Challenges and conundrums in care of the frail elderly diabetic

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Session Outline

- Defining and recognizing Frailty
- Importance of Frailty
- Diabetes, Sarcopenia and Frailty
- Principles of Caring for Frail, Elderly Diabetics
Defining Frailty

“A physiologic syndrome characterized by decreased reserve and resistance to stressors, resulting from cumulative decline across multiple physiologic systems, and causing vulnerability to adverse outcomes”

(Fried et al., 2001)

Or in other words –

Vulnerability to adverse outcomes resulting from an interaction of physical, socio-economic and co-morbidity factors
Knowledge Check > What do you understand about the term “Frail Elderly”? 

Which of the two individuals would you consider frail and why?
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A  B
Knowledge Check > What do you understand about the term “Frail Elderly”? Which of the two individuals would you consider frail and why?
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A B
The four individuals above would be considered frail.

Some of the factors you may have noticed as contributing to frailty were:

- Gait
- Dependency
- Low Mood
- Polypharmacy

- Isolation
- Weight Loss
- Weakness
# Frailty Phenotype Model

<table>
<thead>
<tr>
<th>The five phenotype model indicators of frailty and their associated measures:</th>
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<tr>
<td><strong>Weight Loss</strong>: Self-reported weight loss of more than 4.5 kg or recorded weight loss of ≥5% per year</td>
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<td><strong>Self-reported exhaustion</strong>: Self-reported exhaustion on US Center for Epidemiological Studies depression scale (3–4 days per week or most of the time)</td>
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<td><strong>Low energy expenditure</strong>: Energy expenditure &lt; 383 kcal/week (men) or &lt; 270 kcal/week (women)</td>
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<td><strong>Slow gait speed</strong>: Standardised cutoff times to walk 4.57 m, stratified by sex and height</td>
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<tr>
<td><strong>Weak grip strength</strong>: Grip strength, stratified by sex and body-mass index</td>
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0 factors = Not frail, robust  
1 or two factors = Pre-frail  
3 or more factors = Frail
Cumulative Deficit Model

- Canadian Study of Health and Aging (CSHA) frailty index

- 70 baseline variables
  - Biologically sensible
  - Accumulates with age

- Frailty Index = \( \frac{\text{# Deficits in an individual}}{\text{Total # of deficits}} \)

- Tipping Point = Deficit accumulation of 0.67
Clinical Frailty Scale (CFS) (Rockwood et al., 2005) is completed after a careful comprehensive multidimensional geriatric assessment. It includes assessment of:

- Cognitive status
- Mood and motivation
- Communication (vision, hearing, speech)
- Mobility
- Balance
- Bowel function
- IADLs and ADLs
- Nutrition
- Social resources

In the next few slides we will apply the CFS to the images we examined in an earlier lesson.
The 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 high 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.


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Applying the Clinical Frailty Scale

1. Very fit

2. Well

3. Well, with treated co-morbid disease

4. Apparently vulnerable (slowed up or disease symptoms)

5. Mildly frail (some dependency in IADLs)

6. Moderately frail (help with IADLs and ADLs)

7. Severely frail (dependent for ADLs)
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Most vigorous

Most frail
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How common is Frailty?

• Just under 10% of all individuals 65 years or older in the community might be considered frail (Collard et al 2012)

• Some of the factors which increase likelihood of being frail include:
  ▪ Increasing age:
    • 4% of individuals 65-69 years old
    • 7% of 75-79 year olds
    • 26% of 85 years and older
  ▪ gender: women are twice as likely to be frail as men
  ▪ social vulnerability seems to increase risk
  ▪ presence of 2 or more chronic diseases (co-morbidites) (Andrew et al 2012)
Recognition of presence of Frailty is important because...

- It is predictive of long term outcomes including risk of future use of Institutionalization and mortality.
Probability of Survival based on CSHA Frailty Scale

(Rockwood K, et al., 2005)
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- It is also important to recognize its presence since it may be reversible in early stages.
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- It is predictive of long term outcomes including risk of future use of Institutionalization and mortality.
- It is also important to recognize its presence since it may be reversible in early stages
- Its presence should guide prescribing and care decisions
Clinical Frailty Scale Guiding Care Plan

1. Very fit
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Most vigorous

Health Maintenance and Health Promotion

Chronic Disease Management

Maintain Function, Minimize Adverse Effects and Symptom management
Contributory Factors to Frailty

- Vulnerability to adverse outcomes resulting from an interaction of:
  - Physical
    - Extreme age
    - Weight loss
    - Fatigue/Weakness/Poor grip strength
    - Abnormalities of gait and balance
  - Socio-economic
    - Isolation
    - Caregiver gaps
    - Poverty: gender and immigration status
  - Co-morbidity factors
    - Impaired cognition/mood
    - Polypharmacy especially sedative use
    - Multiple chronic diseases
Diabetes and Frailty

- Diabetics have increased risk of sarcopenia (Park et al 2007)
Sarcopenia

- Progressive decline of muscle mass leading to low and impaired strength and functioning
  - Age 50 onwards annual rate of muscle loss 1-2%
  - Age 60 onwards annual rate of muscle loss 1.5- 3.0%
- Suggested mechanisms include: atrophy, loss of muscle fibres, reduction in muscle quality (infiltration by fat and connective tissue) and changes in muscle metabolism and insulin resistance
- Presence is predictive of future disability and morbidity
Diabetes and Sarcopenia

- Accelerated decline in leg mass, muscle strength and gait speed in older diabetics (Leenders et al 2013)
- Muscle quality and performance reduced in poorly controlled diabetes (Baltimore Long Study of Aging)
- Multiple mechanisms
  - Reduced physical activity
  - Impaired protein synthesis
  - Increased production and accumulation of AGEs (advanced glycation end products) in muscles and joints
  - Peripheral neuropathy and reduced motor neurones
  - Increased inflammatory cytokines
Relationship between DM, Sarcopenia and Frailty

Diabetes
- Increased insulin resistance and hyperglycaemia
- Increased cardiovascular risk factors
- Increased comorbidities especially renal failure, hypertension and dementia
- Decreased motor neurones
- Decreased muscle quality
- Decreased vitamin D

Sarcopenia
- Decreased physical activity
- Decreased muscle glucose uptake
- Hyperinsulinaemia
- Increased insulin resistance

Frailty
- Increased cardiovascular risk factors
- Decreased physical activity
- Increased chronic low-grade inflammation
- Decreased muscle fibre
Diabetes and Frailty

- Diabetics have increased risk of sarcopenia (Park et al 2007)
- Diabetes associated with frailty and incremental association when hypertension or diabetic complications present (Lee et al 2016)
- Increased risk of CVA and Dementia (Fukazawa et al 2013)
  - Mobility (OR 1.71)
  - IADL (OR 1.65)
  - ADL (OR 1.82)
- History of falls twice that of non-diabetics
  - Risk increases with presence of cognitive impairment and/or hypoglycemic events
Diabetes and Frailty

- Cardiovascular Health Study (Watson et al 2002)
  - 25% frail elderly had diabetes, 18.2% pre-frail had diabetes and 12% non-frail had diabetes

- Beijing Longitudinal Study of Aging (Chhetri et al 2017)
  - Older diabetics had prevalence and incidence of frailty 19.2% and 12.3% incidence
  - Older non-diabetics had prevalence and incidence of frailty 11.9% and 7% incidence

- Diabetes associated with frailty and incremental association when hypertension or diabetic complications present (Lee et al 2016)
Diabetes and Frailty

- Diabetics have increased risk of sarcopenia (Park et al 2007)
- Diabetes associated with frailty
- Association of Diabetes, Frailty and Geriatrics Giants
  - Older diabetics have increased risk of CVA and Dementia (Fukazawa et al 2013)
  - Diabetics have increased risk of physical disability (Wong et al 2013)
    - Mobility (OR 1.71)
    - IADL (OR 1.65)
    - ADL (OR 1.82)
  - History of falls twice that of non-diabetics
    - Risk increases with presence of cognitive impairment and/or hypoglycemic events
● Increased impact of a new “illness” on function and ability to cope
● Increased presence of complex co-morbidities
● Increased likelihood of hospitalization
● Increased diagnostic and management challenges to health care providers
● Increased LOS and costs with worsening of outcomes
Caring for Frail Elderly Diabetics

Strategies to prevent or reduce frailty in vulnerable individuals:

1. Seeking to prevent further functional decline
2. Optimize Chronic Disease Management Strategies
3. Early detection of illness and possible adverse drug effects
4. Identifying and responding to problems such as Falls, Immobility, Confusion, Depression, Incontinence
5. Consider safety of the physical environment
6. Maximize community and socio-economic supports
7. Education and Support to Caregivers
1. Seeking to prevent further functional decline

Early identification of the onset of frailty with targeted interventions that promote healthy aging can help!

This might include:

- Use of a glasses and a hearing aid if needed
- Ensuring adequate nutrition and hydration
- Encouraging mobilization
- Attention to bowels and bladder function
- Promote activity and exercise
Exercise & aging

- Exercise started at age 35-39 results in 2 years of life gain!
- Exercise started at age 75 results in nearly 1/2 year of life gain!
- Recommend setting aside 30 minutes, 5 times a week for both stretching, anaerobic and muscle bulk-building exercises
2. Optimize Chronic Disease Management Strategies

- Encourage the person to define their goals
- Customize “best practices” based on patient goals and life expectancy
Clinical Frailty Scale Guiding Care Plan

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- Health Maintenance and Health Promotion
- Chronic Disease Management
- Maintain Function, Minimize Adverse Effects and Symptom management
2. Optimize Chronic Disease Management Strategies

- Encourage the person to define their goals
- Customize “best practices” based on patient goals and life expectancy
- Desirability of case management to link effort and care
- Need for “system navigation” and knowledge of system opportunities
- Multiple disciplines and individuals the rule so good communication pathways essential
- Caregiver support is crucial!
3. Early Detection of Illness or Adverse Drug Reactions

- Look for changes in their health status such as shortness of breath, worsening pain, new weakness etc.

- Observe for any adverse drug reactions especially if new medications are ordered
  - Avoid prescribing cascades
  - Look for evidence of possible medication errors such as missed doses on blister pack, multiple bottles of same medication or medications left lying around outside their container
  - Review indications and treatment goals
4. Identifying Falls, Immobility, Confusion, Depression, Incontinence

- Older, frail individuals may present atypically with new illness or an adverse drug reaction.
- New onset or worsening of problems of falls, immobility, confusion, low mood or incontinence may indicate new illness and should be investigated.
5. Consider the Safety of the Physical Environment

The physical environment can impact on an individuals ability to ambulate and potential fall risks.
Spot the 14 Hazards

(Adapted from Public Health Agency of Canada, 2008)
5. Consider the Safety of the Physical Environment

The physical environment can impact on an individual's ability to ambulate and potential fall risks.

- look for trip or slip hazards
  - reduce or eliminate wet or oily surfaces, wipe up spills
  - organize snow removal if you are in the person’s own home
- remove loose, unanchored rugs or mats, securing (tacking, taping, etc.) mats, rugs and carpets that do not lay flat
- cover uncovered cables
- identify risk of poor lighting
- suggest reduced clutter
6. Maximize Community and Socio-economic Supports

Become aware of formal services and supports in the community so that you can share that information with those who may need it such as family and friends who are the caregivers.

Discussing and sharing your knowledge may help them:

- avoid preventable gaps in care
- reduce caregiver stress or burden
- improve safety and outcomes for the frail older adult
- become aware of types & amount of care options and how to access & utilize resources
- identify alternative ways to afford services or equipment
7. Education and Support to Caregivers

- It is estimated that 80% of the support to frail older adults is provided by spouse, family, neighbors or friends.

- Providing this care can be a challenge with many other competing demands on the individuals.

- Care giving stress is common and can have adverse effects by both the care receiver and provider.

- Providing education and information about the associated health problems and the best ways to provide for their care needs can help reduce the stress on the caregiver.
Caring for Frail Elderly Diabetics

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References

- Tessa Laubscher Loren Regier Julia Bareham, Diabetes in the frail elderly Canadian Family Physician Vol 58: May 2012 |