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Frailty: From Definition to Solution

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Definition of Frailty

- Frailty is an attribute of aged people who are at increased risk of adverse health outcomes
 - Diminished ability to respond to stress
 - An accumulation of deficits



Definition

- First proposed by Buchner & Wagner (1992) as a syndrome of
 - Weakness
 - Impaired mobility
 - Balance
 - Minimal reserve



Definition

- Fried & colleagues from the Cardiovascular Health Study further characterized individuals as frail if :
 - Unintended weight loss (4.5 kg or more in the past year)
 - Fatigue/exercise intolerance
 - Weakness
 - Slowed motor performance
 - Low physical activity



Fried et al Phenotype

- A condition meeting 3 of the 5 phenotypic criteria:
 - Low grip strength
 - Low energy
 - Slowed walking speed
 - Low physical activity
 - Unintentional weight loss




Measurement of Criteria

- Weight loss
 - > 4.5 kg unintentional
 - Some calculations used:
 - Weight in previous year-current weight/weight in previous yr $\geq .05$ and the loss was unintentional
 - Weight at age 60-weight at examination/weight at age 60 ≥ 0.1 BMI at examination <18.5



Measurement


- Exhaustion
 - Self report



Measurement


- Low physical activity
 - Women: energy <270 kcal on activity scale (18 items)
 - Men: energy < 383 kcal on activity scale (18 items)

verbal report




Measurement

- Slowness
 - Observed when walking 4.57 m at usual pace
 - Women: $\geq 7s$ for height ≤ 159 cm
 - Women: $\geq 6s$ for height > 159 cm
 - Men: $> 7s$ for height ≤ 173 cm
 - Men: $\geq 6s$ for height > 173 cm




Measurement

• Grip strength	• Grip strength
– Women	– Men
• ≤ 17 kg for BMI <23	• ≤ 29 kg for BMI < 24
• ≤ 17.3 for BMI 23.1-26	• ≤ 30 for BMI 24.1-26
• ≤ 18 kg for BMI 26.1-29	• ≤ 30 kg for BMI 26.1-28
• ≤ 21 kg for BMI >29	• ≤ 32 kg for BMI > 28



Prefrail Stage

- 1 or 2 criteria from phenotype are present
- Purpose: to identify a group at high risk of progressing to frailty




Alternative Definition of Frailty

- Frailty has also been operationalized as a risk index by counting the number of deficits accumulated over time

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Frailty Index



Frailty Index

- **Includes**
 - Disability
 - Diseases
 - Physical and cognitive impairments
 - Psychosocial risk factors
 - Geriatric syndromes (eg, falls, delirium)

Rockwood and colleagues (1999)



Frailty Index vs Phenotype

- **Disadvantage**
 - Less practical for clinical setting use
 - Phenotype is 5 items
 - Frailty Index is 30-70 items
- **Advantage**
 - More sensitive predictor of adverse health outcomes



Natural History of Frailty

- Process is variable by person
- Weakness tends to be the first clinical indication → slowness → low physical activity.....
- Weakness believed to be due to associated sarcopenia (loss of muscle mass and quality)



The Heterogeneity of Frailty

- Different patterns of development
- In some studies...neither slow walking speed or low activity were associated with frailty
 - ?Observation of behavior versus self report in epidemiological studies



DOOM and GLOOM?

- Not everyone progresses down the slippery slope of frailty
 - 35% of individuals were noted to progress from states of greater to lesser frailty
 - 34% of 405 of the women in the WHASII progressed from states of greater to lesser frailty

Gill et al., 2006; WHASII



Not Everyone Becomes or Acts Frail

- Difficulty with mobility, ADL, IADL does not lead to reduced life space (eg activity) for all.
- Discordance noted between physical capacity and activity
 - Compensation occurs



Progression

- Good bad or otherwise is variable
 - Some progress rapidly
 - Others slowly from prefrail onward

Hmm...What is the Catch

- Multifactorial causes
 - Intrapersonal
 - Interpersonal
 - Environment
 - Policy



Social-Ecological Model



Intrapersonal Center

IT IS ALL ABOUT RESILIENCE!

Resilience

- The capacity to spring back from a physical, emotional, financial, or social challenge
 - Adaptive behavior
 - Less likely to succumb to the challenge
 - Dynamic process and influenced by life over time



Resilience

- Positive interpersonal relationships
- Strong Self efficacy
- Positive Self-esteem
- A sense of purpose
- Spirituality
- Ability to use Humor
- Creativity
- Acceptance of changes
- Maintaining a positive attitude
- Ability to identify and utilize resources
- Self-determination
- Optimism

Need Motivation to be Resilient

- Resilient reintegration for success requires increased energy/motivation to happen
- Motivation=The inner urge that moves or prompts a person to action

Overcoming Frailty

- Healthy behaviors throughout lifespan
- Cognitive stimulation
- Maintaining a purpose in life

Exercise

- Meta-analytic reviews provide strong evidence that participation in either non-specific physical activity or specific aerobic or resistive exercise helps to:
 - decrease risk of coronary heart disease and stroke;
 - lower incidence of viral episodes;
 - decrease progression of degenerative joint disease;
 - prevent osteoporosis of the lumbar spine;
 - decrease incidences of falls;
 - increase gait speed and
 - improve mood, memory and quality of life.

Physical Activity

- Targets 4 frailty criteria
 - Weakness
 - Low physical activity
 - Slowed motor performance
 - Exercise intolerance

Aerobic Activity

- Increases Vo2 max
- Increases muscle mass

Resistance exercise

- Increases muscle strength (Latham et al.; Cochrane review)

Combined Aerobic / Resistive

- Logically would anticipate better outcomes
- Meta-analysis of 6 studies (Baker et al) noted prevention of falls post combined exercise
- Ongoing research needed
 - LIFE study provides some preliminary support



Can Exercise Reverse Frailty?

- Ongoing research is needed
- FIT trial

Conversely.....

- Sedentary lifestyles exacerbate coronary heart disease, degenerative joint disease and osteoporosis, and likelihood of falls and other injuries.
 - It is not just what you do... but what you don't do!

Despite What We Know

- Only 30% engage in regular physical activity
- Obesity continues to be a major problem
- Approximately 9-11% of older adults smoke
- HIV continues to rise in older adults
- Preventable falls happen



Factors that Influence Motivation/ Resilience

- Social supports
- Beliefs (SEE; OE)
- Unpleasant/pleasant sensations
- Mood
- Personality: Resilience
- Goals
- Environment
- Policies

Intrapersonal Level

- At the cellular level and beyond
 - Vitamin D
 - Anemia
 - C/V-CHF and EF/ Afib/Aortic stenosis/
 - Cognition
 - DJD
 - CVA
 - Motivation, resilience and mood

A Note On Resilience

- If you weren't in line when it was handed out.....
 - Resilience can be developed
 - vigor, optimism, and physical robustness;
 - improving socialization practices; and
 - strengthening self-efficacy, self-esteem, and motivation through interpersonal interactions as well as experiences.

Intrapersonal: Motivation

- Inner urge that moves or prompts a person to action
- It is what it is and what it is can be manipulated in frail older adults
 - It is never too late
 - Never give up!

Interpersonal/ SCT Interventions Influence Motivation

- Performance: Just do it
- Verbal encouragement: Just push it
- Physiological feedback: Just eliminate the unpleasant sensations
- Cueing/Role modeling : Just remind

Motivating the Older Adult

- Tricks of the trade
 - Use cueing!
 - Allow extra time to accomplish tasks
 - Do not RUSH!
 - Be kind/patient
 - Set up to succeed!
 - Use appropriate devices to make task easier

Tricks of the Trade in Dementia

Memory impairment
Aphasia
Motor apraxia
Agnosia
Apathy
Depression
Agitated
uncooperative
behaviors

Motivation Tricks of the Trade in Dementia

- **Modifying Communication Techniques**
 - Verbal & written cues; communicating “face on”; repetition; role modeling
- **Care and Consistency**
- **Enhancing Sensory Experiences and the Physical Environment-strong and multiple stimulations (dance & music)**
- **Individualized Care**

Environmental Opportunities

- **General**
- **P-E Fit (Housing Enabler): Fit between individual characteristics and environment and identified barriers.**

General Environment

- **Are there opportunities for challenges?**
- **Are there pleasant/goal producing destinations?**
- **Is it safe-flat smooth but not slippery etc.**
- **Is it wide open and flat and clear**
 - Doorways and clutter free and individual with PD.

P-E Fit : Person Factors & Environment


- **Vision**
- **Hearing**
- **Balance**
- **Coordination**
- **Endurance**
- **ROM**
- **Use of assistive device**
- **Weight/size extremes**

Easy Environmental Changes

- **Clear pathways and rails**
 - Provide a wonderful opportunity to walk
 - Pleasant walking areas and destinations
- **Cues**
 - Reminders-signs and posters
 - Opportunities
- **Bed height**
 - Optimal between 80 and 120 % of lower leg length

Policy

- The message
- The law



Policy Messages

- Safety versus function and physical activity
 - Locked doorways and limited access
 - Lack of outdoor opportunities
 - In facilities marketing materials
 - Care *for* or Care *with*? What is the philosophy of care?



Frailty Doesn't Have to Happen

People who roll with the waves of life!