

## Frailty in HIV and Aging

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### Educational Objectives

**By the end of the session, learners will be able to:**

1. Choose two instruments used to evaluate frailty in HIV-infected patients.
2. Describe two health outcomes that are adversely affected by frailty.
3. Demonstrate how to counsel frail HIV-infected patients regarding prognosis and goals of care.

### Suggested reading:

1. American Academy of HIV Medicine (online). Assessing frailty and functional capacity. Available at: <http://hiv-age.org/wp-content/uploads/2014/02/3.-Assessing-Frailty-and-Functional-Capacity.pdf>. Accessed August 13, 2014.

### CASE ONE:

**Mrs. Feeble is a 70-year-old woman with end-stage-renal disease (ESRD) from hypertension on dialysis, chronic obstructive pulmonary disease (COPD) on 2L oxygen with recurrent pulmonary Mycobacterium Avium Intracellulare (MAI) infection failing past therapies, coronary artery disease s/p stent placement 1 year prior with congestive heart failure (ejection fraction of 40%), right hip osteoarthritis and HIV well-controlled on ART. Patient is in your clinic with her daughter who is her health care proxy for a pre-operative assessment of an elective ventral hernia repair. The daughter tells you the surgeon mentioned that Mrs. Feeble looks frail and wants her optimized before the surgery.**

### Questions:

1. **What is frailty? How do you determine if someone is frail?**
  - *Currently, there is no agreed upon definition of frailty. Overall, frailty connotes diminished reserve capacity, and increased risks of poor health outcomes.*
  - *Because a standard definition for frailty does not exist, there is not a gold standard test that can be used to diagnose frailty. Many approaches have been developed to attempt to measure frailty:*
    - o *Approaches focusing on the frailty phenotype: A study by Fried et al (1) defines the frailty phenotype by the frailty score, which is the presence of 3 or more of 5 components (weight loss, exhaustion, weakness, slowness and low physical activity).*

- *Approaches focusing on accumulated deficits: The frailty index was developed as part of the Canadian Study of Health and Aging (CSHA) study (2) based on the idea that “the more individuals have wrong with them, the more likely they are to be frail.” The frailty index consists of 92 baseline variables of symptoms, signs, abnormal lab values, disease states and disabilities. The index is calculated as the presence of each variable as a proportion of the total (e.g. 20 deficits present of a possible 92 gives a frailty index of  $20/92=0.22$ ). However, in clinical practice, the frailty index might prove too cumbersome.*
- *Approaches focusing on function: Others have suggested that measures of function such as grip strength or the six-minute walk test may be used to measure frailty.*

## **2. How is frailty different in HIV-infected patients compared to the general population?**

- *Using the frailty score, a study by Onen et al (3) found the incidence of frailty in HIV-infected patients within the outpatient setting to be 9%. Another study by Desquilbet et al (4) found that 13.4% of HIV-infected patients over the age of 55 showed the frailty phenotype.*
- *Frailty appears to be more prevalent with an earlier onset in HIV-infected patients compared to their uninfected counterparts (4). A study by Althoff et al (5) reported the incidence of the frailty phenotype in men who have sex with men to be 12% in HIV-infected patients vs 9% in HIV-uninfected men. The conversion to the frailty phenotype was significantly associated with a history of AIDS (adjusted odds ratio of 2.26 [1.50-3.39]), but not with HIV infection alone.*

## **3. What is the effect of frailty on health outcomes?**

- *According to Fried (1), frailty is a high-risk state predictive of the following adverse health outcomes in HIV-uninfected patients over 3 years (reported as hazard ratio):*
  - *Incidence of falls: 1.29 [1.00, 1.68]*
  - *Worsening mobility: 1.50 [1.23, 1.82]*
  - *Worsening ADL disability: 1.98 [1.54, 2.55]*
  - *First hospitalization: 1.29 [1.09, 1.54]*
  - *Death: 2.24 [1.51, 3.33]*
- *Another study by Kim et al (6) predicts postoperative mortality risk using a multidimensional frailty score model consisting of the Charlson Comorbidity index, dependence in activities of daily living, dependence in instrumental activities of daily living, dementia, risk of delirium, short mid-arm circumference, and malnutrition. They found that patients with multidimensional frailty score of more than 5 showed increased postoperative mortality risk (hazard ratio 9.01 [2.15-37.78]) and longer hospital stay (median 9[5-15] vs 6[3-9] days).*

## CASE ONE CONTINUED:

**Mrs. Feeble lost 20 lbs in the past 3 months due to recurrent MAI infections in her lungs. She spends most of her time at home due to weakness and fatigue, except on dialysis days when she gets transported to the dialysis center. She is unstable on her feet and usually holds on to other people when she walks outside her apartment. She feels depressed due to her decline in health and her dependence on dialysis, although she denies suicidal or homicidal ideation. She does not have pain related to the hernia or her other medical conditions.**

**On exam, her pulse was 78, BP 120/65, oxygen saturation 90% on 2L. Her six-minute walk distance was 300m. Her albumin was 3.0 g/dL.**

**4. Is Mrs. Feeble frail? What frailty measure would you use to answer this question.**

- *Mrs. Feeble reports weight loss, exhaustion, weakness, slowness and low physical activity, so her Fried frailty score is 5. Her six-minute walk distance was also less than the average of 400m-700m reported in healthy adults. It would seem that Mrs. Feeble is frail based on both the phenotypic and functional measures.*

**5. What would you do to optimize Mrs. Feeble for the upcoming elective surgery? How would you address her mood, nutrition, and physical function?**

- *Although there are no specific treatments for frailty, frail patients can be optimized in the following ways:*
  - o *Mrs. Feeble's depression should be treated with both counseling and pharmacotherapy, using an interdisciplinary approach involving the primary care physician, care manager, and a psychiatrist. Depression treatment might also help improve her energy, appetite, sleep and weight loss.*
  - o *A workup for weight loss might be considered. For Mrs. Feeble, it seems that the weight loss is caused by increased energy expenditure from recurrent MAI infections if other causes are ruled out. Since the recurrent lung infections have failed prior therapies, it does not seem that the underlying etiology for weight loss can be removed for Mrs. Feeble. At this point, nutritional supplements might be helpful. A Cochrane review from 2009 (7) found that nutritional supplements results in 2.2% weight gain, but there was no effect on overall mortality, function or length of hospital stay. However, since nutritional supplements are well-tolerated with few side effects, most providers may recommend nutritional supplements for patients with weight loss. Enlisting the help of a nutritionist might also be helpful,*

*especially in preparation for the upcoming surgery in which good nutritional status will be critical for wound healing and recovery.*

- *For weakness, an evaluation by physical therapy along with resistance exercise have been shown to increase the strength of older patients living with HIV and allow them to achieve performance levels observed among otherwise healthy controls (8). Exercise may also improve her energy, appetite, and sleep. Additionally, exercise can improve weight loss by increasing muscle mass and reducing sarcopenia, compared to nutritional supplements which increase weight primarily through fat mass. A referral to cardiopulmonary rehab may also increase her functional capacity.*
- *For frail patients with multiple comorbid conditions, consulting a geriatrician might be helpful. A geriatrician can help manage age-related illness found in older adults, and provide counseling regarding prognosis and goals of care.*

**6. How would you counsel Mrs. Feeble's daughter regarding the prognosis?**

- *In lieu of the upcoming elective surgery, it might be helpful to estimate Mrs. Feeble's prognosis to determine treatment priorities and goals of care.*
  - *For patients without one predominant medical condition, consider using the Veterans Aging Cohort Study Index (VACS Index) with an easy-to-use calculator at <http://vacs.med.yale.edu/IC>.*
  - *For ESRD patients like Mrs. Feeble, Charlson Comorbidity Index (9) or serum albumin (10) have been used for prognostication. An easy online calculator is hosted at [http://touchcalc.com/calculators/cci\\_js](http://touchcalc.com/calculators/cci_js). For Mrs. Feeble, her 1-year survival is 64% based on the Charlson Comorbidity Index or 50% based on serum albumin.*
- *Considering Mrs. Feeble's frail status with likely increased risk of postoperative mortality, longer hospital stay and overall limited prognosis due to her ESRD, it may be important to discuss the necessity, benefits and risks related to the elective hernia surgery. Because Mrs. Feeble is not experiencing symptoms related to the hernia and her operative risks are high, risks may outweigh benefits and the surgery might not be sensible at this time.*
- *It will be important to set up a meeting with Mrs. Feeble and all the stakeholders in her health care, such as her daughter or other relatives, to discuss her current medical condition, her frailty and her prognosis in detail. Because her prognosis is poor, you will be delivering bad news and the SPIKES framework should be used (11).*
- *Once prognosis is communicated, goals of care should be determined so that treatment recommendations can be made. Consider using PREPARE as a resource which is available as pamphlets as well as an interactive website at <https://www.prepareforyourcare.org/>. PREPARE helps determine the health care proxy, which is an important step in advanced care planning. It also translates patient's wishes into actionable medical orders and helps determine appropriate care settings that will be in line with the desired goals of care and quality of life.*

### **Additional reference:**

1. Fried LP, Tangen CM, Walston J, et al. Frailty in older adults: evidence for a phenotype. *J Gerontol A Med Sci* 56 (2001):M146–M156.
2. Rockwood K, Song X, MacKnight C, et al. A global clinical measure of fitness and frailty in elderly people. *CMAJ* 173 (2005):489–495
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4. Desquilbet L, Jacobson L, Fried LP, et al. Multicenter AIDS Cohort Study. HIV-1 infection is associated with an earlier occurrence of a phenotype related to frailty. *J Gerontol A Biol Sci Med Sci* 62 (2007):1279-86.
5. Althoff KN, Jacobson LP, Cranston RD, et al. Age, comorbidities, and AIDS predict a frailty phenotype in men who have sex with men. *J Gerontolo A Biol Sci Med Sci* 69.2 (2014):189-198.
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7. Milne AC, Potter J, Vivanti A, et al. Protein and energy supplementation in elderly people at risk from malnutrition. *Cochrane Database Syst Rev* 2009.
8. Souza PM., et al. Effect of progressive resistance exercise on strength evolution of elderly patients living with HIV compared to healthy controls. *Clinics (Sao Paulo)* 66.2 (2011): 261-266.
9. Beddhu S, Bruns FJ, Saul M, et al. A Simple Comorbidity Scale Predicts Clinical Outcomes and Costs in Dialysis Patients. *The American Journal of Medicine* 108 (2000):609-613.
10. Goldwasser P, Mittman N, Antignani A, et al. Predictors of mortality in hemodialysis patients. *Journal of the American Society of Nephrology* 3 (1993):1613-22.
11. Baile WF, Buckman R, Lenzi R, et al. SPIKES – a six-step protocol for delivering bad news: application to the patient with cancer. *The Oncologist* 5 (2000):302-311.