Frailty and Falls Assessment for Internists

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Disclosure

- Dr. Rolfson was the lead author in the development and validation of the Edmonton Frail Scale
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- No other conflicts of interest to declare.
The following presentation represents the views of the speaker at the time of the presentation. This information is meant for educational purposes, and should not replace other sources of information or your medical judgement.
Objectives

1. Define and describe frailty and how it relates to falls
2. Provide a practical approach to frailty
3. Demonstrate similarities in the approach to falls
4. Practice the use of common assessment methods
5. Emphasize the benefits of multimodal interventions

NB: Will not address specific falls interventions
FRAILTY is NOT “univocal”

Frailty is

...a state of exaggerated vulnerability.....

...manifest as a multidimensional syndrome

...involving a dynamic interaction between intrinsic capacity, external resources and stress.
Number of chronic comorbidities by age stratum.
Frailty Index

Appendix 1: List of variables used by the Canadian Study of Health and Aging to construct the 70-item CSHA Frailty Index

- Changes in everyday activities
- Head and neck problems
- Poor muscle tone in neck
- Bradykinesia, problems getting up
- Problems with balance
- Problems carrying objects
- Urinary incontinence
- Toileting problems
- Bulk difficulties
- Rectal problems
- Gastrointestinal problems
- Problems cooking
- Sucking problems
- Problems going out alone
- Impaired mobility
- Musculoskeletal problems
- Bradykinesia of the limbs
- Poor muscle tone in limbs
- Poor balance
- Poor coordination
- Irregular gait
- Falls

- Mood problems
- Feeling sad, blue, depressed
- History of depressed mood
- Memory changes
- Short-term memory impairment
- Long-term memory impairment
- Changes in general mental functioning
- Onset of cognitive symptoms
- Clouding or delirium
- Paranoid features
- History of cognitive impairment or loss
- Family history of cognitive impairment
- Impaired vision
- Tremor at rest
- Postural tremor
- Intention tremor
- History of Parkinson’s disease
- Family history of degenerative disease
- Seizures, partial complex
- Seizures, generalized
- Syncope or blackouts
- Headache
- Peripneal pulses
- Cardiac problems
- Myocardial infarction
- Arrhythmia
- Congestive heart failure
- Skin problems
- Malignant disease
- Breast problems
- Abdominal problems
- Presence of snout reflex
- Presence of the palmar mental reflex
- Other medical history

Index score = positive variables/70 items

Jones D et al. JAGS 2004;52:1829-33
How do people “age quickly”?

- Diminished Repertoire of homeostatic response
- Accumulation of Deficits
- Failure to withstand environmental stress
“ROBUST”

ASSETS

DEFICITS
FRAILTY State

ASSETS

DEFICITS
CHS Frailty Phenotype

- Weight Loss
- Slow walking speed
- Low levels of physical activity
- Subjective exhaustion
- Weakness (low grip strength)

- Scoring
  - 3-5 is “frail”
  - 1-2 is “pre-frail”
  - 0 is not frail

"Look, you’re 103 years old, you’ve got to start taking better care of yourself."
Intrinsic Capacity, WHO 2018
"I knew he was really sick. He hasn't complained about anything for three days."
Delirium: sum of predisposing and precipitating variables

Inouye et al. Acute Hospital Care 1998
Nov;14(4):747
Delirium as a model for other Geriatric Syndromes

- Falls
- Urinary Incontinence
- Nutritional Crisis
## Frailty – the Golden Gate Bridge?

<table>
<thead>
<tr>
<th>“Frailty” Constructs</th>
<th>Examples</th>
<th>Frailty and Resilience from the Perspective of a Complex Structure (Golden Gate Bridge)</th>
<th>Potential Strengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Phenotypic Frailty (defined state)</td>
<td>Fried CHS Study, Sarcopenic Obesity</td>
<td><img src="image1" alt="Golden Gate Bridge" /></td>
<td>Capture existence of a clinically defined and measurable phenotypic state</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image2" alt="Golden Gate Bridge" /></td>
<td>Define risk factors and mechanisms with some specificity for given phenotype</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image3" alt="Golden Gate Bridge" /></td>
<td>Measure treatment effect when a degree of treatment specificity is involved</td>
</tr>
<tr>
<td>B. Stochastic Frailty (accumulation of deficits)</td>
<td>Rockwood FI Index (e.g. FIClin, FIIab)</td>
<td><img src="image4" alt="Golden Gate Bridge" /></td>
<td>Perform prognostication</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image5" alt="Golden Gate Bridge" /></td>
<td>Define cross-cutting risk factors</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image6" alt="Golden Gate Bridge" /></td>
<td>Measure treatment effects when more pleiotropic interventions are studied</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image7" alt="Golden Gate Bridge" /></td>
<td>Measure treatment effects when testing geroscience-guided therapeutics</td>
</tr>
<tr>
<td>C. Resilience (Measure of homeostasis in face of stressor)</td>
<td>Orthostasis, Vaccine Responses, Recovery from infection, surgery, anesthesia, dehydration, bedrest, chemotherapy, trauma or BM transplant</td>
<td><img src="image8" alt="Golden Gate Bridge" /></td>
<td>Identify “hidden” vulnerability</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image9" alt="Golden Gate Bridge" /></td>
<td>Identify resilient mechanisms</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image10" alt="Golden Gate Bridge" /></td>
<td>Obtain more individualized risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image11" alt="Golden Gate Bridge" /></td>
<td>Design more precise interventions</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image12" alt="Golden Gate Bridge" /></td>
<td>Design earlier interventions</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image13" alt="Golden Gate Bridge" /></td>
<td>Design interventions targeting resilient mechanisms</td>
</tr>
</tbody>
</table>

Kuchel G. JAGS Aug 2018;66(8):1451-1454
Approach to Frailty
Frailty: An Integrated Approach

Rapid Case finding
- CFS
- Gait Speed
- eFI

Define Frailty Components
- Multi-dimensional assessment

Address components
- Patient-centered decisions

Ethical Considerations
Frailty Case-Finding Measures 2018

1. Judgment-based Measures (CFS)
2. Physical Performance Measures (Gait Speed)
3. Accumulation of Deficits (eFI)
4. Multidimensional Measures (EFS)
**Clinical Frailty Scale**

1 **Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2 **Well** – People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.

3 **Managing Well** – People whose medical problems are well controlled, but are not regularly active beyond routine walking.

4 **Vulnerable** – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being “slowed up”; and/or being tired during the day.

5 **Mildly Frail** – These people often have more evident slowing, and need help in higher order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6 **Moderately Frail** – People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.

7 **Severely Frail** – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8 **Very Severely Frail** – Completely dependent, approaching the end 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 < 6 months, who are not otherwise evidently frail.

**Scoring frailty in people with dementia**
The degree of frailty corresponds to the degree of dementia. Common symptoms in mild dementia include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In moderate dementia, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In severe dementia, they cannot do personal care without help.
Gait Speed

Cut Point < 0.8m/s
(8 meters in 10 sec)
Electronic Frailty Index

❖ **Proactive approach**
  - Deficits are pre-defined in an EMR
  - Can be calculated and presented as a decision alert

❖ **Scoring**
  - Fit eFl 0–0.12
  - Mild Frailty eFl 0.13-0.24
  - Moderate Frailty eFl 0.25-0.36
  - Severe Frailty eFl >0.36
Frailty: An Integrated Model

Rapid Case finding
• CFS
• Gait Speed
• eFI

Define Frailty Components
• Multi-component assessment

Address components
• Patient-centered decisions

Ethical Considerations
Multi-Dimensional Assessment defines frailty in clinical terms

- Cognitive impairment
- Multi-morbidity
- Polypharmacy
- Functional dependence
- Unintentional weight loss
- Dehydration
- Urinary incontinence

- Depression
- Falls
- Immobility
- Chronic pain
- Constipation
- Social vulnerability
<table>
<thead>
<tr>
<th>Frailty Domain</th>
<th>Item</th>
<th>0 point</th>
<th>1 point</th>
<th>2 points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cognition</strong></td>
<td>Please imagine that this pre-drawn circle is a clock. I would like you to place the</td>
<td>No errors</td>
<td>Minor spacing</td>
<td>Other errors</td>
</tr>
<tr>
<td></td>
<td>numbers in the correct positions then place the hands to indicate a time of ‘ten after</td>
<td></td>
<td>errors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>eleven’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>General health status</strong></td>
<td>In the past year, how many times have you been admitted to a hospital?</td>
<td>0</td>
<td>1–2</td>
<td>≥2</td>
</tr>
<tr>
<td></td>
<td>In general, how would you describe your health?</td>
<td>’Excellent’,</td>
<td>’Fair’</td>
<td>’Poor’</td>
</tr>
<tr>
<td></td>
<td>’Very good’, ’Good’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Functional independence</strong></td>
<td>With how many of the following activities do you require help? (meal preparation, shopping, transportation, telephone, housekeeping, laundry, managing money, taking medications)</td>
<td>0–1</td>
<td>2–4</td>
<td>5–8</td>
</tr>
<tr>
<td><strong>Social support</strong></td>
<td>When you need help, can you count on someone who is willing and able to meet your needs?</td>
<td>Always</td>
<td>Sometimes</td>
<td>Never</td>
</tr>
<tr>
<td><strong>Medication use</strong></td>
<td>Do you use five or more different prescription medications on a regular basis?</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At times, do you forget to take your prescription medications?</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td><strong>Nutrition</strong></td>
<td>Have you recently lost weight such that your clothing has become looser?</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td><strong>Mood</strong></td>
<td>Do you often feel sad or depressed?</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td><strong>Continence</strong></td>
<td>Do you have a problem with losing control of urine when you don’t want to?</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td><strong>Functional performance</strong></td>
<td>I would like you to sit in this chair with your back and arms resting. Then, when I say</td>
<td>0–10 s</td>
<td>11–20 s</td>
<td>One of &gt;20 s</td>
</tr>
<tr>
<td></td>
<td>‘GO’, please stand up and walk at a safe and comfortable pace to the mark on the floor (approximately 3 m away), return</td>
<td></td>
<td></td>
<td>patient unwilling, or requires assistance</td>
</tr>
<tr>
<td></td>
<td>to the chair and sit down’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>Final score is the sum of column totals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Let’s get familiar with some frailty measures

Instructions: Groups of 2-3.

• Assign roles – Assessor or Subject
  • Subject should “role-play” a person recently under their care.

• Administer one of the following Frailty Measures
  • Electronic Frailty Index
  • Clinical Frailty Scale
  • Gait Speed
  • Edmonton Frail Scale

• Score and Interpret
  • Presence/Absence?
  • Severity?
  • What else did you learn?
Approach to Falls

• Prevention
• Assessment
Definition of a fall

“Unintentionally coming to rest on the ground, floor or other lower surface with or without injury”
Case Finding

Multicomponent Assessment

Address Components

Updated AGS/ BGS Clinical Practice Guideline for Prevention of Falls in Older Persons, JAGS 59 (1)148-157, First published: 13 January 2011
Falls - Case Finding

Rapid Bedside Screening
Timed Up and Go (TUG)
Romberg
Gait Speed
Chair Stands
Timed Up and Go Test

• Measures in seconds the time taken to stand from a chair, walk a distance of 3 meters, turn, walk back to the chair and sit down

• High fall risk > 15 seconds

JAGS 1991; 39: 142-48
Phys Ther 2000; 80: 896-903
Single task assessments . . .

- Romberg (10 sec. holds)
- Gait Speed < 0.8 m/sec
- Chair Rising Performance (Sit to stands); < 5 in 15 secs

![Feet together, Semi-tandem, Tandem](image)

Figure 4. Balance (Sharpened Romberg test). Patient stands with feet together, semi-tandem, and tandem, with eyes open for 10 seconds then closed for 10 seconds in each position.

JAGS 2009; 57: 251-259
JAGS 2005; 53: 1675-1680
European Journal of Physical and Rehab Medicine 2010; 46: 249-259
Time to screen for issues with balance and mobility

Instructions: Groups of 2-3.

• Assign roles – Assessor or Subject
  • Subject should “role-play” a person recently under their care.

• Administer one of the following Falls Measures

• Score and Interpret
  • Risk?
  • Severity?
  • What else did you learn?
Falls - Multicomponent Assessment

1. Obtain relevant medical history, physical examination, cognitive and functional assessment
2. Determine multifactorial fall risk:
   a. History of falls
   b. Medications
   c. Gait, balance, and mobility
   d. Visual acuity
   e. Other neurological impairments
   f. Muscle strength
   g. Heart rate and rhythm
   h. Postural hypotension
   i. Feet and footwear
   j. Environmental hazards
Medications –
Meta-analyses of Observational Data

<table>
<thead>
<tr>
<th>Medication</th>
<th>Odds Ratio (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any psychotic</td>
<td>1.78 (1.57-2.01)</td>
</tr>
<tr>
<td>Neuroleptic</td>
<td>1.50 (1.32-1.71)</td>
</tr>
<tr>
<td>Sedative/ hypnotic</td>
<td>1.54 (1.40-1.69)</td>
</tr>
<tr>
<td>Antidepressant</td>
<td>1.59 (1.46-1.73)</td>
</tr>
<tr>
<td>Tranquilizers</td>
<td>1.34 (1.07-1.67)</td>
</tr>
<tr>
<td>Benzodiazepine</td>
<td>1.39 (1.24-1.54)</td>
</tr>
</tbody>
</table>

Journal of Aging and Health 2011; 23: 329-346
FRAILTY and FALLS
What Works?
Frailty: An Integrated Approach

Rapid Case finding
- CFS
- Gait Speed
- eFI

Define Frailty Components
- Multi-dimensional assessment

Address components
- Patient-centered decisions

Ethical Considerations
Frailty - Summary of Evidence

- Exercise alone is effective
- Nutritional Supplements modest benefit
- Androgen Replacement equivocal benefit
- Multidimensional Programs promising but resource intensive

Preventing and Slowing Progression of Frailty

Clear Benefit
• Physical exercise programs (group-based)

Favorable Effects
• Nutritional supplementation (with or without exercise)
• Cognitive training

Lack of Efficacy
• Physical exercise (individual, one-to-one)
• Hormone supplementation
• “Problem-solving therapy”

Falls - Addressing Components

Any indication for additional intervention?

Yes

Initiate multifactorial/multicomponent intervention to address identified risk(s) and prevent falls:
1. Minimize medications
2. Provide individually tailored exercise program
3. Treat vision impairment (including cataract)
4. Manage postural hypotension
5. Manage heart rate and rhythm abnormalities
6. Supplement vitamin D
7. Manage foot and footwear problems
8. Modify the home environment
9. Provide education and information

No

Reassess periodically
Multicomponent Approach

1. Medication reduction

- Gradual withdrawal of **psychotropics** and other drugs associated with increased risk of falls, reduces **rate of falls** (RaR 0.34, 95% CI 0.16-0.73)

  JAGS 1999; 47: 850-53
  Br J Pharmacol 2006; 63: 232-37
  J. Aging Health 2011; 23: 329-46
  Cochrane Database of Systematic Reviews 2009, Apr 15: CD007146
Multicomponent Approach

2. Referral for visual symptoms
   - Expedited first cataract removal shown to reduce falls

3. Osteoporosis risk (BMD)
   - Vitamin D3 supplementation (≥ 800 IU/day) should be considered for falls prevention strategy in all older adults at high risk of falling and especially for those with Vit D deficiency [pooled RR, 0.83 (CI, 0.77-0.89)]; NNT = 15

AIM 2010; 153: 815-825
JAGS 2010; 58: 1299-1310
Multicomponent Approach (cont.)

4. Individualized Tailored Exercise Program
5. Manage Postural Hypotension
6. Manage heart rate and rhythm abnormalities
7. Manage Foot and Footware Problems
8. Modify Home Environment
9. Provide Education and Information
Environmental Modifications and Injury Reduction

- Use of protective equipment
  - Hip protectors, helmets, non slip socks
  - Cushioned floor surfaces
  - Bed or chair alarms
  - Bedside mats
  - Raised mattress edges
- Low beds positioned against the walls
- Avoidance of restraints
- Diligent nursing care responsive to patient needs

www.findingbalancealberta.ca
Frailty and Falls – General

1. Use a Care and Support Plan
   - Single, portable plan
   - Reflecting individual priorities
   - Informed by inter-professional assessments
   - Example: PATH program in Halifax, Nova Scotia.
2. Discuss how to mitigate risk.
   - Cautious use of disease-based guidelines.
   - Choosing best interventions in context of vulnerabilities.
   - Hospital avoidance.
Frailty and Falls

3. Multi-component Interventions

- Physical Activity
- Nutrition
- Medication Review
- Socialization
4. **Address components of frailty**
   - Multidisciplinary approach by teams that communicate
   - Involve specialists in geriatrics as needed
5. Apply Elder Friendly Care processes and practices.
   - Acute Care of Elders (ACE)
   - Delirium Prevention Units
   - Protocols on all units
   - Comfort Rounds
   - Protected Mealtime
   - Early mobilization
   - Recreational programming
   - Environmental modifications
Cautions and Mitigations
Frailty: An Integrated Model

Rapid Case finding
- CFS
- Gait Speed
- eFI

Define Frailty Components
- Multi-dimensional assessment

Address components
- Patient-centered decisions

Ethical Considerations
Figure 1. Model of frailty identity in older adults.
"I think we had much nicer diseases when I was a girl."