FRAILTY

OBJECTIVES
Know and understand:

► Why frailty is a clinical syndrome
► Clinical manifestations of frailty
► Frailty AE’s
► Frailty prevention
► Assessment & management
TOPICS COVERED

- Evidence as to Cause of Frailty
- Assessment of Frailty
- Management Strategies
- Prevention of Frailty
- Frailty vs Failure to Thrive
- Frailty and Palliative Care

Active Learning

- Write your definition of frailty that could be used by clinicians to detect frail older adults.
- Use at least 5 signs or symptoms in your definition.
DEFINE FRAILTY
❖ Age-related syndrome
❖ Decreased physiologic reserves
❖ ↑ vulnerability to stressors
❖ Multiple symptoms (e.g., weakness and fatigue)
❖ Adverse events

CORE CONCEPT
Stressor Risks:
Heat / cold exposure
infection / trauma,
hospitalization / surgery

Delayed recoveries
Functional impairment
Dependency / isolation
Death
Post operative delirium in frail older adults

Aging and Homeostasis

Adapted from *Physiological Basis of Aging and Geriatrics* Paola Timiras
Trajectories

Function

Stressor

100 %

3 months

FRAILTY CONTINUUM

Very fit
Fit
Managing Well
Vulnerable
Mildly Frail
Moderately Frail
Severely Frail
Very Severely Frail
Terminally Ill

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FRAILTY AS A CORE CONCEPT

▶ Severe stage
  ▶ irreversible,
  ▶ pre death phase
  ▶ high 12 M mortality
▶ Earlier phase
  ▶ responsive to treatment

Primary frailty
—results from intrinsic aging processes
Secondary frailty
—associated with end stages of several chronic diseases
How do you identify physiologically vulnerable people before frailty becomes clinically apparent?

2 FRAILTY CONCEPTS

- The number of chronic conditions predicts vulnerability
- Multiple systems dysregulated
Clinical manifestations

- Strength
- Balance
- Motor processing
- Nutrition
- Endurance
- Physical activity
- Mobility
- Cognition (maybe)

CYCLE OF DYSREGULATED ENERGETICS

- Disease, environment, medications
- Chronic undernutrition
- Total energy expenditure
- Activity
- Walking speed
- Strength and power
- VO2 max, exhaustion
- Disability
- Immobility
- Impaired balance
- Falls and injuries
- Sarcopenia, weight loss
- Insulin sensitivity
- Osteopenia

Cycle of Frailty

- Resting metabolic rate
- Immobilization
- Falls and injuries
FRAILTY: A PHYSIOLOGIC PROCESS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Criteria for frailty*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss</td>
<td>Lost &gt;10 pounds unintentionally last year</td>
</tr>
<tr>
<td>Exhaustion</td>
<td>Felt last week that “everything I did was an effort” or “I could not get going”</td>
</tr>
<tr>
<td>Slowness</td>
<td>Time to walk 15 ft (cutoff depends on sex and height)</td>
</tr>
<tr>
<td>Low activity level</td>
<td>Expends &lt;270 kcal/week (calculated from activity scale incorporating episodes of walking, household chores, yard work, etc.)</td>
</tr>
<tr>
<td>Weakness</td>
<td>Grip strength measured using hand dynamometer (cutoff depends on sex and BMI)</td>
</tr>
</tbody>
</table>

FRAILTY
A PHYSIOLOGIC PROCESS

1st manifestations

• weakness
• slow walking speed
• decreased physical activity

Consider differential diagnosis

FRAILTY DIFFERENTIAL DIAGNOSIS

WEIGHT LOSS
Medical: cancer, endocrine, chronic inflammation, organ failure
Psychological
Medications

FATIGUE
OSA
Anemia
Adrenal insufficiency

WEAKNESS
Nervous system
Electrolyte disorders
Myopathies
Medications
FRAILTY AS A PHYSIOLOGIC PROCESS

EVIDENCE AS TO CAUSE:
PRIMARY FRAILTY

- Inflammation (indicated by increased IL-6 and CRP)
- Decreased immune function
- Anemia
- Increased glucose intolerance, insulin resistance
- Low levels of DHEA-S and IGF-1
- Increased cortisol, low testosterone
- Decreased heart rate variability
- Mitochondrial and bioenergetic defects
- Nutritional derangements
EVIDENCE AS TO CAUSE:
SECONDARY FRAILTY

Frailty phenotype:

Immune disorders (HIV/AIDS)
Heart failure
COPD
Chronic infections (cytomegalovirus, TB)

Why Screen patients for frailty?
- Identify risk
- Gauge severity
- Prevention or treatment
- Track change in status over time
- Palliative care transitions
FRAIL Scale

- Fatigue
- Resistance (the ability to climb one flight of stairs)
- Ambulation (the ability to walk one block)
- Illness (greater than five)
- Loss of weight (>5%)

Scoring: 0 = Robust  1-2 = Pre-frail  > 3 = Frail
STRATEGIES FOR MANAGING FRAILTY

Implements outcomes for
- polypharmacy,
- falls,
- functional status,
- mood,
- nursing home admission,
- mortality

The focus of care:

Exclude secondary causes of frailty
- atrophic gastritis or unresolved grief

Improve the clinical manifestations of frailty
- physical activity, strength, and nutrition

Minimize vulnerability
- social support, avoid hospitalization or surgery
STRATEGIES FOR MANAGING FRAILTY

Promote adaptations

► Carefully chose goals

► ADL / IADL support
  ❖ Meal on wheels, Assisted Living, Home companion, personal trainer
  ❖ Optimize the abilities needed to reach these goals
  ❖ Compensate for diminished competencies by increased reliance on other functions or by replacement (e.g., meal on wheels or ALF)

FRAILTY PREVENTION

► Anticipate and avert physiological and psychosocial stressors

► Key precipitants:
  ➢ Immobility: my accelerate the onset of dependency
  ➢ Depression: associated with decreased activity, energy, nutritional intake, inflammation, and social isolation. Appears to be an outcome of frailty as well as a precipitant: Hospitalization, surgery
FRAILTY PREVENTION:
PHARMACOLOGIC TREATMENT

- Hormone replacement does not work
- Future drug treatments need to target multiple systems simultaneously
  - Bioenergetics
  - Anti-inflammation
- Decrease polypharmacy

FRAILTY PREVENTION

- Maintain physical activity and muscle mass
- Resistance, or strengthening, exercise
- Other forms of exercise, including stretching, Tai Chi, and aerobic exercise, also help
- Prevent immobility
FRAILTY PREVENTION

- Mediterranean diet lowers frailty risk over 6 years in community dwelling adults ≥ 65
- Protein and micronutrients supplementation
  - Warning: Sarcopenia in obesity
- In many studies, nutritional supplementation appears to be effective only when added to exercise

FRAILTY AND FAILURE TO THRIVE

- “Failure to thrive” was historically a diagnosis applied to an older patient with severe symptoms that have no apparent cause
- Some experts believe the term should be abandoned because it does not assist in thoughtful evaluation
- Some argue that a term initially used to describe delayed development in children is pejorative when applied to older adults
- Conceptually there may well be overlap between the concept of failure to thrive and very severe or end-stage frailty
FRAILTY AND PALLIATIVE CARE

- Frailty predicts:
  - functional decline
  - dependency at the end of life

- Palliative Care for
  - Frailty score of 4–5
  - low cholesterol and albumin

SUMMARY

- Clinical syndrome dysregulated energetics clinical markers
- physiologic dysregulation
- perturbed cellular and molecular processes

Frailty Index:
1. weakness
2. slowed walking speed,
3. low physical activity,
4. low energy or exhaustion
5. weight loss
SUMMARY

- High risk of adverse clinical outcomes, including falls, disability and dependency, and mortality
- Frailty develops along a continuum of severity,
- The most effective prevention
  - maintaining muscle mass and strength
  - Mediterranean diet

Frailty as a Clinical Syndrome

Clinical Syndrome of Frailty

SYMPTOMS
- Weakness
- Fatigue
- Anorexia
- Under nutrition
- Weight Loss

SIGNS
- Physiologic changes marking increased risk
- Decreased muscle mass
- Balance and gait abnormalities
- Severe deconditioning

Adverse Outcomes of Frailty
- Falls
- Injuries
- Acute Illnesses
- Hospitalizations
- Disability
- Dependency
- Institutionalization
- Death
CASE PRESENTATION

78M c/o arthritis in his hands, shoulders and knees. He is a farmer and worries that arthritis will interfere with his work. He is tired all the time.

Discussion centers on better pain management, what matters, mobility, medications, and mentation.

CASE 1

What aspect of the frailty phenotype predicts reduced activity?

A. Weight loss

B. Exhaustion or fatigue

C. Decreased strength

D. Diminished walking speed
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What aspect of the frailty phenotype predicts reduced activity?

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D. Diminished walking speed

[Diagram showing the relationships between aging, malnutrition, and decreased activity.]
Summary

- Active life expectancy is often followed by a 2 – 3 year span of frailty prior to death, irrespective of age when death occurs.
- Frailty is common and ~ 15% of older adults
- Screening tools such as FRAIL help clinicians better recognize and manage this Geriatric syndrome.
- Frailty can be prevented and may be reversible.