

Frailty assessment in solid organ transplantation

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Read it as: Theou O, Rockwood K. Should frailty status always be considered when treating the elderly patient?. *Aging & Health* 2012;(8)3:

The problem

The number of elderly patients placed on waiting lists has increased dramatically and will further grow. Interdisciplinary collaboration and distinct patient selection is recommended in all recent reviews.

Kneipiess et al., *Ageing Res Rev.* 2012 Jan;11(1):181-7.

Table 4. Relative Risk of Delayed Graft Function, Multivariate Model

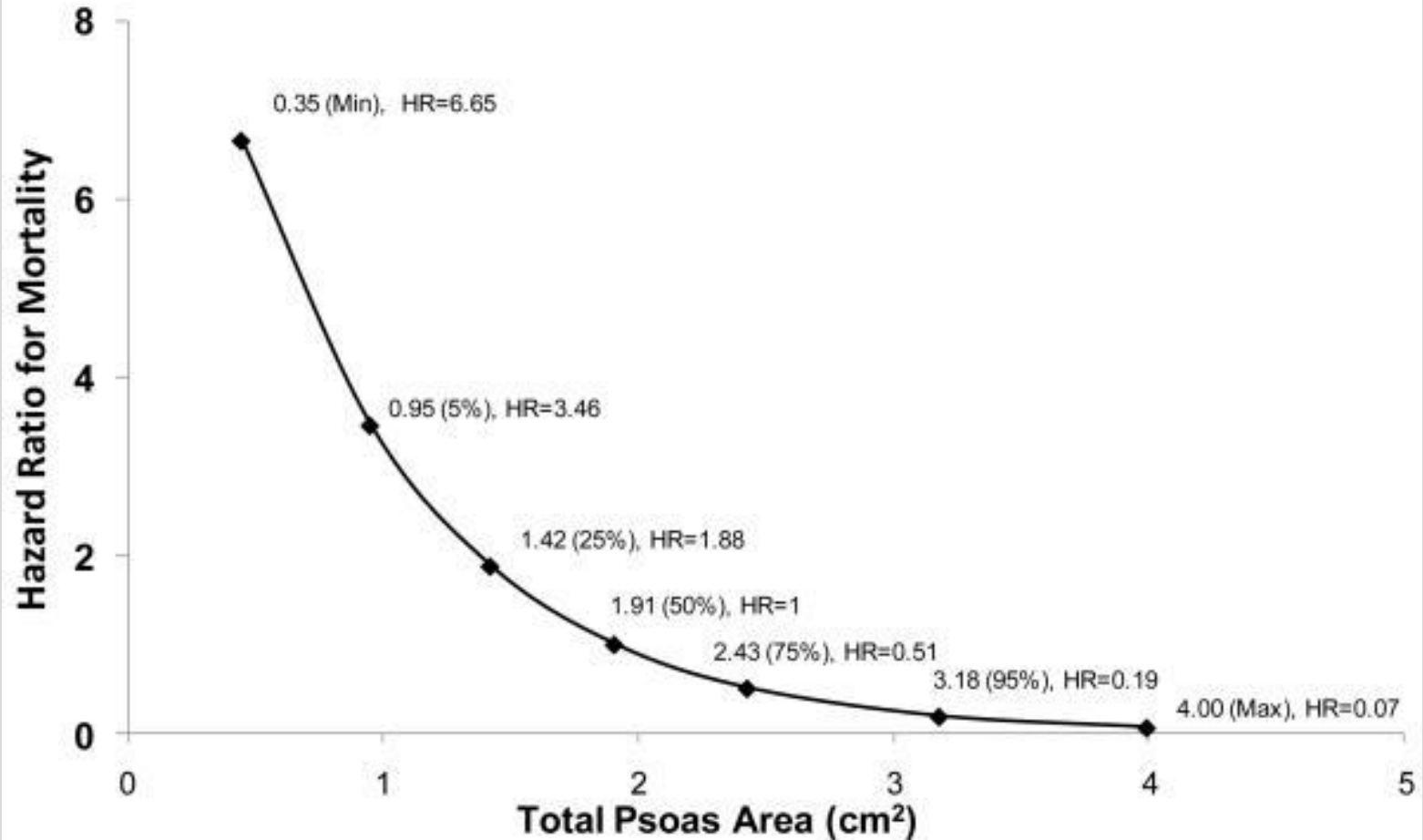
Characteristic	RR (95% CI)	P Value
Frail	1.94 (1.13-3.36)	.02
Age, in decades	0.94 (0.74-1.20)	.62
Donor creatinine level ^a	1.26 (1.10-1.44)	.001
Cold ischemia time		
Live donor	1 [Reference]	
Deceased donor <12 h	4.46 (0.82-23.93)	.08
Deceased donor 12-24 h	6.92 (1.45-33.2)	.02
Deceased donor >24 h	8.47 (1.75-41.12)	.008
Extended criteria donor ^b	1.44 (0.74-2.80)	.28
Donor after cardiac death ^b	2.24 (0.88-5.74)	.09
BMI > 30	1.42 (0.79-2.60)	.24
African American	1.26 (0.64-2.48)	.50
Diabetes	1.04 (0.60-1.80)	.88
Preemptive transplant	0.25 (0.04-1.80)	.17

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); RR, relative risk.

^aFor deceased donors only, per unit of creatinine beyond 1.5.

^bFor deceased donors only.

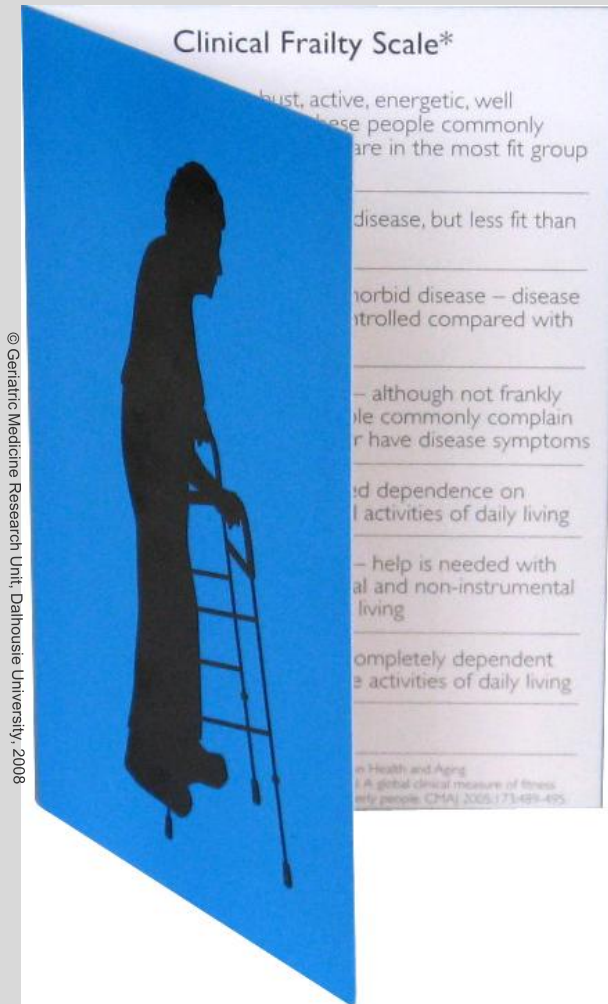
Hazard Ratio For Mortality Related to Psoas Area



SUMMARY

- *Frailty* is variable vulnerability to adverse outcomes
- The more *deficits* that people have *accumulated*, the frailer they are, but there is a *limit* to frailty.
- Frailty can be *screened* by using simple clinical tools, based on *mobility and function two weeks previously*.
- Frailty can be quantified using a *Frailty Index based on a Comprehensive Geriatric Assessment (FI-CGA)*.
- The FI-CGA can identify increased risk; changes in *mobility and balance can track the severity of illness*.
- These lessons can aid older adults in whom solid organ transplantation is being considered or carried out.





List of Frailty:

1. Very Fit
2. Well
3. Managing Well
4. Vulnerable
5. Mildly Frail
6. Moderately Frail
7. Severely Frail
8. Very Severely Frail
9. Terminally ill

1. Canadian Study on Health and Aging
2. K Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005; 173:489-495

Operationalizing frailty

Variables are *highly specified*:
prototype is the frailty
phenotype

- Slow mobility
- Weakness
- Weight loss
- Decreased activities
- Exhaustion
 - Fried et al., 2001;56 *J Gerontol A Biol Sci Med Sci* (3):M146-56.

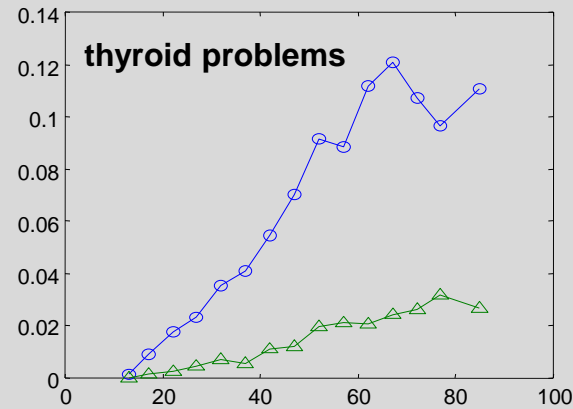
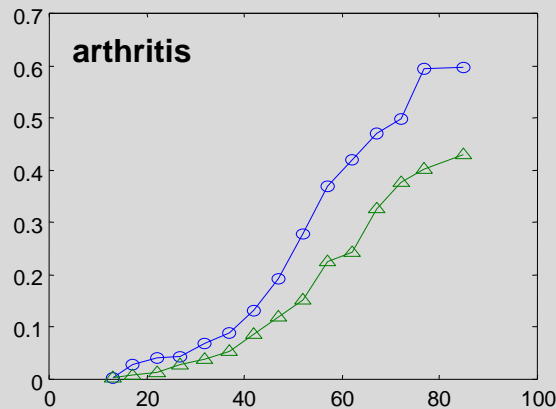
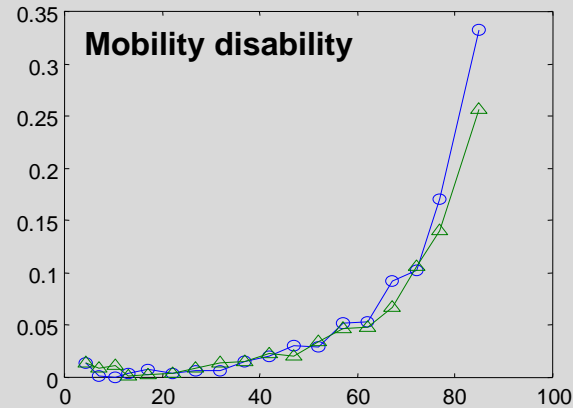
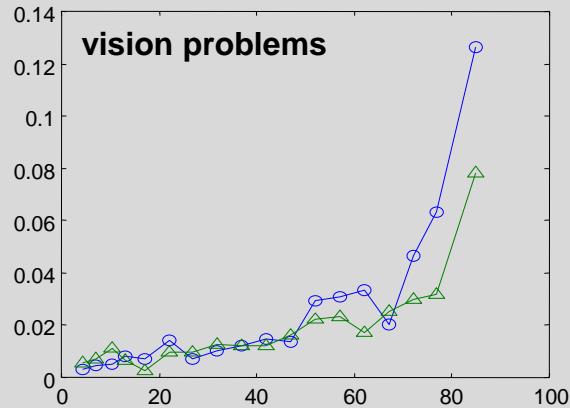
Variables are *hardly specified*:
prototype is the Frailty Index

- Count health deficits (30-100)
 - age associated but does not saturate;
 - associated with adverse outcome
 - <5% missing data
- Divide by the number of deficits considered.
 - Mitnitski et al., *ScientificWorldJ* 2001;1:323-326.
 - Searle et al., *BMC Geriatr* 2008;8:24.

Frailty as deficit accumulation: with age, most problems become more common

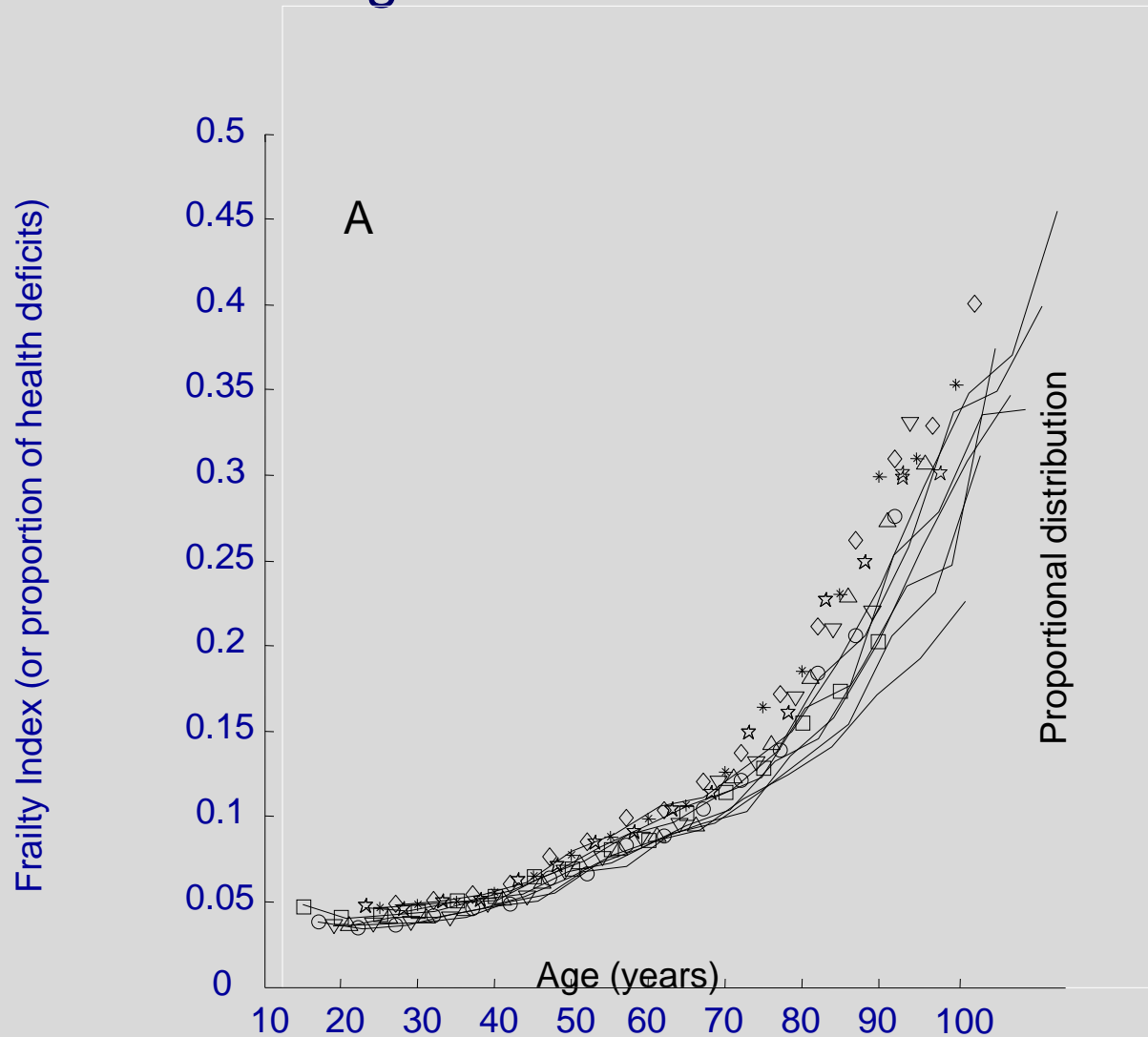
(Canadian National Population Health Survey, n= 66,580)

Proportion of the individuals
with deficit



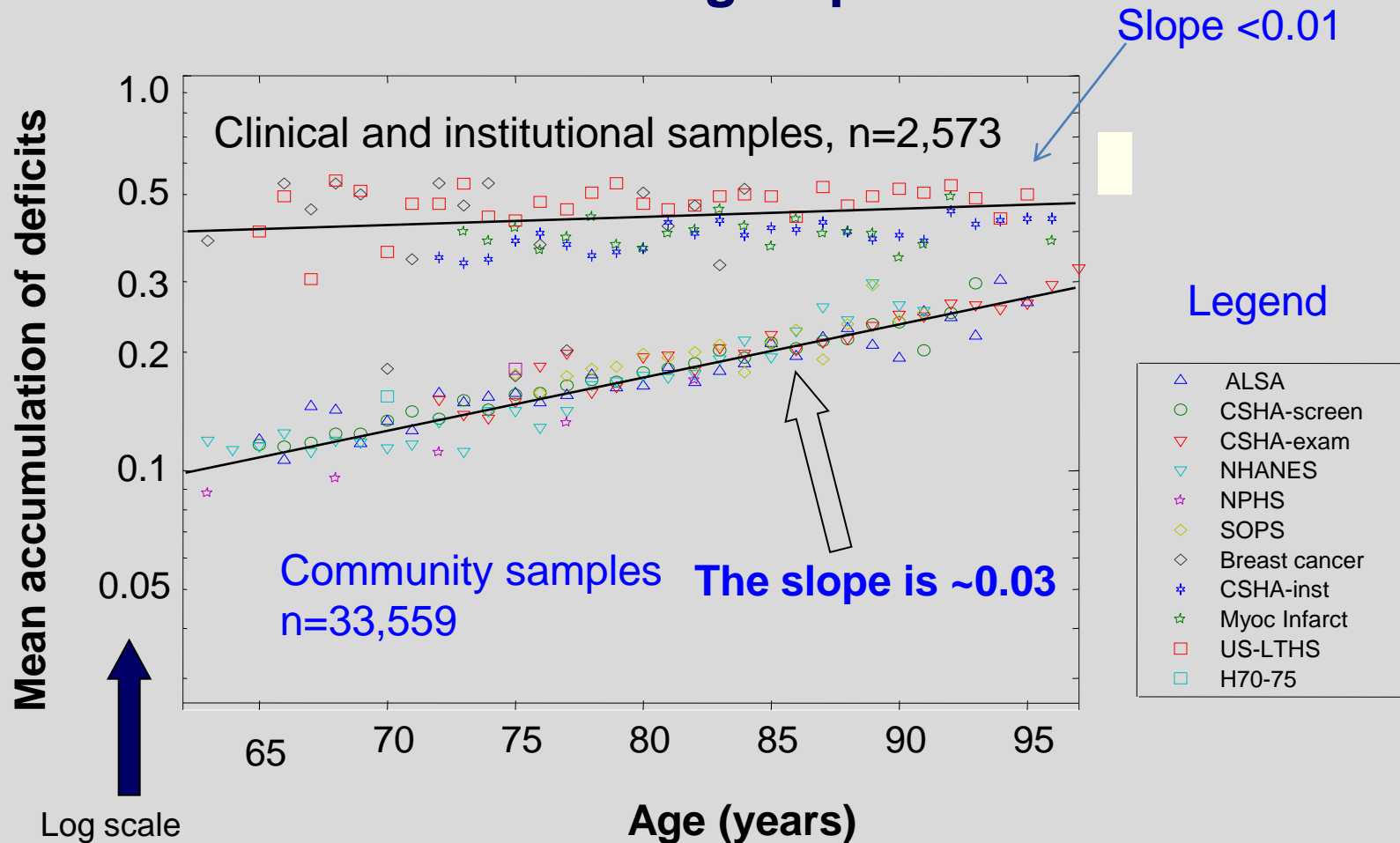
Age (years)

National Population Health Survey - Mean Frailty Index at each cycle in relation to age



Rockwood et al., *CMAJ* 2011; E-pub April 28

Deficits accumulate characteristically, both *between* groups (community vs. institution/ clinical) and *within* groups*



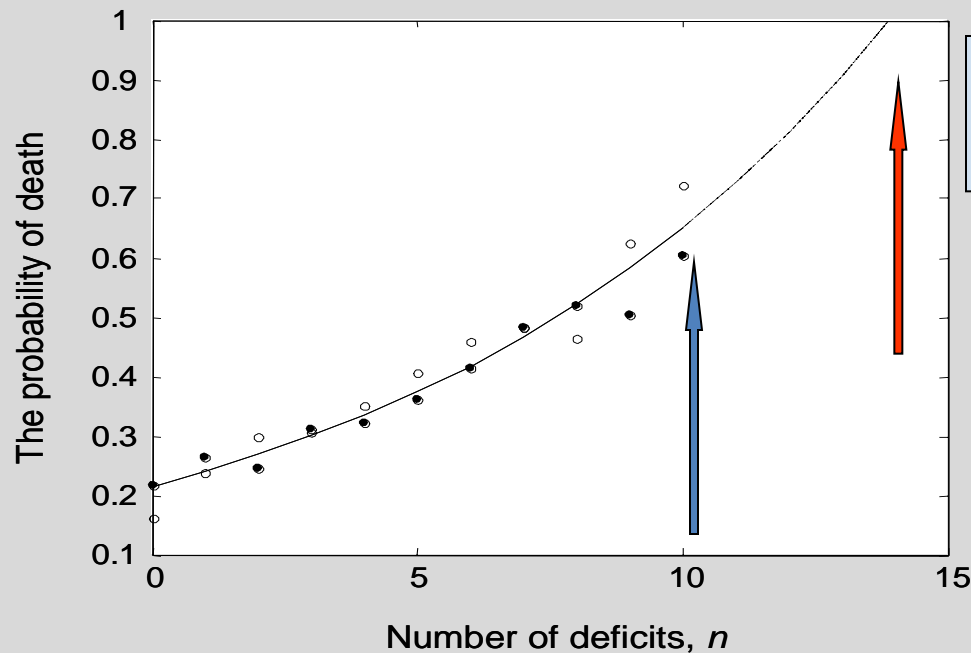
Mitnitski, et al., *J Am Geriatr Soc*, 2005;53:2184-9.



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5. Why the deficit count matters: transitions from n deficits to death during 5 years; Canadian Study of Health & Aging, N=8,547



Of 8,547 people at baseline, only 18 had $>17/31$ possible deficits, and only 7 (of 5586) had $>17/31$ at follow-up

Survival limit close to the frailty Index of about **0.7**

A limit to the number of deficits suggests exhaustion of reserve capacity
– is it operationalizable clinically?

Mitnitski, Bao, Rockwood. *Mech Ageing Dev* 2006;127:490-3.
Rockwood & Mitnitski *Mech Ageing Dev* 2006;127:494-6.

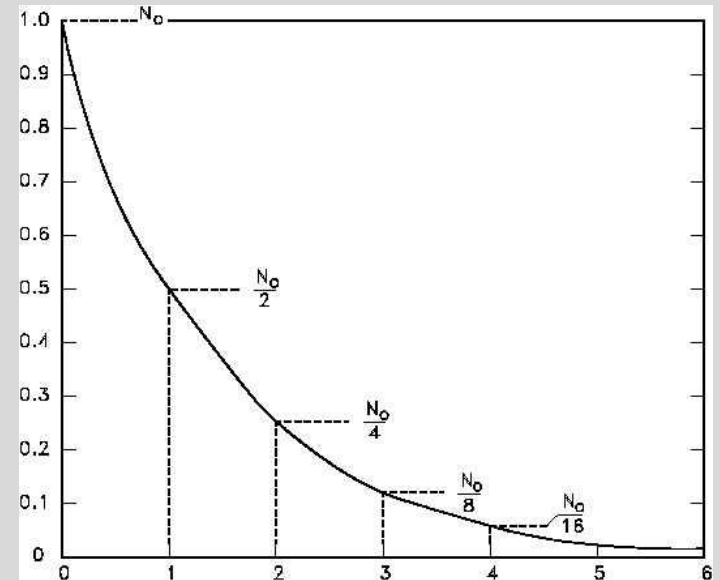
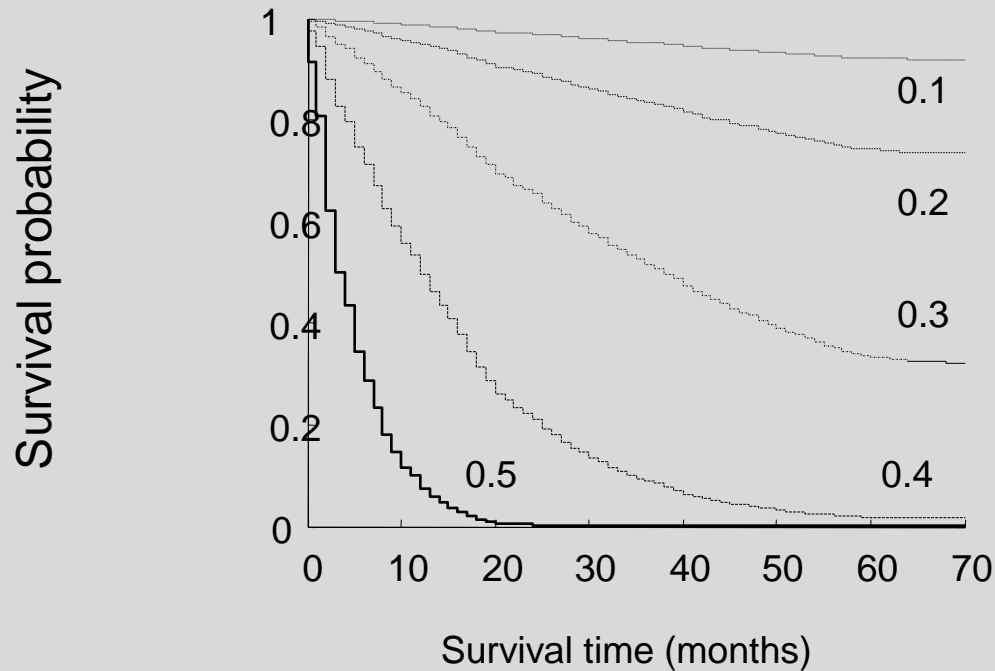


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A Frailty Index based on a Comprehensive Geriatric Assessment identifies a group at the highest risk of dying (some of whom live 18 months).

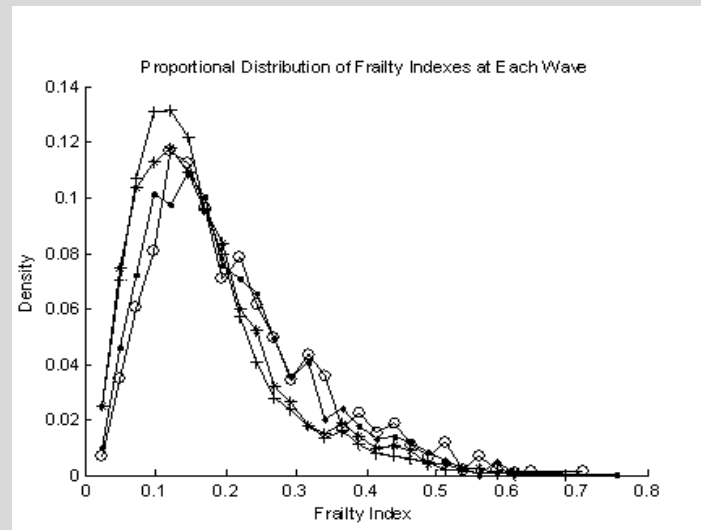
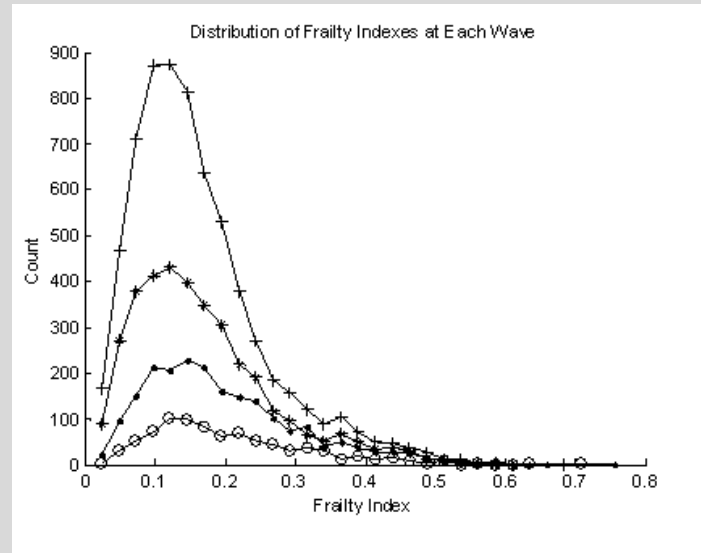
FI-CGA



Distribution of the Frailty Index

in 4 successive waves of the Chinese Longitudinal Health and Longevity Study;

Subjects aged 80-99 years; n= 6664



S Bennett, X Song, A Mitnitski, K Rockwood*. A limit to frailty in very old, community-dwelling people: A secondary analysis of the Chinese Longitudinal Health and Longevity Study. *Age and Ageing*. Accepted September, 2012.



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China + Canada



Comprehensive Geriatric Assessment Form



Capital Health Comprehensive Geriatric Assessment Form

WNL = Within Normal Limits ASST = Assisted IND = Independent DEP = Dependent

☐ Cognition ☐ WNL ☐ CIND ☐ MCI ☐ Dementia ☐ Delirium MMSE: _____ FAST: _____

Chief lifelong occupation: _____ Education (years): _____

☐ Emotional ☐ WNL ☐ ↓ Mood ☐ Depression ☐ Anxiety ☐ Fatigue ☐ Hallucination ☐ Delusion ☐ Other

☐ Motivation ☐ High ☐ Usual ☐ Low Health Attitude ☐ Excellent ☐ Good ☐ Fair ☐ Poor ☐ Couldn't say

☐ Communication Speech ☐ WNL ☐ Impaired Hearing ☐ WNL ☐ Impaired Vision ☐ WNL ☐ Impaired

☐ Strength ☐ WNL ☐ Weak Upper: PROXIMAL DISTAL Lower: PROXIMAL DISTAL

☐ Exercise ☐ Frequent ☐ Occasional ☐ Not

		BASELINE (two weeks ago)				CURRENT (today)				NOTES
		WNL	Y	Impaired	WNL	Y	Impaired			
		N		Number	N		Number			
<input type="radio"/> Balance	Balance Falls									
<input type="radio"/> Mobility	Walk Outside	IND		ASST	IND		ASST			
	Walking Transfers	IND	SLOW	ASST	IND	SLOW	ASST			
	Bed Aid	IND	Stand by	ASST	IND	Stand by	ASST			
		IND	PULL	ASST	IND	PULL	ASST			
		None	Cane	Walker	None	Cane	Walker			
				Chair						
<input type="radio"/> Nutrition	Weight Appetite	GOOD	UNDER	OVER	STABLE	LOSS	GAIN			
		WNL	FAIR	POOR	WNL	FAIR	POOR			
<input type="radio"/> Elimination	Bowel Bladder	CONT	CONSTIP	INCONT	CONT	CONSTIP	INCONT			
		CONT	CATHETER	INCONT	CONT	CATHETER	INCONT			
<input type="radio"/> ADLs	Feeding Bathing Dressing Toileting	IND	ASST	DEP	IND	ASST	DEP			
		IND	ASST	DEP	IND	ASST	DEP			
		IND	ASST	DEP	IND	ASST	DEP			
<input type="radio"/> IADLs	Cooking Cleaning Shopping Medications Driving Banking	IND	ASST	DEP	IND	ASST	DEP			
		IND	ASST	DEP	IND	ASST	DEP			
		IND	ASST	DEP	IND	ASST	DEP			
		IND	ASST	DEP	IND	ASST	DEP			
		IND	ASST	DEP	IND	ASST	DEP			
		IND	ASST	DEP	IND	ASST	DEP			

☐ Sleep ☐ Normal ☐ Disrupted ☐ Daytime drowsiness Socially Engaged ☐ Frequent ☐ Occasional ☐ Not

	Lives	Home	Supports	Caregiver Relationship	Caregiver Stress	
<input type="radio"/> Social	<input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed <input type="checkbox"/> Single	<input type="checkbox"/> Alone <input type="checkbox"/> Spouse <input type="checkbox"/> Other	<input type="checkbox"/> House (Levels _____) <input type="checkbox"/> Steps (Number _____) <input type="checkbox"/> Apartment <input type="checkbox"/> Assisted Living <input type="checkbox"/> Nursing home <input type="checkbox"/> Other	<input type="checkbox"/> Informal <input type="checkbox"/> HCNS <input type="checkbox"/> Other <input type="checkbox"/> Req. more support <input type="checkbox"/> None <input type="checkbox"/> Code Status <input type="checkbox"/> Do not resuscitate <input type="checkbox"/> Resuscitate	<input type="checkbox"/> Spouse <input type="checkbox"/> Sibling <input type="checkbox"/> Offspring <input type="checkbox"/> Other	<input type="checkbox"/> None <input type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High
	<input type="radio"/> Advance directive in place? <input type="checkbox"/> Yes <input type="checkbox"/> No				Caregiver occupation (CG): _____	

Problems:	Med adjust req.	Associated Medication: (* mark meds started in hospital with an asterisk)
1. _____	<input type="radio"/>	_____
2. _____	<input type="radio"/>	_____
3. _____	<input type="radio"/>	_____
4. _____	<input type="radio"/>	_____
5. _____	<input type="radio"/>	_____
6. _____	<input type="radio"/>	_____
7. _____	<input type="radio"/>	_____
8. _____	<input type="radio"/>	_____
9. _____	<input type="radio"/>	_____
10. _____	<input type="radio"/>	_____
11. _____	<input type="radio"/>	_____
12. _____	<input type="radio"/>	_____

Assessment Forms
CD0184MR_06_09

Assessor/Physician: _____ Date: _____

(YYYY/MM/DD)

☐ Action Required
☐ Monitor

Patient contact:

☐ Inpatient
☐ Clinic
☐ GDH
☐ NH
☐ Outreach
☐ Home
☐ Assisted Living
☐ ER
☐ Other

PT = PATIENT
CG = CAREGIVER

Current Frailty Score:

Scale	PT	CG
1. Very fit		
2. Well		
3. Well with 1 or 2 co-morbid disease		
4. Apparently vulnerable		
5. Mildly frail		
6. Moderately frail		
7. Severely frail		
8. Very severely frail		
9a. Terminally ill - walker		
9b. Terminally ill - bed		

ACTION REQUIRED (check appropriate circles)



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Comprehensive Geriatric Assessment Form: value-added

Comprehensive Geriatric Assessment Form											
WNL = Within Normal Limits ASST = Assisted IND = Independent DEP = Dependent											
<input type="checkbox"/> Cognition <input type="checkbox"/> WNL <input type="checkbox"/> CIND <input type="checkbox"/> MCI <input type="checkbox"/> Dementia <input type="checkbox"/> Delirium MMSE: _____ FAST: _____ Chief lifelong occupation: _____ Education (years): _____											
<input type="checkbox"/> Emotional <input type="checkbox"/> WNL <input type="checkbox"/> ↓ Mood <input type="checkbox"/> Depression <input type="checkbox"/> Anxiety <input type="checkbox"/> Fatigue <input type="checkbox"/> Hallucination <input type="checkbox"/> Delusion <input type="checkbox"/> Other											
<input type="checkbox"/> Motivation <input type="checkbox"/> High <input type="checkbox"/> Usual <input type="checkbox"/> Low Health Attitude <input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Couldn't say											
<input type="checkbox"/> Communication Speech <input type="checkbox"/> WNL <input type="checkbox"/> Impaired Hearing <input type="checkbox"/> WNL <input type="checkbox"/> Impaired Vision <input type="checkbox"/> WNL <input type="checkbox"/> Impaired											
<input type="checkbox"/> Strength <input type="checkbox"/> WNL <input type="checkbox"/> Weak Upper: PROXIMAL DISTAL Lower: PROXIMAL DISTAL											
<input type="checkbox"/> Exercise <input type="checkbox"/> Frequent <input type="checkbox"/> Occasional <input type="checkbox"/> Not											
<input type="checkbox"/> Balance Balance Falls <input type="checkbox"/> WNL <input type="checkbox"/> Impaired <input type="checkbox"/> WNL <input type="checkbox"/> Impaired											
<input type="checkbox"/> Mobility Walk Outside <input type="checkbox"/> IND <input type="checkbox"/> SLOW <input type="checkbox"/> ASST <input type="checkbox"/> Can't <input type="checkbox"/> IND <input type="checkbox"/> SLOW <input type="checkbox"/> ASST <input type="checkbox"/> Can't Walking <input type="checkbox"/> IND <input type="checkbox"/> Stand by <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> Stand by <input type="checkbox"/> ASST <input type="checkbox"/> DEP Transfers <input type="checkbox"/> IND <input type="checkbox"/> PULL <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> PULL <input type="checkbox"/> ASST <input type="checkbox"/> DEP Bed <input type="checkbox"/> None <input type="checkbox"/> Cane <input type="checkbox"/> Walker <input type="checkbox"/> Chair <input type="checkbox"/> None <input type="checkbox"/> Cane <input type="checkbox"/> Walker <input type="checkbox"/> Chair Aid											
<input type="checkbox"/> Nutrition Weight <input type="checkbox"/> GOOD <input type="checkbox"/> UNDER <input type="checkbox"/> OVER <input type="checkbox"/> OBESE <input type="checkbox"/> STABLE <input type="checkbox"/> LOSS <input type="checkbox"/> GAIN Appetite <input type="checkbox"/> WNL <input type="checkbox"/> FAIR <input type="checkbox"/> POOR <input type="checkbox"/> WNL <input type="checkbox"/> FAIR <input type="checkbox"/> POOR											
<input type="checkbox"/> Elimination Bowel <input type="checkbox"/> CONT <input type="checkbox"/> CONSTIP <input type="checkbox"/> INCONT <input type="checkbox"/> CONT <input type="checkbox"/> CONSTIP <input type="checkbox"/> INCONT Bladder <input type="checkbox"/> CONT <input type="checkbox"/> CATHETER <input type="checkbox"/> INCONT <input type="checkbox"/> CONT <input type="checkbox"/> CATHETER <input type="checkbox"/> INCONT											
<input type="checkbox"/> ADLs Feeding <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP Bathing <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP Dressing <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP Toileting <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP											
<input type="checkbox"/> IADLs Cooking <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP Cleaning <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP Shopping <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP Medications <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP Driving <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP Banking <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP <input type="checkbox"/> IND <input type="checkbox"/> ASST <input type="checkbox"/> DEP											
<input type="checkbox"/> Sleep <input type="checkbox"/> Normal <input type="checkbox"/> Disrupted <input type="checkbox"/> Daytime drowsiness Socially Engaged <input type="checkbox"/> Frequent <input type="checkbox"/> Occasional <input type="checkbox"/> Not											

☐ **Action Required**
☐ **Monitor**

Patient contact:
☐ Inpatient
☐ Clinic
☐ GDH
☐ NH
☐ Outreach
☐ Home
☐ Assisted Living
☐ ER
☐ Other

PT = PATIENT
 CG = CAREGIVER

Current Frailty Score:

Scale	PT	CG
1. Very fit		
2. Well		
3. Well with Rx'd co-morbid disease		
4. Apparently vulnerable		
5. Mildly frail		
6. Moderately frail		
7. Severely frail		
8. Very severely frail		
9a. Terminally ill - walker		
9b. Terminally ill - bed		

Comprehensive Geriatric Assessment Form: brain function

WNL = Within Normal Limits ASST = Assisted IND = Independent DEP = Dependent

☐ **Cognition** ☐ WNL ☐ CIND ☐ MCI ☐ Dementia ☐ Delirium MMSE: _____ FAST: _____

Chief lifelong occupation: _____ Education (years): _____

☐ **Emotional** ☐ WNL ☐ ↓ Mood ☐ Depression ☐ Anxiety ☐ Fatigue ☐ Halluncination ☐ Delusion ☐ Other

☐ **Motivation** ☐ High ☐ Usual ☐ Low **Health Attitude** ☐ Excellent ☐ Good ☐ Fair ☐ Poor ☐ Couldn't say

☐ **Communication** **Speech** ☐ WNL ☐ Impaired **Hearing** ☐ WNL ☐ Impaired **Vision** ☐ WNL ☐ Impaired

☐ **Strength** ☐ WNL ☐ Weak Upper: PROXIMAL DISTAL Lower: PROXIMAL DISTAL

Comprehensive Geriatric Assessment Form: co-morbidity & medications

Problems:		Med adjust req.	Associated Medication: (* mark meds started in hospital with an asterisk)
ACTION REQUIRED	1. _____	<input type="radio"/>	_____
	2. _____	<input type="radio"/>	_____
	3. _____	<input type="radio"/>	_____
	4. _____	<input type="radio"/>	_____
	5. _____	<input type="radio"/>	_____
	6. _____	<input type="radio"/>	_____
	7. _____	<input type="radio"/>	_____
	8. _____	<input type="radio"/>	_____
	9. _____	<input type="radio"/>	_____
	10. _____	<input type="radio"/>	_____
	11. _____	<input type="radio"/>	_____
	12. _____	<input type="radio"/>	_____

Assessor/Physician: _____ Date: _____
(YYYY/MM/DD)

Assessment Forms
CD0184MR 06 09



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Learning from other complex systems applications



Comprehensive Geriatric Assessment

Form: **new impairment in function**

Activities of Daily
Living &
Instrumental
Activities of Daily
Living

Baseline
(two weeks ago)

Current
(today)

○ ADLs	Feeding	IND	ASST	DEP	IND	ASST	DEP
	Bathing	IND	ASST	DEP	IND	ASST	DEP
	Dressing	IND	ASST	DEP	IND	ASST	DEP
	Toileting	IND	ASST	DEP	IND	ASST	DEP
○ IADLs	Cooking	IND	ASST	DEP	IND	ASST	DEP
	Cleaning	IND	ASST	DEP	IND	ASST	DEP
	Shopping	IND	ASST	DEP	IND	ASST	DEP
	Medications	IND	ASST	DEP	IND	ASST	DEP
	Driving	IND	ASST	DEP	IND	ASST	DEP
	Banking	IND	ASST	DEP	IND	ASST	DEP

Which patient is the more frail?

Which patient is the more acutely ill?

Capital Health
Comprehensive Geriatric Assessment Form

WNL = Within Normal Limits ASST = Assisted IND = Independent DEP = Dependent

Cognition ☒ WNL ☐ CIND ☐ MCI ☐ Dementia ☐ Delirium MMSE: NL FAST: 3
Chief lifelong occupation: Insurance / sales Education (years): 16

Emotional ☒ WNL ☐ Mood ☐ Depression ☐ Anxiety ☐ Fatigue ☐ Hallucination ☐ Delusion ☐ Other

Motivation ☒ High ☐ Usual ☐ Low Health Attitude ☒ Excellent ☐ Good ☐ Fair ☐ Poor ☒ Couldn't say

Communication ☒ Speech ☒ WNL ☐ Impaired ☒ Hearing ☒ WNL ☐ Impaired ☒ Vision ☒ WNL ☐ Impaired

Strength ☒ WNL ☐ Weak Upper: PROXIMAL DISTAL Lower: PROXIMAL DISTAL

Exercise ☒ Frequent ☐ Occasional ☐ Not

Balance ☒ Frequent ☐ Occasional ☐ Not

Mobility ☒ WNL ☐ Impaired ☐ Can't

Nutrition ☒ WNL ☐ Impaired ☐ Can't

Elimination ☒ WNL ☐ Impaired ☐ Can't

ADLs ☒ WNL ☐ Impaired ☐ Can't

IADLs ☒ WNL ☐ Impaired ☐ Can't

Sleep ☒ Normal ☐ Disrupted ☐ Daytime drowsiness ☒ Socially Engaged ☒ Frequent ☐ Occasional ☐ Not

Social ☒ Married ☐ Lives ☐ Home ☐ Supports ☐ Caregiver Relationship ☐ Caregiver Stress

Advance directive in place? ☒ Yes ☐ No

Problems: 1. ? Seizure (fall) 2. Hypertension 3. IND 4. Elevated Cholesterol 5. Arthritis 6. Cataract 7. Glaucoma

Med adjust req: 1. HCTZ 12.5 mg 2. Metoprolol 50 mg BID 3. Atorvastatin 20 mg/day 4. Ibuprofen ad lib + Tylenol 5. "drops" BID

Associated Medication: (*mark meds started in hospital with an asterisk)

Assessor/Physician: Date: 2012/01/01

Capital Health
Comprehensive Geriatric Assessment Form

WNL = Within Normal Limits ASST = Assisted IND = Independent DEP = Dependent

Cognition ☒ WNL ☐ CIND ☐ MCI ☐ Dementia ☐ Delirium MMSE: NL FAST: 3
Chief lifelong occupation: Office Manager Education (years): 16

Emotional ☒ WNL ☐ Mood ☐ Depression ☐ Anxiety ☐ Fatigue ☐ Hallucination ☐ Delusion ☐ Other

Motivation ☒ High ☐ Usual ☐ Low Health Attitude ☒ Excellent ☐ Good ☐ Fair ☐ Poor ☒ Couldn't say

Communication ☒ Speech ☒ WNL ☐ Impaired ☒ Hearing ☒ WNL ☐ Impaired ☒ Vision ☒ WNL ☐ Impaired

Strength ☐ WNL ☒ Weak Upper: PROXIMAL DISTAL Lower: PROXIMAL DISTAL

Exercise ☐ Frequent ☐ Occasional ☒ Not

Balance ☐ Frequent ☐ Occasional ☒ Not

Mobility ☐ WNL ☐ Impaired ☐ Can't

Nutrition ☐ WNL ☐ Impaired ☐ Can't

Elimination ☐ WNL ☐ Impaired ☐ Can't

ADLs ☐ WNL ☐ Impaired ☐ Can't

IADLs ☐ WNL ☐ Impaired ☐ Can't

Sleep ☐ Normal ☐ Disrupted ☐ Daytime drowsiness ☐ Socially Engaged ☐ Frequent ☐ Occasional ☐ Not

Social ☒ Married ☐ Lives ☐ Home ☐ Supports ☐ Caregiver Relationship ☐ Caregiver Stress

Advance directive in place? ☒ Yes ☐ No

Problems: 1. Weak and dizzy - falls 2. COPD 3. Osteoarthritis 4. Osteoporosis 5. Mild CRF 6. Disordered sleep 7. Hypertension 8. GERD 9. Large lung mass (KR NYD) 10. Anemia hgb 85(N) indices 11. Hypocalcemia Nsk = 1.28 12. Hypoalbuminemia (22)

Med adjust req: 1. Advir/Ventolin +/- Prednisone 2. Tylenol PRN (no NSAIDs) 3. Ramipril 5 mg/day 4. Trazadone 50 mg PO qhs 5. Amlodipin 5 mg 6. Omeprazol 20 mg/day

Associated Medication: (*mark meds started in hospital with an asterisk)

Assessor/Physician: Date: 2012/01/01

Frailty measurement in acutely ill older adults

Screening

- Rapid
- Easy to use
- Valid
- Reliable
- More sensitive than specific

Definitive evaluation

- Feasible
- Easy for routine use
- Valid
- Reliable
- Needs high specificity

A detailed screenshot of the 'Capital Health Comprehensive Geriatric Assessment Form'. The form is organized into several sections with checkboxes and input fields. Key sections include: 'Patient Information' (Name, DOB, etc.), 'Medical History' (listing various conditions like Diabetes, Hypertension, etc.), 'Functional Status' (Assessment of activities of daily living, instrumental ADLs, etc.), 'Cognitive Function' (MMSE score, etc.), 'Mental Health' (Depression, Anxiety, etc.), 'Social Support' (Living alone, etc.), and 'Care Needs' (Nursing, etc.). The form is designed for a healthcare professional to complete a comprehensive assessment of an elderly patient.

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.

* 1. Canadian Study on Health & Aging, Revised 2008.

2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

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.
Frailty Index score is <0.10 .

Well older adults share most attributes of the very fit, except for regular, vigorous exercise. Like them, some may complain of memory symptoms, but without objective deficits.



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. Often rate health no better than 'fair'. Typically, walking is slow. Frailty index $\sim 0.35 - 0.45$.

If a memory problem causes the dependency, often recent memory will be very impaired, even though they seemingly can remember their past life events well.



What do frail patients need that is different from other people?

- At low levels of frailty / high levels of fitness, older adults can be treated exactly as are younger patients with single system illness.
- The frailer the individual
 - The less they will withstand toxic or invasive interventions.
 - The less they benefit from more than 5-7 drugs
 - The more they need to be treated as a complex system on the verge of failure.



The problem

The number of elderly patients placed on waiting lists has increased dramatically and will further grow. Interdisciplinary collaboration and distinct patient selection is recommended in all recent reviews.

Kneippiess et al., *Ageing Res Rev.* 2012 Jan;11(1):181-7.

High order system failures



Measuring mobility: the HABAM

The Hierarchy of Balance & Mobility *In bed-mobility*

- Cannot move off pressure points
- Moves side to side
- Can push to sit up
- Can swing legs over the side

MacKnight & Rockwood *Age Ageing* 1995;24:126-30

MacKnight & Rockwood *J Clin Epidemiol* 2000;53:1242-7

Rockwood *et al. J Am Geriatr Soc*, 2008; 56:1213-1217-24



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Hierarchical Assessment of Balance and Mobility: embracing complexity through pattern recognition in a state variable

Hierarchical Assessment of Balance and Mobility

Figure 1. Scores for two patients over their hospital course.

Date Assessed											
Instrument	Day	01	02	03	04	05	06	07	08	09	10
BALANCE											
21. stable ambulation											
14. stable dynamic standing								•	•		
10. stable static standing						•	•				
7. stable dynamic sitting		▲			•						
5. stable static sitting		•	•, ▲	•							
0. impaired static sitting				▲	▲						
TRANSFERS											
18. independent								•	•		
12. 1 person standby							•				
11. 1 person minimal assist						•					
7. 1 person assist					•						
3. 2 person assist		•, ▲	•	•							
0. total lift			▲	▲	▲						
MOBILITY											
26. unlimited											
25. limited > 50m											
21. unlimited with aid											
18. with aid >50m								•	•		
15. with aid 8-50m							•				
12. 1 person standby/+/- aid						•					
9. 1 person hands-on/+/-aid					•						
7. lying-sitting independently		▲		•							
4. positions self in bed		•	•, ▲								
0. needs positioning in bed				▲	▲						

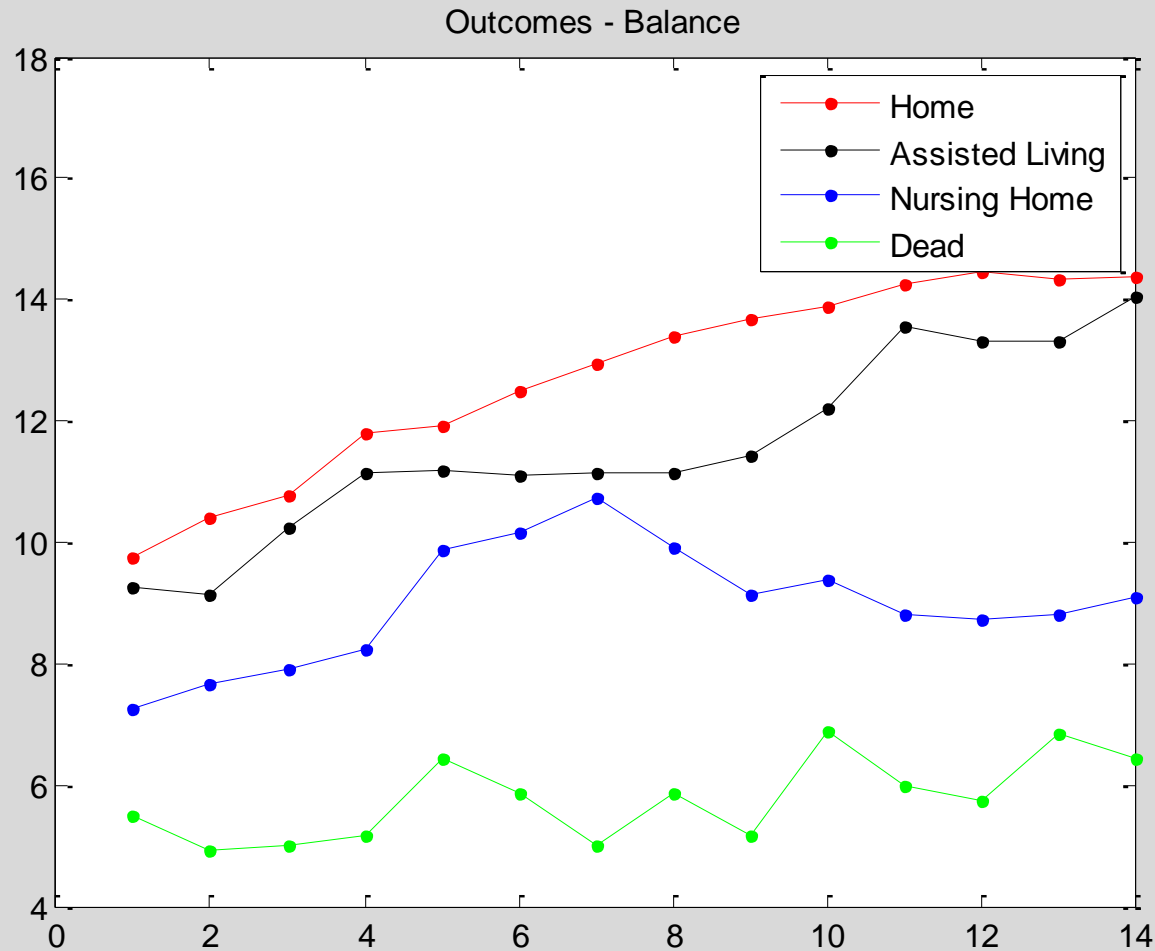
Rockwood et al., *J Am Geriatr Soc*, 2008;56:1213-1217



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Mean value of first 14-day HABAM scores by discharge disposition



Hubbard et al., submitted, 2010

Risk of death within 30 days in relation to HABAM scores

- **Absolute risk** of death if:
 - mobility & balance was no worse (same/better) in the first 48 hours: 4%
 - mobility only was worse in the first 48 hours: 8%
 - mobility & balance was worse in the first 48 hours: 74%

SUMMARY

- *Frailty* is variable vulnerability to adverse outcomes
- The more *deficits* that people have *accumulated*, the frailer they are, but there is a *limit* to frailty.
- Frailty can be *screened* by using simple clinical tools, based on *mobility and function two weeks previously*.
- Frailty can be quantified using a *Frailty Index based on a Comprehensive Geriatric Assessment (FI-CGA)*.
- The FI-CGA can identify increased risk; changes in *mobility and balance can track the severity of illness*.
- These lessons can aid older adults in whom solid organ transplantation is being considered or carried out.



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