Frailty - What do I do now?

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Geriatric Medicine
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The family doctor’s role in the care of the elderly

K T C Koh

ABSTRACT
With the anticipated increase in the number of aged persons in our local population, there will be an increased workload for the family doctor caring for the elderly in the community. Diseases thought to be attributed to ageing may be non-degenerative and hence treatable. This paper highlights the role of the family physician in the care of the elderly as the doctor’s recognition of these diseases and consequent early intervention may result in an improved outcome for the patient. Optimal care can be achieved with the family doctor’s systematic planning of the individual’s care, networking with hospitals and other health professionals and providing support for carers.

Keywords: family doctor, elderly, continuing care, multidisciplinary team, carers.

b) Basic geriatric skills
i) Awareness of diagnostic pitfalls
The family doctor’s consultation is often the point of first contact between an elderly person with a health problem and the health care system. The doctor can therefore act as a “gatekeeper” by screening and facilitating referrals for secondary care such as the stroke rehabilitation centre or the geriatric ward. In order that these referrals be appropriately made, doctors should be aware of certain pitfalls when making a diagnosis and identifying problems in the elderly patient. In particular, three common pitfalls are:

Firstly, disturbances such as infection or falls which are of minor consequence to a younger person may have serious consequences in an older person and should not be dismissed lightly.

Secondly, there is a tendency for old people to under-report

- Family doctors as gate keeper by screening and facilitating referral
- Early detection of treatable condition like infection, AMI etc from atypical presentation.
- Functional assessment
- Health promotion and prevention
- Care giver support
Contents

• What is Frailty? And Implications.
• Frailty models
• Incidence
• How do we screen frailty?
• Limitations in screening
• Screening tools
• Practically –
• What do we do now?
  - Falls clinic – TUGT, STS, Hand grip, Cognitive assessment, GDS, BMI, ZBI, SF12
  - PRISMA questionnaire
• Management – Nutrition, Exercise
What is Frailty?

Conceptually defined as a:

- State of increased vulnerability
- Aging-associated decline in reserve and function
- Affects multiple physiologic systems
- Ability to cope with everyday or acute stressors is comprised.

Frailty is a common clinical syndrome in older adults that carries an increased risk for poor health outcomes including falls, incident disability, hospitalization, and mortality.

State of increased vulnerability

Regardless of the cause, frail older adults have decreased reserves with which to compensate and likely to deteriorate with minor stressors and become dependent and takes much longer time to recover.
Why is frailty important?

• Clinically a chronic, progressive condition, with a spectrum of severity

• **Earlier phases may be responsive to treatment** either to prevent or ameliorate the clinical manifestation

• The most severely frail older adults appear to be in an **Irreversible, pre-death phase** with high mortality over 6-12 months.

• The frailty state for an individual is **not static**; it can be made better and worse.

• Frailty is **not an inevitable part of ageing**; it is a long term condition in the same sense that diabetes or Alzheimer’s disease is.
Concept of Overlapping (Causation + Management)

Primary Frailty

Frailty

Long term medical conditions

Disability

Secondary Frailty
Pathophysiology of Frailty

Frailty is independent risk factor for Falls

How do we objectively define Frailty?

“End of the bed” or “Eye ball”

While I can’t define it .... I know it when I see it.

Justice Potter Stewart,
US Supreme Court.
## Models: 1. Phenotype Model

### FRAILTY PHENOTYPE MODEL

<table>
<thead>
<tr>
<th>BASED ON OBJECTIVE CRITERIA:</th>
<th>Effects on Outcome Measures</th>
<th>FRAILTY CATEGORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Weight loss</td>
<td>New falls</td>
<td>• 3-5 – FRAIL</td>
</tr>
<tr>
<td>• Slow walking speed</td>
<td>Deteriorating mobility</td>
<td>• 1-2 – INTERMEDIATE</td>
</tr>
<tr>
<td>• Low levels of physical activity</td>
<td>Hospitalization</td>
<td>• 0 – NOT FRAIL</td>
</tr>
<tr>
<td>• Subjective exhaustion</td>
<td>Disability</td>
<td></td>
</tr>
<tr>
<td>• Weakness</td>
<td>Death</td>
<td></td>
</tr>
</tbody>
</table>

2. Deficit Accumulation Model

- **The Frailty Index (FI)** was initially created using data from the Canadian Study of Health and Aging CSHA by Kenneth Rockwood.
- 92 variables identified
  - A variety of symptoms
  - Abnormal lab values
  - Comorbidities
  - Disability assessment
- $\text{FI} = \frac{\text{number of variables identified}}{\text{total possible}}$
- $\text{FI} = 0.67$ threshold

*K Rockwood et al, A global clinical measure of fitness and frailty in elderly. CMJ 2006*
Appendix 1: List of variables used by the Canadian Study of Health and Aging to construct the 70-item CSHA Frailty Index

<table>
<thead>
<tr>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes in everyday activities</td>
</tr>
<tr>
<td>Head and neck problems</td>
</tr>
<tr>
<td>Poor muscle tone in neck</td>
</tr>
<tr>
<td>Bradykinesia, facial</td>
</tr>
<tr>
<td>Problems getting dressed</td>
</tr>
<tr>
<td>Problems with bathing</td>
</tr>
<tr>
<td>Problems carrying out personal grooming</td>
</tr>
<tr>
<td>Urinary incontinence</td>
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<tr>
<td>Toileting problems</td>
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<tr>
<td>Bulk difficulties</td>
</tr>
<tr>
<td>Rectal problems</td>
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<tr>
<td>Gastrointestinal problems</td>
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<tr>
<td>Problems cooking</td>
</tr>
<tr>
<td>Sucking problems</td>
</tr>
<tr>
<td>Problems going out alone</td>
</tr>
<tr>
<td>Impaired mobility</td>
</tr>
<tr>
<td>Musculoskeletal problems</td>
</tr>
<tr>
<td>Bradykinesia of the limbs</td>
</tr>
<tr>
<td>Poor muscle tone in limbs</td>
</tr>
<tr>
<td>Poor limb coordination</td>
</tr>
<tr>
<td>Poor coordination, trunk</td>
</tr>
<tr>
<td>Poor standing posture</td>
</tr>
<tr>
<td>Irregular gait pattern</td>
</tr>
<tr>
<td>Falls</td>
</tr>
<tr>
<td>Mood problems</td>
</tr>
<tr>
<td>Feeling sad, blue, depressed</td>
</tr>
<tr>
<td>History of depressed mood</td>
</tr>
<tr>
<td>Tiredness all the time</td>
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<tr>
<td>Depression (clinical impression)</td>
</tr>
<tr>
<td>Sleep changes</td>
</tr>
<tr>
<td>Restlessness</td>
</tr>
<tr>
<td>Memory changes</td>
</tr>
<tr>
<td>Short-term memory impairment</td>
</tr>
<tr>
<td>Long-term memory impairment</td>
</tr>
<tr>
<td>Changes in general mental functioning</td>
</tr>
<tr>
<td>Onset of cognitive symptoms</td>
</tr>
<tr>
<td>Clouding or delirium</td>
</tr>
<tr>
<td>Paranoid features</td>
</tr>
<tr>
<td>History relevant to cognitive impairment or loss</td>
</tr>
<tr>
<td>Family history relevant to cognitive impairment or loss</td>
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<tr>
<td>Impaired vibration</td>
</tr>
<tr>
<td>Tremor at rest</td>
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<tr>
<td>Postural tremor</td>
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<tr>
<td>Intention tremor</td>
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<tr>
<td>History of Parkinson’s disease</td>
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<tr>
<td>Family history of degenerative disease</td>
</tr>
<tr>
<td>Seizures, partial complex</td>
</tr>
<tr>
<td>Seizures, generalized</td>
</tr>
<tr>
<td>Syncope or blackouts</td>
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<tr>
<td>Headache</td>
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<tr>
<td>Cerebrovascular problems</td>
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<tr>
<td>History of stroke</td>
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<tr>
<td>History of diabetes mellitus</td>
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<tr>
<td>Arterial hypertension</td>
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<td>Peripheral pulses</td>
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<tr>
<td>Cardiac problems</td>
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<tr>
<td>Myocardial infarction</td>
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<tr>
<td>Arrhythmia</td>
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<td>Congestive heart failure</td>
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<tr>
<td>Lung problems</td>
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<tr>
<td>Respiratory problems</td>
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<tr>
<td>History of thyroid disease</td>
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<tr>
<td>Thyroid problems</td>
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<tr>
<td>Skin problems</td>
</tr>
<tr>
<td>Malignant disease</td>
</tr>
<tr>
<td>Breast problems</td>
</tr>
<tr>
<td>Abdominal problems</td>
</tr>
<tr>
<td>Presence of snout reflex</td>
</tr>
<tr>
<td>Presence of the palpmomental reflex</td>
</tr>
<tr>
<td>Other medical history</td>
</tr>
</tbody>
</table>
How common is Frailty among elderly?


• Around 10% of people aged over 65 years have frailty, rising to between a quarter and a half of those aged over 85 years. (Canada data Clegg A; Young J; Iliffe S; Rikkert MO; Rockwood K. Frailty in elderly people. Lancet. 2013; 381868):752-762)

• Higher in Women 8% vs 5%

• Increase with age (as mentioned above)
Why do we need to identify Frailty?

- Potentially reversible if intervened early
- Frailty should be identified with a view
  - To improving outcomes (Surgical or other intervention)
  - To avoiding unnecessary harm.
  - To making informed decision
- Screening and early intervention are a priority in primary health care.
Limitations in screening

• Perception on population screening
  • Age UK research has shown that in a series of filmed case studies of ‘frailty’, none of the participants classified themselves as “frail”.
  • Some of them mentioned finite periods where they “had been frail”, but they did not see it as a lifetime condition or as defining them.

• Time and Costly

• Lack of most suitable and validated screening tools
In what circumstances does it help to recognize people with frailty?

• Any interaction between an older person and a health or social care professional
• Routine outpatient appointments in all departments
  • Surgical (Orthopedic, GI, vascular and ophthalmic departments),
  • Medical and
  • Mental health (memory clinics).
• Primary care review of older people
  • either medical intervention or medicines review or one of the long term conditions clinics
• Social services assessment for care and support.
• Review by the community care teams and home carers in the community.

Fit for Frailty
British Geriatrics Society 2014
Measuring frailty

• There are **different intentions** in measuring frailty - assessing, screening, case-finding or predicting prognosis.

• Measurement **tools differ** - according to whether the tool is intended for **the researcher, lay research assistant, geriatrician, general practitioner, public health physician, epidemiologist or allied health professional**

• Measurement of frailty has mainly been undertaken in the research setting - so clinical use?
How do we screen?

### Frailty Scales (top examples)
1. Clinical Frailty Scale (9 stages)
2. CHSA-FI 70 items, SHARE-FI
3. Fried Phenotype Index
4. FI-CGA – Rockwood 70 items
5. Edmonton Frailty scale
6. Groningen Frailty Indicator
7. Tilburg Frailty Indicator
8. SHARE-FI75+
9. PRISMA self assessment questionnaire
10. SPPB (Short Physical Performance Battery)

### 7 simple methods, a review found those useful (BGS)
1. PRISMA questionnaire (>3)
2. Gait speed (<0.8 m/s) (>5 sec for 4 m)
3. Timed up and go test (>10 sec)
4. Self reported health <6
5. GP assessment on clinical status
6. Medications record (Polypharmacy >5)
7. The Groningen Frailty Indicator questionnaire (>4/15)

However, the accuracy of a test is related to the prevalence of a condition in a population.
Prisma 7 Questions

1] Are you more than 85 years?
2] Male?
3] In general do you have any health problems that require you to limit your activities?
4] Do you need someone to help you on a regular basis?
5] In general do you have any health problems that require you to stay at home?
6] In case of need can you count on someone close to you?
7] Do you regularly use a stick, walker or wheelchair to get about?
Comprehensive Geriatric Assessment

• Holistic medical review
• Takes 45 – 90 mins
• Involves multidisciplinary teams’ assessment
• Very good tool to diagnose Frailty
• Optimize medical conditions
• Set individualized goals
• Anticipatory care plan
• Medication review

• Comorbid conditions
• Function and mobility
• Cognition and mood, behavior
• Sensory assessment, vision, hearing
• Nutrition, Swallowing
• Continence, bowel and bladder
• Falls
• Medications
• Social background and care
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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DALHOUSIE UNIVERSITY
Inspiring Minds
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.
SPPB – Short Physical Performance Battery

• Balance – Side-by-side standing, semi tandem, tandem stand
• Gait speed – 3 meter walk test
• Chair stand test – 1 time, 5 times

Reference: A meta-analysis from 17 studies (n = 16,534, mean age 76 ± 3 years), SPPB less than 9 were associated with an increased risk of all-cause mortality. The association between poor performance on SPPB and all-cause mortality remained highly consistent independent of follow-up length, subsets of participants, geographic area, and age of the population.*

* Rita Pavasini et al; Short Physical Performance Battery and all-cause mortality: systematic review and meta-analysis; BMC Medicine, Dec 2016.
SPPB – Short Physical Performance Battery

1. Balance Tests
   - Side-by-Side Stand: Feet together side-by-side for 10 sec
     - 10 sec (1 pt)
     - < 10 sec (0 pt)  
       - Go to 4-Meter Gait Speed Test
   - Semi-Tandem Stand: Heel of one foot against side of big toe of the other for 10 sec
     - 10 sec (+1 pt)
     - < 10 sec (+0 pt)  
       - Go to 4-Meter Gait Speed Test
   - Tandem Stand: Feet aligned heel to toe for 10 sec
     - 10 sec (-2 pt)
     - 3-9.99 sec (+1 pt)
     - <3 sec (+0 pt)

2. Gait Speed Test
   - Measures the time required to walk 4 meters at a normal pace (use best of 2 times)
   - 4.82 sec 4 pt
   - 4.82-6.20 sec 3 pt
   - 6.21-8.70 sec 2 pt
   - >8.7 sec 1 pt
   - Unusable 0 pt

3. Chair Stand Test
   - Pre-test: Participants fold their arms across their chest and try to stand up once from a chair
   - Unable Stop (0 pt)
   - 5 repeats: Measures the time required to perform five rises from a chair to an upright position as fast as possible without the use of the arms
   - 5-11.10 sec 4 pt
   - 11.20-13.60 sec 3 pt
   - 13.70-16.60 sec 2 pt
   - >16.7 sec 1 pt
   - >60 sec or unable 0 pt
Hand Grip Strength (HGS)

• Several cross sectional studies show close correlation between HGS and functional mobility, disability
• Portable instrument, easy to use
• Results – depends on type of instrument, instruction given
• Most reliable and commonly used – Jamar dynamometer
Any of tools are yet validated in Singapore.

So.. You may go back to this!

“End of the bed” or “Eye ball”

While I can’t define it …. I know it when I see it.

Justice Potter Stewart.
US Supreme Court.
Some recommendations by BGS

- Gait speed, TUGT
- PRISMA questionnaire for self completion or postal questionnaire
- Hand grip strength – may be useful when patient is not feasible to walk
- Outpatient surgical setting – Edmonton frail scale with identification of aspects of frailty amenable to preoperative optimization (e.g. cognition, nutrition)

- 2 steps approach
  - PRISMA7 questionnaire
  - Gait speed / TUGT/ HGS
  And
  - Brief Clinical Assessment to confirm frailty
- Comprehensive Geriatric Assessment, then
  - CFS to assess severity
Osteoporosis

- Education
- Counseling
- Fall Prevention Information (Foot Wear, Home Safety, etc.)

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<thead>
<tr>
<th>Date</th>
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</table>

2. Strength: (Tested with Dynamometer: kg pressure generated.)
   Best of 3 efforts in the dominant limb tested. (kg) in kg force

<table>
<thead>
<tr>
<th>Ankle Dorsiflexion:</th>
<th>Hand Grip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td>Right</td>
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<tr>
<td>Left</td>
<td>Left</td>
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<table>
<thead>
<tr>
<th>Sitt to Stand X6</th>
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<tbody>
<tr>
<td>1st attempt</td>
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<tr>
<td>2nd attempt</td>
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<tr>
<th>Time up and Go</th>
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<tbody>
<tr>
<td>1st attempt</td>
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<td>2nd attempt</td>
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</tbody>
</table>

Clinical Frailty Score

- Very Frail: Active and motivated, regular exercise, fit for their age
- Fair: No active disease symptoms, occasionally active
- Moderate: Sedentary, occasionally active
- Vulnerable: Not dependent but active limitations
- Morally Frail: Limited mobility, need help with high-risk ADLs
- Moderately Frail: Need help with all outdoor activities and housekeeping
- Generally Frail: Completely dependent for personal care
- Very Severely Frail: Completely dependent and approaching end-of-life
- Terminal: Life expectancy less than 6 months

Adapted with permission from Rockwood, Katz, (2005).

Falls Specific Tools - PRI BM 7 Questionnaires

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you more than 85 years of age?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Is it hard to walk?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>In general, do you have any health problems that require you to limit your activities?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Do you need someone to help you do a regular daily task?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>In general, do you have any health problems that require you to stay at home?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>In case of need, can you count on someone close to you?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Do you regularly use a stick, cane, or wheelchair to get around?</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Frailty Management

The focus of care should be to:

- **Exclude any modifiable precipitating causes of frailty**, including causes that are treatable or environmental

- **Improve the core manifestations of frailty**, especially physical activity, strength, exercise tolerance, and nutrition

- **Minimize the consequences of vulnerability**, whether in terms of environmental risks, risks from low social support, or risks from stressors such as acute illness or injury, hospitalization, or surgery
What do I/ We do?

• Holistic review of medical, functional, psychological and social needs based on CGA principles

• Ensure that reversible medical conditions are considered and addressed.

• **Consider referral to geriatric medicine where frailty is associated with significant complexity, diagnostic uncertainty or challenging symptom control.**

• Conduct personalized medication reviews for older people with frailty possibly using evidence based criteria (e.g. STOPP START criteria).

• Generate a personalized shared care and support plan (CSP) which documents treatment goals, management plans, and plans for urgent care, determined in advance. (ACP)
What do I/ We do?

• Establish systems to share the health record of older people with frailty between primary care, emergency services, secondary care and social services.

• Develop local protocols and pathways for old people with frailty, taking into account the common acute presentations of falls, delirium and sudden immobility, ensuring a timely response to urgent need.

• Many older people with frailty in crisis will manage better in the home environment but only with support systems for their health and care.
Exercise to Modify Frailty

• Why might exercise work?
  • Spontaneous increase in gait speed (Hardy 2007)
  • Self participation in exercise (Peterson 2009)

• Types of exercise
  • Aerobic / endurance training
  • Resistance training – improved strength and function

• The evidence... (Valkenet 2010, Jack 2011)
  • Care home residents (Forster 2010)-
  • In heart failure (Witham 2003) – improved symptoms & exercise capacity
  • Following hip fracture (Binder 2004) -
Effect of Exercise:

• Exercise programs in very old patients may lead to improvements in several domains including
  • Strength
  • Cognitive well-being
  • Balance

• Physical activity programs: reduction in
  • inflammatory activation
  • production of free radical scavengers
  • metabolic modulation
  • improvement of insulin resistance
Nutrition to Modify Frailty

• Vitamin D supplementation – Latham 2003
  • Combat sarcopenia
  • Not shown to modify sarcopenia

• Protein supplementation: - Waters 2010, Kim 2012
  • Benefit in sarcopenia and frailty related outcomes
  • Controversy regarding amount and form

• Anaemia can be considered surrogate marker for nutrition
  • Iron, B12 and Folate
  • 28 days prior to surgery
Take home messages

• Frailty is getting common as population age, associated with poor health outcomes.

• Frailty is with the spectrum of severity and reversible if intervene early.

• It is recommended to screen every elderly who comes to the clinic for their health related conditions.

• Recommended screening tools for frailty are CGA, PRISMA 7 questionnaire, STS, TUGT/gait speed, HGS, CFS for severity.

• Refer those with significant complexity, diagnostic uncertainty or challenging symptom control, falls to Geriatric Clinics/ Falls and Balance clinic/ Frailty clinic.

• Treat easily correctable insults like infections, Encourage strengthening exercise, Oversee nutrition, and Modify those which can worsen vulnerability.
Unanswered Questions:

• Should we routinely measure Frailty?
• Which tool, biomarker or functional assessment?
• What should be our frailty intervention be? Are Nutrition and Exercise enough to prevent frailty?
• Do we count frailty in acute life threatening but reversible condition e.g. with emergency surgery?
• Thank you
• Questions?