ashm

optimising care 2020

Optimising the care of people living with HIV: An update on management of comorbidities to improve patient health

GILEAD

Sponsored by Gilead Sciences

ashm

Geriatric Medicine: Frailty and Cognitive Decline

Prof Ruth E. Hubbard

BSc, MBBS, MRCP, MSc, MD, FRACP

26th September 2020

GILEAD Sponsored by Gilead Sciences

ashm

Objectives

Provide an overview of frailty

- Understanding ageing
- Frailty measures
- What causes frailty
- What frailty causes

Review cognitive decline

- Explain cognitive reserve theory of ageing
- Assessment of a patient with impaired cognition
- Differential diagnoses of dementia

What is frailty?

Frailty has been defined as a state of increased vulnerability to stressors

A frail individual has reduced physiological reserve and reduced ability to compensate for disruptions to homeostasis

Increased risk of:

- Disability
- Institutionalisation
- Death

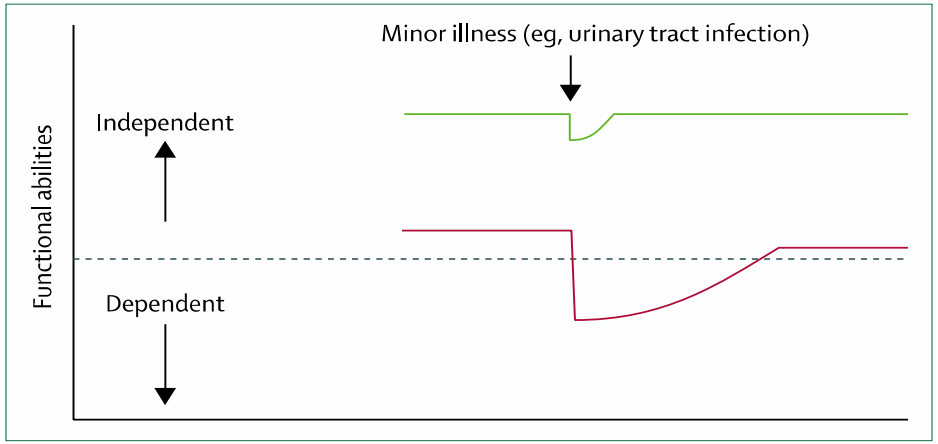
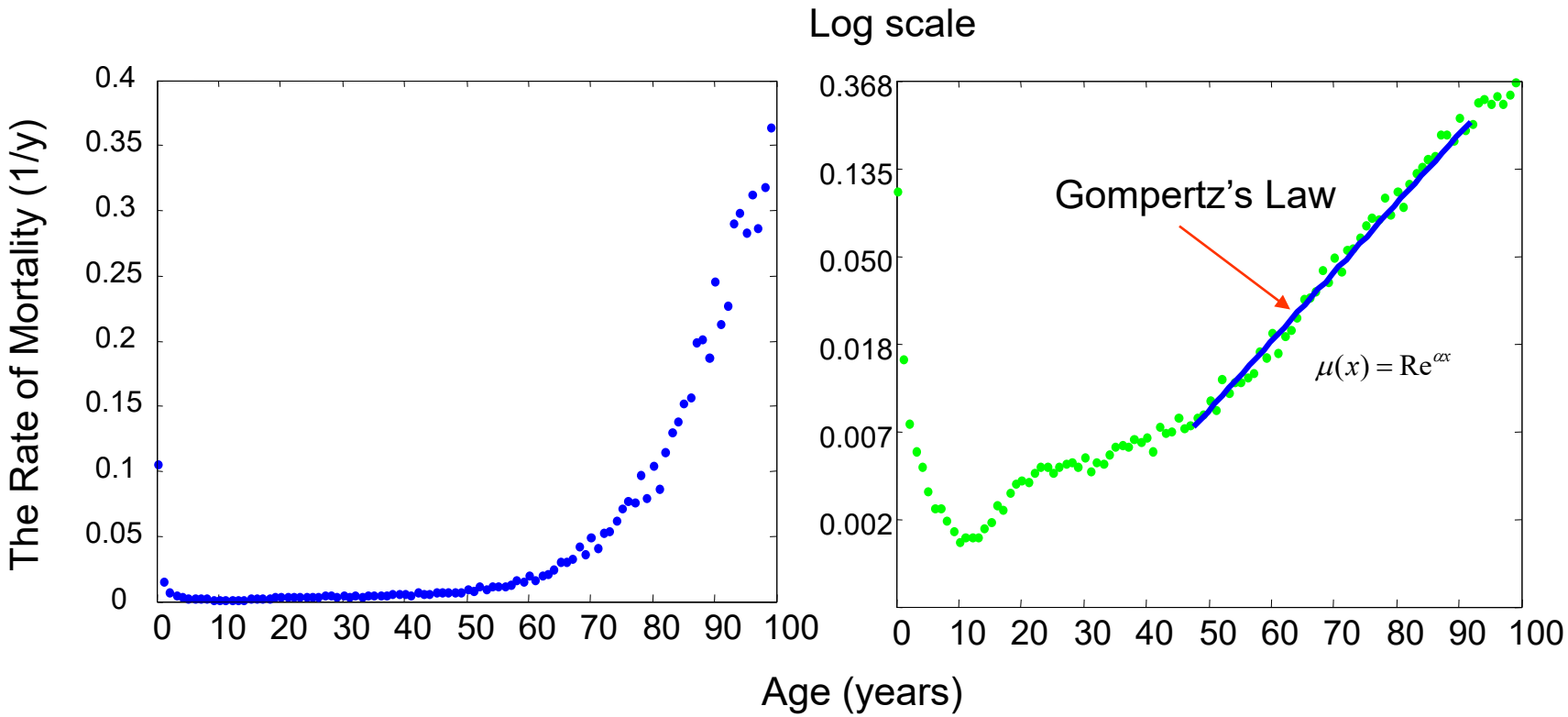


Figure 1: **Vulnerability of frail elderly people to a sudden change in health status after a minor illness**

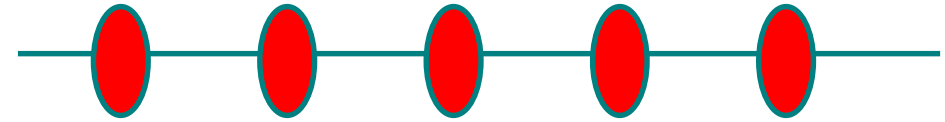
Understanding ageing

Context: As people get older, they are more likely to die



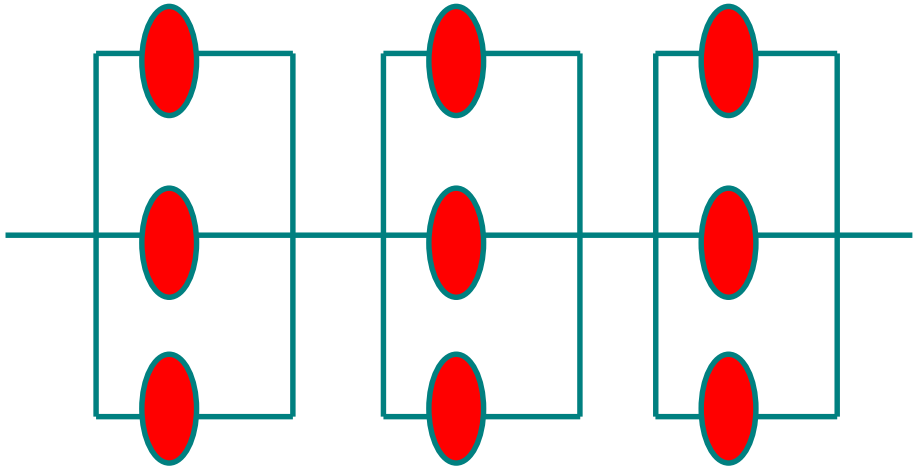
Mortality rate is a measure of the number of deaths in some population, scaled to the size of that population, per unit time.

System arrangements



A string of Christmas tree lights

Organs



Electricity supplied to many rooms in a house simultaneously

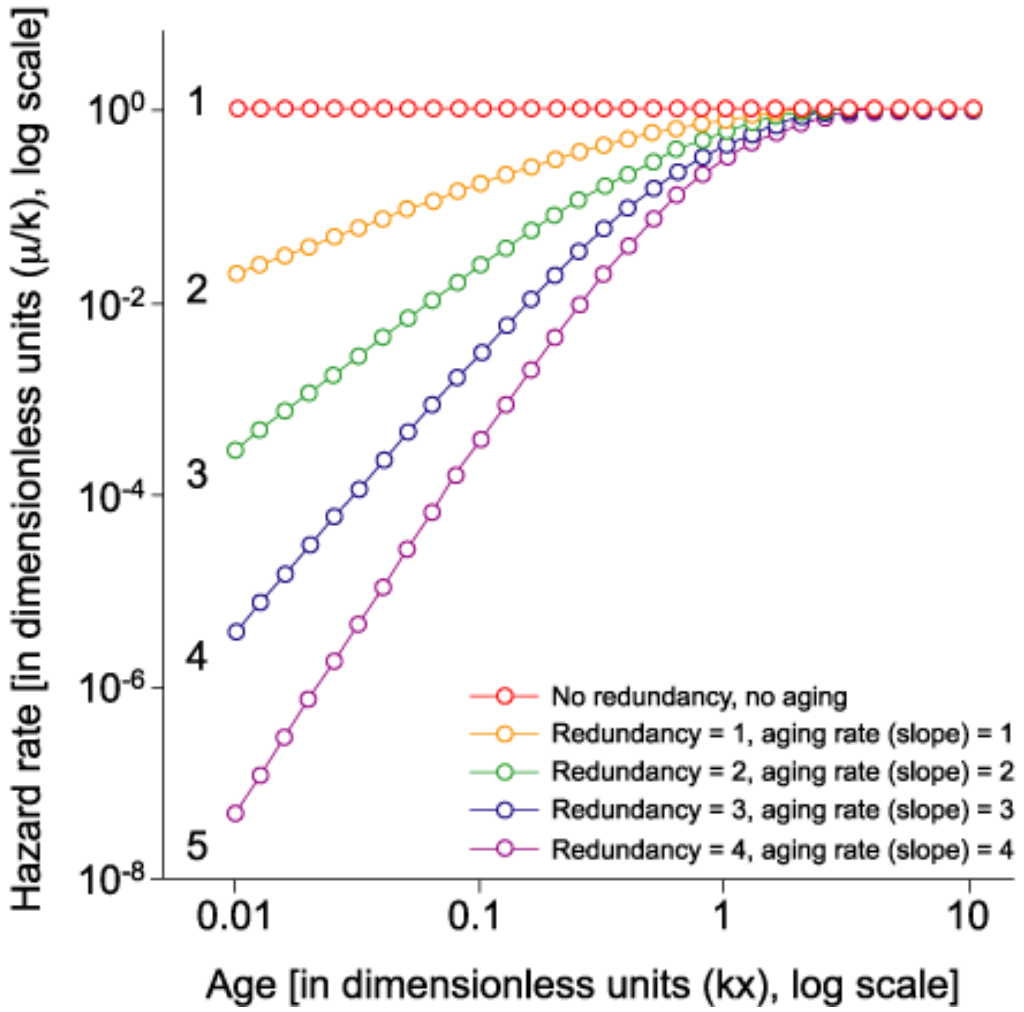
Tissues

How do systems prevent failure?

Living systems: redundancy

Machines: QC of individual parts

Failure kinetics



From Gavrilov & Gavrilova Sci Aging Knowlege Env, 2003

How can frailty be measured?

“Frailty”

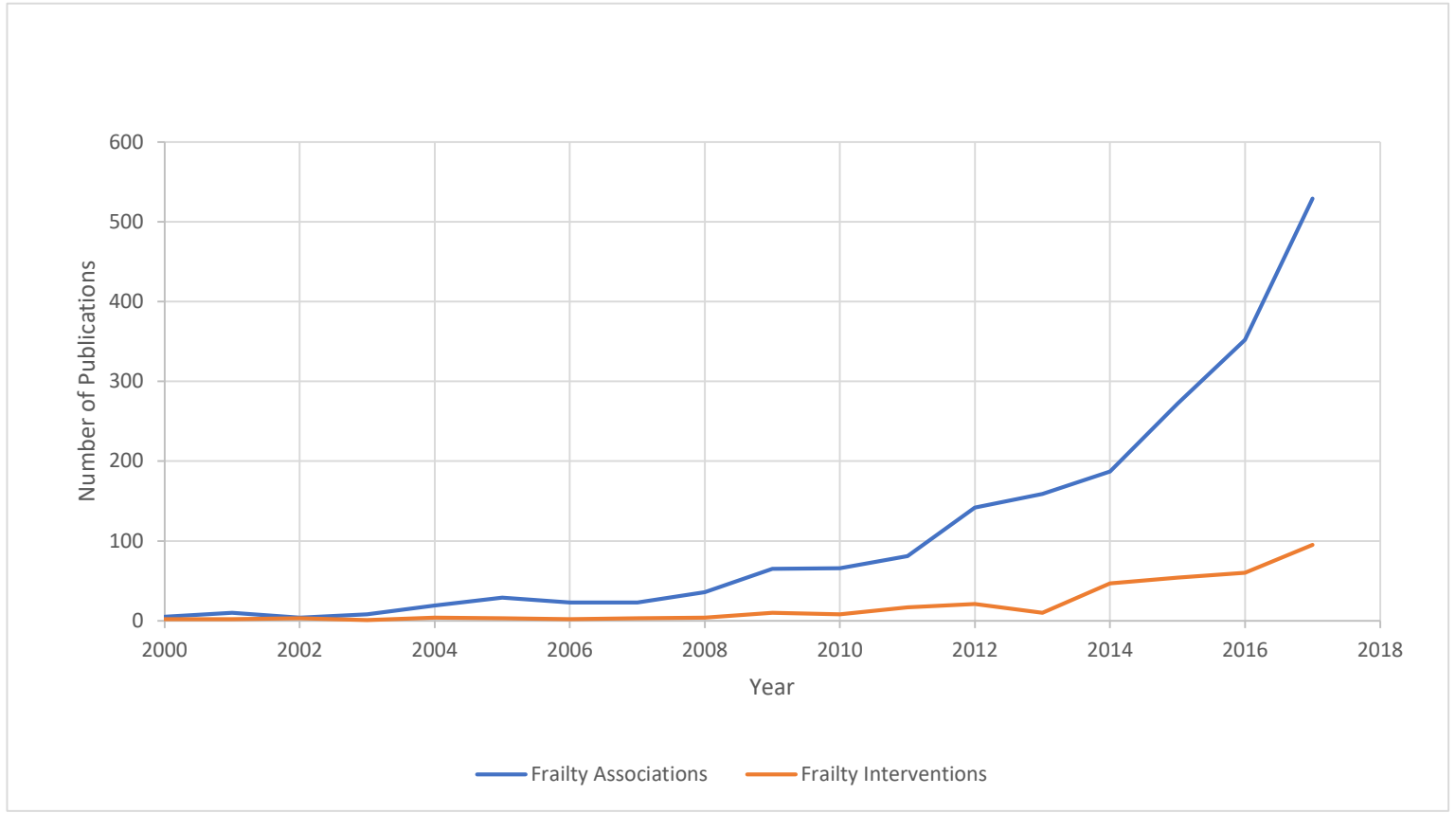
Surgical patients:

- 110 studies between 2007 and 2017
- 37 different measurement tools

Older inpatients:

- 617 papers between 2002 and 2015
- 2/3 didn’t use any instrument to measure frailty
- Others included 48 different instruments

Frailty: mind the gap



Fried phenotype

The most well known and widely used phenotype

Criteria

- unintentional weight loss of 10 lbs or more in past year
- self reported exhaustion
- weak grip strength
- slow walking speed
- low physical activity

Clinical Frailty Scale

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

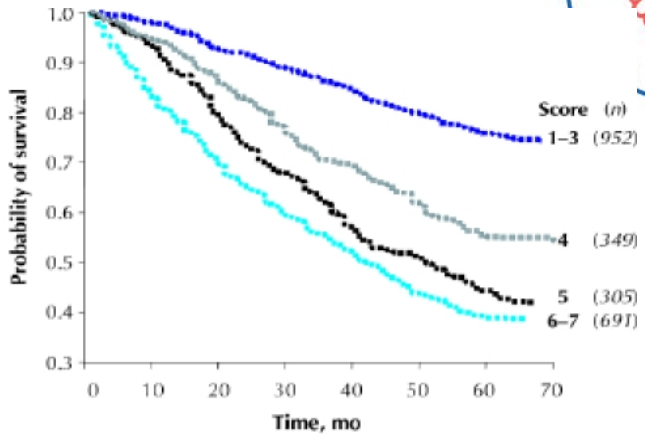
The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

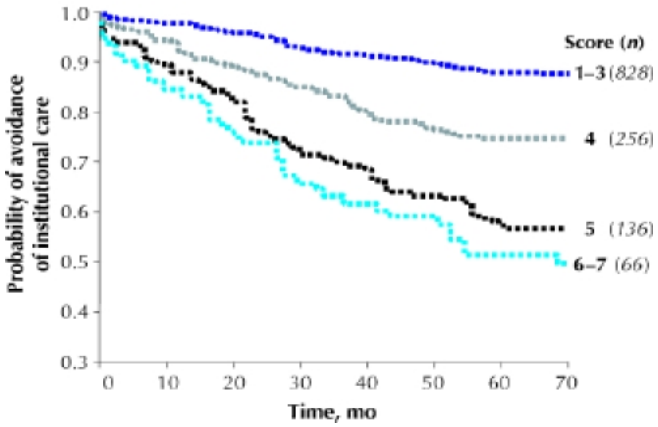
In **moderate dementia,** recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

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





Deficit accumulation

Frailty = multidimensional risk state

Can be measured by quantity rather than by the nature of health problems

Various disorders are accumulated by individuals during their lives

The more deficits that are accumulated, the more likely that person is to be frail

Rockwood and Mitnitski, 2001

Deficit accumulation

Deficits can be symptoms, signs, diseases, disabilities, abnormal laboratory measurements

- Accumulate with age
- Associated with adverse outcome
- Do not saturate
- Cross different domains
- Use same items longitudinal data

FRAILTY INDEX

Minitski et al., 2001; Searle et al., 2008

Frailty Index

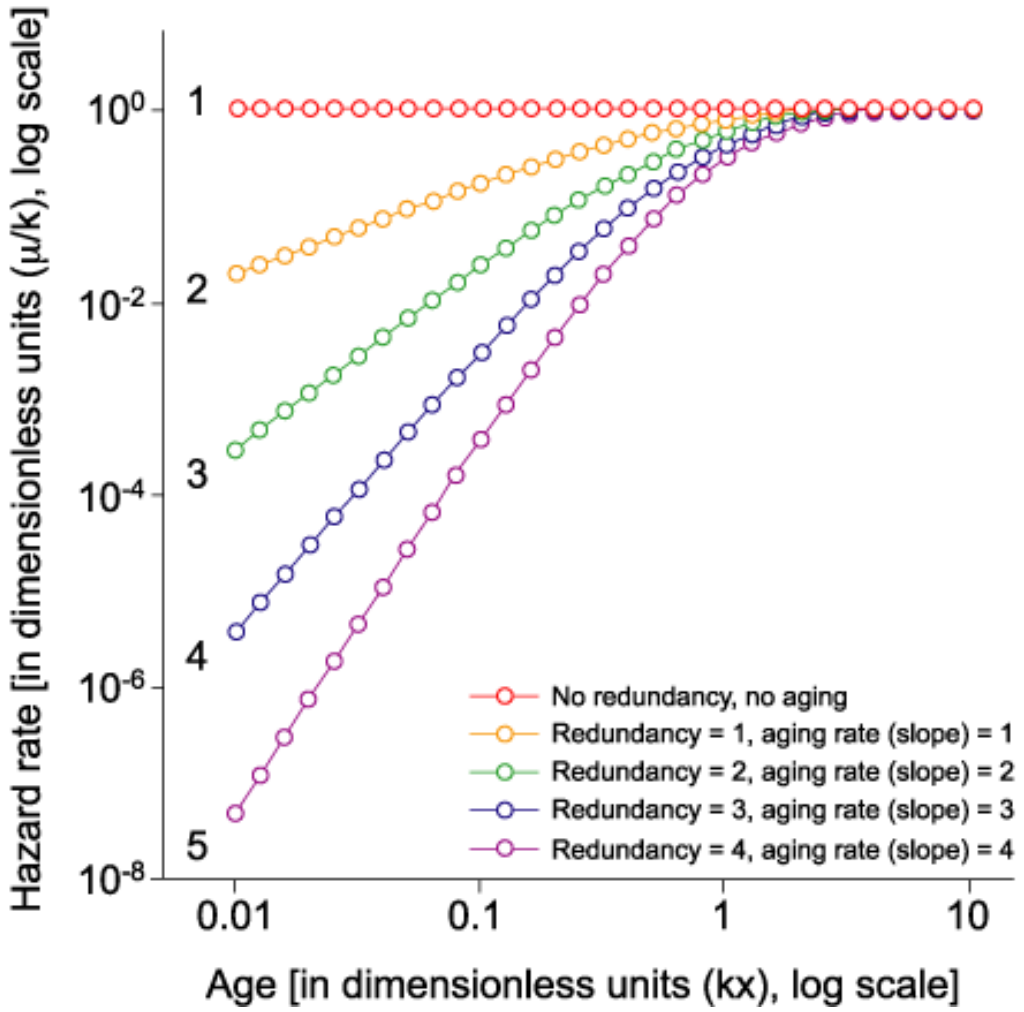
Frailty indices can be constructed from different numbers and types of variables

36,424 older people

- FI values closely comparable across countries
- increasing with age at approximately 3% per year in community-dwellers
- correlating highly with mortality

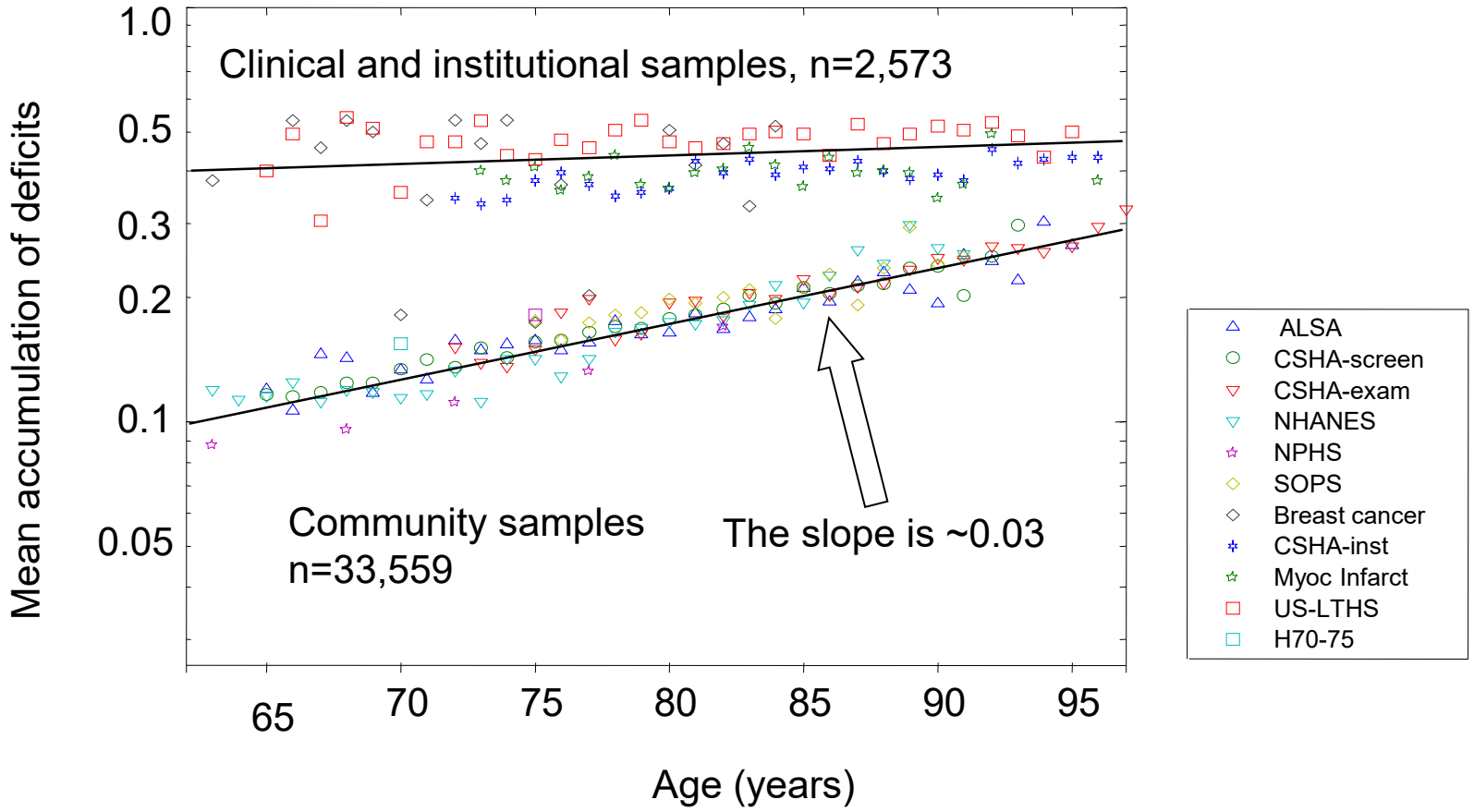
Risk of adverse outcomes defined more precisely by deficit indices than by phenotypic definitions of frailty

Failure kinetics

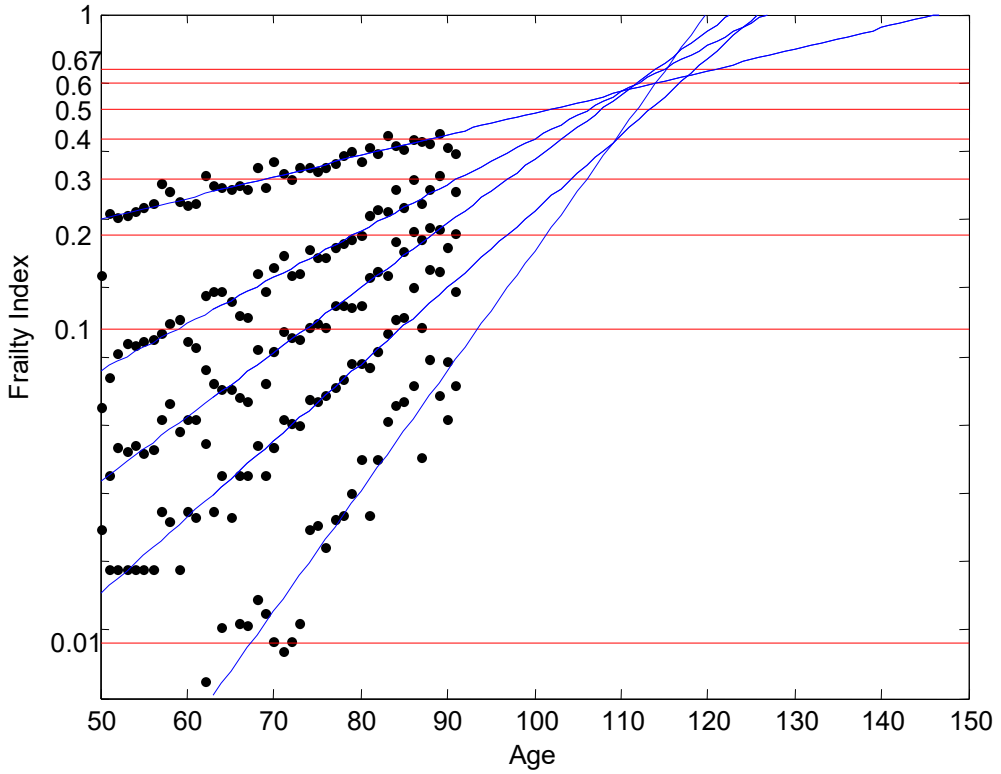


From Gavrilov & Gavrilova Sci Aging Knowlege Env, 2003

Deficit accumulation



English Longitudinal Study of Ageing



Jeanne Calment 1875 - 1997

What causes frailty?

Pathophysiology

There is an association between inflammation and frailty

Inflammation may

- be part of the driving force toward disability
  - anti-inflammatory strategies desirable
- reflect a compensatory response
  - anti-inflammatory strategies undesirable
- be an epiphenomenon
  - anti-inflammatory strategies irrelevant

Risk factors 1: Chronic disease

Frailty ≠ comorbidity but ≈ comorbidity

Chronic kidney disease

- strong cross-sectional association between frailty and CKD

Cerebrovascular disease

- link to slow gait speed
- importance of control of hypertension

Cardiovascular disease

- link to muscle weakness
- frailer patients do better with slightly higher BPs

Risk factors 2: Lifestyle

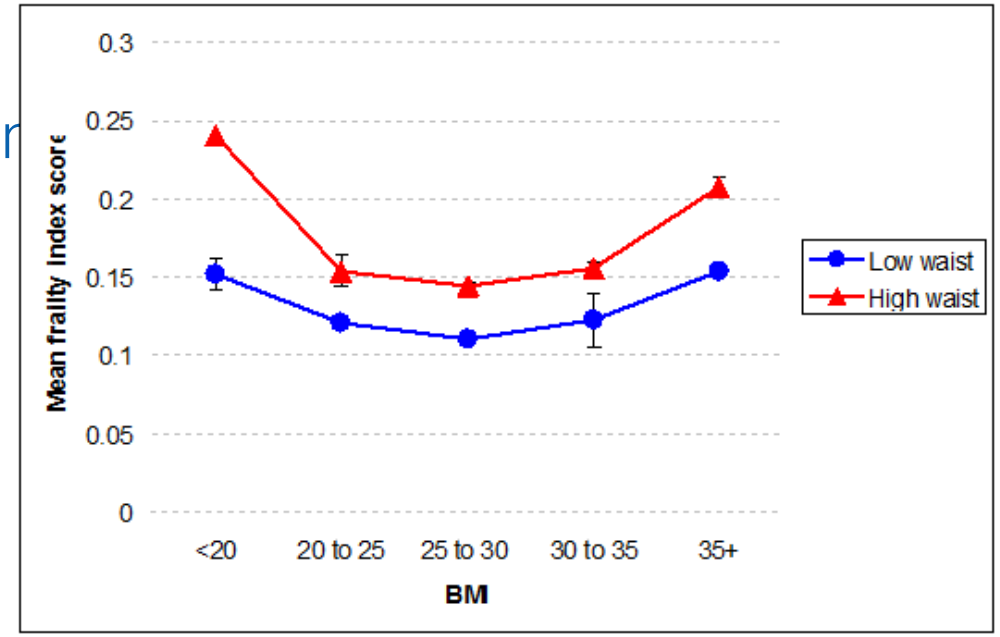
Smoking

- dose response effect on frailty

Exercise

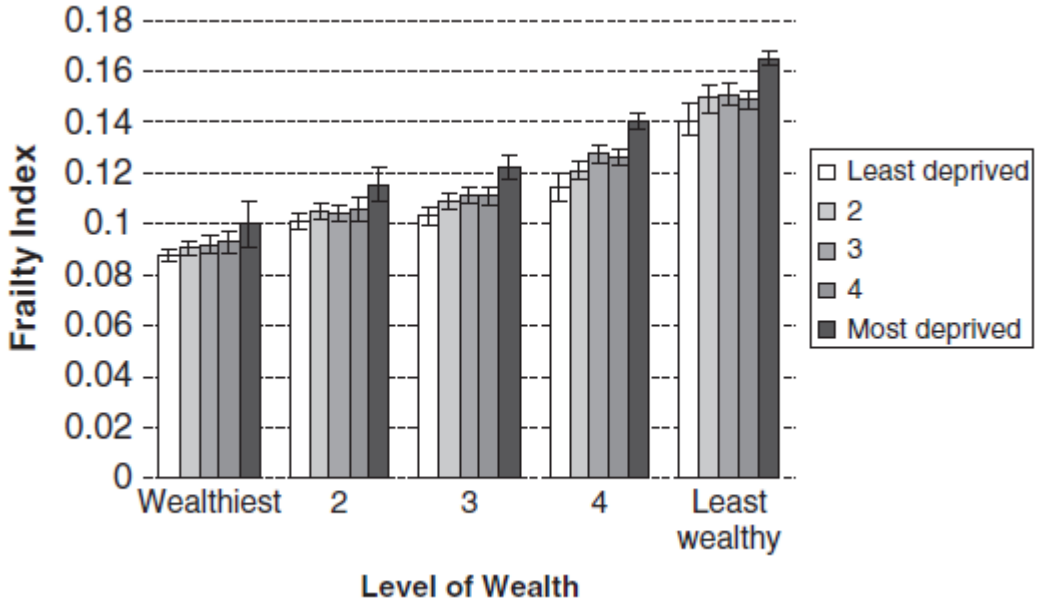
- beneficial across frailty spectrum

Low or high BMI



Risk factors 3: Environment/ resources

Frailty impacted by individual wealth and neighbourhood deprivation



What does frailty cause?

Geriatric giants and loss of redundancy

A frail older person is analagous to a complex system on the threshold of failure, redundancy has been lost.

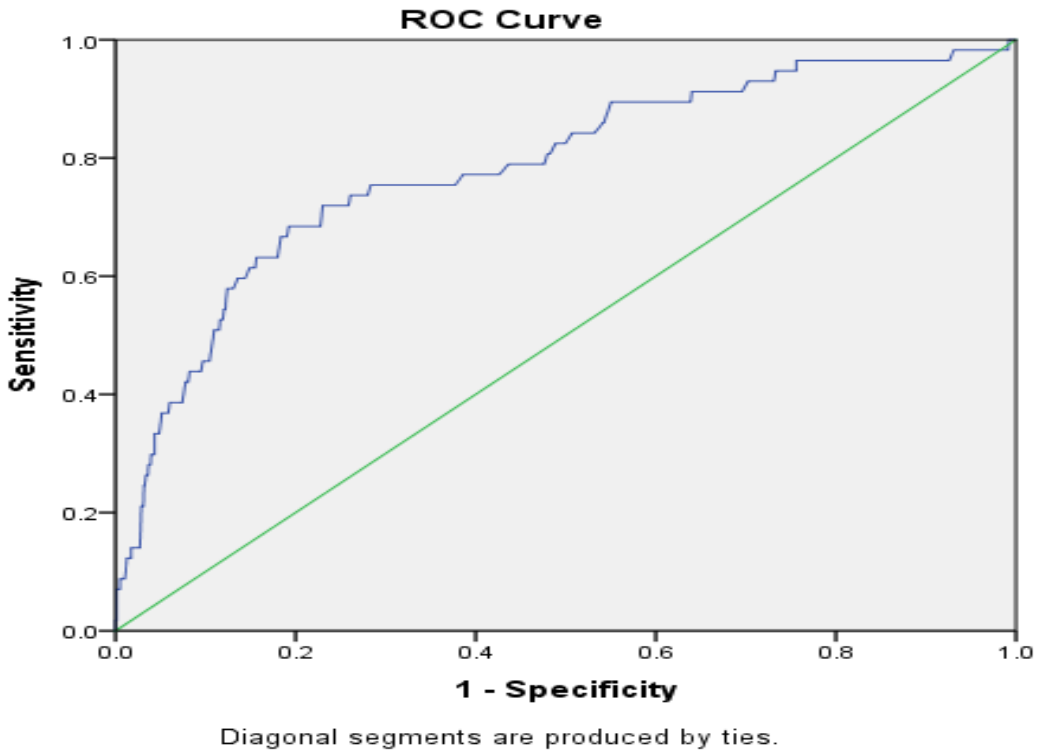
When a complex system fails, it fails with higher order functions first.

Higher order functions

- Upright bipedal ambulation
- Divided thinking

Inpatient mortality

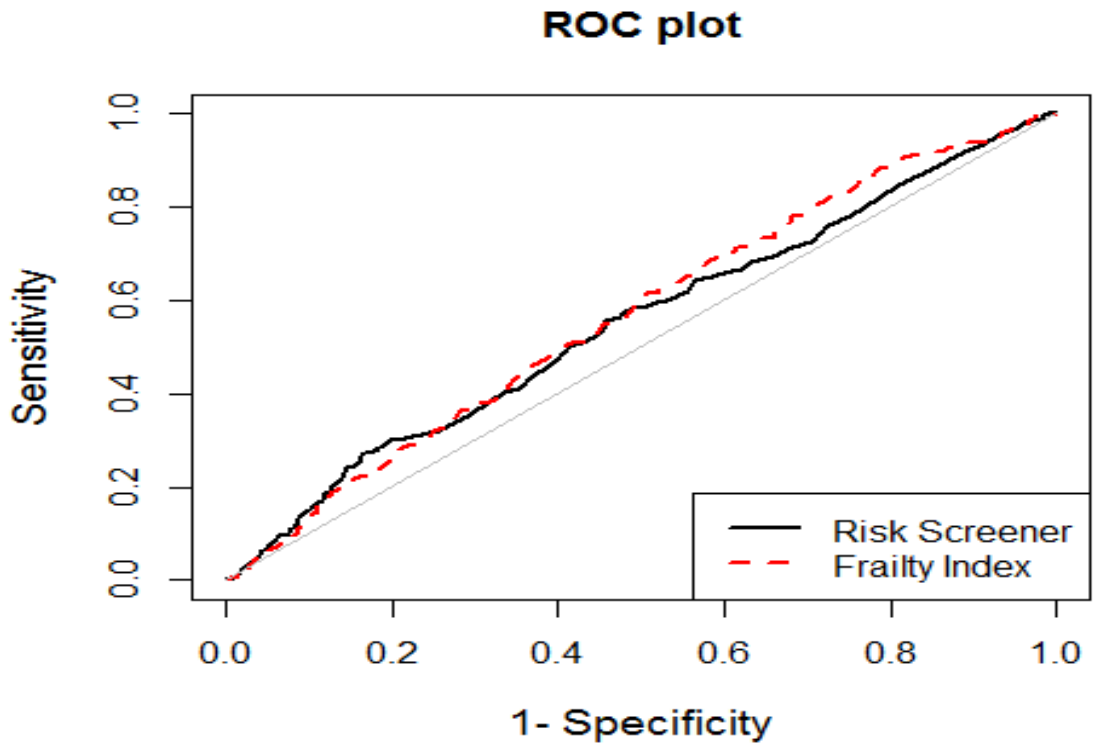
	OR	AUC	
FI	2.00 (CI: 1.66, 2.42)	0.78 (CI: 0.71, 0.85)	



Adverse Outcome	At FI > 0.4			
	Sensitivity	Specificity	PPV	NPV
Length of stay>28 days	35/77 (45%)	991/1341 (74%)	35/385 (9%)	991/1033 (96%)
Newly discharged to RAC	29/66 (44%)	977/1295 (75%)	29/347 (8%)	977/1014 (96%)
Inpatient falls	36/83 (43%)	985/1334 (74%)	36/385 (9%)	985/1032 (95%)
Inpatient delirium	196/321 (61%)	889/1072 (83%)	196/379 (52%)	889/1014 (88%)
Inpatient pressure ulcer	23/42 (55%)	973/1279 (76%)	23/329 (7%)	973/992 (98%)
Inpatient mortality	38/57 (67%)	1014/1361 (75%)	38/385 (10%)	1014/1033 (98%)

Readmission

	OR	AUC	
FI	1.17 (CI:1.065, 1.284	0.567(CI:0.532, 0.603)	ns



Compare and contrast....

ashm

Summary

Provide an overview of frailty

- Understanding ageing — failure of a complex system
- Frailty measures — multiple different instruments
- What causes frailty — chronic disease, lifestyle, environment
- What frailty causes — “geriatric giants”

Cognitive decline

ashm

Approaches to Cognitive Decline

Mild Cognitive Impairment (Minor NCD)

Dementia

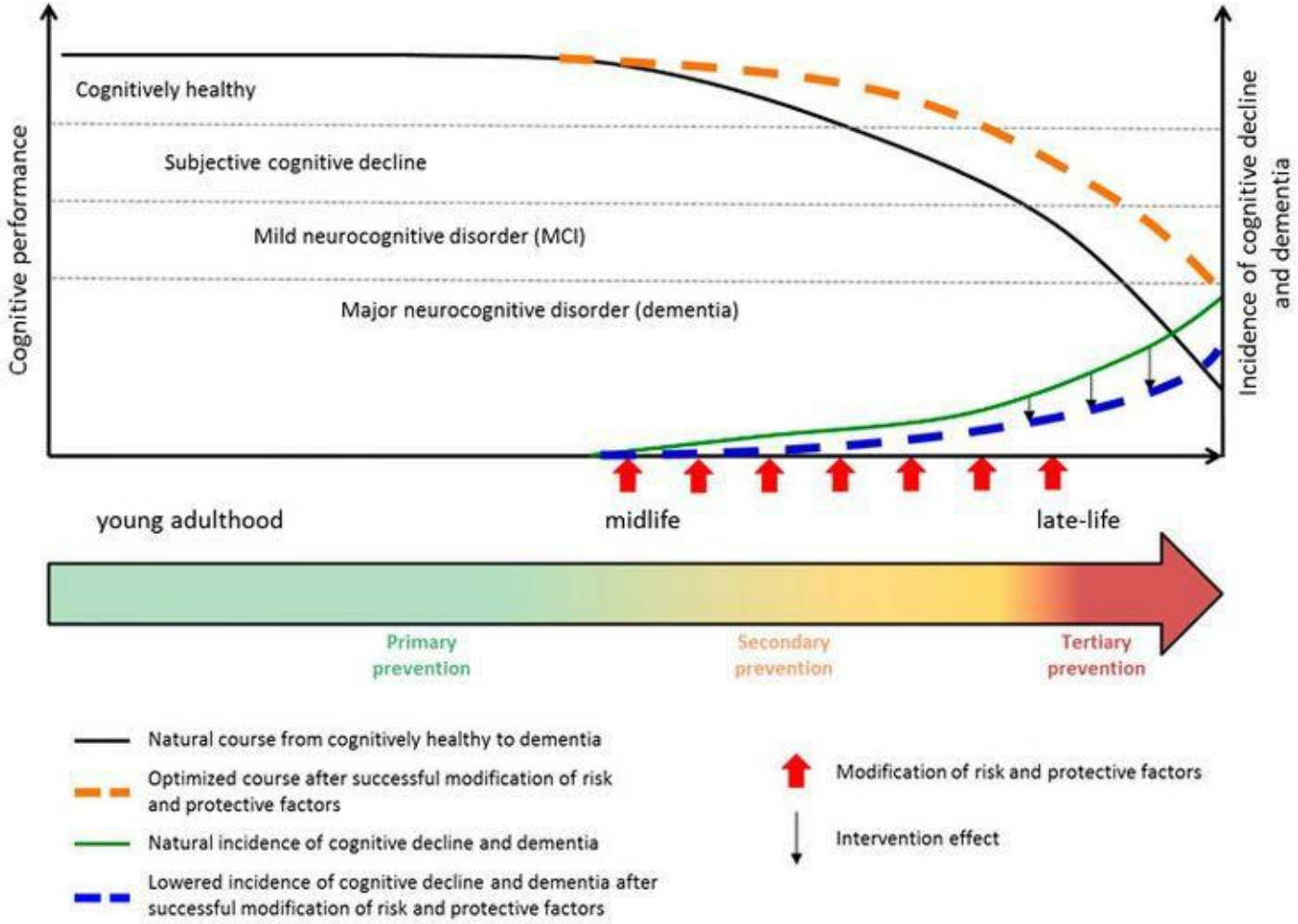
Delirium

Depression

{Intellectual impairment}

{Acquired brain injury}

Cognitive reserve theory

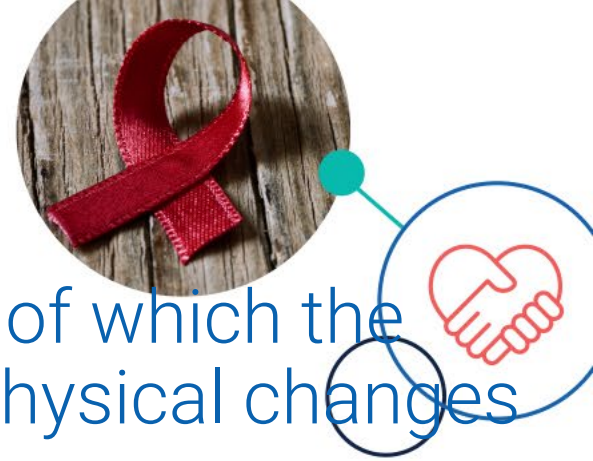


Mild Cognitive Impairment

Moderate Cognitive Decline
NO interference with independence
Not due to delirium
Not due to other mental disorder

3-5 times increase risk of dementia
15% progress to dementia annually
Increased risk delirium

Dementia



Umbrella term for a number of neurological conditions, of which the major symptom is the decline in brain function due to physical changes in the brain.

Women > Men ↑↑ with age

Dementia Alzheimer's Type

Vascular Dementia

Frontotemporal Dementias

Lewy Body Dementia/ Parkinson's disease Dementia

Alcohol related dementia

{Brain injury/ Chronic psychiatric disease}

Dementia - assessment

Dementia is a clinical diagnosis!

- History-patient and informant – with focus on function
- Social and educational history
- Medical/ surgical history esp vascular RFs
- Medications + alcohol
- Psychiatric history
- Rule out other disorders

Cognitive impairment history

- Temporal evolution
- Language, hallucinations sleep, movement issues

Assessment continued

Formal Cognitive assessment

https://qheps.health.qld.gov.au/caru/networks/dementia/cognitive-impairment-screening-toolkit

- MMSE/ RUDAS/ MOCA/ ACE3
- Geriatric Depression Scale
- IQCODE

Physical examination

- Investigations
- Radiology-CT Brain +/- MRI or PET MRI
- Bloods

+/- Neuropsychological assessment

ashm

Delirium vs Dementia

Delirium	Dementia
Acute onset, hours to weeks	Gradual onset, months to years
Potentially reversible	Neurodegenerative with no cure
Fluctuates during the day, worse at night	Tends to persist unchanged during the day
Reduced awareness	Awareness is clear
Abnormally low or high alertness/vigilance	Normal alertness/vigilance
Inattentive causing distractibility; fluctuates over the day	Relatively unaffected attention except in DLB and vascular dementia
Illusions and hallucinations are common	Absent in early stages but common later; common in DLB and PD
Sleep-wake cycle is always disrupted	Sleep-wake cycle normal
Working memory is always impaired	Working memory is normal in early stages
Incoherent, hesitant speech (fast or slow)	Difficulty with word finding

KR Causes for Delirium

- Meds
- Meds
- Meds
- Heart Failure
- Infection
- Other!

Remember balance between **severity of insult** and **degree of vulnerability**

Depression

May have an atypical presentation

–Chronic unexplained physical symptoms

–Memory loss

–Behavioural changes

Causes may also be different

–Physical ill health

–Social isolation and loneliness

–Symbolic and real losses

ashm

Summary

Review cognitive decline

- Explain cognitive reserve theory of ageing life course management
- Assessment of a patient with impaired cognition history > physical exam
- Differential diagnoses of dementia MCI, delirium, depression

Thank you!