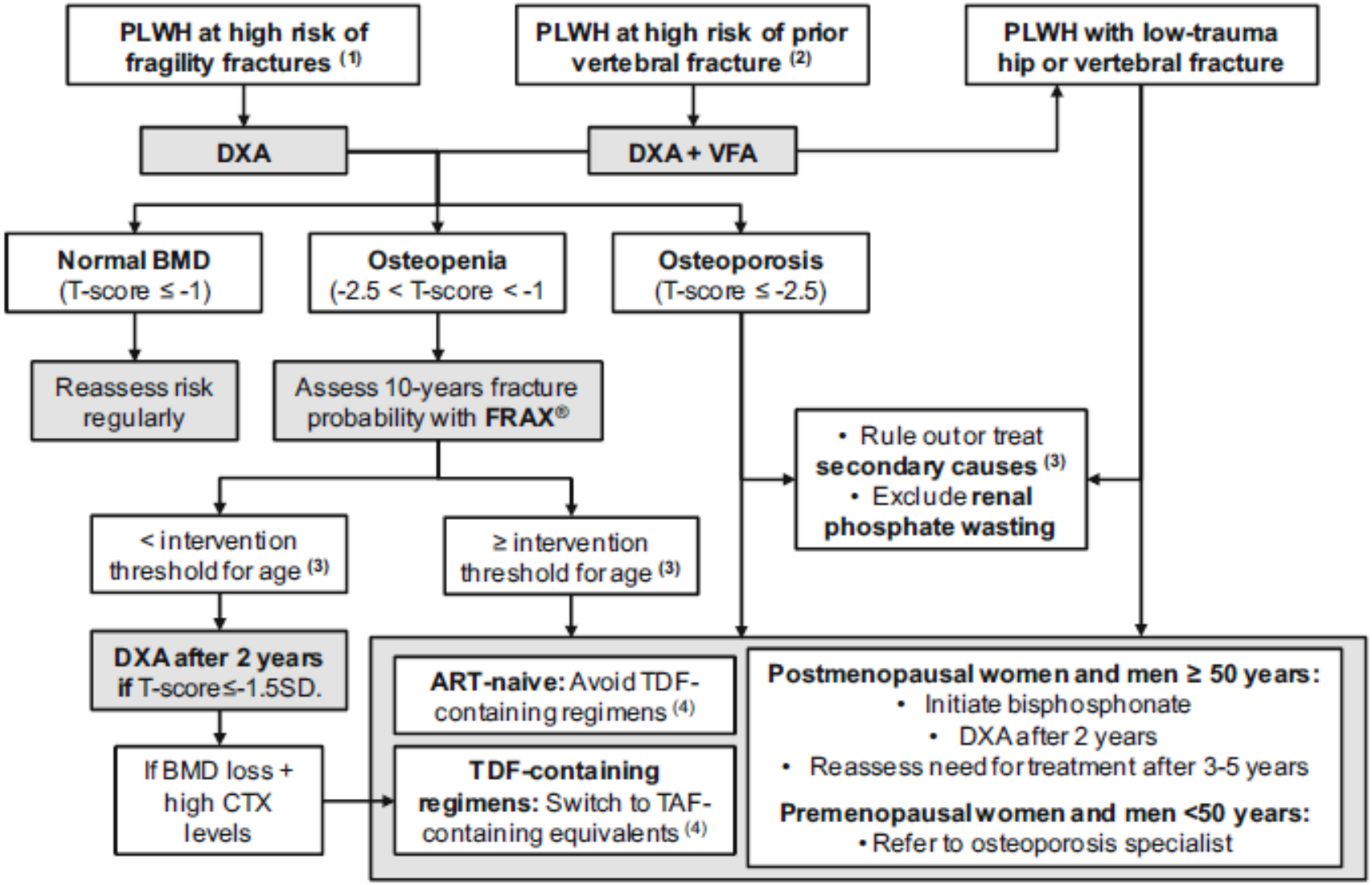
Guaraldi G, et al. *HIV Clin Trials*. 2004;5(5):269-77; Mondy K, et al. *J Acquir Immune Defic Syndr*. 2005;38(4):426-31; McComsey GA, et al. *AIDS*. 2007;21(18):2473-82; Rozenberg S, et al. *AIDS Res Hum Retroviruses.* 2012;28(9):972-80; Bolland MJ, et al. *J Clin Endocrinol Metab.* 2007;92(4):1283-8; Huang J, et al. *AIDS.* 2009;23(1):51-7.
Slide courtesy of Dr Todd Brown.

Osteoporosis treatment with Zolendronic Acid in HIV

- Zolendronic acid more effective for increasing BMD in small group of male patients randomized to ZOL versus TDF → TAF switch
  - 7.4% increase in spine BMD versus 2.9% TDF → TAF
  - 4.6% increase in hip BMD versus 2.6% TDF → TAF
- Zolendronic acid PLUS TDF → TAF switch (144 weeks)
  - 5% vs 2.6% in spine BMD (< 0.05)
  - 4% vs 2.3% in hip BMD (NS)
- More data is needed to know how best to utilize bisphosphonates in PLWH

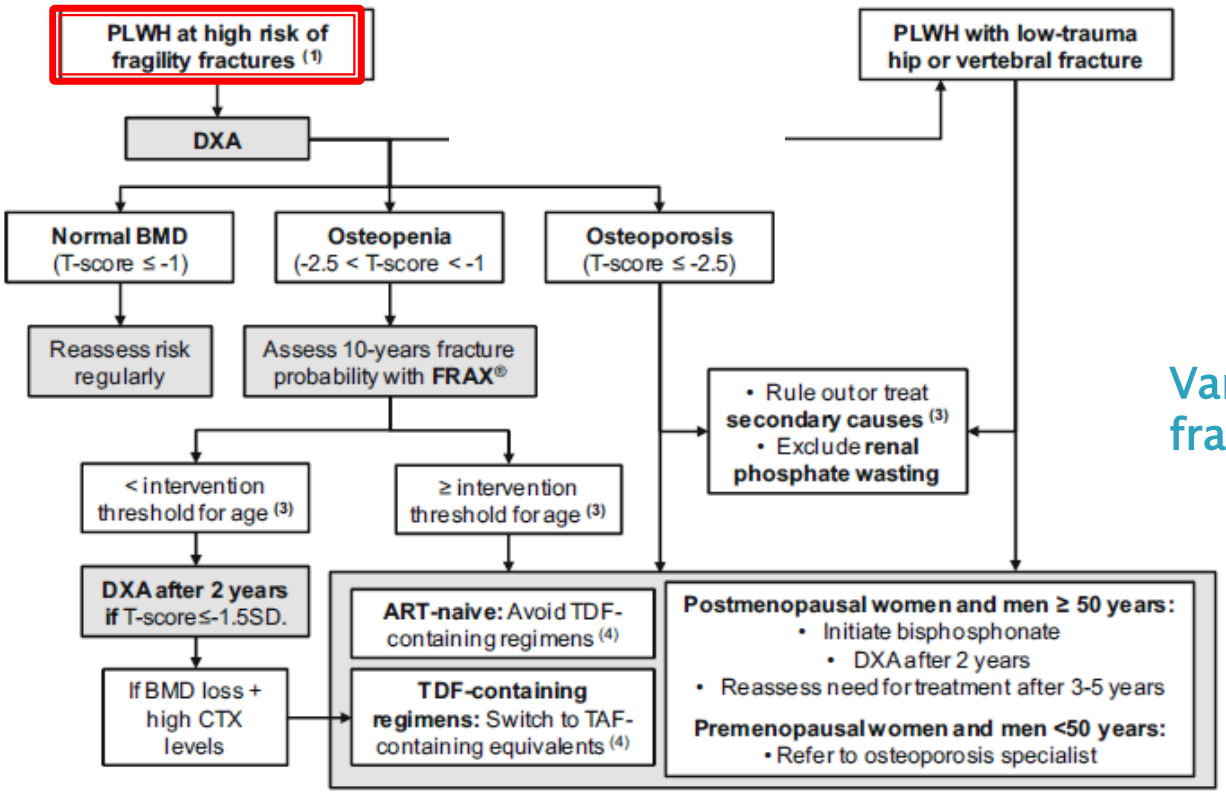
Brown T et al. Combined effects of Bisphosphonates and TDF → TAF switch in HIV+ Adults with low BMD. CROI 2018. Hoy J et al. ZOL is superior to TDF for low BMD in adults with HIV. AIDS 2018, 32:1967-1975

Bone health algorithm for PLWH (Swiss Association against Osteoporosis, 2019)



Biver E et al. Osteoporos Int. 2019 Jan 2. doi: 10.1007/s00198-018-4794-0

Bone health algorithm for PLWH (Switzerland, 2019)

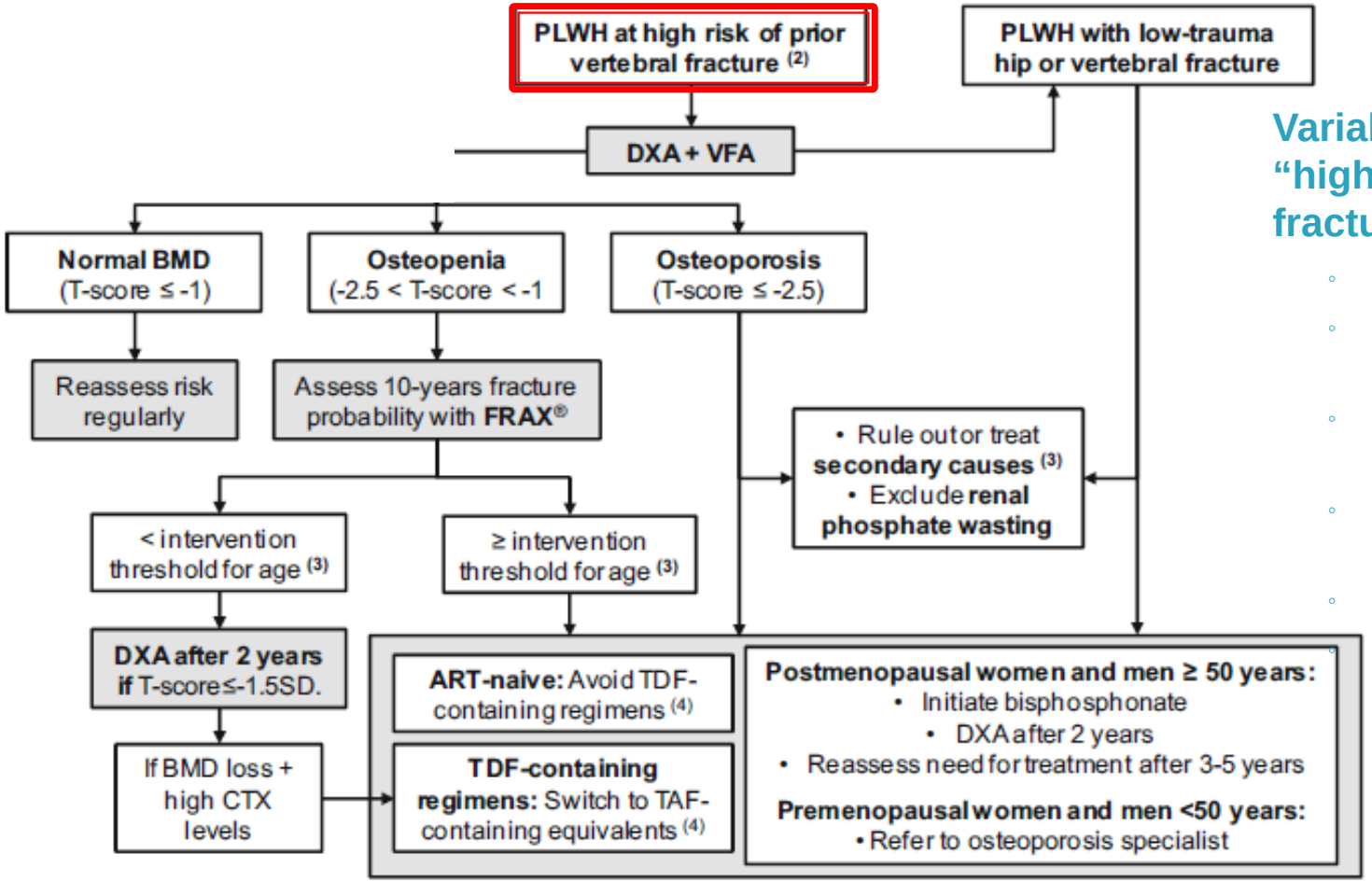


Variables confiding a "high risk for fragility fractures"

- Post-menopausal women
- Men ≥ 50 years
- History of clinical low trauma fracture(s)
- Evidence of vertebral fracture on previous thoracic and abdominal imaging
- Oral glucocorticoids ≥ 2.5 mg/d > 3 months
- Hypogonadism
- Malabsorption
- Inflammatory bowel diseases
- Primary hyperparathyroidism

Biver E et al. Osteoporos Int. 2019 Jan 2. doi: 10.1007/s00198-018-4794-0

Bone health algorithm for PLWH (Switzerland, 2019)



Variables confiding a "high risk for vertebral fracture"

- Age ≥ 70 years
- Significant height loss (>4 cm) or kyphosis
- Prior non-vertebral low-trauma fracture
- Oral glucocorticoids ≥ 2.5 mg/d > 3 months
- Hypogonadism
- Chronic inflammatory disease

Biver E et al. Osteoporos Int. 2019 Jan 2. doi: 10.1007/s00198-018-4794-0

Conclusions

- As people with HIV are living longer screening for geriatric syndromes such as frailty, gait instability/falls and osteoporosis will become critical in the care of our patients

- Screening for geriatric syndromes will ideally provide opportunities to decrease risks of functional decline, thus preventing ADL dependence/need for long term care

- I look forward to fruitful collaborative efforts between Geriatric and HIV providers on how to allow all of our patients to age gracefully and independently

Resources for HIV providers on Aging

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Grand Opening: The Go-To Place On HIV And Aging

Editorial February 5, 2014 3 Comments

In the U.S. the HIV population is aging. By 2015 half of the over 1.4 million people infected with HIV will be age 50 and older. Each day 80 more people become part of this older adult group. And, 1 in every 6 new HIV diagnoses occurs in the age 50 and older population. This graying of… Continue Reading

Card For Clinicians Caring For HIV-Infected Older Adults

Science Spotlight February 5, 2014

CARD FOR CLINICIANS CARING FOR HIV-INFECTED OLDER ADULTS The Quick Reference Card for Managing Older Adults with HIV was developed out of the New York State Dept. of Health AIDS Institute Office Of The Medical Director. To obtain a copy, access www.hivguidelines.org. The AIDS Institute determined HIV and Aging as a priority over ten years ago. The number… Continue Reading

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AAHIVM American Academy of HIV Medicine

acria

AGS Geriatrics Healthcare Professionals

http://hivage.org/

Thank you! Questions?