Cancer Care
Geriatric Oncology Day

Phil St John

March 9, 2018

Faculty/Presenter Disclosure

- **Faculty: Phil St John**

- **Relationships with commercial interests:**
    - **Grants/Research Support: CIHR, Research MB, Riverview Foundation**
    - **Speakers Bureau/Honoraria: None**
    - **Consulting Fees: None**
    - **Other: Employee of University of Manitoba, WRHA**

Disclosure of Commercial Support

- **<u>Conflicts for the programme are previously disclosed</u>**

- **<u>Potential for conflict(s) of interest</u>:**
  - Phil St John has not received payment/funding, etc. from an organization supporting this program <u>AND/OR</u> organization whose product(s) are being discussed in this program.

Mitigating Potential Bias

Not applicable.

General Objectives

1. Summarize the physiological characteristics of the older person.

2. Discuss the heterogeneity of the older person.

3. Compare different approaches and tools used in geriatric assessment.

4. Review how cancer and cancer treatment impacts the aging process of patients.

KEY POINTS

- An aging society is GOOD; growing old is GOOD

- Aging is associated with accumulating deficits balanced by assets

- The older population is highly heterogeneous
  - Health status
  - Functional status
  - Social situation
  - Cognitive status
  - Health goals

- Geriatric Syndromes are increasingly common as we grow older

- We need an approach which accepts this complexity and individualises care

PHYSIOLOGY
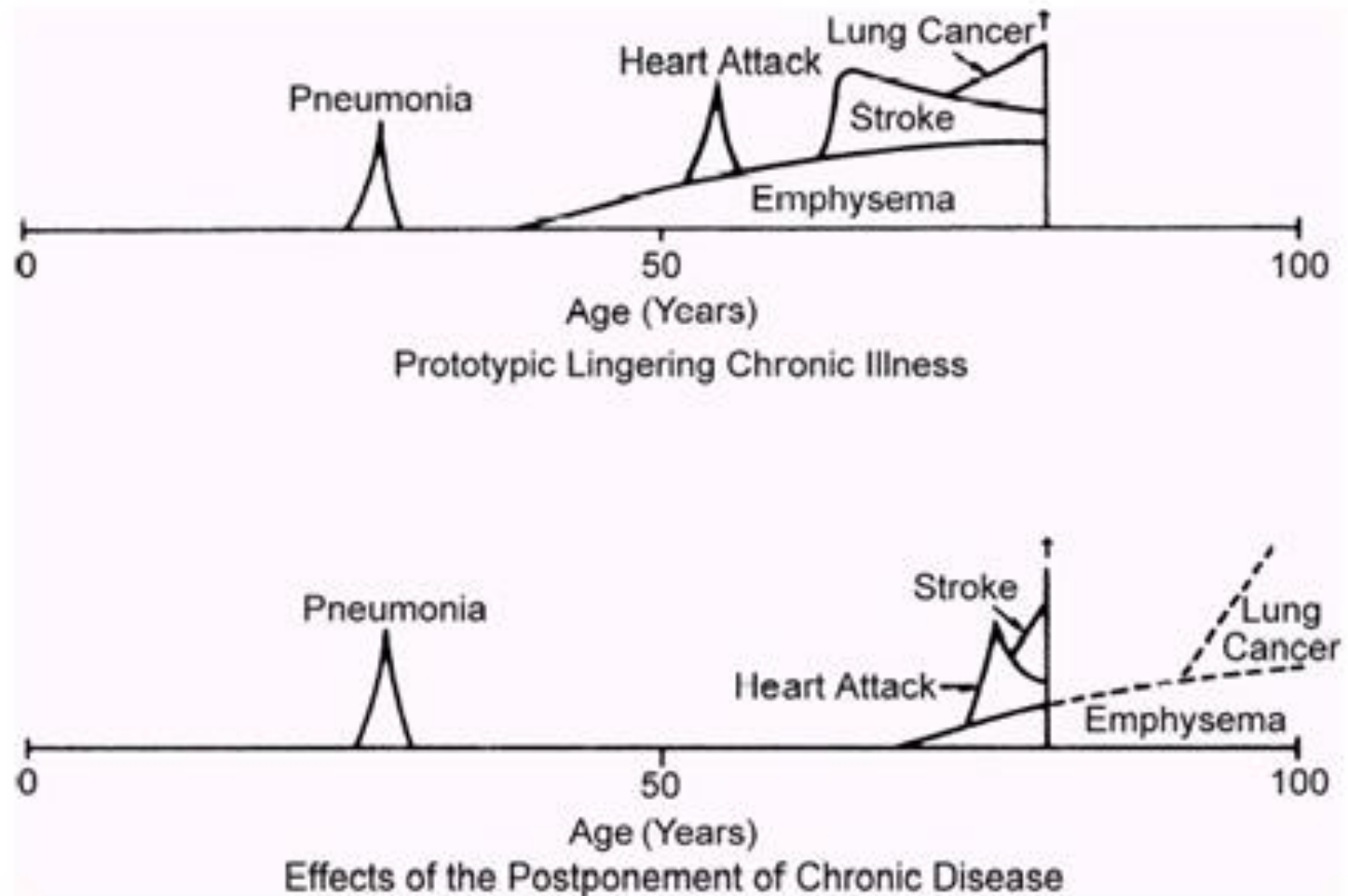
The Life Course Approach
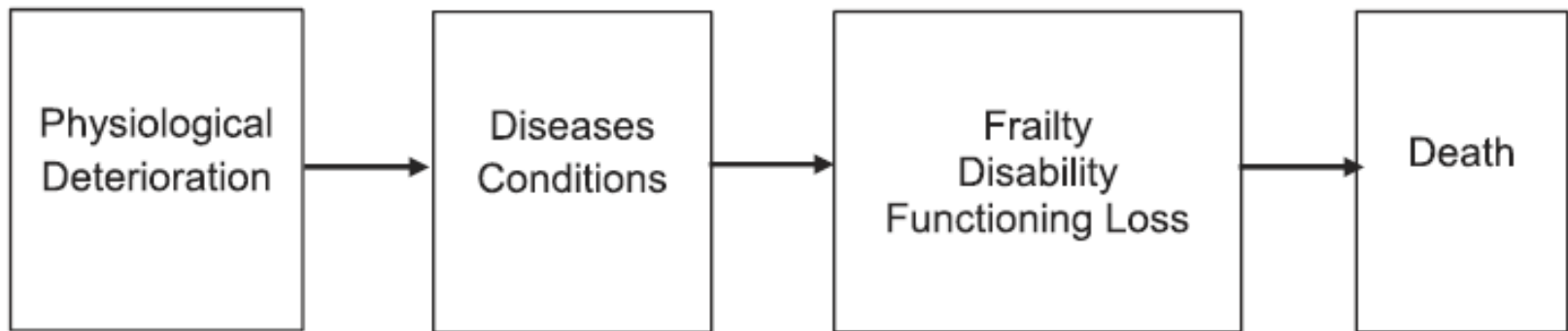
COMPRESSION OF MORBIDITY

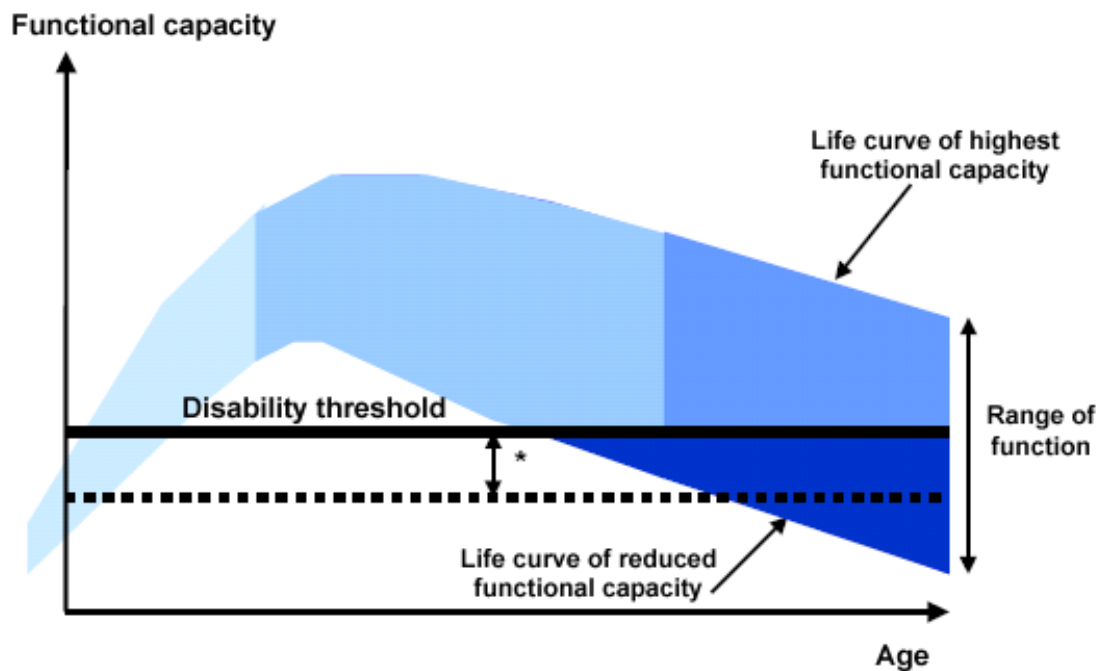Prototypic Lingering Chronic Illness

Effects of the Postponement of Chronic Disease

Figure 1: A life-course perspective for maintenance of the highest possible level of functional capacity

Functional capacity

Life curve of highest functional capacity

Disability threshold

*

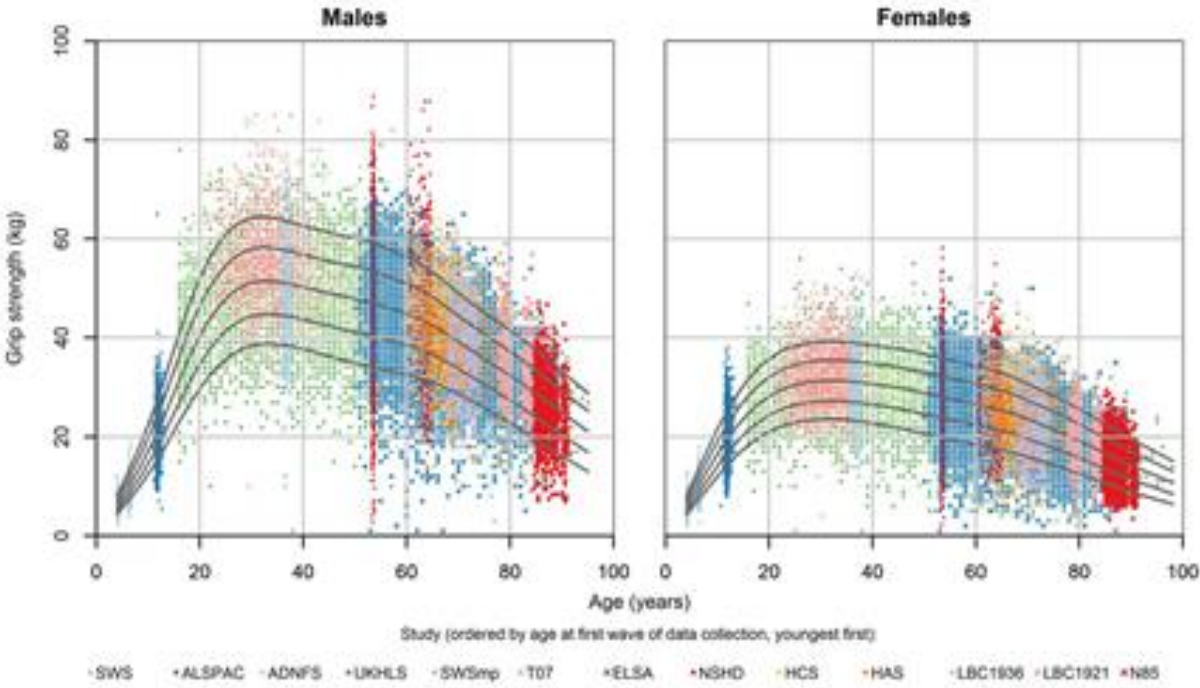Range of function

Life curve of reduced functional capacity

Age

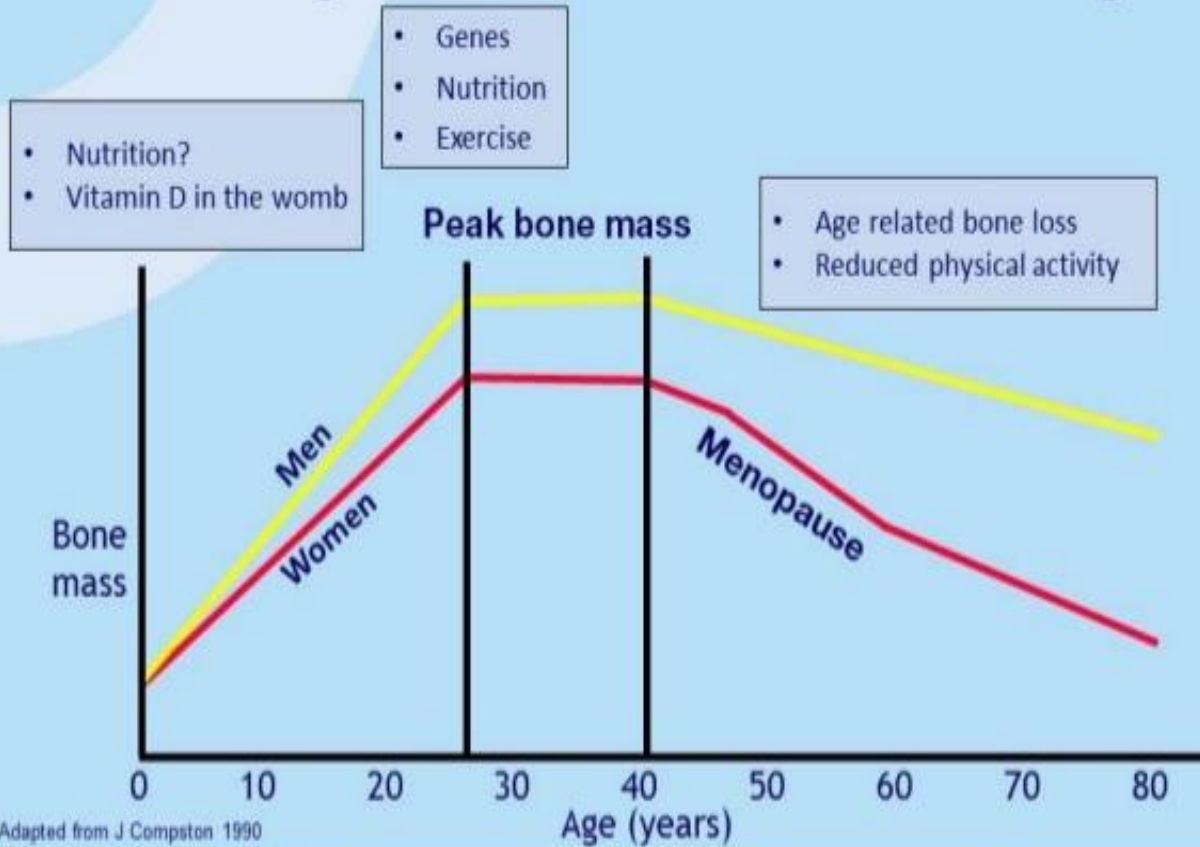*changes in external environment can lower disability threshold

Early life interventions to ensure the highest possible functional capacity

Adult life interventions aimed at slowing down the decline

For those in older age above the disability threshold, revisiting previous interventions

For those in older age below the disability threshold, interventions are aimed at improv interventions ing the quality of life

WHO

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GRIP STRENGTH OVER THE LIFE COURSE

Life Course Trajectory
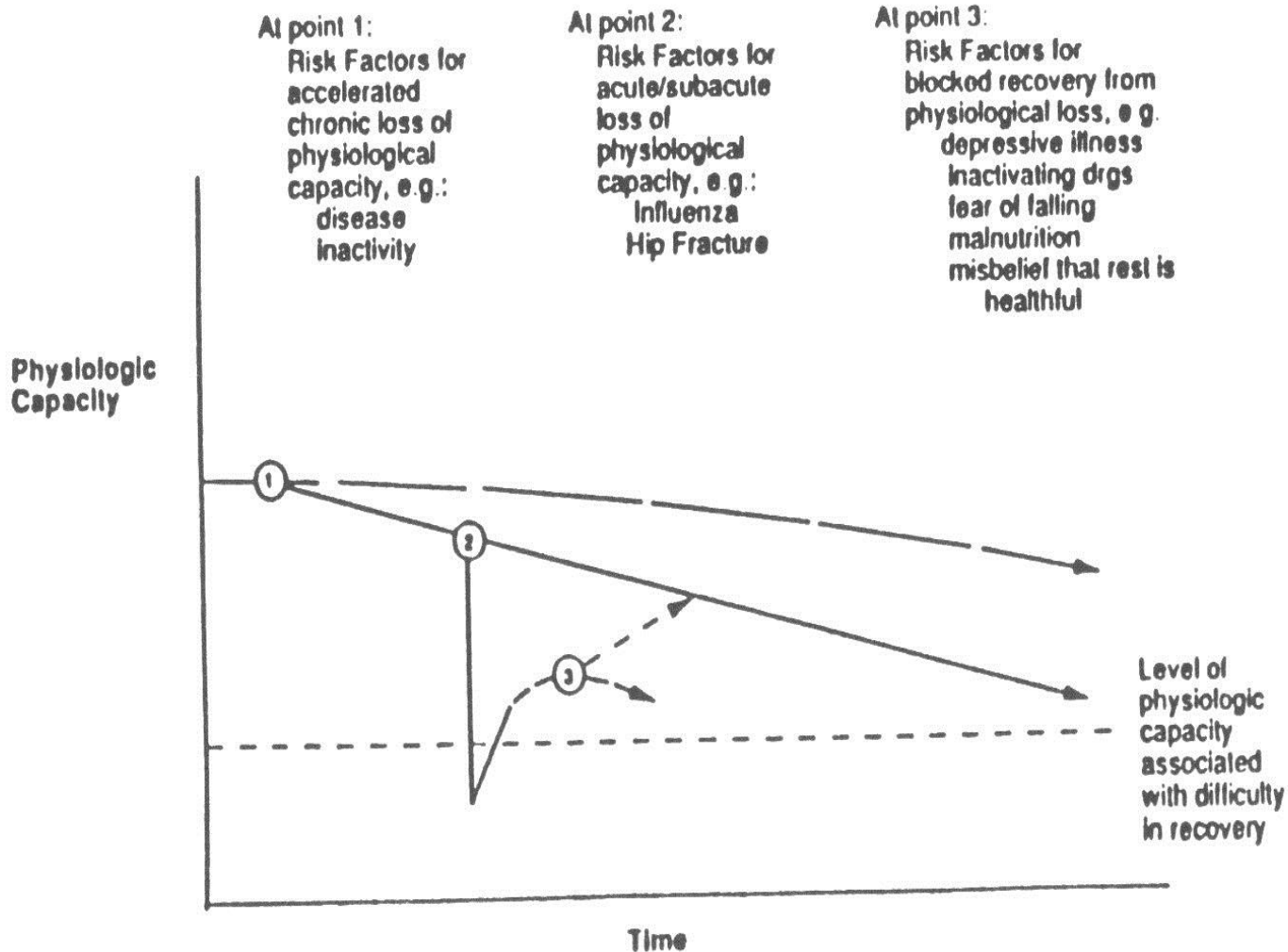
Figure 2. Conceptual model of how risk factors cause frailty.

LIFE AND AGE OF MAN.

STAGES OF MAN'S LIFE FROM THE CRADLE TO THE GRAVE.

Fear God, and keep his Commandments

Resist the Devil, and he will flee from you.

| Until the first Five years be spent, the Child is lamblike innocent | At Ten, he goat like skips and joys in games & sports and foolish toys. | At Twenty, love doth swell his veins and eagle like untamed remains. | With bull like strength to smite his foes. At Thirty to the field he goes. | At Forty nought his courage quails but lion like, by force prevails. | Strength fails at Fifty, but with wit, fox like he helps to manage it. | At Sixty, oft by stealthy ways, wolf like, he tries his wealth to raise. | At Seventy, news he'll hear and tell, but dog like loves at home to dwell. | The cat keeps house and loves the fire. At Eighty we the same desire | At Ninety every trifling care becomes a burden hard to bear. | If we should reach the Hundreth year The sick of life the grave we fear. |

AGE 18-24

- Shared taste in music, books and films is more important
- Needs to pass the 'friends test'

AGE 25-34

- The importance of physical attraction is at its peak
- Ambition is a key trait

AGE 35-44

- Manners maketh the man; less than 1% will date men with bad manners
- Most willing to date a younger man

AGE 45-54

- A high income is now more important than ever
- Women are least picky about who they date

AGE 55+

- Intelligence, shared values and humour are more important
- Women at 55 and over are the pickiest

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THE STAGES OF MAN

ADOLESCENCE   ADULTHOOD   MATURITY   DENIAL

SUTTON

What are the epidemiological features?

- Increasing rates of
  - Multiple morbidities – "multimorbidity"
  - Functional decline
  - Cognitive decline and dementia
  - Social isolation

- Stable (or improving)
  - Life satisfaction
  - Depression

- Embrace complexity
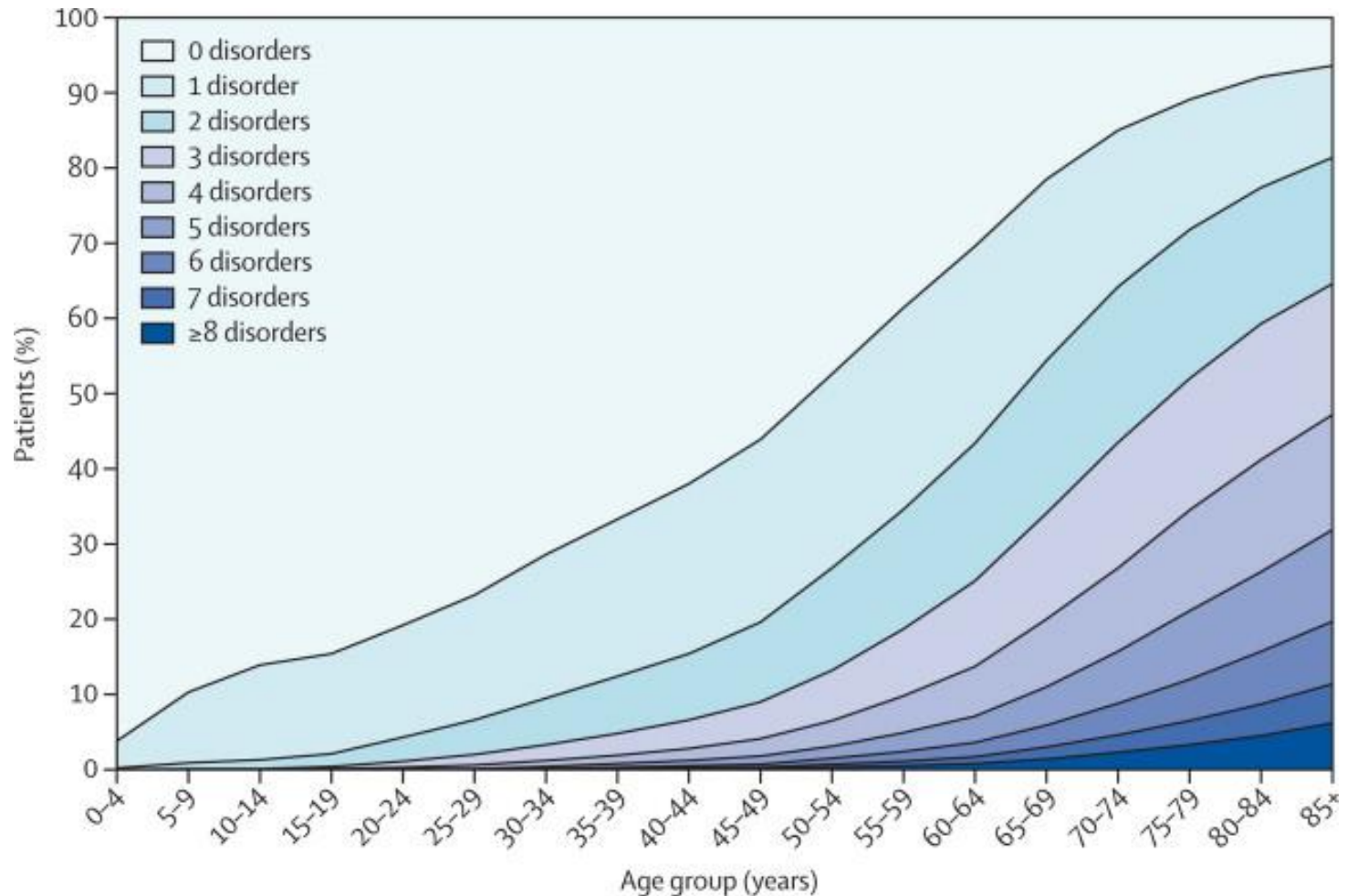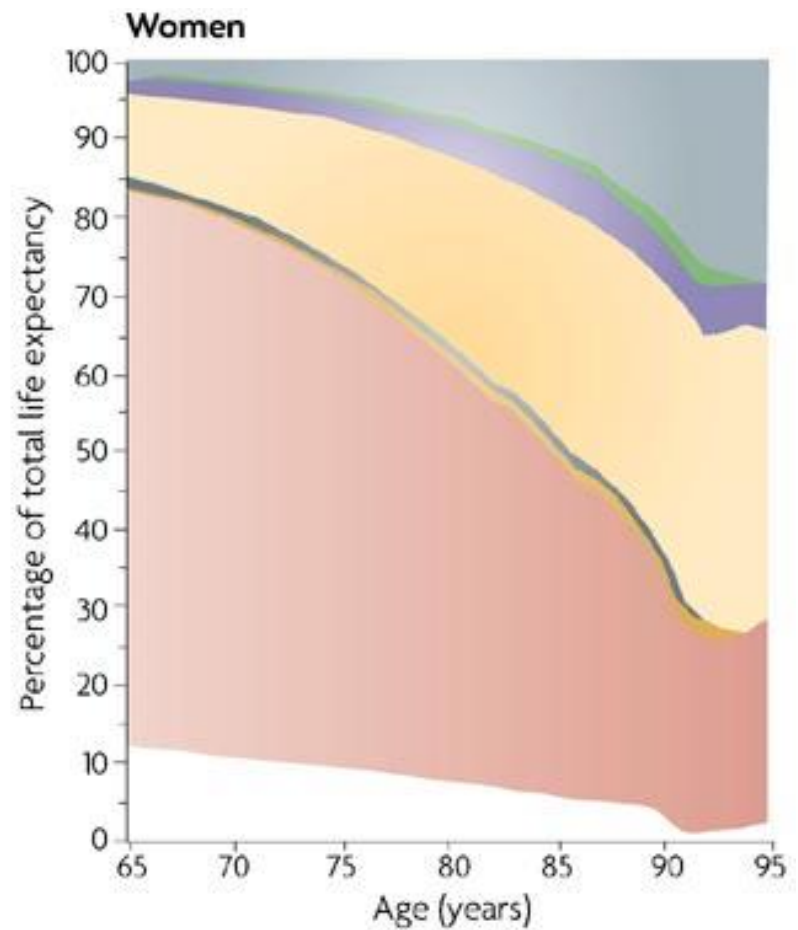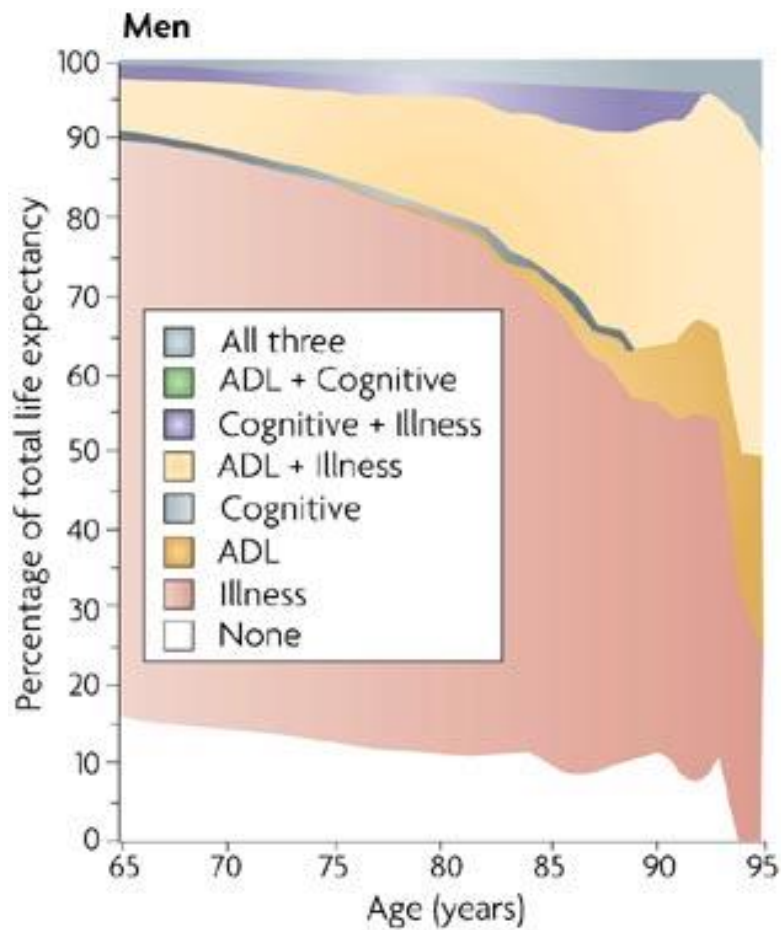
Age and Multimorbidity

Figure 1. Number of chronic disorders by age-group

Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study

The Five Ms

GERIATRIC 5Ms©	
MIND	Mentation, Dementia, Delirium, Depression
MOBILITY	Impaired gait and balance, fall injury prevention
MEDICATIONS	Polypharmacy, De- prescribing, Optimal prescribing, Adverse medication effects and medication burden
MULTI-COMPLEXITY	Multi-morbidity, Complex bio-psycho-social situations
MATTERS MOST	Each individual's own meaningful health outcome goals and care preferences.

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Visual of a hand providing an alternative representation of the GERIATRIC 5Ms© framework

MOBILITY

MIND

MEDICATIONS

MULTI-COMPLEXITY

MATTERS MOST
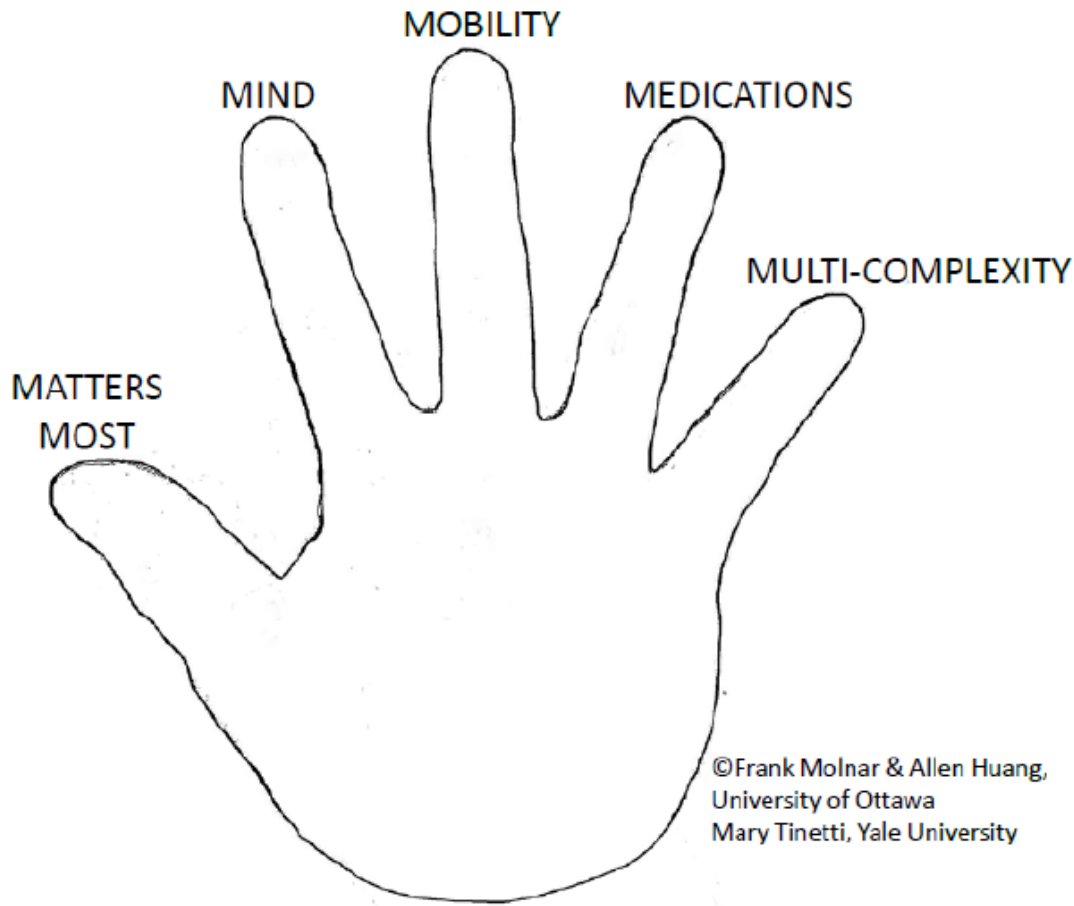
©Frank Molnar & Allen Huang,
University of Ottawa
Mary Tinetti, Yale University

Geriatric Giants (c 1962)

- Instability,

- Immobility,

- Incontinence,

- Intellectual impairment,

- Impaired independence

MANAGEMENT

The Onion. 2008

HETEROGENEITY

- As we age, we become less alike

- Difficult to predict
  - Renal Function
  - Hepatic Function
  - Drug effects

- Overall prognosis

% Population with perfect EQ-5D scores (e)

(a)

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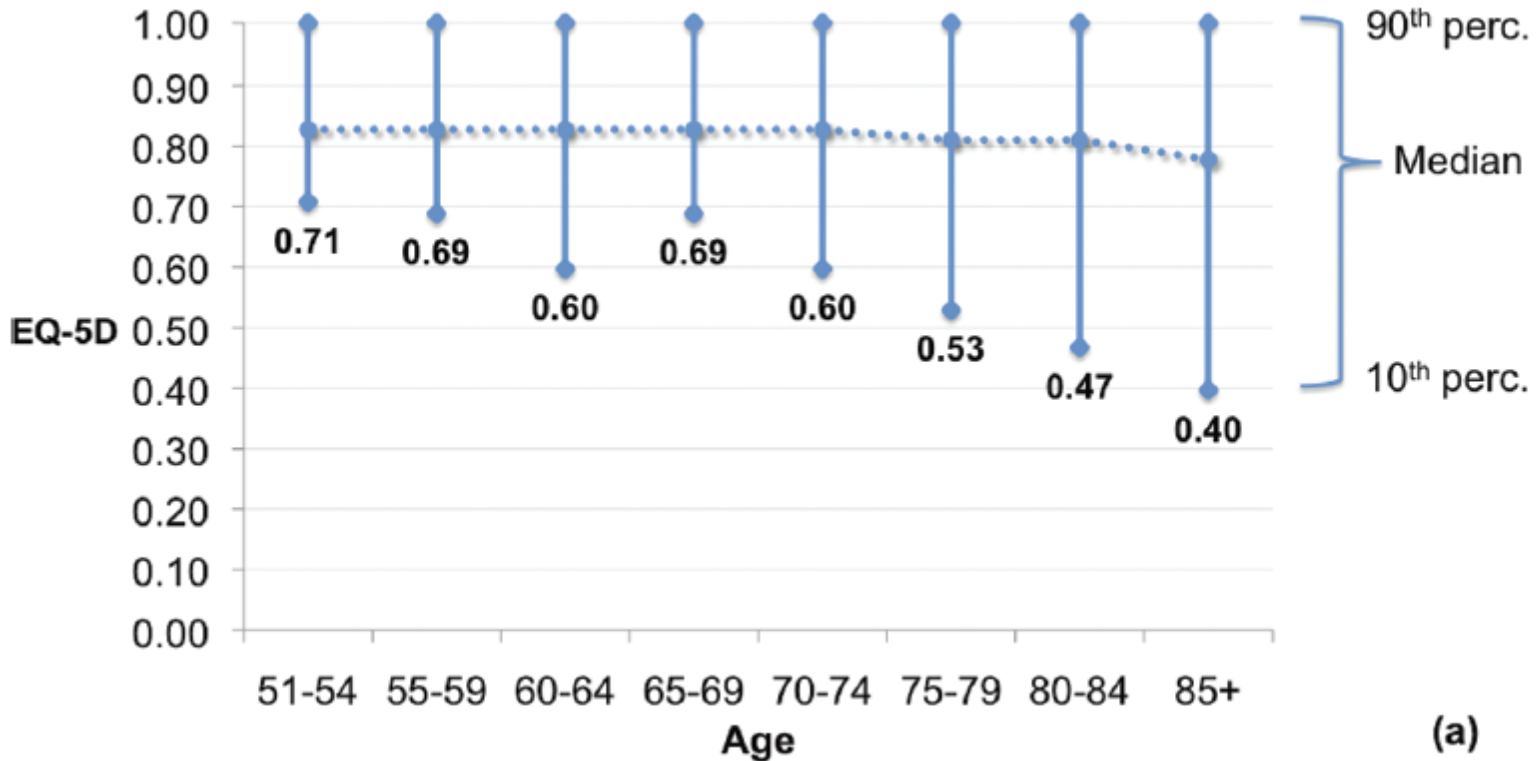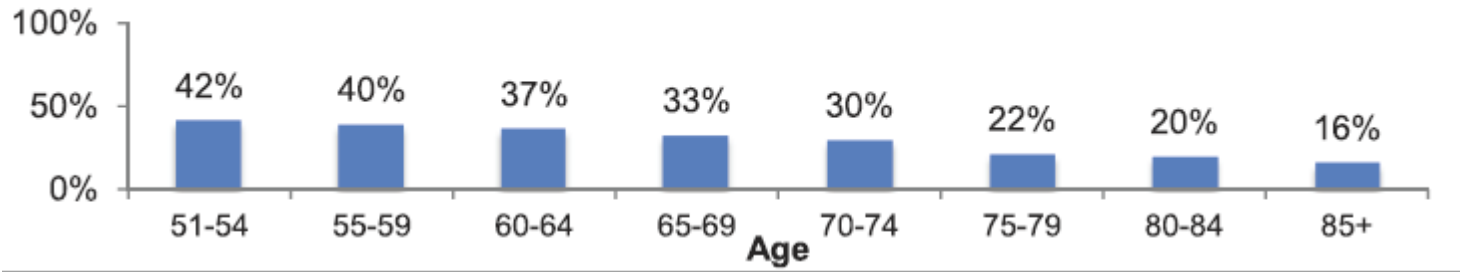
Heterogeneity of Treatment Goals

Most important outcome, %	
Keeping you alive	27
Maintaining independence	42
Relief of pain	21
Relief of other symptoms	10
Least important outcome, %	
Keeping you alive	36
Maintaining independence	5
Relief of pain	27
Relief of other symptoms	32

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GENERAL APPROACH

- Looking and listening

- Functional measures
  - OARS
  - FIM

- Quality of Life Measures

- Cognitive Measures
  - MMSE
  - MoCA

Geriatric Assessment

- is a multidimensional, multidisciplinary **assessment** designed to evaluate an older person's functional ability, physical health, cognition and mental health, and socioenvironmental circumstances

Kane and Kane

FUNCTIONAL STATUS PREDICTS ALL ADVERSE OUTCOMES IN ALL POPULATIONS IN ALL SETTINGS EVER STUDIED

Functional Status and Mortality in Hospital

Inouye et al, NEJM, 1999
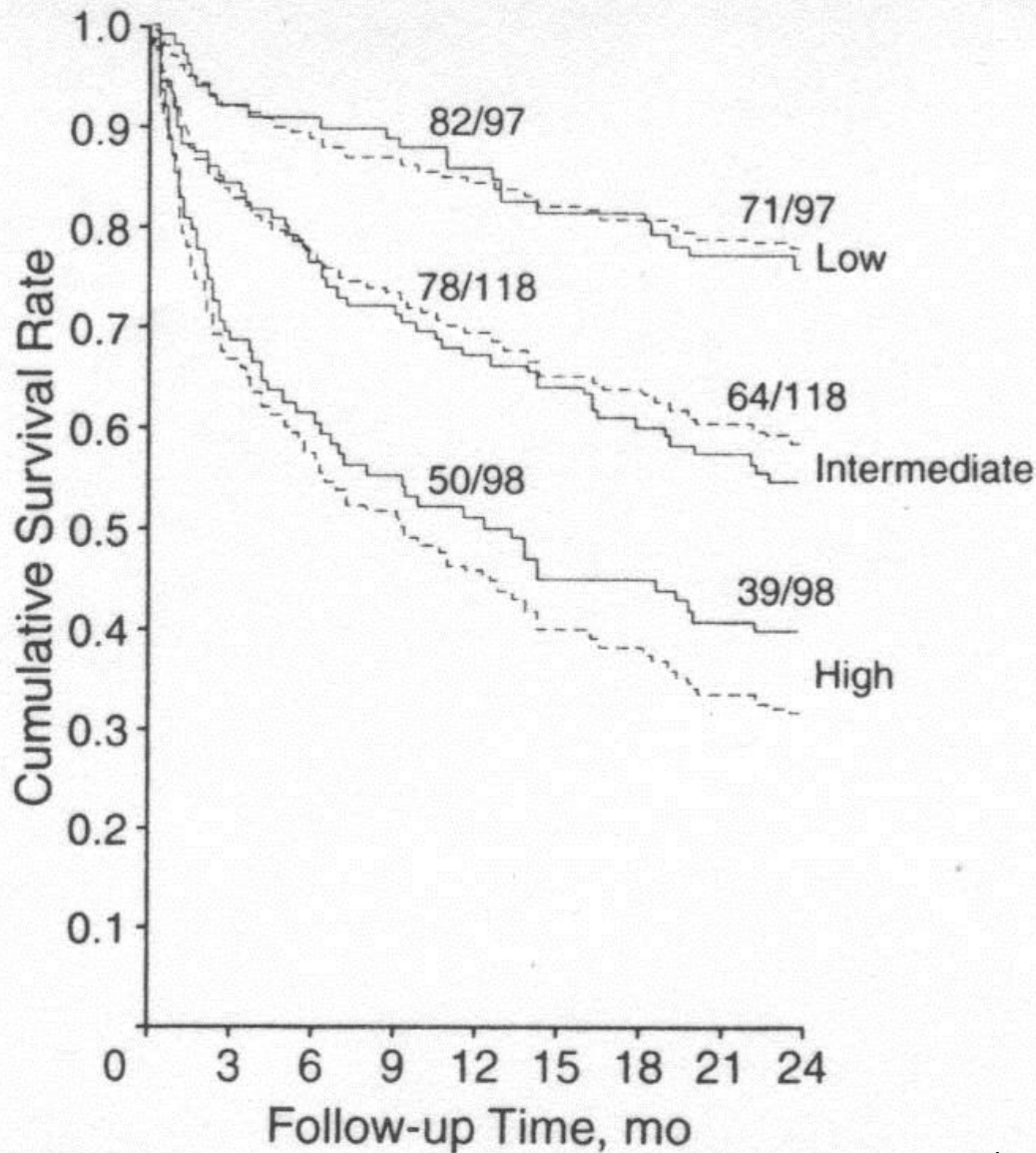
Different Diseases and Syndromes Have Difference Functional Trajectories

Sudden Death — Function (High to Low) vs. Time, with Death marked at the sudden drop.

Terminal Illness — Function (High to Low) vs. Time, with Death marked at the end of the steep decline.

Organ Failure — Function (High to Low) vs. Time, with Death marked at the end.

Frailty — Function (High to Low) vs. Time, with Death marked at the end.

Sudden Death (n = 649)

Cancer (n = 897)

Organ Failure (n = 817)

Frailty (n = 837)

ADL Dependencies

Months Before Death

Risk Indices

Table 3. Independent Risk Factors for 4-Year Mortality in the Development Cohort in the Multivariable Analysis

Risk Factor	Adjusted OR (95% CI)*	Points
Demographics		
Age, y		
60-64	1.9 (1.4-2.5)	1
65-69	2.8 (2.1-3.7)	2
70-74	3.7 (2.8-4.9)	3
75-79	5.4 (4.1-7.1)	4
80-84	8.3 (6.3-11.0)	5
≥85	16.2 (12.2-21.6)	7
Male sex	2.0 (1.8-2.3)	2
Comorbidities and behaviors		
Diabetes mellitus	1.8 (1.5-2.1)	1
Cancer	2.1 (1.7-2.4)	2
Lung disease	2.3 (1.8-2.9)	2
Heart failure	2.3 (1.8-3.1)	2
BMI<25	1.7 (1.4-1.9)	1
Current smoker	2.1 (1.7-2.5)	2
Functional measures		
Bathing	2.0 (1.6-2.4)	2
Managing finances	1.9 (1.6-2.3)	2
Walking several blocks	2.1 (1.8-2.4)	2
Pushing/pulling heavy objects	1.5 (1.3-1.8)	1

- "I know an *x* year old (wo)man who is so sick they can't do *y*"

Lee et al, JAMA, 2006

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Figure. Four-year Mortality by Risk Score in Differing Age Groups
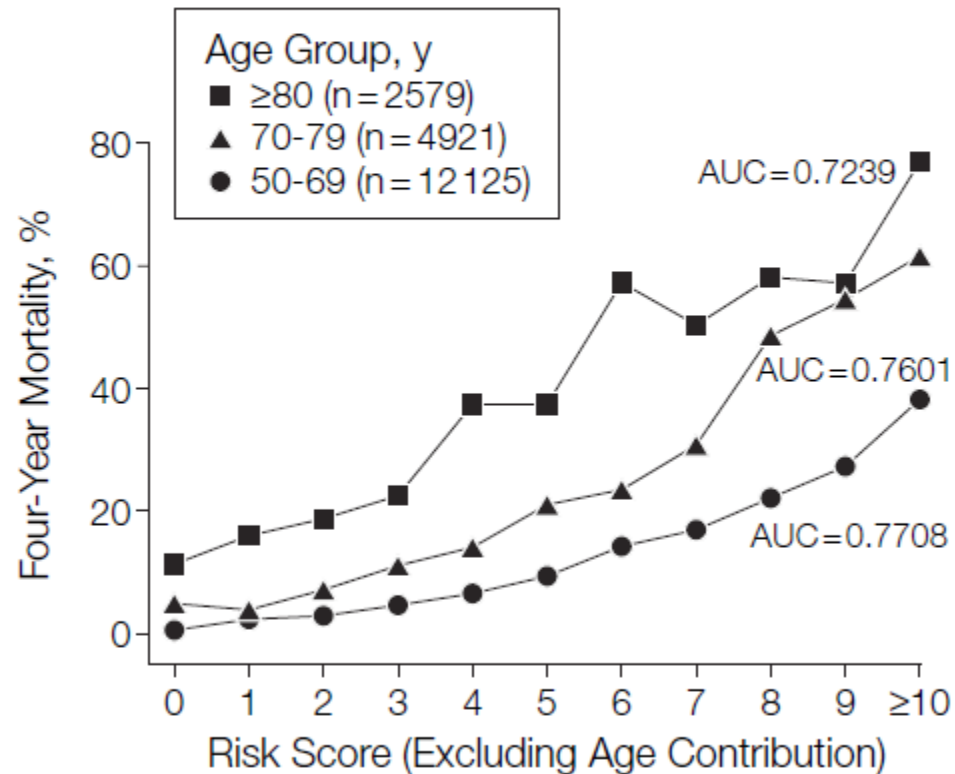
AUC indicates area under the curve.

Ten Year Mortality

Figure. Kaplan-Meier Survival in Validation Cohort by Selected Risk Points
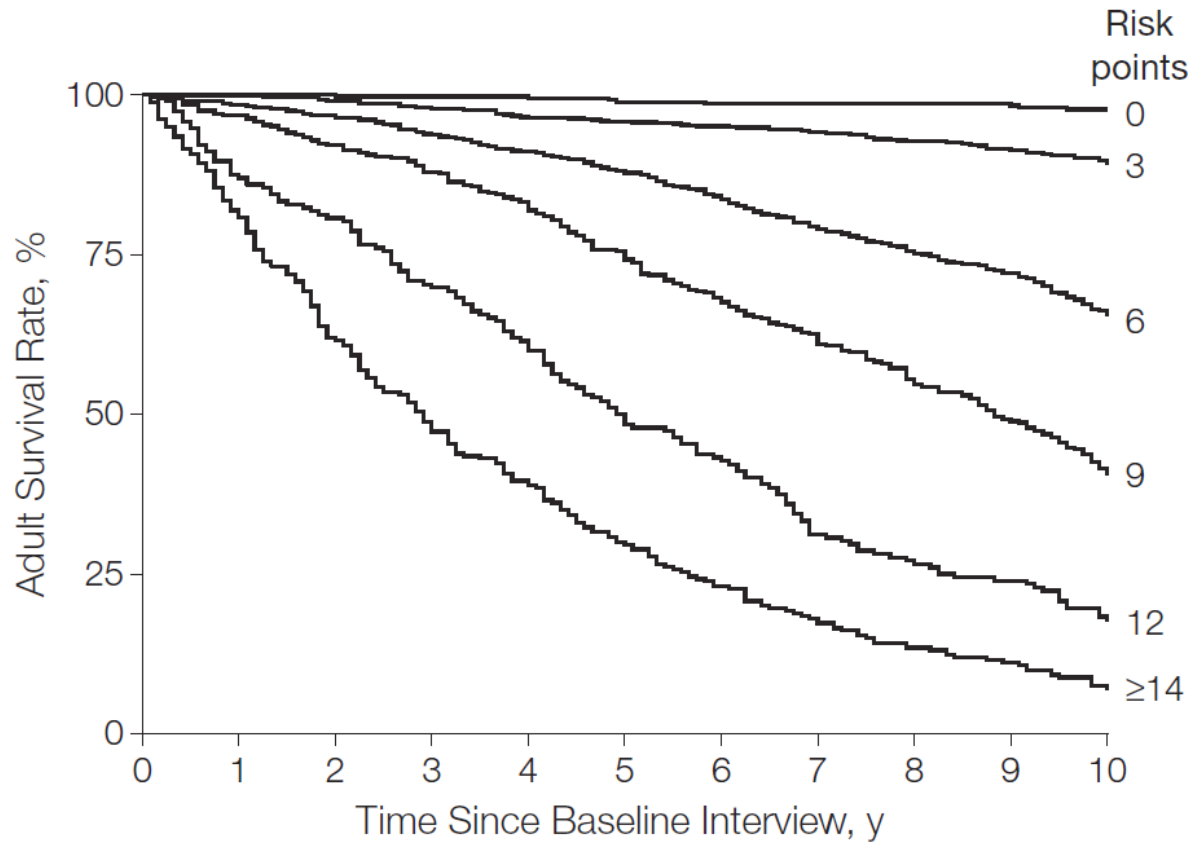
This is not News….

Mental State
   Normal, 4; slight impairment, 3; moderate impairment, 2; gross impairment, 1; (coma, 0).

Incontinence
   Not, 2; moderate, 1; severe, 0.

Physical State

Mobility	*Daily living activities*
Out of doors	Feeding
Climb stairs	Dressing
Indoors	Washing
Get in and out of chair	Shaving (men) and attention to
Get in and out of bed	hair (women)
	Cooking
	Cleaning

Activity performed unaided, 2; with help, 1; unable to do it, or never did it, 0.

Arnold, Exton-Smith, Lancet, 1962
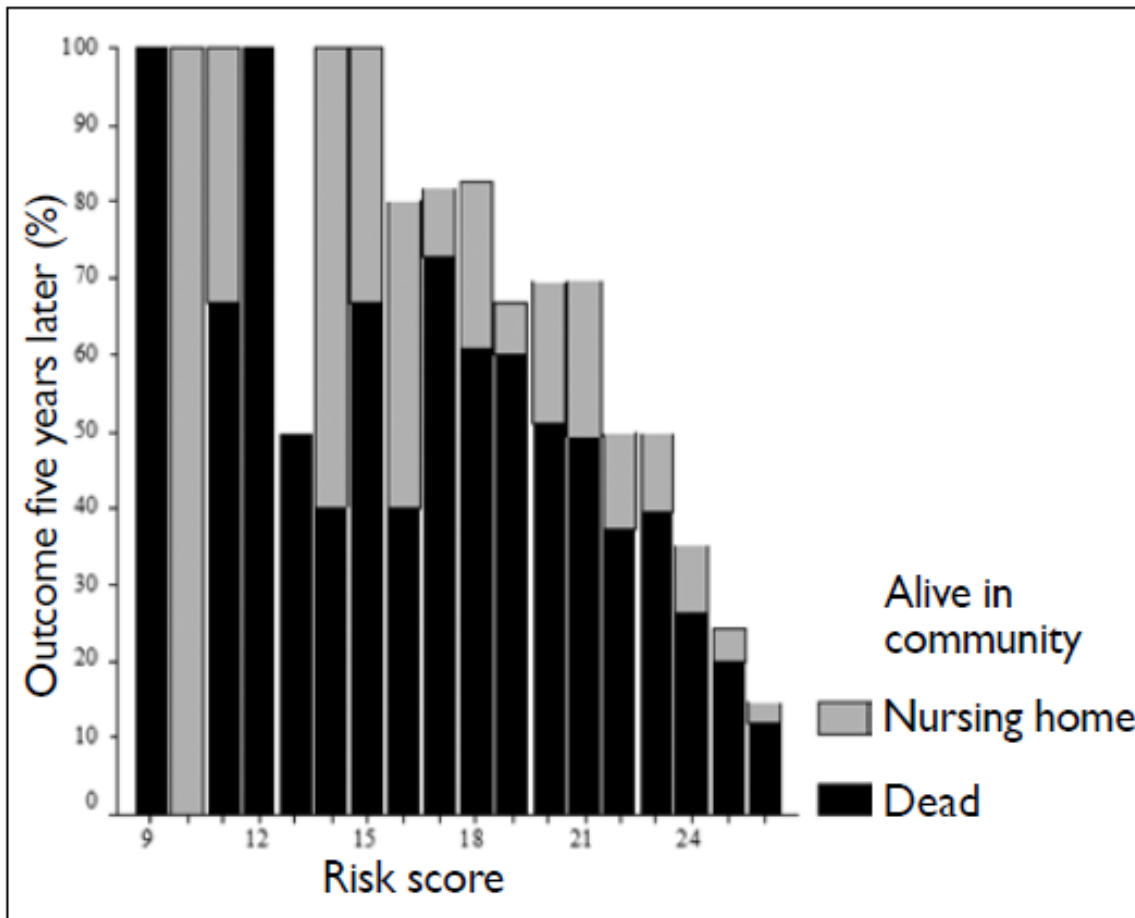
FIGURE 1 The risk score predicts death and NH placement over a five-year interval in community-dwelling older adults.

St John and Montgomery, J R C Edin, 2014

Cognition

- Median survival time from age of onset of dementia ranges from 3.3 to 11.7 years, with most studies in the 7 to 10-year period (Todd et al, Int J Geriatr Psych, 2012).

- High risk of treatment complications

- Issues with understanding and adhering to treatment

Hippocrates – Global Prognosticators

St John and Montgomery, BMJ, 2014
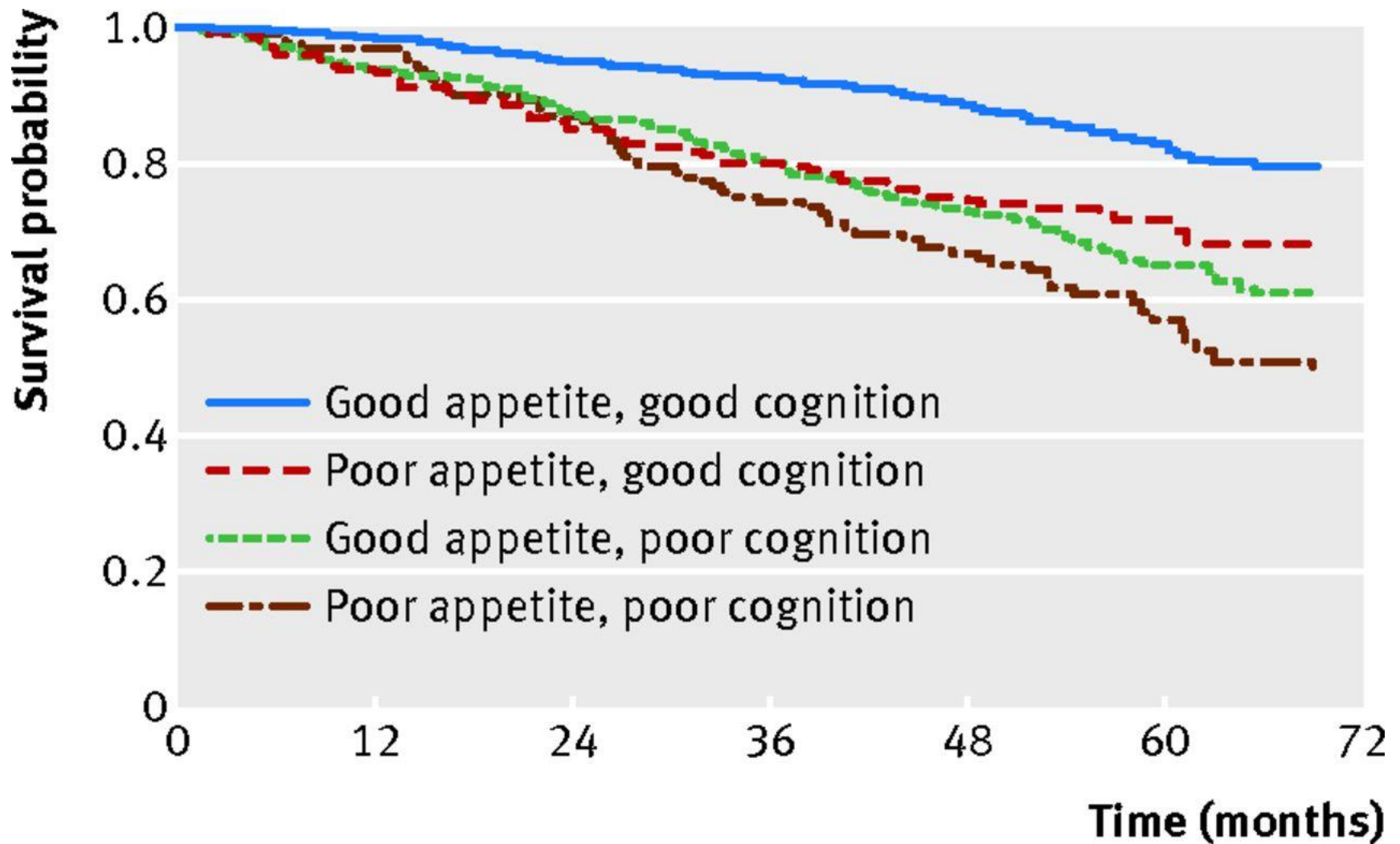
The Notion of Frailty

- An important notion in geriatrics

- Associated with poor outcomes

- Numerous definitions – the two most common are - "Frailty Phenotype" and the "Accumulation of Deficits"

Accumulation of Deficits

- Frailty is the outcome of a number of unrelated abnormal conditions in an individual

  - This multimorbid state → increased risk of mortality

  - The number of conditions predicts this vulnerability

- # Frailty Index
  - ## Tally of deficits
  - ## Not weighted

  - Age related
  - Untoward
  - Common, but not universal
  - Similar across time waves
  - Wide range of systems
  - (in several domains)

Table 1. List of Deficits, Their Scale Levels, and Population Means

Deficit Code	Deficits	Levels	Mean
1	Eyesight	5	0.3006
2	Hearing	5	0.2831
3	Help to eat	3	0.0039
4	Help to dress and undress	3	0.0114
5	Ability to take care of appearance	3	0.0093
6	Help to walk	3	0.0303
7	Help to get in and out of bed	3	0.0070
8	Help to take a bath or shower	3	0.0684
9	Help to go to the bathroom	3	0.0085
10	Help to use the telephone	3	0.0309
11	Help to get to place out of walking distance	3	0.0736
12	Help in shopping	3	0.1148
13	Help to prepare own meals	3	0.0656
14	Help to do housework	3	0.1871
15	Ability to take medicine	3	0.0224
16	Ability to handle own money	3	0.0424
17	Self-rating of health	5	0.2353
18	Troubles prevent normal activities	3	0.3491
19	Living alone	2	0.3605
20	Having a cough	2	0.1251
21	Feeling tired	2	0.1756
22	Nose stuffed up or sneezing	2	0.1661
23	High blood pressure	2	0.3388
24	Heart and circulation problems	2	0.3014
25	Stroke or effects of stroke	2	0.0480
26	Arthritis or rheumatism	2	0.5651
27	Parkinson's disease	2	0.0133
28	Eye trouble	2	0.3041
29	Ear trouble	2	0.2876
30	Dental problems	2	0.1975
31	Chest problems	2	0.1722
32	Trouble with stomach	2	0.2560
33	Kidney trouble	2	0.1212
34	Losing control of bladder	2	0.1503
35	Losing control of bowels	2	0.0467
36	Diabetes	2	0.0969
37	Trouble with feet or ankles	2	0.3261
38	Trouble with nerves	2	0.1895
39	Skin problems	2	0.1767
40	Fractures	2	0.0590

Mitniski et al, 2001, and Searle et al, 2008

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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.

DALHOUSIE UNIVERSITY
Inspiring Minds

Rockwood et al, 2005

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Frailty as a Phenotype

- Distinct entity

- Physiologic process resulting from dysregulation of multiple physiologic systems

- Emphasizes physical performance

Fried, J Geront Med Sc, 2001

Characteristic	Criteria (≥3 indicates frailty)
Weight loss	Lost >10 pounds unintentionally last year
Exhaustion	Felt that everything I did in the last week was an effort *or* Could not get going in last week
Slowness	Walking 15 feet in: ≤7 sec for height ≤ 159 cm ≤6 sec for height >159 cm
Low activity level	<270 kcal of physical expenditure on 18-item activity scale (see slide notes)
Weakness	Grip strength of the dominant hand: ≤17 kg for BMI ≤ 23 ≤17.3 kg for 23 < BMI ≤ 26 ≤18 kg for 26 < BMI ≤ 29 ≤21 kg for BMI > 29

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How fast does the Grim Reaper walk? Receiver operating characteristics curve analysis in healthy men aged 70 and over

Figures

Conclusion The Grim Reaper's preferred walking speed is 0.82 m/s (2 miles (about 3 km) per hour) under working conditions. As none of the men in the study with walking speeds of 1.36 m/s (3 miles (about 5 km) per hour) or greater had contact with Death, this seems to be the Grim Reaper's most likely maximum speed; for those wishing to avoid their allotted fate, this would be the advised walking speed.
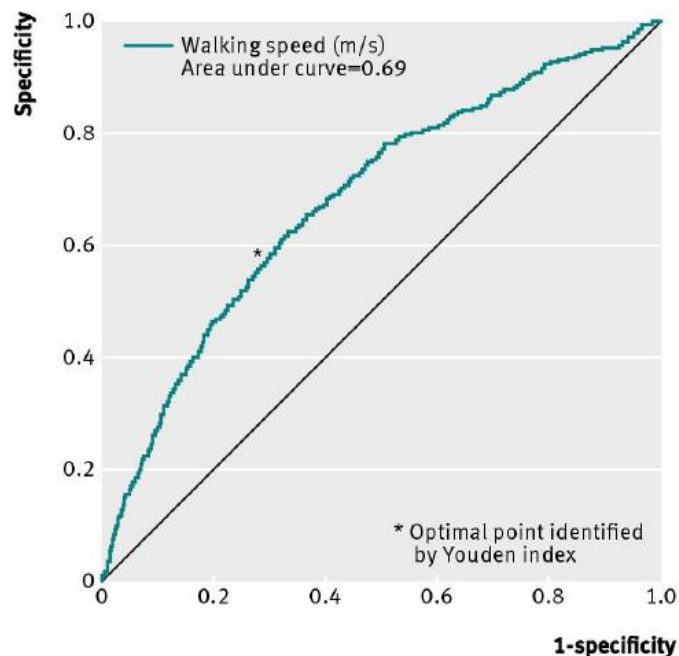
This is not a small effect....

eFigure 2. Survival According to Gait Speed Categories using Pooled Data from Nine Cohort Studies
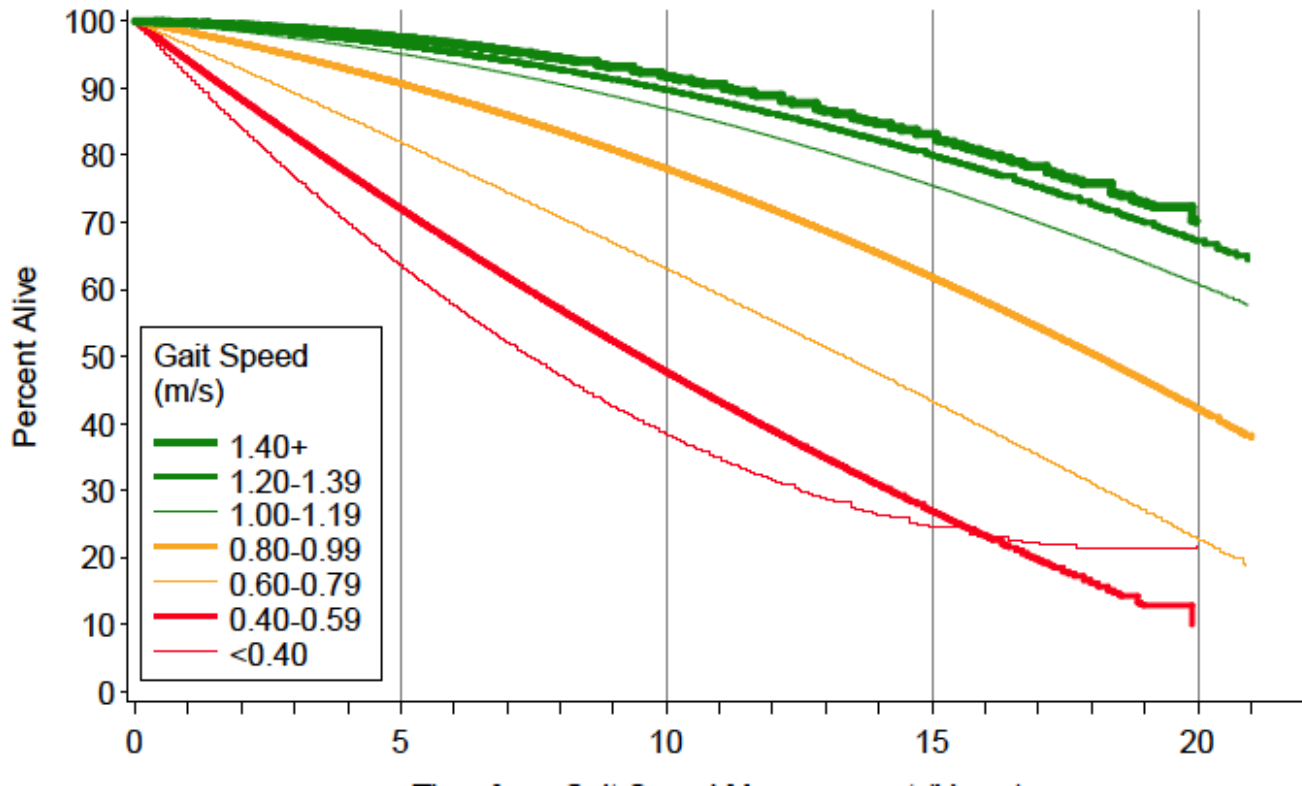
Grip Strength…..

Grip Strength Predicts Mortality

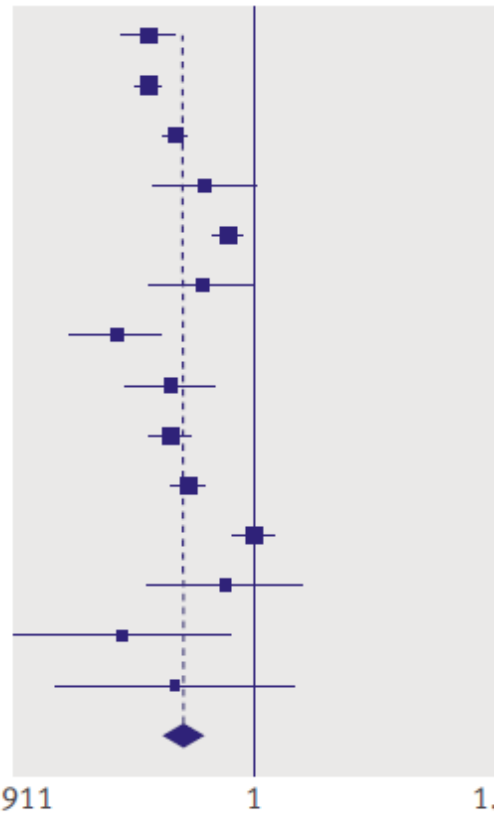| Study author/s (sex) (total No; No of deaths)	Hazard ratio (95% CI)
Al Snih (B) (2488; 507)	0.96 (0.95 to 0.97)
Cawthon and Ensrud (MrOS) (M) (5631; 1070)	0.96 (0.95 to 0.97)
Cawthon and Ensrud (SOF) (F) (9700; 5536)	0.97 (0.96 to 0.98)
Cesari 2008* (B) (335; 71)	0.98 (0.96 to 1.00)
Gale (B) (800; 756)	0.99 (0.98 to 1.00)
Katzmarzyk (B) (8148; 269)	0.98 (0.96 to 1.00)
Klein (B) (2612; 194)	0.95 (0.93 to 0.97)
Newman* (B) (2292; 286)	0.97 (0.95 to 0.99)
Rantanen (M) (6040; 2900)	0.97 (0.96 to 0.98)
Sasaki (B) (4821; 2407)	0.98 (0.97 to 0.98)
Shibata* (M) (192; 59)	1.00 (0.99 to 1.01)
Shibata* (F) (221; 43)	0.99 (0.96 to 1.02)
Syddall (B) (714; 52)	0.95 (0.91 to 0.99)
Takata* (B) (642; 94)	0.97 (0.93 to 1.02)
Overall: I^2=89.5%, 95% CI 84% to 93%, P<0.001	0.97 (0.96 to 0.98)
Between study variance=0.0002	

0.911   1   1.1

Hazard ratio per 1 kg increase in grip strength

Cooper, R. BMJ 2010;341:c4467

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Can your handshake predict your heart health? Canadian study suggests link
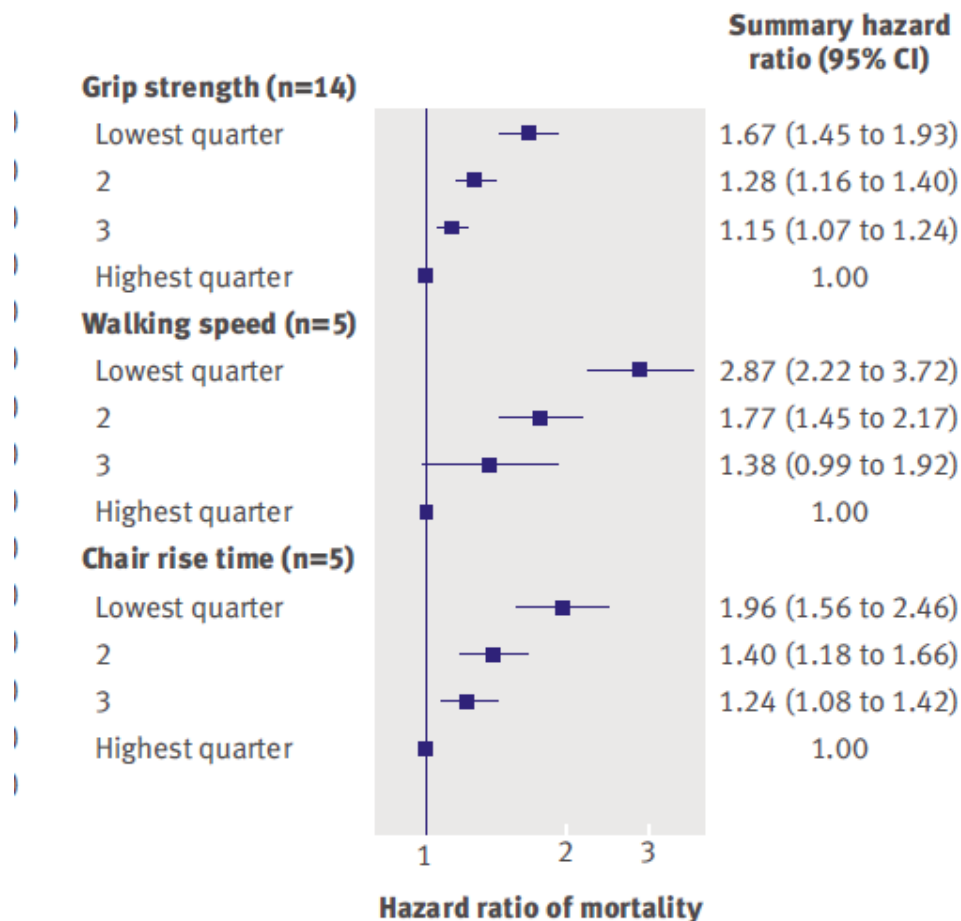

- "Doctors or other health care professionals can measure grip strength to identify patients with major illnesses such as heart failure or stroke who are at particularly high risk of dying from their illness,"
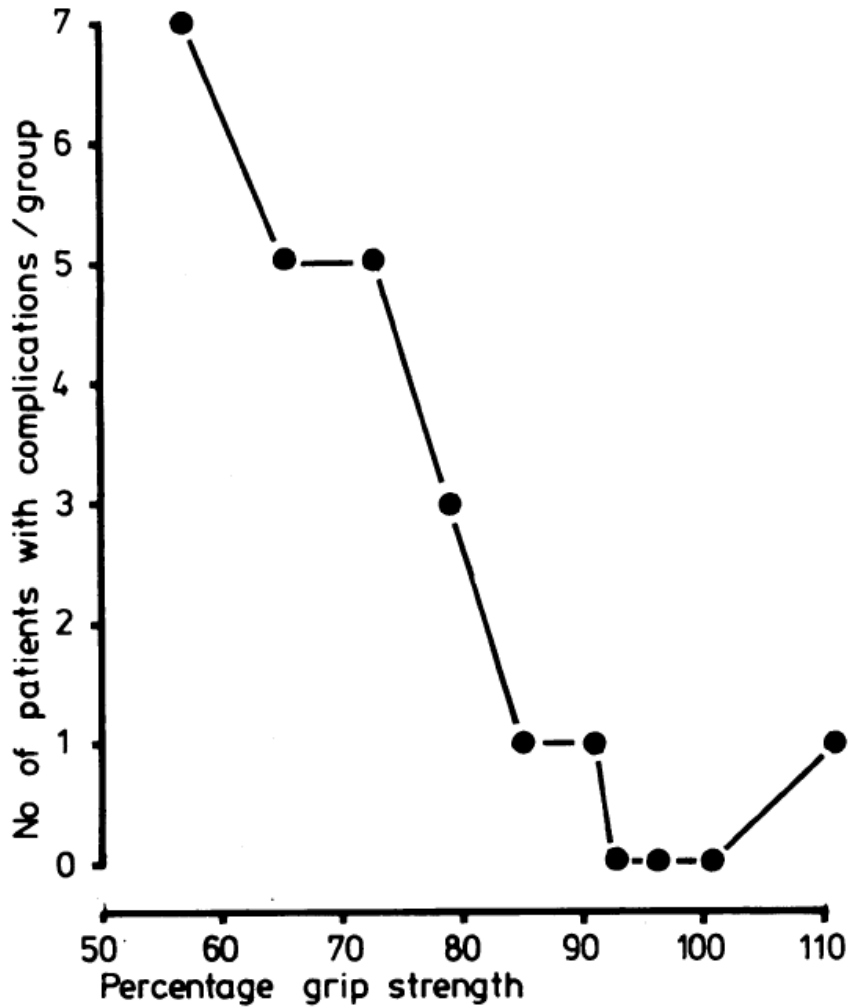
Grip strengths in patients with and without complications.
Patients were grouped in tens according to grip strength.

Physical Performance Measures Gradient

Summary hazard ratio (95% CI)

Grip strength (n=14)
- Lowest quarter — 1.67 (1.45 to 1.93)
- 2 — 1.28 (1.16 to 1.40)
- 3 — 1.15 (1.07 to 1.24)
- Highest quarter — 1.00

Walking speed (n=5)
- Lowest quarter — 2.87 (2.22 to 3.72)
- 2 — 1.77 (1.45 to 2.17)
- 3 — 1.38 (0.99 to 1.92)
- Highest quarter — 1.00

Chair rise time (n=5)
- Lowest quarter — 1.96 (1.56 to 2.46)
- 2 — 1.40 (1.18 to 1.66)
- 3 — 1.24 (1.08 to 1.42)
- Highest quarter — 1.00

Hazard ratio of mortality

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How Does Ageing Affect Cancer and Treatments?

- Age **does** matter – but less than other factors
- Things to note
  - Functional status and trajectory
  - Cognitive Status
  - Frailty status
  - Comorbid conditions
  - Social networks and supports
  - Caregiver stress (and cognition and health)
  - Care goals

POSSIBLE APPROACHES

- Nobody knows
  - Trials exclude those with co-morbidities
  - Trials exclude the elderly (never mind the very elderly)
  - Observational trials may bias towards healthier elderly

GENERAL APPROACHES

- Be honest

- Accept uncertainty

- Understand patient and family wishes

- Be flexible

- Possibly in the future
  - Dose adjustments
  - Shorter duration
  - Differing regimens

GENERAL APPROACHES

- Generally, try to be less aggressive in those with
  – More co-morbidities,
  – Lower functional status,
  – Worse cognition
  – Who don't want it