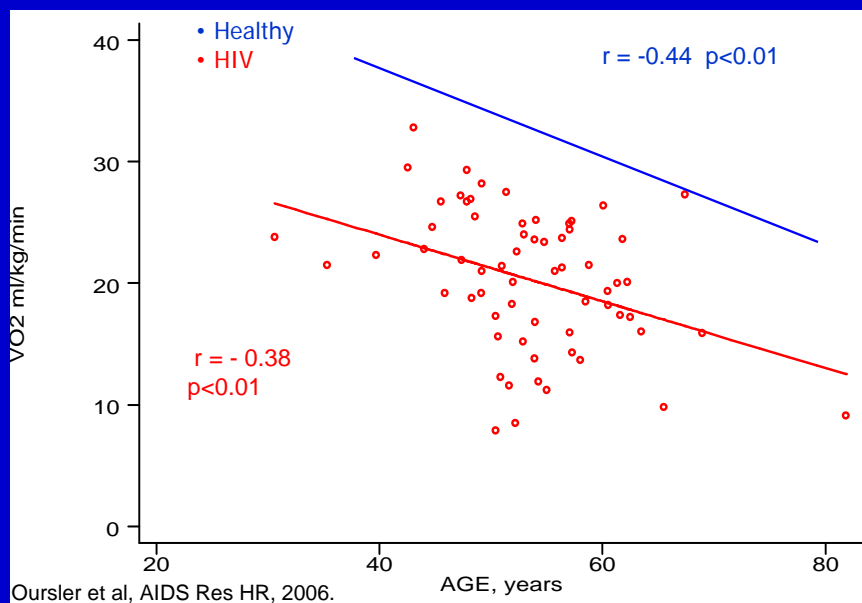


Overview

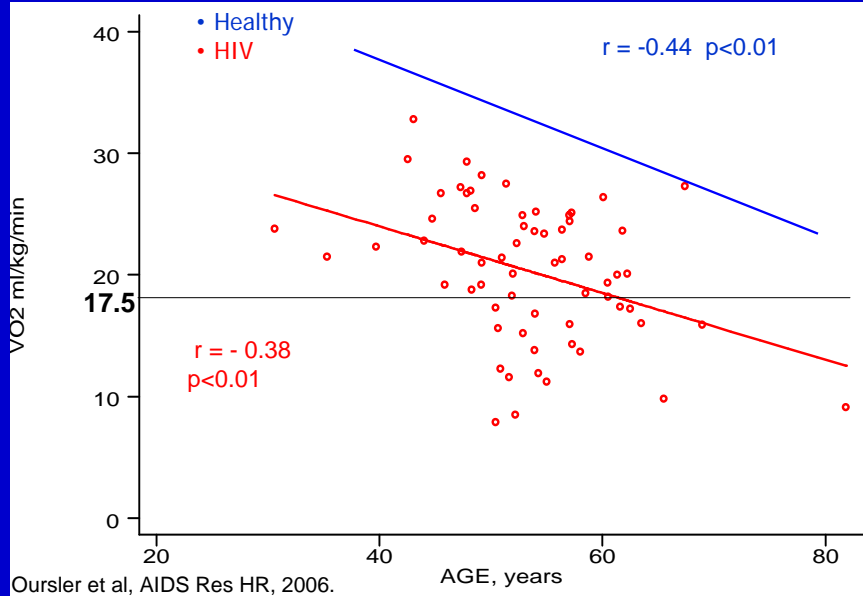
- Clinical characteristics of frailty:
 1. Poor endurance
 2. Slowed walking speed
 3. Low physical activity
 4. Weakness
 5. Weight loss and sarcopenia
- Opportunities for intervention
- Points for discussion

Kris Ann Oursler, MD

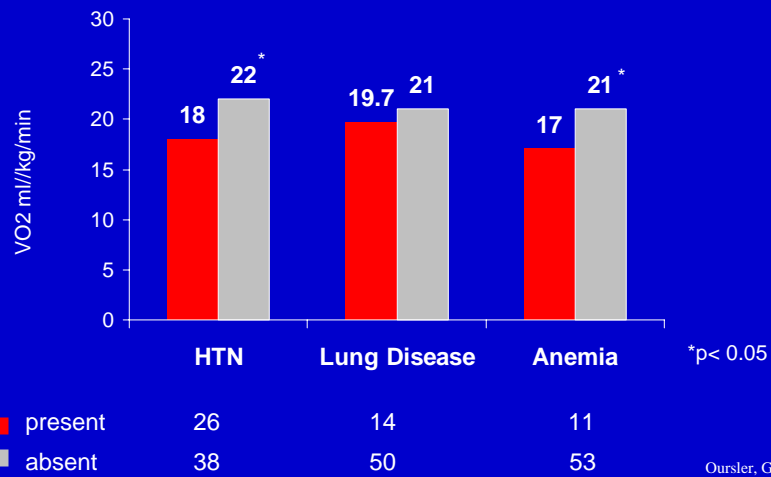
1. Endurance is reduced 40%



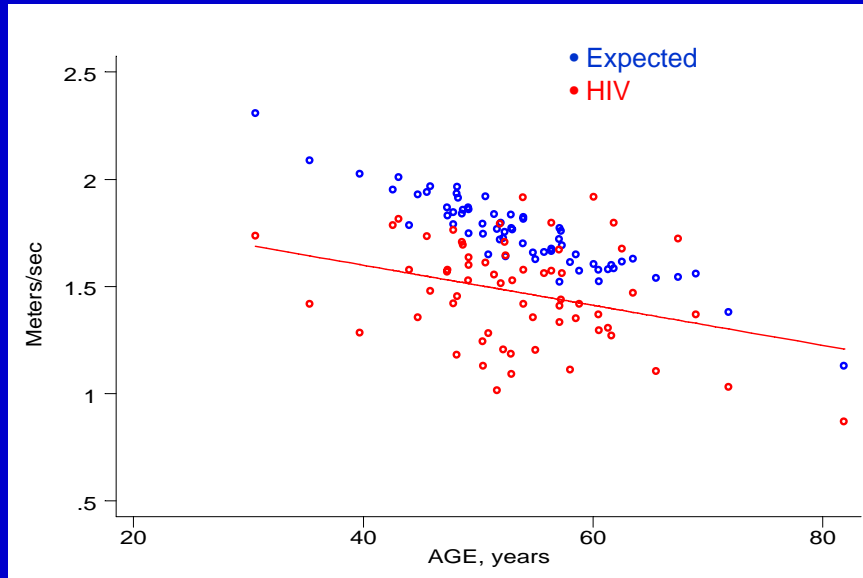
1. Endurance is reduced 40%



Mean VO₂peak is lower in HIV adults with comorbid conditions

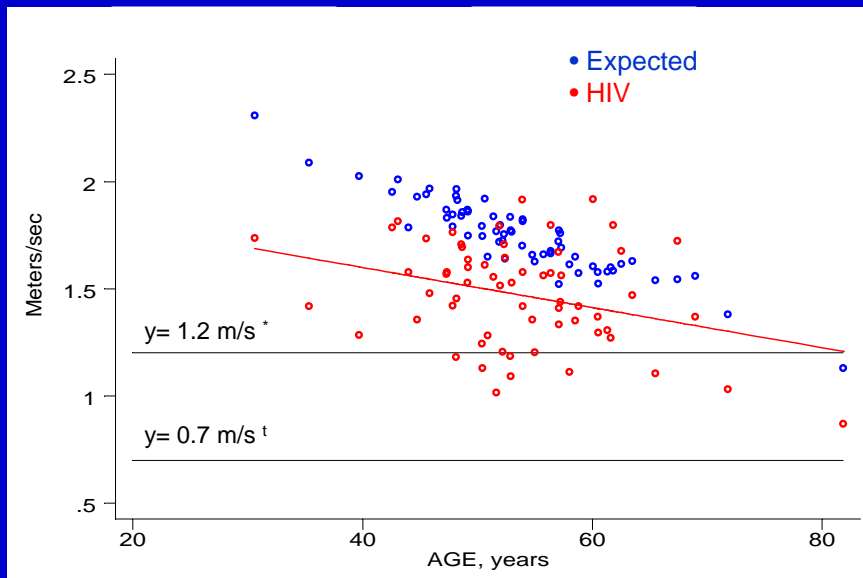


2. Walking speed is reduced 15%



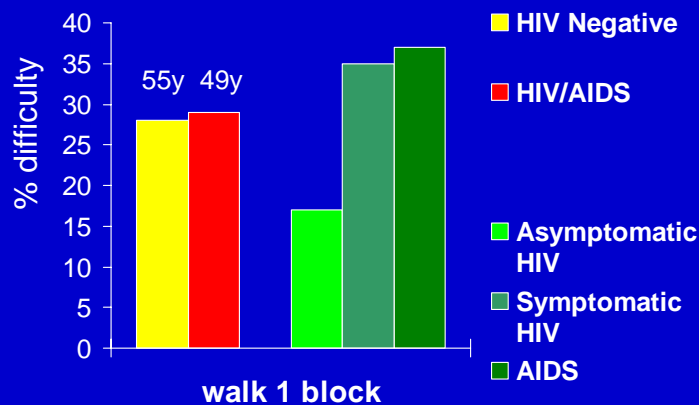
*Enright, P. Reference Equations for the 6MW in Healthy Adults. AM J Respir Crit Care 1998

2. Walking speed is reduced 15%



* Manini, T, JAGS 2007 † Fried, L, J Ger Med Sci, 2001

3. Physical Activity is comparable to older adults



Oursler, K, AIDS Medical Care & STDs, 2006

4. Weakness: strength is reduced 10%

- Grip strength in middle-age HIV men is 10% lower than expected for healthy men, adjusted for age
 - 41.3 kg (HIV) vs. 46.2 kg (Healthy)

Oursler et al, AIDS Res HR, 2006.

- Not meet criterion used for men 65+ yrs
 - values for lowest 20% in CHS
 - 29- 32 kg, based on BMI

Fried, Tangen, Walston, et al, J Ger Med Sci, 2001

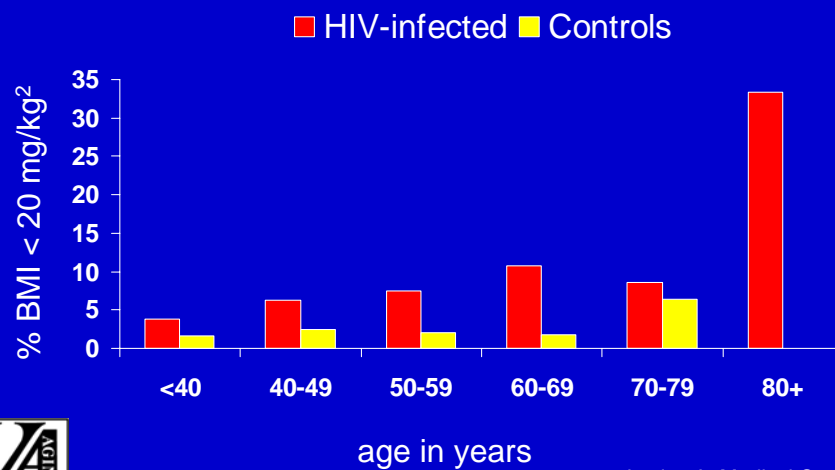
5. Weight Loss and Sarcopenia are still common problems

Nutrition Healthy Living Cohort (n=466)

- 90% on HAART regimen at some time
- During Follow up:
 - 18% lost >10% body weight
 - 8% dropped to BMI <20 kg/m²
- Fat-free mass represented 1/3 of body mass loss

Wanke CA, CID, 2000

Low Body Mass Index in HIV-infected vs Controls



Justice A, Medical Care, 2006



Self-reported Measures of Frailty in MACS 1994-1996

HIV-infected (n=245) vs. HIV-negative men (n=1905)

	Weight Loss	Exhaustion	Slowness	Low Activity	Frailty ≥ 3 factors
Adjusted Model*	OR	OR	OR	OR	OR
All subjects	12.8	3.0	3.9	3.4	10.9
Exclude w/ weight loss	–	2.2	2.8	2.5	4.5

* age, ethnicity, education

Desquilbert, Jacobson, Fried, et al,
in press, J Gerontology Med Sci

Exercise Interventions in HIV

- Resistive exercise training
 - Improves strength 44%
 - Increases lean body mass 2.3%
 - Both independently associated with function

Roubenoff R, Med Sci Sports Exercise, 2001

- Aerobic exercise training improves endurance
 - VO₂ 32 ml/kg/min → 40 ml/kg/min

Terry, L Med Sci Sports Exerc 2006

Summary

- Clinical frailty syndrome
 - Variability in measures, definitions, and cut-points
 - Limited data in HIV-infected adults with mean age 20-30 years lower than traditional frailty studies
- Middle-age HIV-infected adults on HAART:
 - Endurance is comparable to sedentary 70+ year olds
 - Reduced strength and muscle mass
- Evidence for accelerated aging
 - Self-report measures with controls in MACS and VACS
 - Objective measures in small cross-sectional studies

Discussion Points

- Identify frail HIV-infected adults
 - Clinical characteristics
 - Predictors of disability and death besides comorbidity and HIV
- Approach to develop effective interventions
- Investigating mechanisms
 - Inflammatory mediators
 - Mitochondrial DNA and oxidative function