# Multi-morbidity, Frailty and Polypharmacy

**Prof Graham Ellis**
**National Clinical Advisor**
**Ageing and Health**

Enabling health and social care improvement

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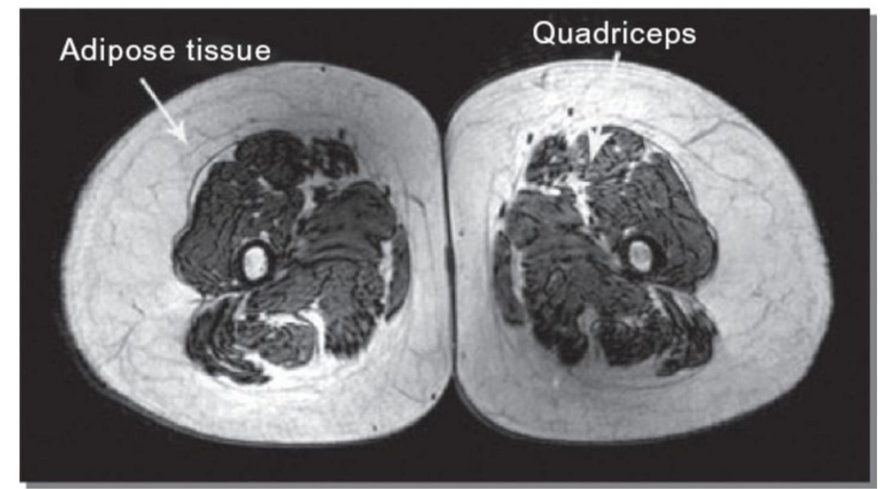
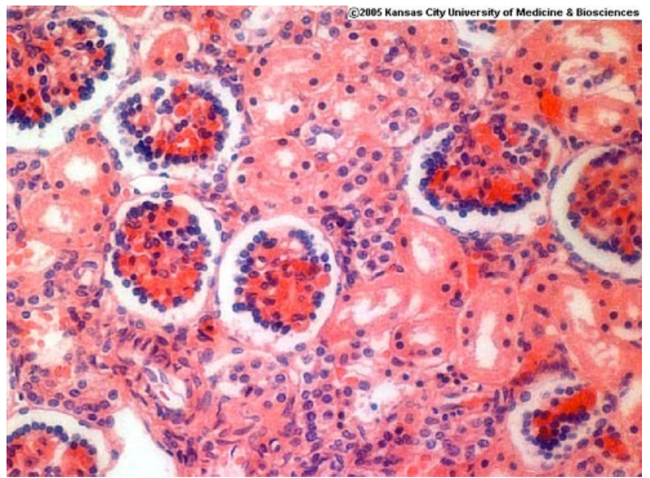
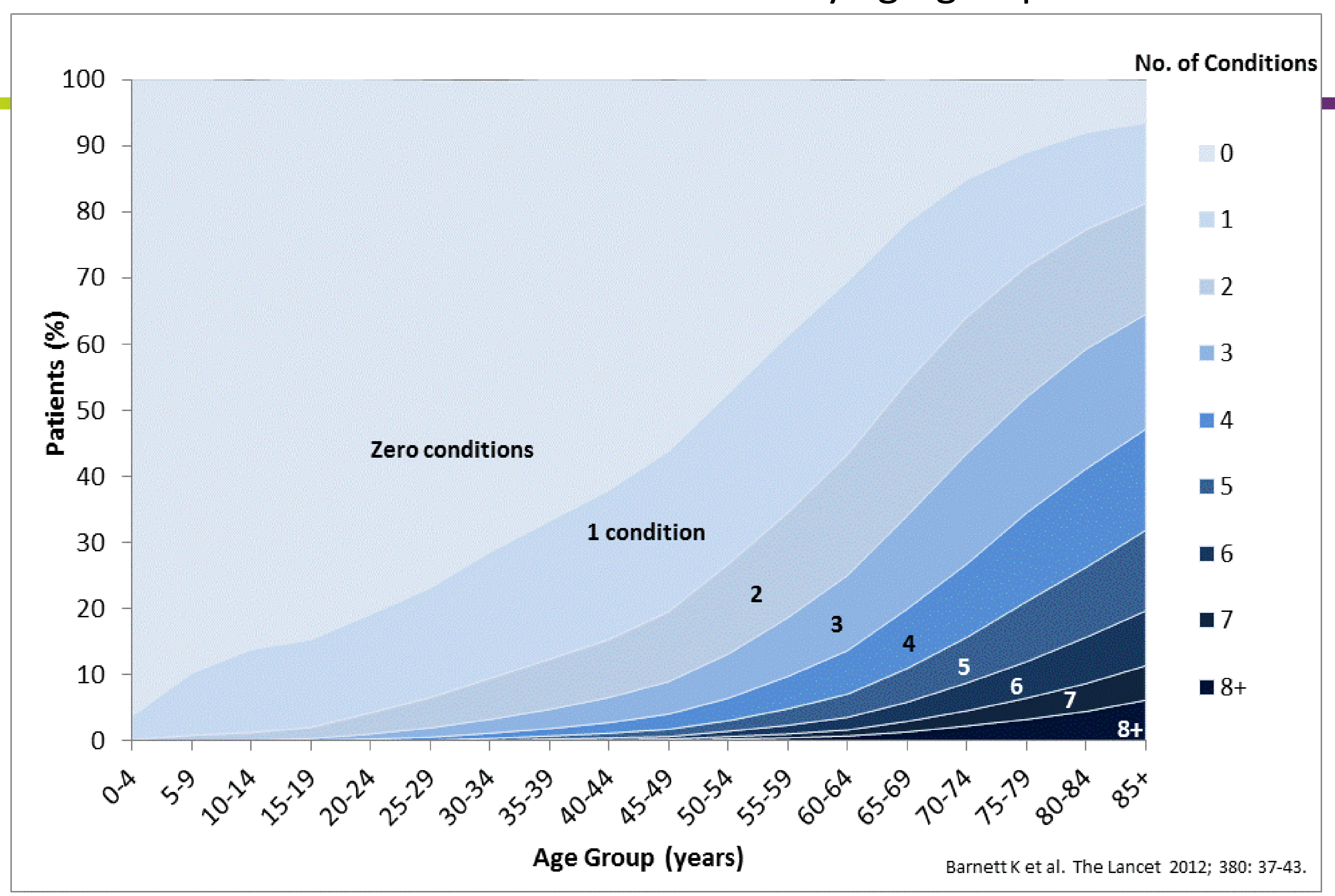
# Changes Associated with Ageing

- Respiratory – 30-40% loss of respiratory function with age
- Renal – 50% reduction in functioning nephrons
- Bone – 1% loss per year after 50
- Muscle – 25-50% loss by 80
- Vision 66% loss of light by age 60
- Brain – atrophies after 30!



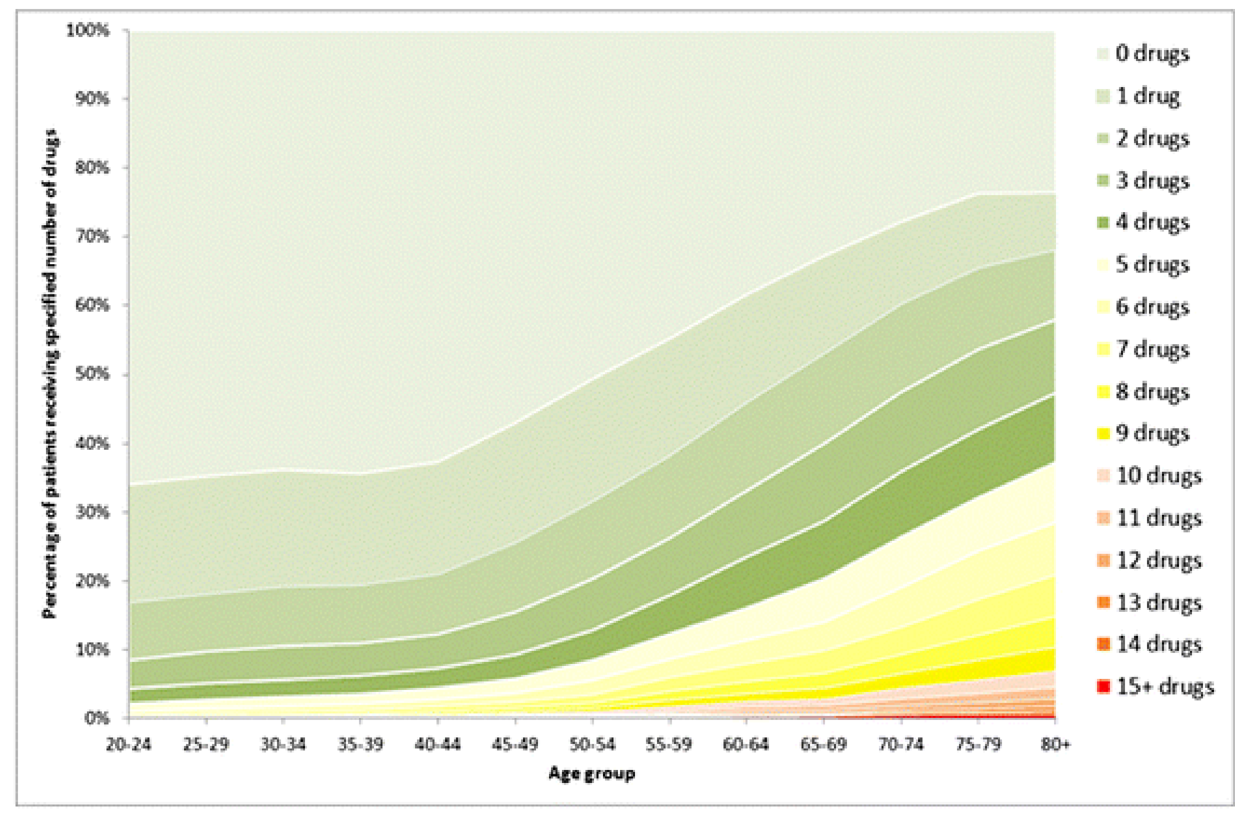



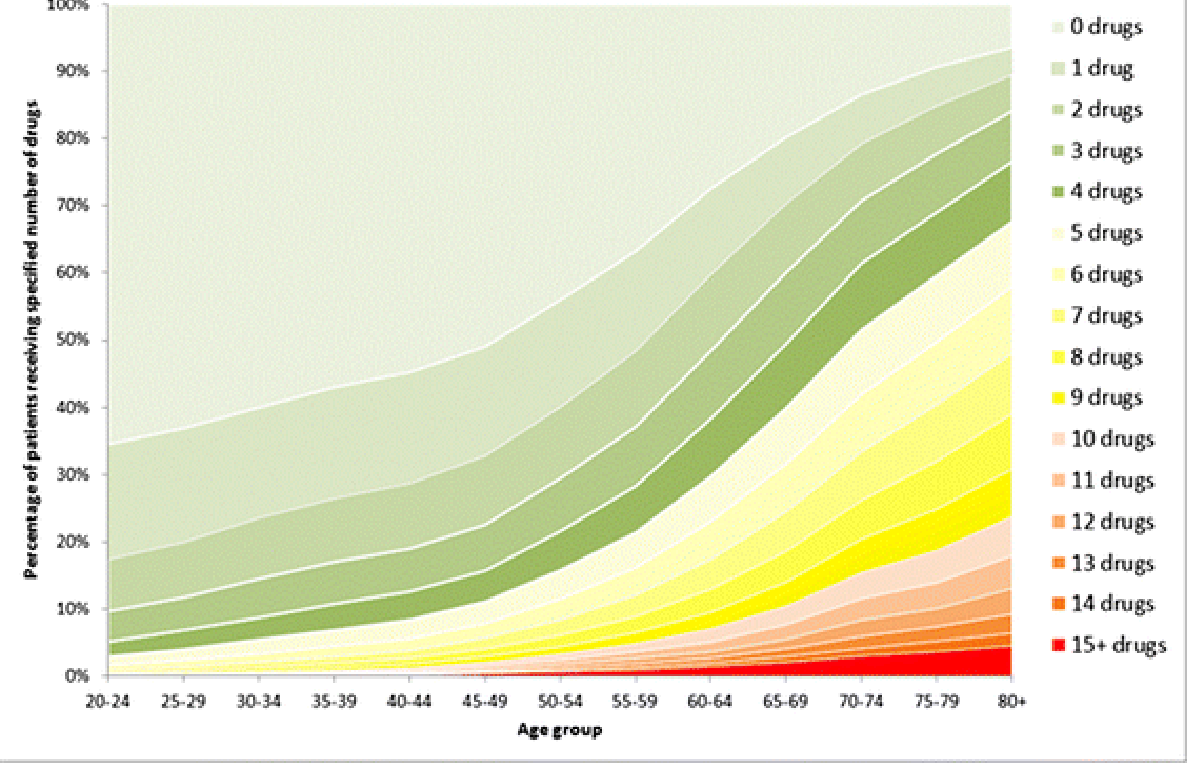
# Number of chronic conditions by age-group



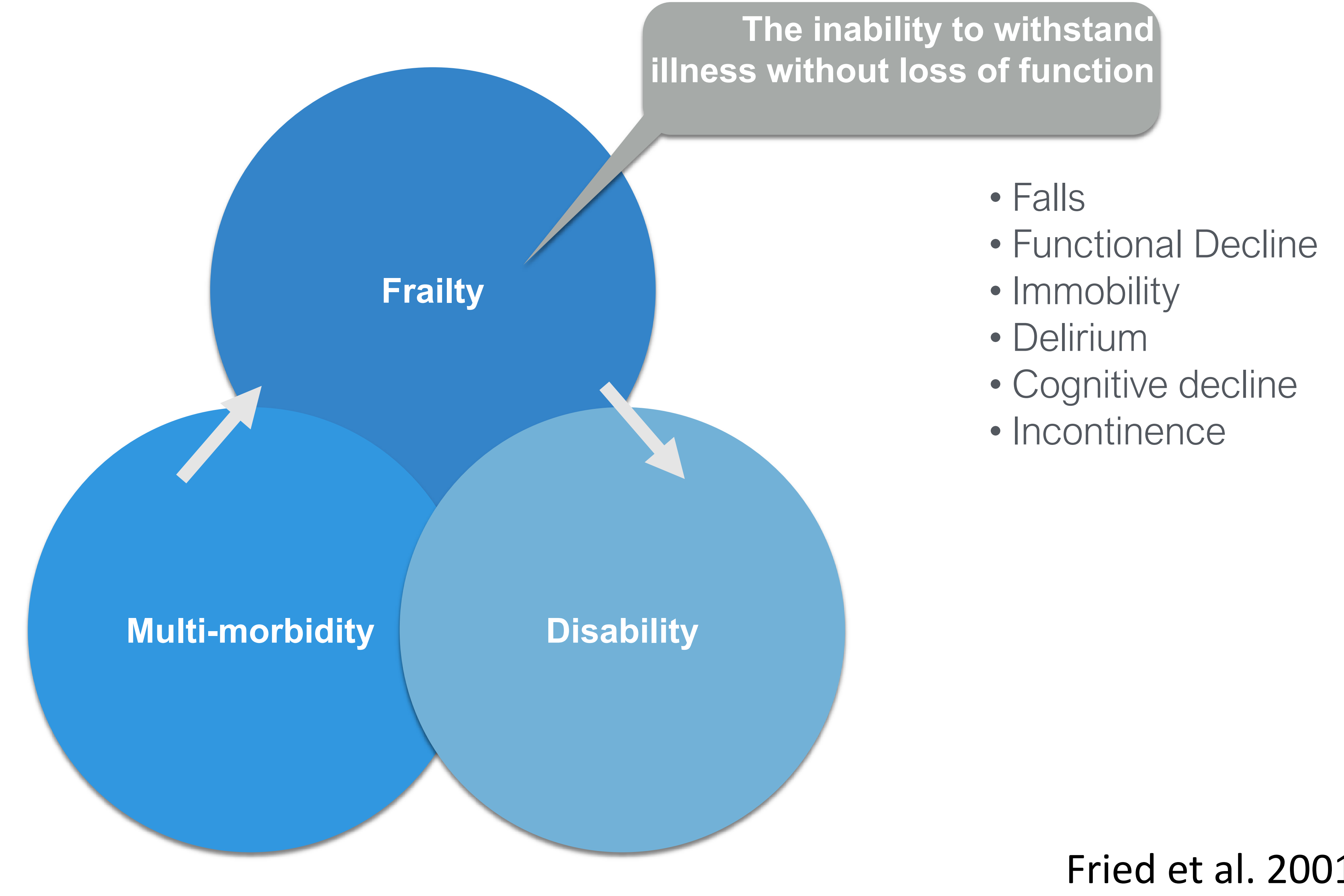

Most over-65s have 2 or more conditions, and most 75+ have 3 or more conditions

- Multiple and multiplying drugs




Guthrie et al 2015 BMC Medicine

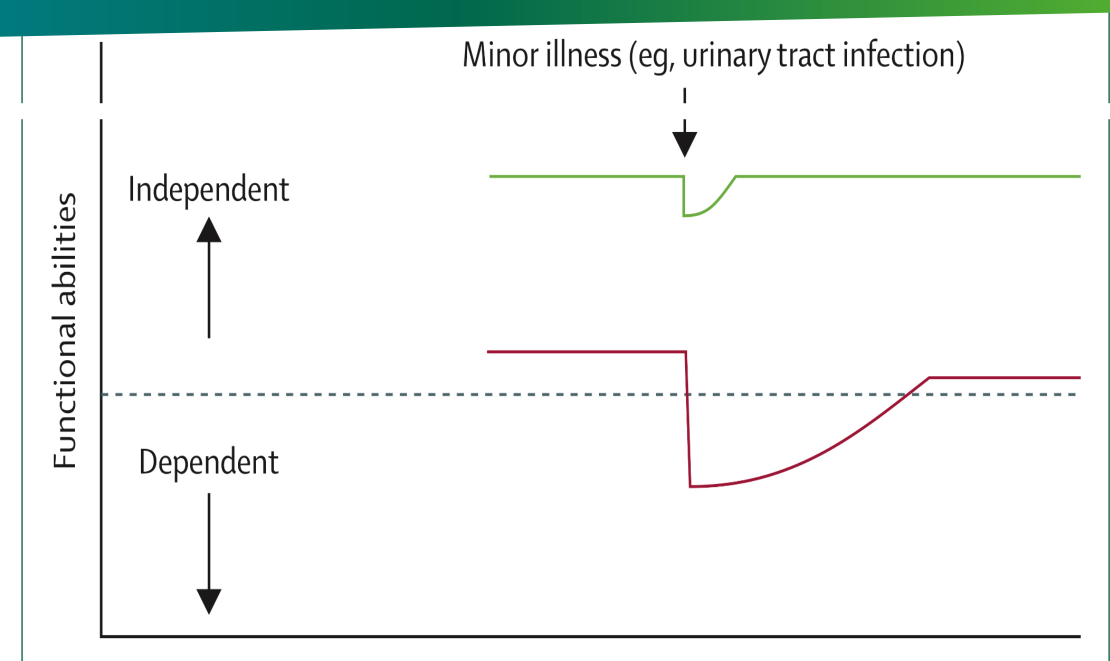

The inability to withstand illness without loss of function
Frailty
Multi-morbidity
Disability
• Falls
• Functional Decline
• Immobility
• Delirium
• Cognitive decline
• Incontinence
Fried et al. 2001

# Why focus on frailty?

Increasing numbers of people at risk of developing frailty leading to low resilience to crisis with gradual dependence on care.

Not frail | Mild frailty | Moderate frailty | Severe frailty

High resilience | Low resilience




Clegg et al. Lancet 2013

*Rockwood, K. et al. Canadian Medical Association Journal. 2005;173:5 489-495*

# Risk factors for Frailty

| Risk Factor | Reference |
|---|---|
| Age | Clegg A et al Lancet 2013;381(9868):752-762 |
| Smoking | Kojima G et al BMC Geriatrics 2015;15(131) |
| Alcohol (>15g/day) | Bioscience trends 2017;11(5):600-602 |
| Physical inactivity | Shinghini S et al BMJ 2018;360:k1046 |
| Obesity | Shinghini S et al BMJ 2018;360:k1046 |
| Loneliness | Lund R et al. Age&Ageing 2010;39(3):319-326 |
| Socioeconomic deprivation | Shinghini et al. BMJ 2018;360:1046 |
| Multi morbidity | Fried LP et al J Gerontol A Biol Sci Med Sci. 2001 Mar;56(3):M146-56. |
| Dementia | Kojima G et al. Current Alzheimers Research 2017;14(12):1256-1263 |
| Depression | Soysal s. et al Ageing Research reviews 2017;36:(78-87) |
| Diabetes | Shinghini S et al BMJ 2018;360:k1046 |

# Frailty Predicts… Everything!

| Primary care | Adjusted OR (95%CI) |
|---|---|
| Falls | 1.23 (0.99-1.54) |
| Disability | 1.79 (1.47-2.17) |
| NH admission | 2.60 (1.36-4.96) |
| Hospitalisation | 1.27 (1.11-1.46) |
| Mortality | 1.63 (1.27-2.00) |
| Dementia | 1.33 (1.07-1.67) |
| QOL | |
| Caregiver strain | |
| Depression | 4.42 (2.66-7.35) |
| Disability | 2.05 (1.73-2.44) |

| Secondary Care | OUTCOME | Adjusted OR (95%CI) |
|---|---|---|
| Cardiology | 30 day mortality post AS | 2.22 (1.28 – 3.67) |
| Critical care | 12m recovery after ICU | 0.32 (0.19-0.56) |
| General surgery | Post op morbidity | 2.06 (1.18-3.60) |
| | 30 post op morbidity | 4.00 (1.10-15.20) |
| Gen medicine | Inpatient delirium | 8.50 (4.80-14.80) |
| Oncology | Chemo intolerance | 4.86 (2.19-10.78) |
| Renal medicine | Mortality in ESRD on dialysis | 2.24 (1.60-3.15) |
| Respiratory | 90 readmission after COPD exacerbation | 1.43 (1.13-1.80) |

# Why does frailty matter?

| | 45% not frail | 35% mild frailty | 15% moderate frailty | 5% severe frailty |
|---|---|---|---|---|
| Average length of stay per unplanned admission | | 13.5 | 23.4 | 36.4 |
| Average days lost to delayed discharge per admission | | 1.2 | 3.3 | 3.7 |
| Average GP appointments in a year | | 10 | 14 | 18 |
| Average number of individually prescribed items per year | | 9 | 12 | 15 |

# Early identification and intervention

| Intervention | Description | Impact | Evidence |
| --- | --- | --- | --- |
| **Geriatric Assessment in general elderly population** | Proactive approach<br>Prevention focus<br>Education element<br>Nurse/GP/Social work/ health visitor/ Geriatrician (rarely)<br>Follow up | NNT 263 | Meta analysis of RCTs |
| **Geriatric Assessment in elderly population selected as frail** | Nurse/health visitor/social work/GP/geriatrician (<50%)<br>Comprehensive review<br>Prevention focus<br>Follow up visits | | Meta analysis of RCTs |

Beswick AD et al Lancet 2008;371:725-735

# Drivers for change

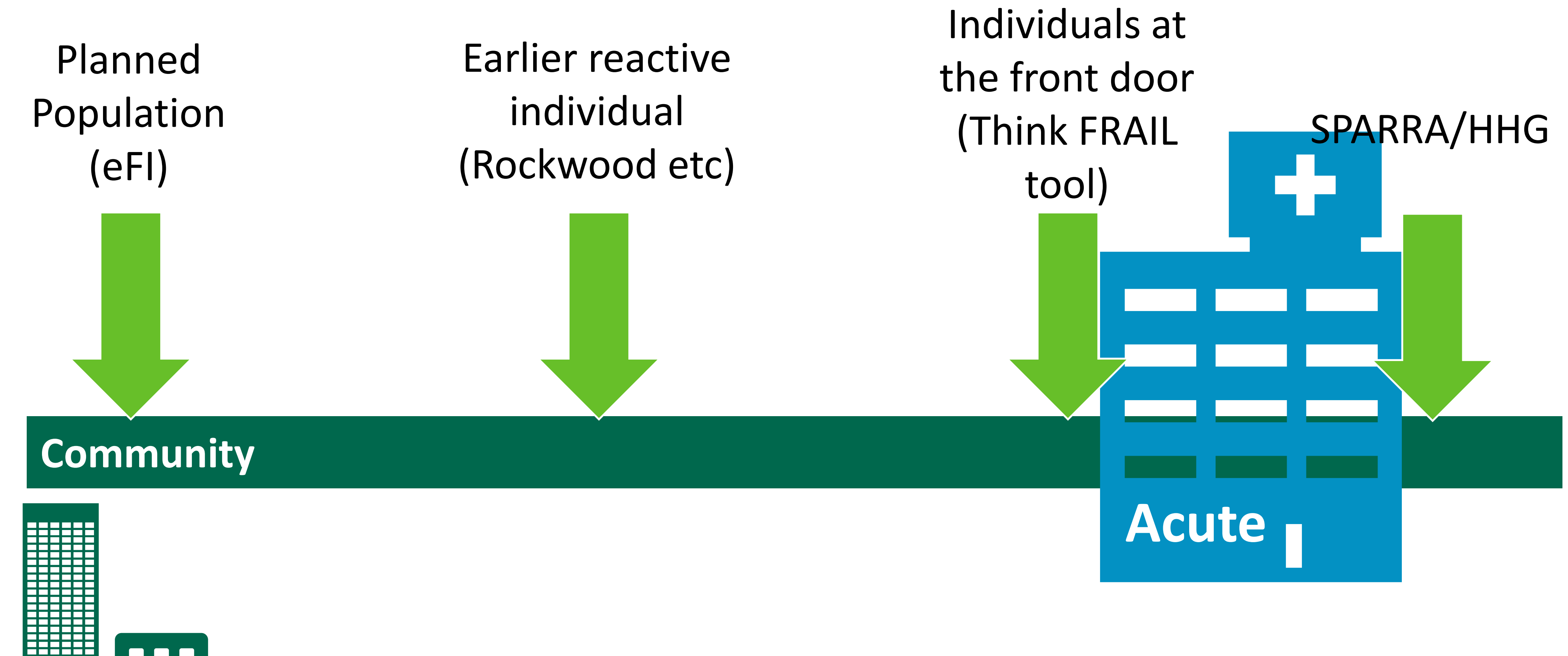
Identify people before a crisis

Multidisciplinary team working

Access preventative support

Plan for the future

# Identifying people before a crisis



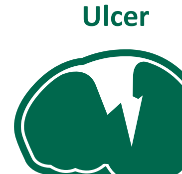
# Electronic frailty index (EFI)

## Disease State

Arthritis

Diabetes

Heart Valve Disease



Parkinson's Disease

Skin Ulcer

Atrial Fibrillation

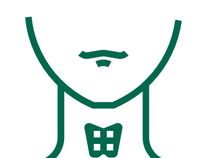
Foot Problems

Hypertension

Peptic Ulcer

Stroke and TIA

Chronic Kidney Disease



Fragility Fracture

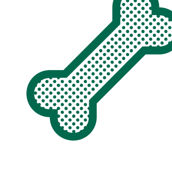
Hypotension /Syncope

Peripheral Vascular Disease

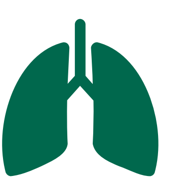
Thyroid Disorders

Coronary Heart Disease

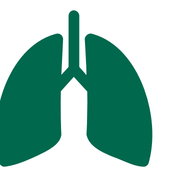
Heart Failure



Osteoporosis



Respiratory Disease



Urinary System Disease

## Symptoms / Signs

Dizziness

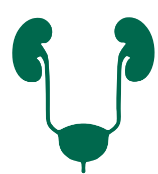
Polypharmacy

Dyspnoea

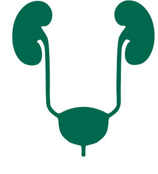
Sleep Disturbance

Falls

Urinary Incontinence



Memory and Cognitive Problems



Weight Loss and Anorexia

## Disability

Activity Limitation

Requirement for Care

Housebound

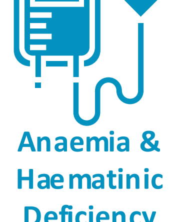
Social Vulnerability

Hearing Loss

Vision Problems - Blindness

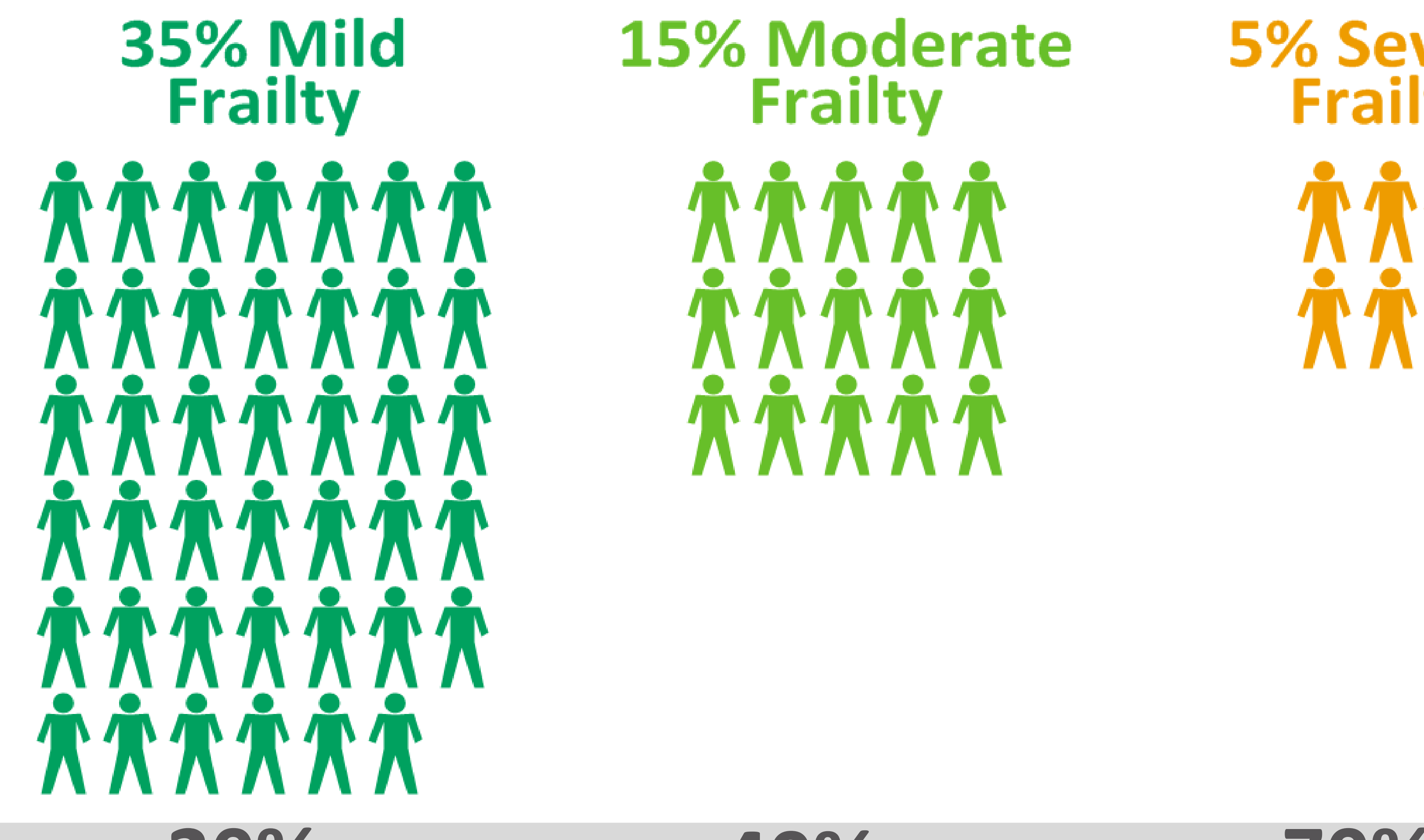
Mobility and Transfer problems

## Abnormal Lab Value

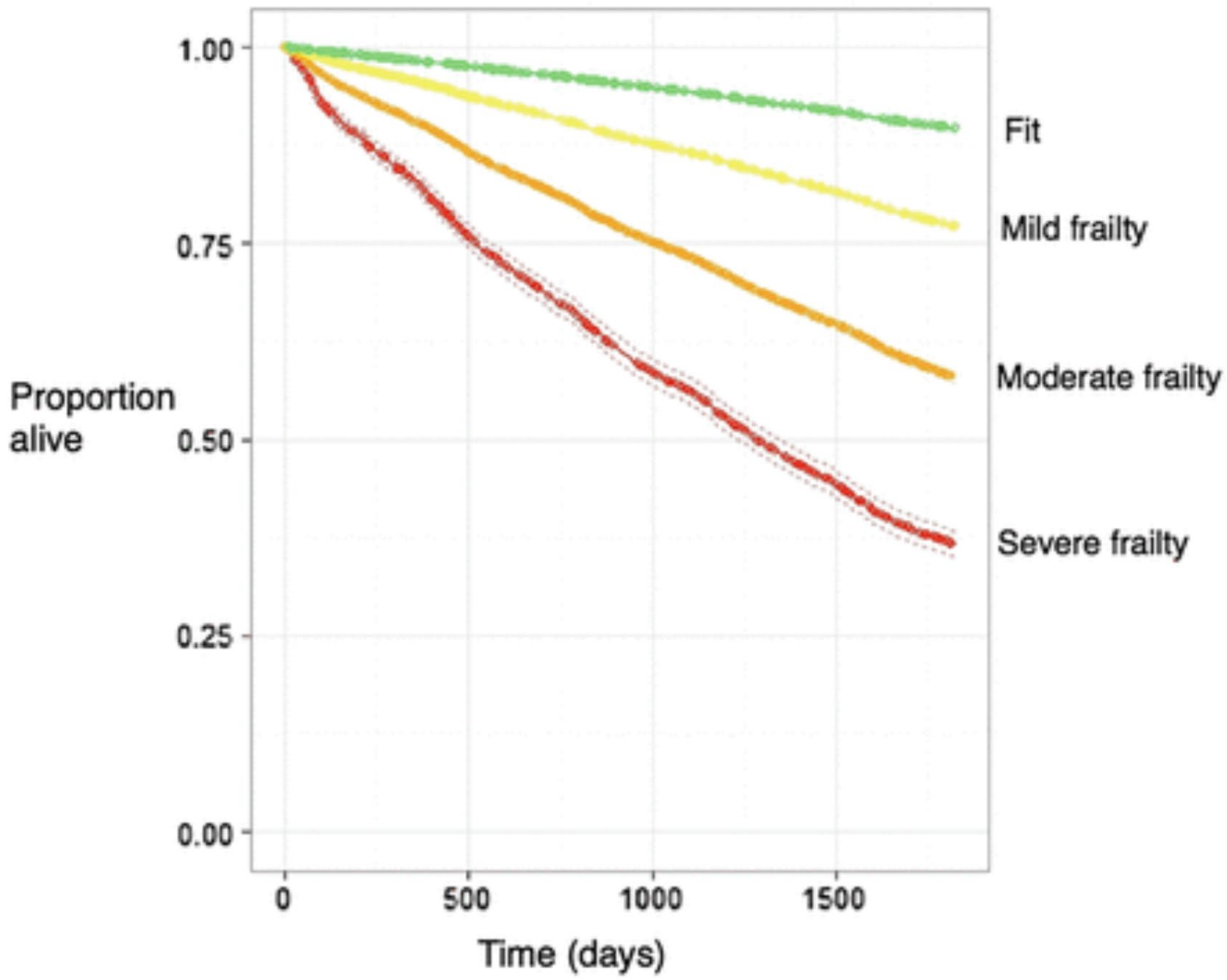


Anaemia & Haematinic Deficiency

# Electronic Frailty Index (EFI)




*People registered with test GP practices aged 65 and over*




From: Development and validation of an electronic frailty index using routine primary care electronic health record data

Age Ageing. 2016;45(3):353-360. doi:10.1093/ageing/afw039

# eFI on SPIRE

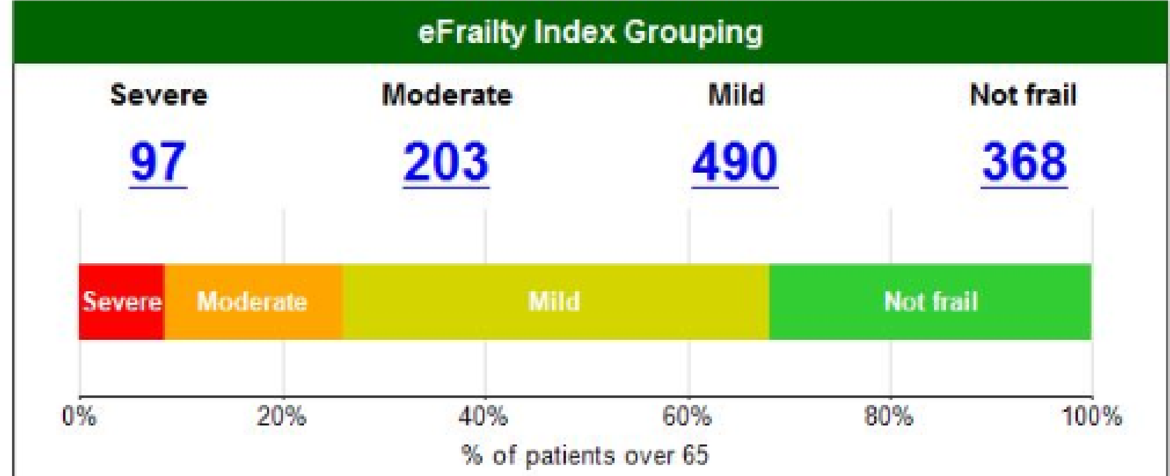
eFrailty Index Report

Data as of 01/03/2019

Help

The electronic frailty index (eFI) is a severity grading of frailty of older patients based on patterns of frailty coded in your clinical system. This report provides an overview of the patients in each eFI category in your practice, and highlights those whose eFI has increased over the past six months.

A full list of older (65+) patients and their eFI can be accessed here.




**High Priority Patients**

| Increasing severe | Escalation to severe | Moderate but increasing | Escalation to moderate |
|---|---|---|---|
| 3 | 8 | 2 | 22 |

# Identifying people before a crisis

**Midlock medical centre** in Glasgow:

- MDT started to discuss high risk patients
- 50% of people who were 'severely frail' were not known to them
- Nearly 50% were dead six months later
- Use the eFI to generate a list to discuss at monthly MDT meetings for joint decision making around how these people can be supported

- Video available: https://youtu.be/Ynwv9UvCwa4

# Access preventative support

- **Lorn Medical Centre in Oban** –
- Identify people with frailty
- Comprehensive assessment
- MDT discussion
- Direct towards appropriate support –re-ablement delivered by third sector.
- Blog on Oban: https://livingwellincommunities.com/2018/02/14/working-together-to-make-a-difference-for-people-with-frailty-in-oban/

- **Path Medical Practice in Kirkcaldy** –
- Pharmacists using EFI to identify patients
- GP input to agree frailty levels
- Target frailty and multiple medicines for polypharmacy reviews.

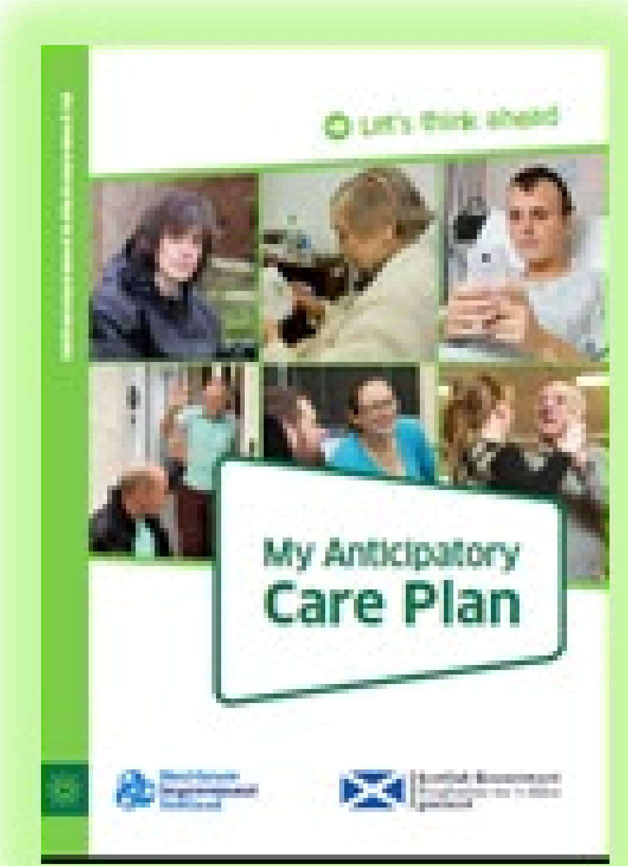
- **Dr. Iain Morrison, Cluster Quality Lead, Midlothian** – Hypoglycaemia cluster initiative – review of frail type 2 diabetics – Rx pulled back as appropriate

# Planning for the future

- **Dollar health centre** in Forth Valley use the eFI
- Identify people with moderate/severe frailty
- Discuss at monthly MDT palliative care meetings.
- Increased number of ACP conversations
- Patients and families feeling more in control and aware of help available in crisis.
- Increased community referral (e.g. ACP community team, dementia outreach)

- Video Available on our website:

https://ihub.scot/improvement-programmes/living-well-in-communities/electronic-frailty-index-efi/



# Frailty Recognition: What should you be thinking about?

- A background understanding of the Frailty Models may help:

**Phenotype**

- Involuntary weight loss?
- Exhaustion?
- Slow gait speed?
- Poor hand grip strength?
- Sedentary behaviour?

**Cumulative Deficits**

- Low mood
- Loss of hearing
- Loss of vision
- Increasing polypharmacy
- Increased dependency/loss of independent function
- Worsening memory and thinking
- Loss of social connections

**Frailty syndromes**

- falls
- immobility
- delirium
- incontinence

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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.

**Mild**

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.

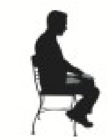
**Moderate**

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.

**Severe**

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.



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# Frailty and polypharmacy: why does it matter?

- Frail people with excessive polypharmacy are **6 times more likely to die** than their non-frail counterparts.

  *Polypharmacy and frailty: prevalence, relationship and impact on mortality in a French Sample of 2350 old people. https:doi.org/10.1002/pds.3772*

- **Frailty is a stronger predictor** of Medication Related Harm (MRH) than age

  *Parekh N. (2019) https://doi.org/10.1093/ageing/afy202.03*

  *Clegg A. Young J. Iliffe S. et al. Frailty in elderly people. The Lancet 2013 Mar 2; 381(9868):752-762. doi:10.1016/S0140-6736(12)62167-9*

- ‘Appropriate’ treatment targets for fit patients may be at best inappropriate, at worst harmful in frail patients

# BP Control

## **Overly tight BP targets in frail patients have:**

### No evidence of benefit

- **No mortality difference** for frail older people if BP <140/90

  *Age and Ageing, Volume 48, Issue 5, September 2019, Pages 627–635, https://doi.org/10.1093/ageing/afz072*
- **No relationship between SBP and mortality** observed among slower walkers.

  *J Gerontol A Biol Sci Med Sci. 2012; 67:977–983. doi: 10.1093/gerona/glr245.*

### Emerging evidence of harm

- **Increased mortality in frail, care home patients** if SBP<130 on ≥2 antihypertensive Rx (NNH = 10 over 2 years)
  *PARTAGE study. https://doi: 10.1001/jamainternmed.2014.8012*
- **Lower SBP correlated to higher mortality** in pts aged ≥75 years **with impaired MMSE or ADL.**

  *Milan Geriatrics 75 + study Age Ageing. 2015; 44:932–937. doi: 10.1093/ageing/afv141*
- **BP negatively associated with the risk of death** in patients unable to complete the walk test.

  *J Am Soc Hypertens. 2011; 5:259–352. doi: 10.1016/j.jash.2011.06.001*

# Frailty guidelines are emerging & thankfully becoming more specific

## NHS Fife Hypertension (before)

Aim for: BP ≤ 140/90 mmHg (≤150/90 if > 80 years of age). If h/o CVD, diabetes, CKD, aim for < 130/80.
*In frail/elderly patients the above targets may be difficult to achieve and individual targets should be set based on appropriateness and tolerability.*

## NHS Fife Hypertension (now)

- **Fit/Mildly frail patients** - **treat as per usual guidelines** unless postural drop.
- **Moderate frailty** – aim for **140-160.** < 140 – pull back. In the presence of postural drop/symptoms affecting QOL a SBP of160 -190 mmHg may be reasonable.
- **Severely frail** / assisted standing patients/patients unable to attempt timed walking test/short life expectancy - **stop all anti-hypertensives/stop measuring BP.**

# Frailty and Diabetes etc.
# (NHS Gloucestershire CCG)

 NHS

## Prescribing Guidance for Moderate to Severely Frail Patients

If only mild frailty (ie. Rockwood scores 1 to 4) – continue usual prescribing.

| DIABETES: In mild frailty aim for: HbA1c 54-59: BP 14[illegible]85 | | |
|---|---|---|
| Rockwood 5 to 6: Modest Frailty | Therapeutic Target | Control of symptom[illegible] ¦ HbA1c 60 – 85 ¦ BP 160/90 and no postural drop |
| | Suggested Actions: | Review metformin if eGFR <30 or low weight ¦<br>Do not use third line agents unless to control symptoms ¦<br>Do not restrict diet if low weight or losing weight |
| Rockwood 7 to 9: Severe Frailty | Therapeutic Target | Symptom control ¦ Avoid hypos ¦ HbA1C only to identify risk of hypos (aim >65) ¦ Usually no BP Rx |
| | Suggested Actions: | Reduce treatment ¦ Symptomatic drugs only – stop other drugs eg statins, BP ¦ Stop metformin if eGFR <30 ¦ Consider stopping sulphonlyurea or insulin (type 2) ¦ Watch for falling weight<br>In EOL Type 1, give low dose once daily long acting insulin |

| | | |
|---|---|---|
| [illegible] 5 to 6: Modest Frailty | Therapeutic Target | [illegible] of phenytoin |
| | Suggested Actions: | If faller, check Vit D (esp phenytoin and valproate) and consider reducing doses ¦ Reduce doses if seizure free 10 yrs ¦ Reduce doses if losing weight |
| Rockwood 7 to 9: Severe Frailty | Therapeutic Target | Rx usually continued |
| | Suggested Actions: | Reduce doses if delirium ¦<br>Consider midazolam by syringe driver in EOL if poorly controlled |

| OSTEOPOROSIS: | | |
|---|---|---|
| Rockwood 5 to 6: Modest Frailty | Therapeutic Target | Alendronate for 5yrs 1st choice ¦ Denosumab for Rx failures, or those not able to comply with bisphosphonates ¦ Usually combined with Vitamin D |
| | Suggested Actions: | Review compliance ¦ Give Vit D if frequent faller ¦<br>Thorough medication review if faller, and reduce anticholinergic burden |
| Rockwood 7 to 9: Severe Frailty | Therapeutic Target | Drugs unlikely to be of value if life expectancy <1yr ¦<br>May still consider Vitamin D |
| | Suggested Actions: | Stopping Rx if poor life expectancy |

Published by NHS Gloucestershire Clinical Commissioning Group June 2017.

| | | |
|---|---|---|
| Modest Frailty | Suggested Actions: | Ensuring compliance with inhaler therapy ¦<br>Consider stopping theophylline ¦ Anticipatory Care Plan |
| Rockwood 7 to 9: Severe Frailty | Therapeutic Target | Usual Rx but may be unable to use inhalers ¦<br>Avoid theophyllines ¦ Avoid oral salbutamol |
| | Suggested Actions: | Anticipatory care plan for managing exacerbations at home ¦<br>Consider palliative oxygen therapy |

| ANALGESIA: Usually not to exceed: Morphine 60mg bd; Fentanyl 25 mcg patch | | |
|---|---|---|
| Rockwood 5 to 6: Modest Frailty | Therapeutic Target | NSAID's only if eGFR >30, and then only short term ¦<br>Buprenorphine patch useful for poor compliance, but less flexible ¦<br>Neuralgic drugs addictive and side-effects |
| | Suggested Actions: | 2 weeks only NSAID – naproxen 500mg bd or ibuprofen 400mg bd ¦<br>Remember opioid equivalence for fentanyl ¦<br>Co-prescribe laxatives – stimulant plus softener ¦<br>Pregabalin 150mg per day max Gabapentin 900mg per day max |
| Rockwood 7 to 9: Severe Frailty | Therapeutic Target | Often reduce doses ¦ Risk of over treatment with patches ¦ Abbey pain scale |
| | Suggested Actions: | Titrate doses down with weight loss ¦ Titrate all drugs down if delirium (anticholinergic burden) ¦ Assess for constipation |

# Anticholinergic Cognitive Burden (ACB)

| Score 1 | Score 2 | Score 3 |
| --- | --- | --- |
| • Atenolol<br>• Captopril<br>• Ranitidine<br>• Codeine<br>• Prednisone<br>• Digoxin<br>• Furosemide | • Carbamazepine<br>• Pethidine<br>• Amantadine | • Amitriptyline<br>• Atropine<br>• Chlorpheniramine<br>• Clozapine<br>• Olanzapine<br>• Oxybutynin<br>• Paroxetine |
| No x 1 | No x 2 | No x 3 |

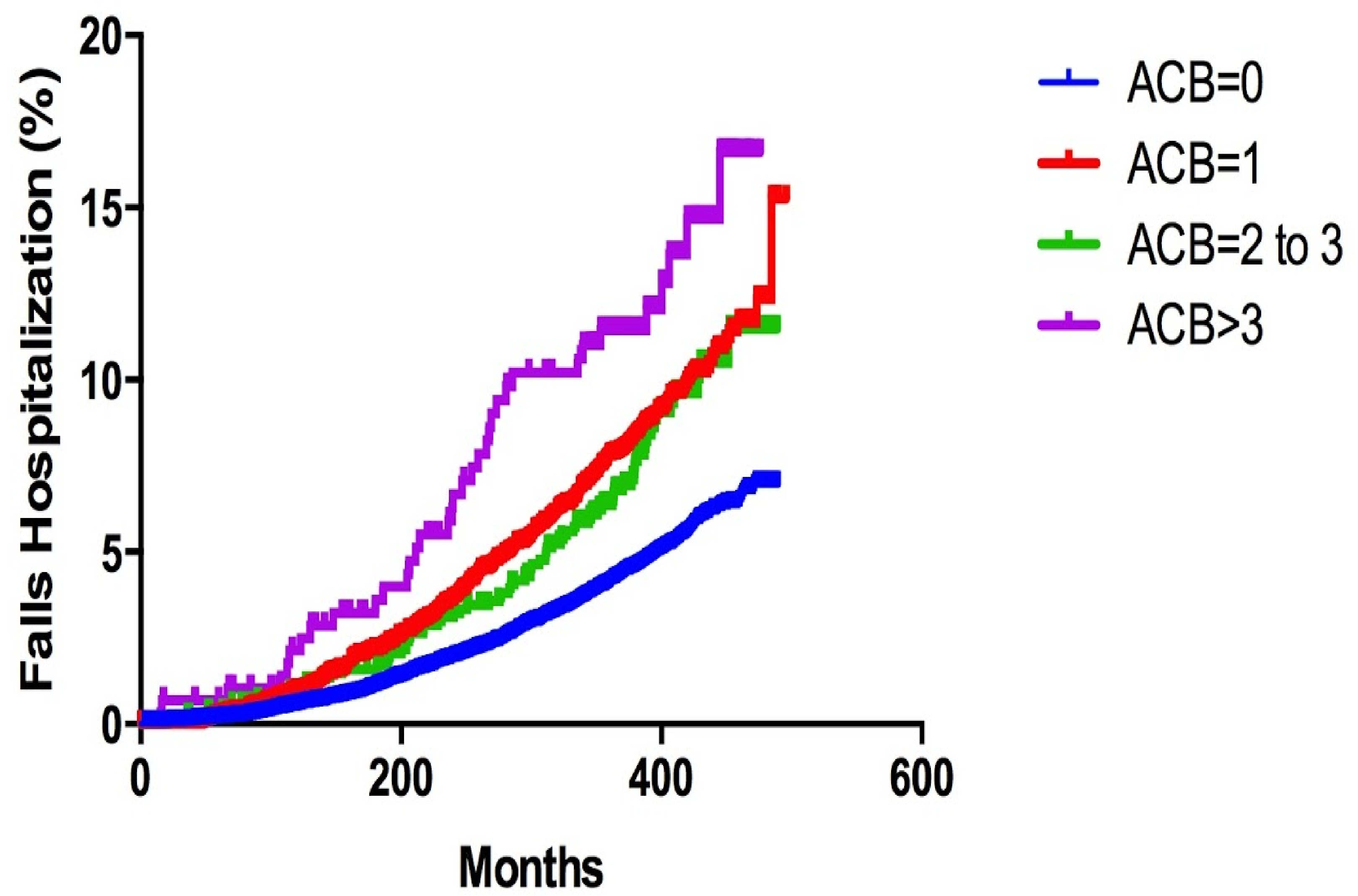
No x 1 + No x 2 + No x 3 = Total Anticholinergic Burden Score

A positive ACB score was associated with falls **OR 1.8**

Falls through gait and balance impairment
- not muscular weakness

*Anam Z, et al. *Maturitus* 2016;84:32-7.

# Hospitalisation with falls over 10 yrs in the EPIC-Norfolk



# Is this patient frail?

- 82 years old.
- She is having elective pelvic floor surgery due to urinary incontinence
- Noticed herself "slowing down" over the last 6 months and has not had the energy to travel
- She is feeling more fatigued throughout the day and not as active as she once was.
- Not limited her ability to look after her home or herself
- Finding herself less likely to join her husband on their daily nature walks. Instead, she finds herself in the garden because it doesn't come with the same level of physical exertion that walking does.
- She is beginning to wonder if she should further investigate her fatigue

# Is this patient frail?

- Female Age 65
- Lives at home with her husband
- Rises from her chair slowly in the waiting room and walks with a stick for balance (2 falls in last year). Feels dizzy on rising.
- Wears glasses
- Struggles with pain
- History of TIA
- On 10 regular Rxs – struggled to manage.
- Worries about her memory
- Not very active. Looks after her grandchildren after school but feels ‘tired all the time’

# Why does it matter for this patient?

- On 3 BP Rxs.
- Systolic in 150s on sitting, 130 on standing
- (postural drop, but sitting systolic on high side in patient with a h/o TIA and also falls)
- NHS Fife guideline– Fit/mildly frail – treat as normal ***unless*** postural drop

# Is this patient frail?

- Female, Age 84
- Lives at home with her daughter (meals and cleaning)
- Struggling with ADL – needing prompting for washing and dressing for 3+ weeks now
- Daughter doing cooking and cleaning
- Presents with:
  - Fall
  - Increasing confusion over 3 week period

# Is medication ‘appropriate’ to her level of frailty?

- Adcal-D3
- Paracetamol
- Cetirizine
- Folic Acid
- Apixaban
- Lercanidipine
- Losartan
- Bisoprolol
- Digoxin

- Zopiclone
- Lorazepam
- MST Continus (20mg/15mg)
- Co-codamol (8/500)
- Lactulose
- Voltarol gel

**Background:**

Vascular dementia
CKD
AF
Psoriatic Arthropathy
Osteoporosis
Hypertension

**Value**

- BP = 117/56, Hb = 12.6, eGFR = 54

# Is this patient frail?

- Female, age 86
- Lives in a care home (not nursing home)
- Wears glasses
- Wears pads for urinary incontinence (and occasional faecal incontinence)
- Dementia
- Mood good – can chat away, very smiley
- Assisted standing
- Needs help with dressing, washing. Independent with feeding/drinking.
- On 8 regular medicines

# Is her medication 'appropriate' to her level of frailty?

If not, what would you change & why?

- Atenolol 50mg od
- Bendroflumethiazide 2.5mg od
- Metformin 1G BD
- Gliclazide 40mg OD
- Donepezil 5mg OD
- Solifenacin 5mg OD
- Alendronic acid 70mg weekly
- Adcal D3 caplets 2 BD

**PMH**

- Hypertension
- NIDDM
- Dementia
- Osteoporosis
- Urinary incontinence

**Value**

- BP = 112/67
- Hba1c = 52
- eGFR = 54

# If you would like more information

## Clinical Frailty Scale (CFS) Training Module

https://rise.articulate.com/share/deb4rT02lvONbq4AfcMNRUudcd6QMts3#/

## Multi-morbidity: clinical assessment and management NICE guideline [NG56]

https://www.nice.org.uk/guidance/ng56

## Living and Dying Well with Frailty Collaborative

https://ihub.scot/improvement-programmes/living-well-in-communities/our-programmes/living-and-dying-well-with-frailty/

## Electronic Frailty Index

https://ihub.scot/improvement-programmes/living-well-in-communities/electronic-frailty-index-efi/

## People Living with Frailty

https://ihub.scot/improvement-programmes/living-well-in-communities/people-with-frailty/

# Thank you and thoughts