

# Detection and Significance of Frailty in Elderly Insurance Applicants

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# Detection and Significance of Frailty in Elderly Insurance Applicants

- Description
- Pathophysiology
- Predictors of frailty
- Frailty in Asia
- Underwriting considerations

# Frailty important to insurers: No agreement on definition or measurement

- Frail person at high risk for
  - Disability: disability insurance
  - Failure of instrumental activities of daily living (IADLs) and activities of daily living (ADLs): long term care insurance
  - Death: life insurance and substandard annuities
- Dozens of proposed definitions and measurement criteria
- General description
  - Geriatric syndrome of advanced age that leaves person vulnerable to falls, functional decline, morbidity, and mortality

# Descriptions of frailty

Descriptions of the frailty syndrome
Condition of advanced age characterized by vulnerability to stressors and decreased ability to maintain homeostasis*
Precarious balance between ability to maintain health and function, and deficits that threaten the balance
Diminished ability to carry out important practical and social activities of daily living
Lack of physiologic reserve, "living on the edge," near threshold for failure
Inability to mount a response in the face of stress
Multisystem impairment
Instability, with changes over time
Inability to regain function after acute illness
Low energy expenditure, decreased muscle mass and strength, reduced mobility
Three of the following: involuntary weight loss, slow walking speed, low level of physical activity, subjective exhaustion, low grip strength
* Homeostasis is the ability to maintain functional status.

# Descriptions of frailty: Two underlying themes

- ★ Loss of functional reserve in multiple areas (domains)
  - Cognitive
  - Musculoskeletal (mobility, strength, balance, flexibility, reaction time, coordination)
  - Nutrition
  - Cardiovascular endurance
  - Other (depression, pain, impaired vision / hearing)
- ★ Existence at level close to or past threshold for failure, with negligible tolerance of external stresses of day-to-day living

# Frailty is not disability

- Frailty and disability: similarities
  - More common with advanced age, both increase morbidity and mortality
- Frailty and disability: differences
  - Frailty always means multisystem failure; disability may be due to failure of one or more systems
  - Frailty always unstable; disability may be stable
    - Unstable: small changes (minor illness or injury) lead to large effects (immobility, dependency, death)
  - Frailty is present in many older people who are not disabled
- Thus, frailty often described as “subclinical” or “preclinical” disability
  - Frail people may not be disabled, but high risk for future disability

# Prevalence

- 29-year follow-up in Alameda County Study (California, U.S.)\*
- Frailty: “deficiencies in two or more domains involving physical (e.g., sudden loss of balance, weakness), nutritive (e.g., loss of appetite or unexplained weight loss), cognitive, and sensory (e.g., reading a newspaper, hearing over the telephone) capabilities”
- Male / female differences not statistically significant

\* Strawbridge WJ, Shema SJ, Balfour JL, et al. Antecedents of frailty over three decades in an older cohort. J Gerontol 1998;53B:S9-S16.

Characteristic	Subjects	Frail (%)
Age	--	--
65-69	169	18.3
70-74	175	21.7
75-79	109	32.1
80-84	80	32.5
85+	41	48.8
Gender	--	--
Male	247	28.3
Female	327	24.5

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# Pathophysiology: Sarcopenia

- Age-related decline in muscle mass
- Result
  - Slow walking speed
  - Low physical activity
  - Decreased exercise tolerance
  - Low grip strength
  - Increased fall rates
  - Decreased ability to maintain body temperature
- Both males and females have age-related decline in muscle mass
- Sarcopenia affects women more
  - Lower baseline total muscle mass
  - Increased rate of loss of muscle mass in postmenopausal period
- Thus, women reach critical threshold of muscle mass loss and weakness more quickly

# Pathophysiology: Neuroendocrine dysregulation

- Age-related dysregulation between hypothalamus, pituitary gland, adrenal glands
- Testosterone decreases in males
  - Testosterone helps maintain muscle mass
  - Levels decrease gradually
  - Contributes to sarcopenia
- Estrogen decreases in females
  - Levels decline rapidly at menopause
  - Contributes to rapid loss of muscle mass
- Cortisol secretion by adrenal glands increases in males and females
  - Contributes to sarcopenia, decreased resistance to infection
  - Older women have higher cortisol levels than men, so more sarcopenia
- Growth hormone secretion by pituitary gland decreases in males and females
  - Needed to maintain muscle mass
  - Older women have lower levels than men, so more sarcopenia

# Pathophysiology: Immune dysfunction

- Cytokines
  - Regulatory peptides produced by nucleated cells
  - Cytokine family includes interleukins, interferons, tumor necrosis factor, transforming growth factor, colony-stimulating factor, others
- Aging associated with
  - Increased levels of catabolic cytokines (which breakdown tissue), e.g., interleukin-6, tumor necrosis factor, others
  - Decline in humoral immunity
- Result
  - Increase in sarcopenia
  - Exacerbation of neuroendocrine dysregulation
- Gender differences in catabolic cytokine production
  - Males: Testosterone limits production
  - Females: Estrogen may increase production, so greater likelihood of frailty

# Pathophysiology: Related factors

- Bone loss
  - Women lose bone mass faster, starting from lower baseline
  - Series of events
    - Women have more sarcopenia, so more weakness and falls
    - When falls occur, lower bone mass results in more fractures
- Physical activity
  - Older men generally more active and have higher food intake
    - Sarcopenia develops more slowly
- Result of these processes: women approximately twice as likely to develop frailty

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# Factors associated with morbidity and mortality in the elderly

- Factors associated with morbidity and mortality also common in frail elderly people
- Geriatric syndromes
  - often contribute to death, e.g., depression, failure to thrive, osteoporosis, neglect and abuse
  - may directly cause death, e.g., falls
  - identify frail people, e.g., delirium, incontinence, polypharmacy

## Factors associated with morbidity and mortality in the elderly

Advanced age

Functional decline

Instrumental activities of daily living

Activities of daily living

Comorbidity

Number of comorbid conditions

Severity of comorbid conditions

Geriatric syndromes

Delirium\*

Dementia

Depression

Osteoporosis

Failure to thrive†

Falls

Incontinence

Neglect and abuse

Polypharmacy‡

\* Delirium is transient cognitive impairment due to a medical condition unrelated to the central nervous system.

† Failure to thrive is a poorly understood syndrome characterized by weight loss despite adequate food intake.

‡ Polypharmacy means five or more medications.

# Factors associated with functional decline

- Review of risk factors\*
- Useful to underwriters
  - risk higher with depression
  - small / moderate alcohol intake lowers risk
  - risk with comorbidity depends on which diseases
  - risk higher if five or more medications
  - risk higher if social isolation

\* Stuck AE, Walthert JM, Nikolaus T, et al. Risk factors for functional status decline in community-living elderly people: A systematic literature review. Soc Sci Med 1999;48:445-58.

Summary of risk factors associated with decline in functional status	
Variable	Risk of decline
Psychiatric	--
Depression	Higher
Anxiety	None
Alcohol	--
Small to moderate amounts	Lower, males and females
Heavy drinking	Higher, males only (insufficient data for females)
Cognition	Higher (highly significant)
Comorbidity	Higher, but variable depending on disease combinations
Falls	Higher, but only if more than one fall
Functional limitation	Higher (highly significant, a precursor to further decline)
Hearing	Higher, but minimally higher
Medications	Higher if $\geq 5$ medications, independent of underlying diseases
Nutrition	Higher for both high and low BMI
Physical activity	Higher with physical inactivity, lower with physical activity
Self-rated health	Higher if poor self-rated health
Smoking	Higher if current or former smoker
Social factors	Higher if social isolation*
Vision	Higher with visual impairment
Specific medical disorders	Higher with many impairments, innumerable combinations
Socio-demographic	--
Age	Always the highest risk factor
Gender	Males and females similar after adjusting for other variables
Income	Higher with low income
Education	Higher if less education
Marital status	None

\* Social isolation may indicate cognitive impairment or existing problems with IADLs or ADLs.

# Likelihood of frailty after 29-year follow-up

- Alameda County Study (California, U.S.) reported frailty over 29-year follow-up
- Odds ratio = odds of frailty with risk factor divided by odds of frailty without risk factor
- Strongest predictors: history of fair / poor perceived health, depression, two or more chronic symptoms, physically inactive
- Authors: “prior smoking may cast a long shadow impacting frailty in old age”
  - Effect of smoking related most strongly to amount / duration of smoking (pack-years)
  - e.g., risk high in former “life-long” smoker who quit within last few years

Likelihood of frailty over 29-year follow-up		
Characteristic	Subjects	Odds ratio
Fair/poor perceived health	67	4.1
Depressed	53	3.2
2+ chronic symptoms	177	2.6
Physically inactive	355	2.0
Socially isolated	78	1.6
Alcohol consumption	--	--
Abstainer	94	1.6
Heavy drinker	69	1.4
Cigarette smoker	173	1.4
Obesity	97	1.2

# Modified physical performance test

- Modified physical performance test provides objective assessment of frailty\*
- High correlation with
  - disability
  - loss of independence
  - early mortality
  - nursing home placement

\* Brown M, Sinacore DR, Binder, EF, et al. Physical and performance measures for the identification of mild to moderate frailty. *J Gerontol A Biol Sci Med Sci* 2000;55:M350-5.

## Modified physical performance test items\*

1. Book lift. A book of about 7 pounds (3.2 kg) is lifted from waist height to a shelf approximately 12 inches (31 cm) above shoulder level.
2. Put on and take off a coat. Subjects put on and take off a standard lab coat of appropriate size as quickly as possible.
3. Pick up a penny. Subjects pick up as quickly as possible a penny that is located about 12 inches (31 cm) in front of the foot.
4. Chair rise. Subjects sit in a chair that has a seat height of 16 inches (41 cm). They then stand fully and sit back down, without using the hands, five times, as quickly as possible.
5. Turn 360 degrees. Participants turn both clockwise and counterclockwise quickly but safely. They are subjectively graded on steadiness and ability to produce continuous turning movement.
6. 50-foot (15 m) walk. Subjects walk 25 feet (7.5 m) in a straight line, turn, and return to the initial starting place as quickly as possible, safely.
7. One flight of stairs. The time required to ascend 10 steps.
8. Four flights of stairs. Participants climb four flights of stairs. One point is given for each flight of stairs completed.
9. Progressive Romberg tests. Subject are scored according to their ability to maintain a reduced base of support: feet together, semi-tandem, and full tandem, for a maximum of 10 seconds.

\* Each of the nine items of the PPT was worth a maximum of four points, for a perfect score of 36. Frailty status was assessed as follows: not frail, 32 to 36 points, mild frailty, 25 to 31 points, and moderate frailty, 17 to 24 points. Prior experience indicated that subjects with scores below 17 could not live independently in the community.

# Modified physical performance test

- Test includes
  - Upper / lower extremity strength
  - Range of motion
  - Balance
  - Gait (speed, stride length)
  - Coordination and reaction speed
  - Sensation
- Frail people have deficits in multiple areas
  - Isolated measures (strength, flexibility, coordination) insufficient for identifying frailty
- Balance is major determinant of frailty
- Physical tests do not identify all frail people
  - Other factors contribute to frailty, e.g., cognitive impairment, depression, impaired vision or hearing, pain, comorbidity

# Modified physical performance test

- Gait speed important
  - Average “fast” gait speed for moderate frailty group almost equal to preferred (untested) gait speed of “not frail” subjects
  - Fastest gait speed for moderate frailty group so slow that they would not be able to cross street before stop light changes from green to red
- Walking speed of 4 feet/second (1.2 meters/second) needed to cross street before *Walk* sign changes to *Don't Walk*
- Other investigators report that slow gait is strong predictor of functional decline
  - Gait speed may be marker for unmeasured comorbidity

# Frailty index

- Some authors propose frailty index\*
- No accepted scoring system
- Frailty will eventually be defined and quantified via some index
- Much work remains to be done to determine index components, measures, scoring system

\* Campbell AJ, Buchner DM. Unstable disability and fluctuations of frailty. *Age and Ageing* 1997;26:315-18.

Component	Measurement
Musculoskeletal function	Grip strength
	Chair stand†
Aerobic capacity	Sub-maximal stress test
	6-minute walk
Cognitive/integrative neurologic function*	Mini-mental state exam
	Static balance test
Nutritional state	Body mass index

\* Functions required for interaction with the environment.  
† Time to complete five chair stands, i.e., stand up and sit down without using one's arms.

# Self-reported function

- Good correlation between self-reported function and actual performance\*
- Self-reported walking ability best single predictor of functional mobility
  - “Self-reported walking ability may be best indicator of ADL and mobility performance in community-dwelling older adults”
  - Why? Difficult with mobility predicts future disability with IADLs and ADLs

\* Alexander NB, Guire KE, Thelen DG, et al. Self-reported walking ability predicts functional mobility performance in frail older adults. J Am Geriatr Soc 2000;48:1408-13.

## Roslow-Breslau questionnaire

Able to do heavy work around the house like shoveling snow and washing windows, walls, or floors without help

Able to walk up and down stairs to the second floor without help

Able to walk a half a mile (1.6 km) without help

# Self-reported function

- 436 American women aged 70-79 asked if functions below could be done (1) with no difficulty, (2) only with task modification (change in method or frequency)
  - mobility
  - upper extremity function
  - household management
  - self-care
- Also tested for time to walk 13 feet (4 meters) and climb up and down one flight of stairs
- 18 months later, subjects asked about difficulties walking 1/2 mile (0.8 km) or climbing one flight of stairs
- If initially in “task modification” group
  - 4 times more likely to report walking / stair climbing problems
  - Task modification for mobility most predictive of future problems
- Disability also predicted by
  - time to walk 13 feet (4 meters)
  - time to climb up and down one flight of stairs

\* Fried LP, Bandeen-Roche K, Chaves PHM, et al. Preclinical mobility disability predicts incident mobility disability in older women. J Gerontol 2000;55A:M43-M52.

# Laboratory tests

- Numerous studies report higher mortality with low serum albumin\*
- Low serum cholesterol a risk factor for frailty#
- Low albumin and cholesterol reflect poor nutrition

\* Reuben DB, Ferrucci L, Wallace R, et al. The prognostic value of serum albumin in healthy older persons with low and high serum interleukin-6 (IL-6) levels. *J Am Geriatr Soc* 2000;48:1404-07.

# Ranieri P, Rozzini R, Franzoni S, et al. Serum cholesterol levels as a measure of frailty in elderly patients. *Exper Aging Res* 1998;24:169-79.

Relative risk of four-year mortality, by serum albumin level

Serum albumin (g/dL)	Relative risk
≥4.4	1.0
4.2-4.3	1.6
4.0-4.1	1.6
<4.0	2.2

# Other predictors of frailty

- Loss of function after hospitalization
  - If loss of function after hospitalization, 50% more likely to be readmitted to hospital or nursing home in next 6 months (U.S.)
- Overweight
  - Only very obese elderly women (BMI  $29 \text{ kg/m}^2$  or greater) at increased risk for functional decline (U.S.)
- Limited mobility
  - Inability to walk one kilometer / 0.6 miles (Japan)
- Minimal activity plus weight loss
  - Higher morbidity / mortality if combination of less than 3.5 hours per week of exercise or participation in avocations requiring physical exertion and weight loss of more than 4 kg (9 pounds) in prior five years (Holland)
- Orthostatic hypotension
  - Drop in systolic blood pressure of 20 mm Hg or more, or a drop in diastolic blood pressure of 10 mm Hg or more (Japanese Americans)

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# Frailty in Japan

- Study of 583 nondisabled, rural Japanese\*
  - Ages 65-89 (mean, 71±5)
  - Akita Prefecture, Honshu
  - 3-year follow-up
- Assessed IADLs and ADLs
  - Tokyo Metropolitan Institute of Gerontology Index of Competence

\* Ishizaki T, Watanabe S, Suzuki T, et al. Predictors for functional decline among nondisabled older Japanese living in a community during a 3-year follow-up. *J Am Geriatr Soc* 2000;48:1424-29.

Tokyo Metropolitan Institute of Gerontology Index of Competence	
1.	Can you use public transportation (bus or train) by yourself?
2.	Are you able to shop for daily necessities?
3.	Are you able to prepare meals by yourself?
4.	Are you able to pay bills?
5.	Can you handle your own banking?
6.	Are you able to fill out forms for your pension?
7.	Do you read newspapers?
8.	Do you read books or magazines?
9.	Are you interested in news stories or programs dealing with health?
10.	Do you visit the homes of friends?
11.	Are you sometimes called on for advice?
12.	Are you able to visit sick friends?
13.	Do you sometimes initiate conversations with young people?

# Frailty in Japan

- Decline in IADLs predicted by
  - age 75 years or older
  - low hand-grip strength
  - hospitalization in prior year
  - poor intellectual activities
  - poor social role
- Decline in ADLs predicted by
  - age 75 years or older
  - low hand-grip strength
  - hospitalization in prior year
  - no habit of daily walking

Risk factors for IADL and ADL decline		
Risk factor	Predictor of IADL decline	Predictor of ADL decline
Age $\geq 75$	Yes	Yes
Low hand-grip strength	Yes	Yes
Hospitalization in prior year	Yes	Yes
Poor intellectual activities	Yes	--
Poor social role	Yes	--
No habit of daily walking	--	Yes

# Frailty in Japan: Culture-specific risk factors\*

- Decreased hand-grip strength means high risk for failure
  - Hand-grip strength correlates with upper body strength
  - Greater upper / lower body strength needed to get up from tatami mats
- No habit of daily walking means high risk for failure
  - Greater use of public transportation
  - Walking needed to reach bus / train
  - Low hand-grip strength also means difficulty entering public transportation
- Poor social role means high risk for failure
  - Measured by visiting homes of friends, being asked for advice
  - Poor social role predictive of failure even though 83% of subjects lived with children, 65% lived with spouse
- Reduced ability to care for elderly due to industrialization in Japan<sup>#</sup>
  - Smaller families, more working women

\* Yukawa M, McCormick WC. Cultural specific implications for decline in ADL and IADL. J AM Geriatr Soc 2000;48:1527-28.

# Hashizume Y. Salient factors that influence the meaning of family caregiving for frail elderly parents in Japan from a historical perspective. Sch Inq Nurs Pract 1998;12:123-34.

# Frailty in China

- Risk factors for functional decline similar to those in West\*
    - Older age
    - Female gender
    - Being single
    - Poor cognitive function
    - Low formal education
    - Depression
    - Existing ADL dependency
  - Reduced ability to care for elderly due to industrialization in China
    - Limited living space, more working women, smaller extended families
    - Likely growth in private insurance to cover LTC needs\*
    - Hong Kong survey of 1023 people#
      - 57% of respondents said it would be better if disabled elderly people lived in institution rather than home
  - Death due to frailty (pneumonia, falls, septicemia) becoming more common in China#
- \* Woo J, Ho SC, Yu ALM et al. An estimate of long-term care needs and identification of risk factors for institutionalization among Hong Kong Chinese aged 70 years and over. J Gerontol A Biolog Sci Med Sci 2000;55:M64-M69.
- # Lam TP, Chi I, Piterman L, et al. Community attitudes to institutional care of the aged in Hong Kong. HK Med J 1996;2:10-17.

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# Characteristics of frailty

- ★ Loss of functional reserve in multiple areas (domains)
  - Cognitive
  - Musculoskeletal (mobility, strength, balance, flexibility, reaction time, coordination)
  - Nutrition
  - Cardiovascular endurance
  - Other (depression, pain, impaired vision / hearing)
- ★ Existence at level close to or past threshold for failure, with negligible tolerance of external stresses of day-to-day living
- Frailty indicates
  - Multisystem failure
  - Instability
  - Subclinical” or “preclinical” disability
- Frail person at high risk for
  - Disability: disability insurance
  - Failure of IADLs and ADLs: long term care insurance
  - Death: life insurance and substandard annuities

# Detection of frailty in insurance applicants: General approach

- Age and gender
- List impairments and severity
- IADL and ADL problems
- Cognitive impairment
- Events of significance
- Mobility, balance, aerobic capacity
- Physical performance tests
- Self-reported function
- Nutrition
- Laboratory tests
- Social factors
- Insurance application
- Physician's statement

# Detection of frailty in insurance applicants: IADL and ADL problems, cognitive impairment

- IADL problems
  - Compare current IADL function to baseline function when healthy
  - No longer uses public transportation
  - Does not do routine household chores
  - Daughter balances checkbook
  - Neighbor does shopping
- ADL problems
  - Mobility, dressing, eating
  - Moving from bed to chair, getting up from chair
  - Use of toilet
- Any nursing home confinement
- Hospitalization in prior year
- Loss of function after hospitalization
- Downward trend in physical, social, or cognitive function
- Cognitive impairment
  - Look for cognitive impairment in application and physician's statement
  - Perform cognitive test during insurance exam

# Detection of frailty in insurance applicants: Events of significance

- Geriatric syndromes

- Delirium
- Dementia
- Depression
- Osteoporosis
- Failure to thrive
- Falls
- Incontinence
- Neglect and abuse
- Polypharmacy

- Falls

- Risk higher if caused by minor event (fall in home) vs. during exercise
- Prolonged duration on floor less favorable
- Related to strength, balance, polypharmacy, cardiovascular, cognitive state, vision

# Detection of frailty in insurance applicants: Events of significance

- Driving

- Frequent accidents, single car accident, multiple citations for bad driving
- Ask applicant: Do you still drive? (If no) Why not? (If yes) May I see your driver's license for purposes of identification (check if license current)?
- Most people very unwilling to stop driving
  - Stopping may mean problems with vision, reaction time, cognitive state

- Orthostatic hypotension

- Drop in systolic blood pressure of 20 mm Hg or more, or drop in diastolic blood pressure of 10 mm Hg or more

# Detection of frailty in insurance applicants: Mobility, balance, aerobic capacity

- Mobility one of strongest predictors of frailty and functional decline
- Risk higher if
  - walks less often or not as far
  - cannot walk 1/2 mile (about 1 km)
  - slow walking speed, e.g., less than 4 feet (1.2 m) per second
  - less than 30 minutes of strenuous (for age) activity per day
  - decreased exercise tolerance
  - short (for age) duration of exercise during treadmill test
- Balance and aerobic capacity are strong predictors of frailty
- Questions for application
  - How far can you walk?
  - How often do you walk? How far? When did you last walk this distance?
  - Do you walk less now than previously? Why?
  - How many flights of stairs can you climb?
  - Do you exercise daily? What type?
  - Do you do heavy work in the house, e.g., shovel snow, wash windows and floors? Or do you need help?

# Detection of frailty in insurance applicants: Physical performance tests

- PPTs provide objective evidence of frailty and functional status
- Measurements (depending on test) can include
  - Upper / lower extremity strength
  - Range of motion
  - Balance
  - Gait (speed, stride length)
  - Coordination and reaction speed
  - Sensation
- Use of PPTs by LTC insurers
  - A number of clinical tests have been validated (predict frailty and functional decline)
  - These tests could be used in insurance setting
  - Would increase accuracy of risk classification
  - Chosen test(s) should emphasize mobility and balance
  - Additional benefit of using PPTs
    - Ability to follow test instructions confirms good cognitive status

# Detection of frailty in insurance applicants: Self-reported function

- Self-reported function is sensitive measure of early decline
  - People know when deterioration is occurring
  - This information not captured by cognitive / physical performance tests
  - Thus, early frailty not detected by underwriting evaluation
- Solution? Ask applicant, agent, and physician questions about
  - General health / overall function
  - Walking ability (walks less often / not as far, holds wall / furniture when walking)
- Solution (continued)
  - Task modification (change in method or frequency)
  - Assistive devices (cane / walking stick, jar openers)
- Any comment less favorable than “good” may indicate higher risk
- Problem
  - Applicant / physician may not indicate actual self-reported function

# Detection of frailty in insurance applicants: Nutrition and laboratory tests

- Loss of appetite
- Unexplained weight loss
  - Often found via physician's statement
  - Frailty, cancer, depression, dementia
- Overweight or underweight
  - Use values appropriate for market
  - For Western populations
    - Risk of frailty if BMI 22 kg/m<sup>2</sup> or less
    - Risk of functional decline if BMI 29 kg/m<sup>2</sup> or greater
- Episode of hypothermia
- Complaint of always being cold
  - Beyond what is expected for age
- Serum albumin below normal
- Serum cholesterol below 3.8 mmol/L (145 mg/dl)
- Low creatinine for body size
- Anemia (many causes other than frailty)

# Detection of frailty in insurance applicants: Social factors

- Living arrangements
  - With spouse/friend or alone
- Social isolation
- Avocations
  - Volunteering, gardening, continued employment, social clubs, travel
  - If avocations discontinued, why
- Risk higher if
  - less education
  - lower socioeconomic status

# Physician's statement

- Often requested at age 70 or older
- Generally contains
  - Major diagnoses, medications
  - Control, compliance, complications
  - Weight over time, laboratory tests
  - Falls that caused injury
- May contain
  - Lifestyle information
  - Exercise test, bone density test
  - Pulmonary function test
  - Overall condition, activity level
  - History of depression, incontinence
- Generally do not contain
  - Functional status, unless significantly impaired
  - Cognitive status, unless significantly impaired
- Consider asking specific questions about
  - Cognitive status
  - IADLs and ADLs
  - Frailty
  - Task modification
  - Trends
  - Overall assessment with regard to type of insurance (life, LTC, etc.)

# Charlie: frail, disabled, and cognitively impaired

- Application
  - Male, age 78, retired laborer
- Medical
  - Controlled hypertension, normal weight, bilateral knee prosthesis, urinary incontinence once per day
- Social
  - Lives alone (wife died 18 months ago) in assisted living facility (could not maintain house)
  - Visits senior center 3 times per week
  - Outgoing personality, talkative, no indication of cognitive impairment during routine conversations
- IADL
  - Takes “senior” bus to senior center
  - Cannot drive but can enter “senior” bus without assistance
  - Daughter handles finances
  - Does not cook or clean apartment
- ADL
  - Walks very slowly with cane
  - Considerable decrease in mobility after hospitalization for 2<sup>nd</sup> knee surgery
- Cognitive
  - Daughter has “power of attorney”

# Anne: disabled but not frail

- Application
  - Female, age 75, retired salesperson
- Medical
  - Mild osteoarthritis, borderline diabetes mellitus, normal weight, almost totally blind due to macular degeneration
  - Fall 2 months ago, severely bruising face
    - Occurred while descending icy stairs of train station after unaccompanied trip to New York City to visit friends
- Social
  - Lives alone (husband died 3 years ago) in condominium (same location for 30 years)
  - Volunteers at senior center and condominium functions
  - Remarkably pleasant personality displaying obvious “zest” for life
- IADL
  - Takes “senior” bus to senior center
  - Reads via magnifier
  - Handles finances, cooking, cleaning
- Cognitive / ADL
  - Normal

# Otis: cognitively impaired but not frail

- Application
  - Male, age 86, retired farmer
- Medical
  - Remarkably fit for age, normal weight, small myocardial infarction 9 years ago
- Social
  - Lives alone (wife died 12 years ago) in house (same location for 25 years), town of 2000 people
  - Walks 2-4 miles (3-6 km) per day to senior center and girlfriend's home
  - Favorite of women at senior center: fantastic dancer
- IADL
  - Does own cooking and cleaning, son handles finances
  - Lost driver's license (kept getting lost while driving)
  - Continues to drive girlfriend's car
    - She provides directions
    - He wears woman's wig while driving so not stopped by police
- ADL
  - Normal
- Cognitive
  - 10 months ago scored 4 out of 10 on Delayed Word Recall test

# Olga: frail but not disabled

- Application
  - Female, age 84, retired factory worker
- Medical
  - Mild osteoarthritis, weight loss of 10 pounds (4.5 kg) over last few years, current BMI 22 kg/m<sup>2</sup>
  - Fell 8 months ago in garden, lying on ground all night until noticed by neighbor
- Social
  - Lives alone (husband died 30 years ago) in house (same location for 40 years)
  - Walks daily but slowly, enjoys dancing at senior center
- IADL
  - Does own cooking and cleaning
  - Very sharp mentally, enjoys following investments in stock market
  - Has drivers license, but prefers senior citizen bus or car with boyfriend
- ADL / Cognitive
  - Normal