



# Physical Activity Interventions for Older People living with Frailty: Opportunities and Challenges

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# Conflict of Interest

- Director of Later Life Training Ltd. A Not for profit organisation that runs falls prevention exercise training in the UK, Europe and Singapore for health and fitness professionals.



# Summary of Session

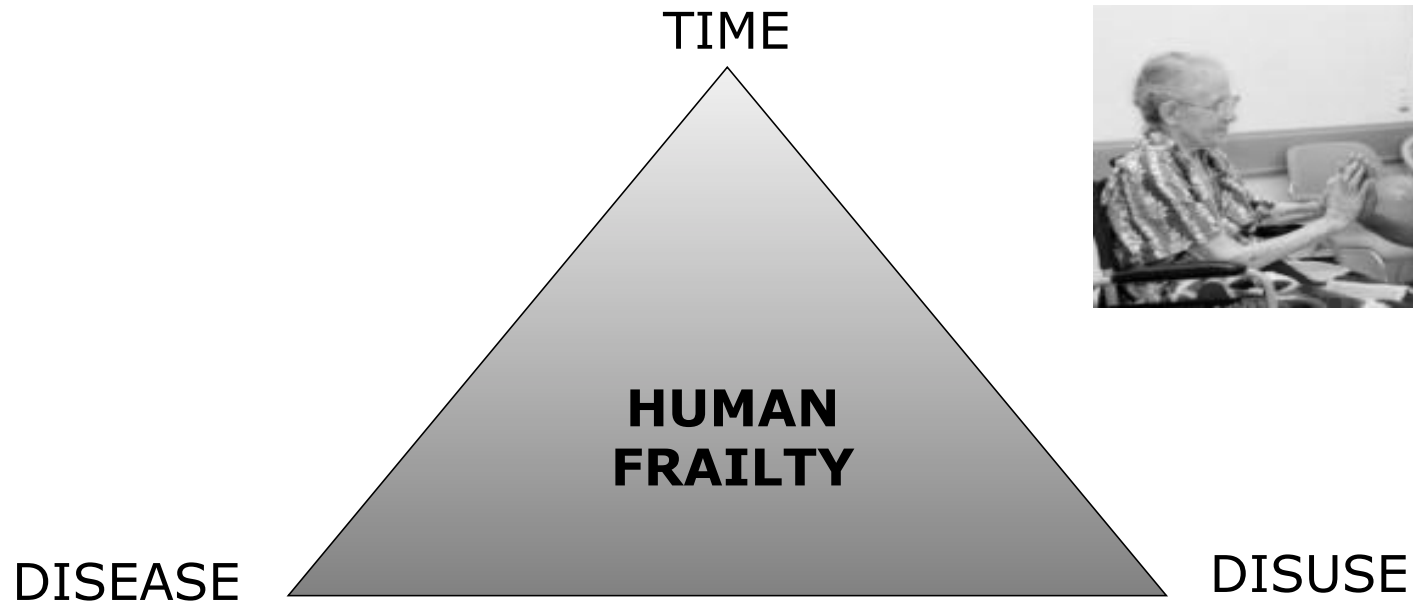


- Frailty, sarcopenia, falls
- Physical Activity Vs Exercise – Treatment or prevention?
- Reminder of main evidence...
- When things go wrong!
- Simple messaging – all singing from the same song sheet!
  - SIT LESS MOVE MORE
  - Strength & Balance exercise – progression
  - Need an effective dose/duration
- **'Exercise for frailty' is using exercise as a treatment**
  - **we should treat it like a drug and prescribe the correct dose, duration**
  - **the right people should be prescribing and delivering it!**





# 3 Dimensions of Human Frailty



“Lack of Activity destroys the good condition of every human being  
While movement and methodical physical exercise saves and preserves it”

PLATO 427-347 BC

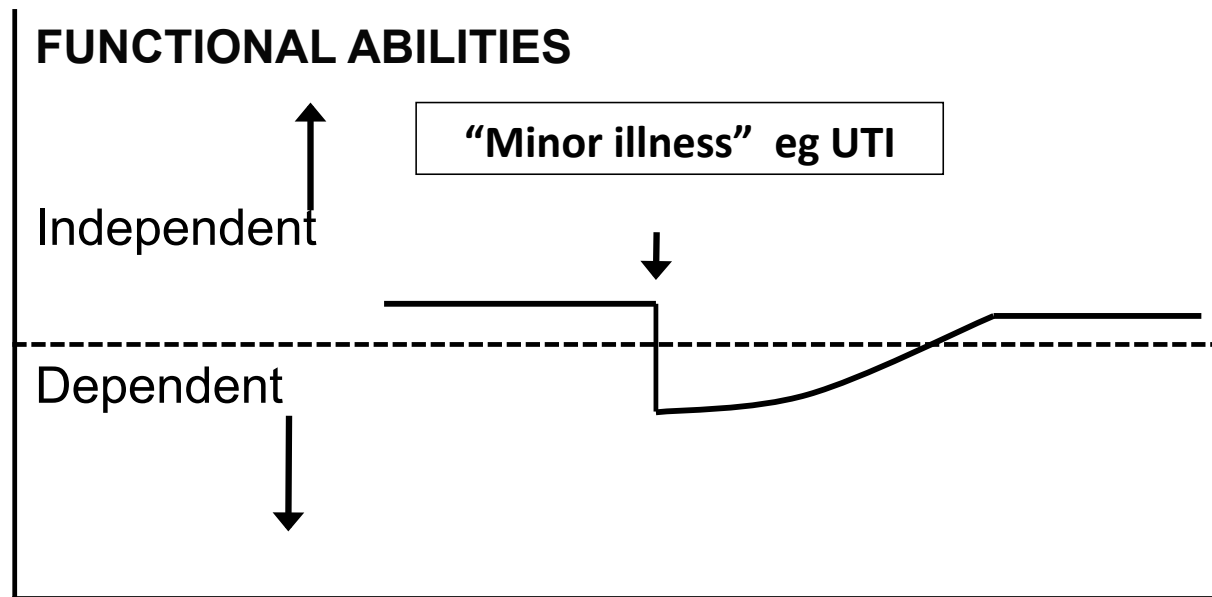
*Spiriduso, 1995*



# Frailty - a loss of physiological reserve



## Frailty syndromes (and falls) present in crisis



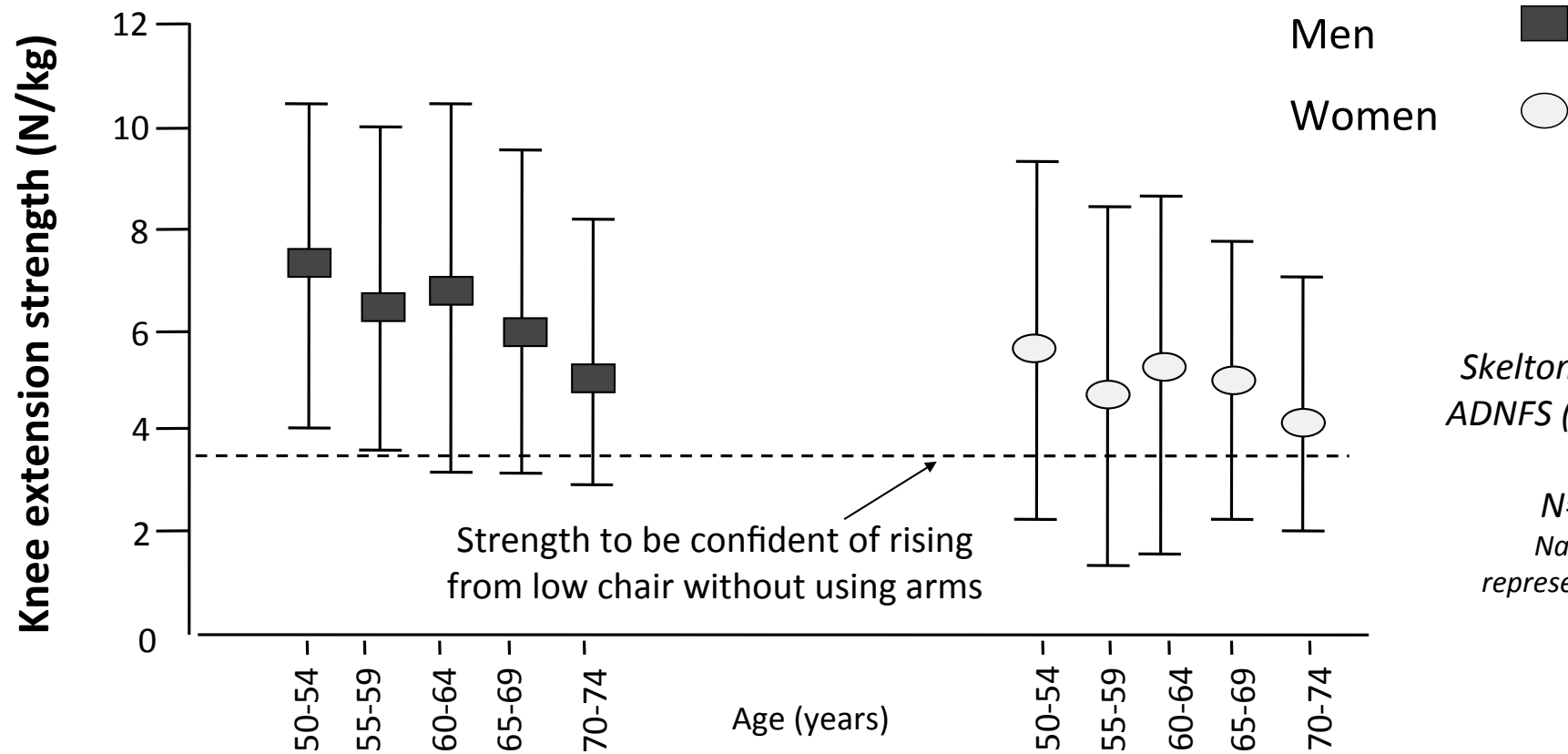
Hyper-acute Frailty syndromes:

- Immobility
- Falls
- Delirium
- Fluctuating disability
- Incontinence

*(Clegg, Young, Rockwood Lancet 2013)*



# Isometric Quadriceps Strength

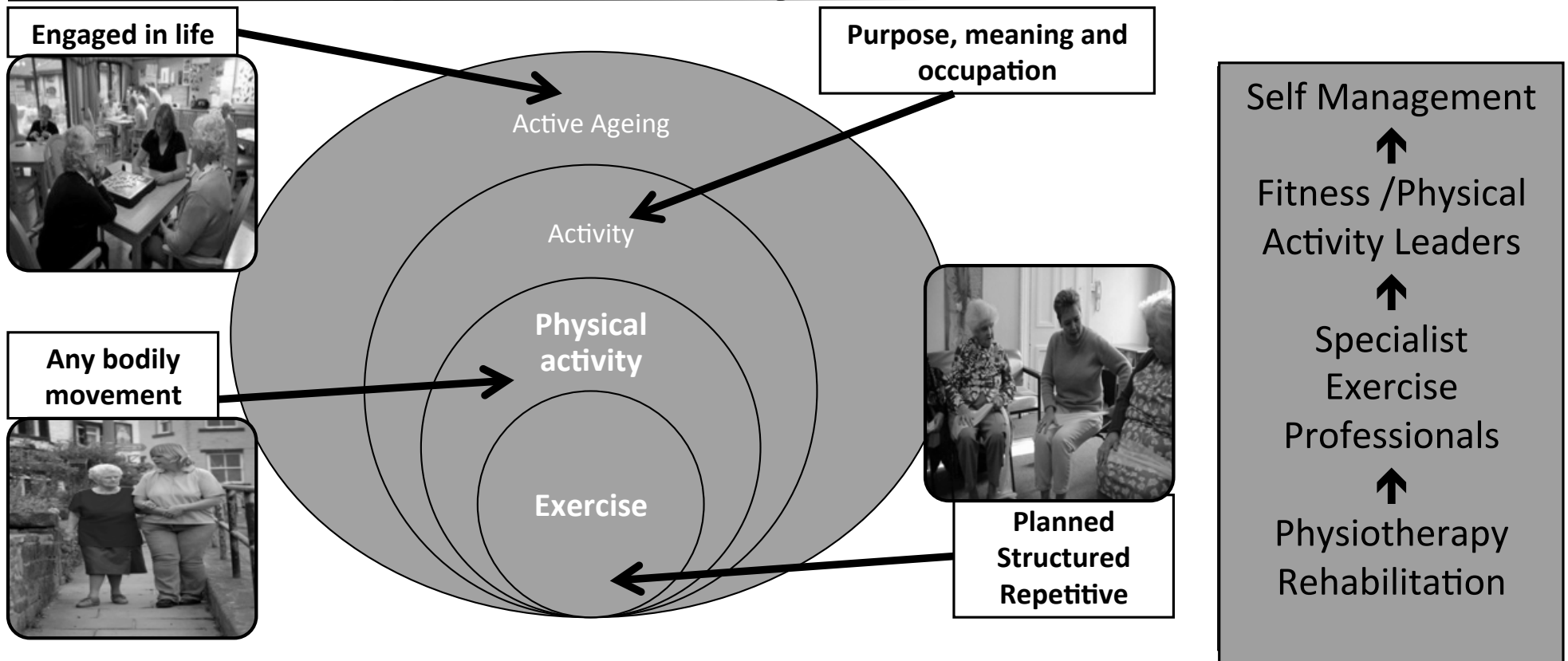


*Skelton et al.  
ADNFS (1999)*

*N=1318  
Nationally  
representative*



# What's the difference? Physical Activity and Exercise



Philosophy, purpose, skills , outcomes and prejudices



# Physical Activity at 65 predicts falls at 90



- Cohort of 1596 retirement community residents
  - Current age = mean 94 years
  - Self reported PA in 1980s, self reported falls now
  - 52% fallers, 32% recurrent fallers
- Risk of falls related to
  - Medical history and medication use
  - Use of assistive devices
- Risk of falls and recurrent falls **35-40% lower** in those reporting **30+ minutes** of moderate intensity physical activity per day compared to those doing less
- OR **0.65 for 30-45 mins per day** and **0.64 for >1 hr per day** adjusting for age, sex, medical history and use of devices.

PHYSICAL  
ACTIVITY =  
PRIMARY  
PREVENTION





# But...those who are frail need Exercise



*"Just like the Olympic athlete, the elderly person must perform, frequently and consistently, at the very limit of their physical ability. The 85-year-old can therefore benefit from the study of athletic training methods..."*



(Professor Archie Young, 1997)





# It's never too late for exercise!



- A 12 week Strength Training programme in 90+ year old nursing home residents doubled their leg strength (*Fiatarone, 1990*)
- Over 75s rejuvenated 20 years of lost strength in 12 weeks of seated strength exercises (*Skelton, 1995*)
- High Intensity Functional Exercise for Care home residents with dementia (12 wks) improved strength, balance and ADLs (*Littbrand, 2011*)





# Is exercise the answer for all frailer patients?

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- Yes

- If done properly and for long enough (dose and delivery)
- If supported and encouraged (adherence)

- No

- Many won't do it or stick to it
- Some are too ill to do it
- Some just don't want to do it!
- Some need tailoring and adapting of the exercise programme and there is no one there to do that with them (unsafe?)



# Fit for frailty?



## 4.2 Managing the physical features of frailty - what is the evidence that frailty can be reversed and what interventions are effective?

A central feature of physical frailty, as defined by the phenotype model, is loss of skeletal muscle mass and function (sarcopenia). There is a growing body of evidence for beneficial interventions to address this aspect of frailty and this has been reviewed recently.<sup>22</sup> The benefits of exercise in older people with frailty shows that home-based and group-based interventions result in improvement in both mobility and functional ability. Strength and balance training is a key component although a wide range of approaches have been employed and the optimal exercise regimen remains uncertain.





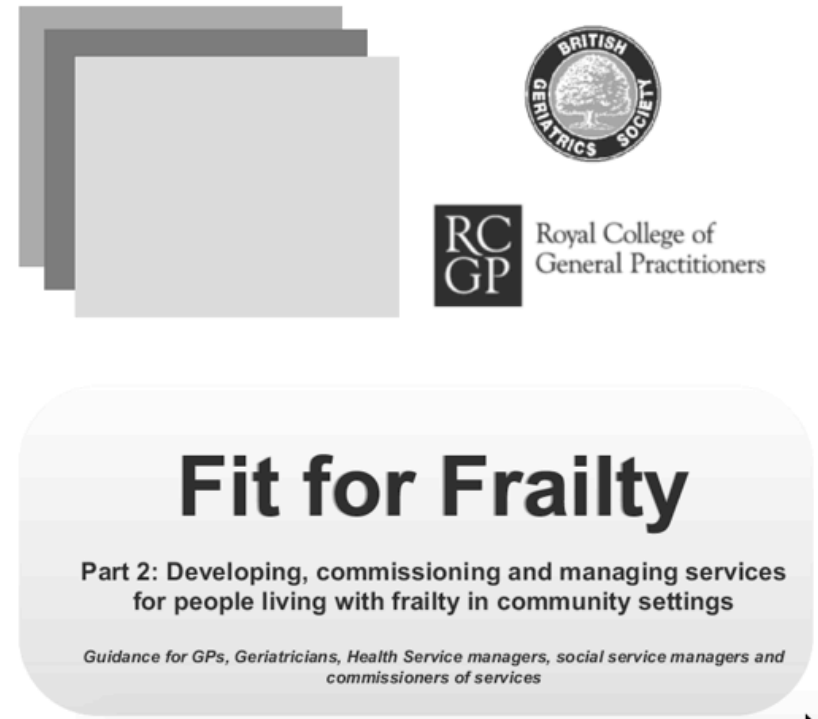
# Fit for frailty?



## Managing Frailty

Make available interventions for older people with frailty which improve overall physical, mental and social functioning, using a goal-orientated rather than a disease focused approach, taking account of individual needs and personal assets, rather than deficits.

Individuals with less severe frailty may benefit from group-based exercise or other activity programmes. GPs are the gatekeepers and decision-makers in terms of referral pathways for patients with frailty.





# Exercise for sarcopenia



- Systematic reviews, exercise + nutrition. Many have NOT focussed on FRAILER older people and most participants well nourished!
- Multimodal exercise (strength, balance, sometimes aerobic) <sup>1</sup>
  - 79% of studies - muscle mass increased, adding nutritional supplementation improved outcomes in only 23.5%
  - 83% of studies muscle strength improved, adding nutritional supplementation improved outcomes in only 23%
  - 93% of studies physical function improved, adding nutritional supplementation improved outcomes in only 14%
- Much more work needed in very frail older people, considering nutritional status at baseline and looking at minimum dose <sup>2</sup>

1. Beaudart et al. *Osteoporos Int.* 2017; 2. Denison et al. *Clin Interv Aging* 2015;



# Exercise for sarcopenia – Frailer older people



Who	Duration	Type	Frequency	Time
Aged 70-85 Mobility Limited (Chale et al. 2013)	6 months	Strength, supervised and progressive	3 x p/w	45-60 mins
Sarcopenic women (Kim et al. 2012, 2013) (Shahar et al. 2013)	3 months	Multi-component, progressive	2 x p/w	60 mins
Sarcopenic men (Zdzieblik et al. 2015)	3 months	Multi-component, progressive	3 x p/w	60 mins
Retirement Village (Daly et al. 2014)	4 months	Multi-component, progressive	2 x p/w	60 mins
Retirement Care (Oesen et al. 2015)	6 months	Strength, progressive	2 x p/w	45-60 mins
Frail women (Kim et al. 2015)	3 months	Multi-component, progressive	2 x p/w	60 mins
Frail (Tieland et al. 2012)	6 months	Strength, progressive	2 x p/w	45-60 mins
Care homes (Rosendahl et al. 2006)	3 months	Multi-component, progressive	5 x per fortnight	60 mins
Care homes (Bonney et al. 2003)	9 months	Multi-component, progressive	3 x p/w	60 mins
Hospitalised men (Miller et al. 2006)	3 months	Strength, progressive	3 x p/w	45-60 mins

*Beaudart et al. Osteoporos Int. 2017*



## And didn't work for outcomes....

Who	Duration	Type	Frequency	Time
Nursing Home (Trabal et al. 2015)	4 weeks	Multi-component, progressive	4 x p/w	45-60 mins
Nursing Home (Binder et al. 1995)	8 weeks	Multi-component, progressive	3 x p/w	45-60 mins

? Not long enough, patients too unwell to progress

*Beudart et al. Osteoporos Int. 2017*





# Exercise for frailty



- Interventions to improve frailty-related health outcomes
  - exercise, nutrition, multicomponent interventions, and individually tailored geriatric care models.
- The reviewed studies were generally long in duration ( $\geq 6$  months) with sessions lasting around 60 minutes performed three or more times per week, including multicomponent exercises.
- In conclusion, although exercise interventions appear to be effective in managing the various components of frailty and preventing/delaying the onset of frailty, the most effective exercise program in this population remains unidentified.

*Walston et al. Clin Geriatr Med 2018; Silva et al. J Frailty Aging 2017; Lee et al. J Clin Geront Geriatr 2012*



# Exercise for falls prevention



- Update of 2009 review
- 159 trials with 79,193 participants
- most common interventions tested
  - exercise as a single intervention (59 trials)
  - Multi-factorial programmes (40 trials)



## Conclusions:

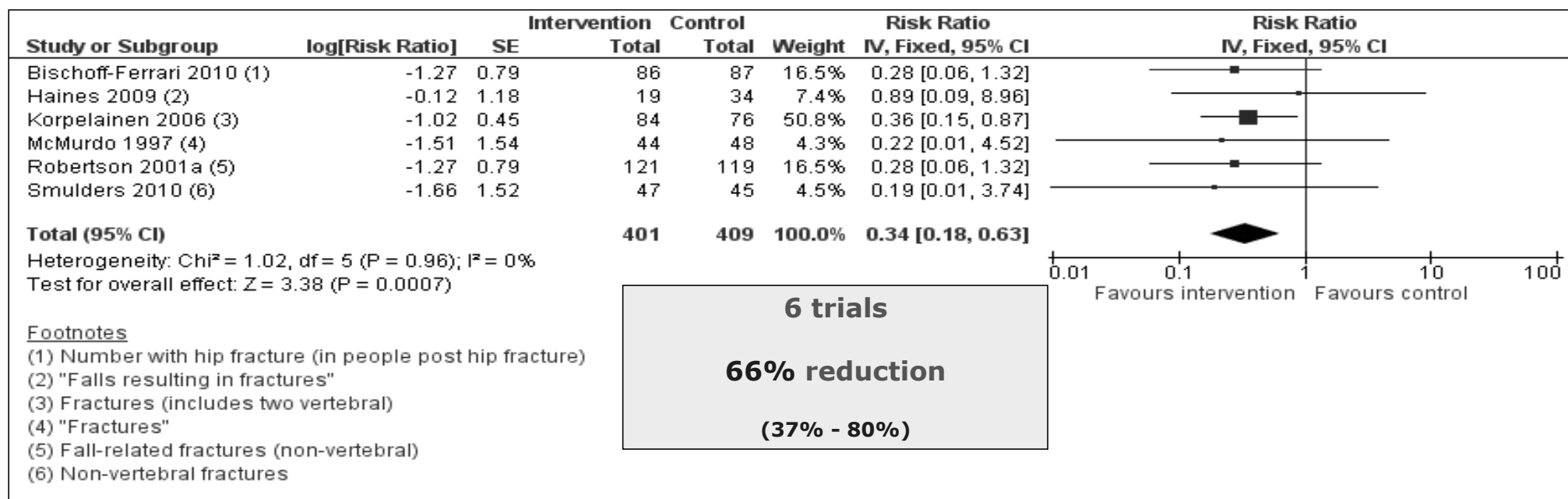
- Group and home-based exercise programmes
  - Strength & Balance
  - Tai Chi
- Home safety interventions
- Multi-factorial assessment and intervention programmes

*Gillespie et al. Cochrane Library 2012*



# Exercise to prevent falls

Outcome: Fractures



### Footnotes

- (1) Number with hip fracture (in people post hip fracture)
- (2) "Falls resulting in fractures"
- (3) Fractures (includes two vertebral)
- (4) "Fractures"
- (5) Fall-related fractures (non-vertebral)
- (6) Non-vertebral fractures

## Interventions for preventing falls in older people living in the community (Review)

Gillespie LD, Robertson MC, Gillespie WJ, Sherrington C, Gates S, Clemson LM, Lamb SE



@LaterLifeTrain



# What makes the difference for exercise to work?

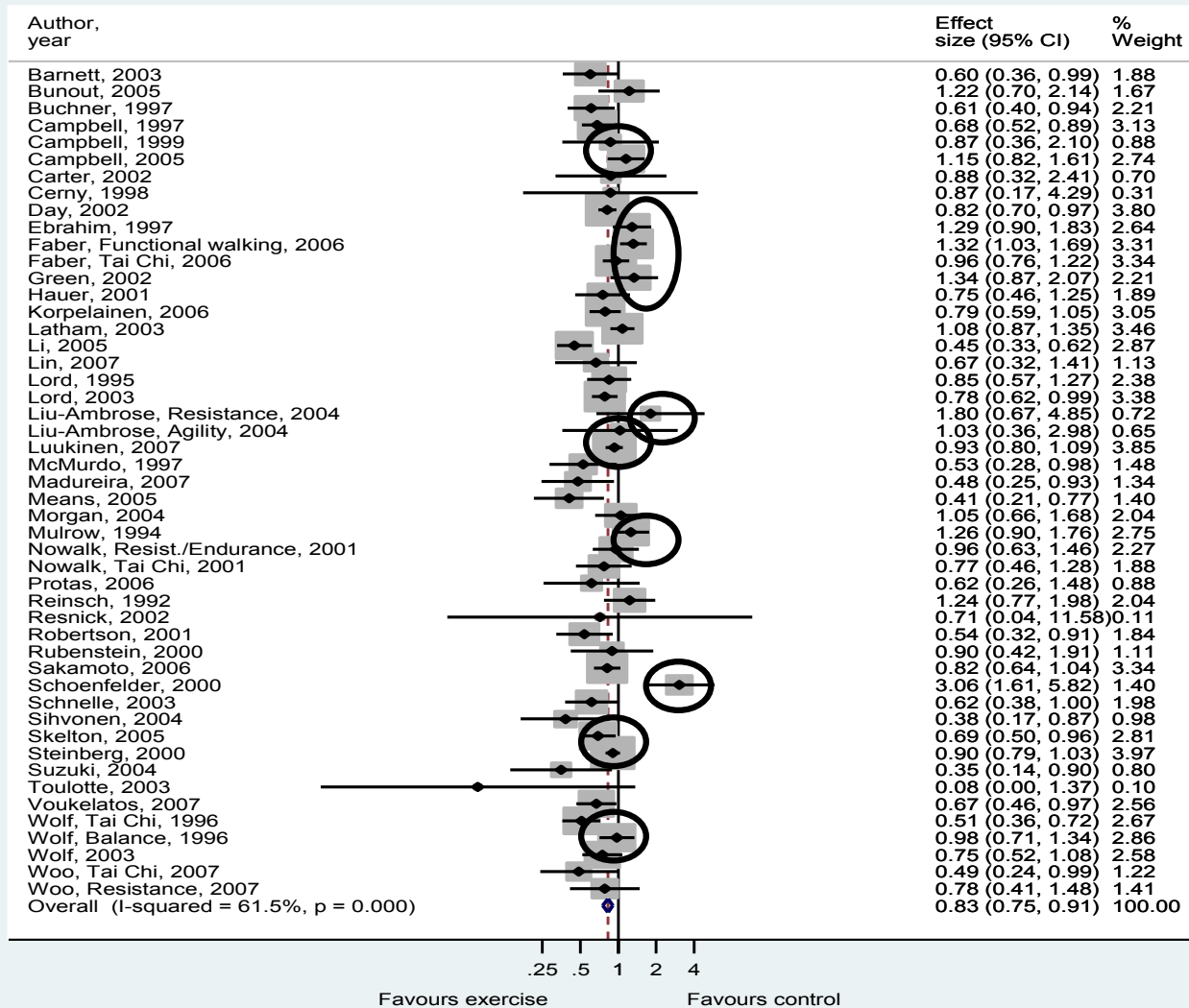


- Greatest effects of exercise on fall rates (39% reduction) from interventions including:
  - **Highly challenging balance training (>3 hrs per week)**
  - **High dose (50+ hours)**
  - **Progressive strength training**
  - **Avoiding brisk walking**
- These types of exercise also reduce fear of falling
- **COMMUNITY DWELLING OLDER PEOPLE**
- **Exercise alone in frailer care home residents does not work**
  - Difficulty in standing balance and lack of strength focus?

*Sherrington et al., JAGS 2008, NSWPHB 2011, BJSM 2016  
Kendrick Cochrane Review FoF 2014  
Cameron et al. Cochrane Review 2012*

# Hidden perils

# Ineffective dose / balance challenge



Sherrington et al., JAGS 2008, 2011



# Treat Exercise as you would a 'drug'



- Exercise is one of the most frequently prescribed therapies in both health and disease
- As with any other 'medicine' – DOSAGE (volume and intensity), FREQUENCY of administration (sessions per week), TYPE (components of physical fitness), SYSTEMIC and PSYCHOACTIVE effects, CONTRAINDICATIONS and SIDE EFFECTS all have to be taken into account to achieve the BEST CLINICAL OUTCOME
- Should start with a MINIMUM EFFECTIVE DOSE and titrate upwards (progress!)



## REVIEW

### Exercise acts as a drug; the pharmacological benefits of exercise

J Vina, F Sanchis-Gomar, V Martinez-Bello and MC Gomez-Cabrera



# Exercise as 'Treatment' for the Frail Older Person



- For Medicines there is a strict approval process and strict guidelines on who can prescribe and for how long, what dose etc.
- Yet for exercise, it seems anyone can deliver it, to anyone, for any length of time and any dose?
- For effective outcomes in frailty we have to have FAST OUTCOMES to change prognosis! We need to use EBP programmes, trained deliverers who can tailor to suit ability and need and an effective dose!



Medicines & Healthcare  
products  
Regulatory Agency



**Failing the Frail: A Chaotic Approach  
to Commissioning Healthcare Services  
for Care Homes**



# But services translate this evidence to.....



- More than half the class seated
- Average duration 8 weeks and frequency once per week!  
= 8 hours!
- Little or no strength progression
  - Ankle weights often not increased (or used!) in Otago-based services
  - Max 2 therabands progression in FaME-based services

Highly challenging balance?

Ineffective dose ?  
Or increase confidence before  
ability 😞

Lack of strength progression ?

*RCP Exercise Falls Audit 2012*





# Transitioning onto other exercise opportunities



- Important to:
  - encourage an active lifestyle beyond rehabilitation
  - meet effective dose requirements (>50 hours)
  - work on bone health improvements
  - change exercise habits and increase social involvement
- But
  - Barriers to continuation after 'rehabilitation' in those with multiple comorbidities!
    - perceived cost (43%), travel time (43%), and physical symptoms (39%)
  - Facilitators to continuation.....
    - case manager (82%), a supported transition following rehabilitation (78%), and a condition-specific program (78%)



*Sherrington 2016, Skelton 2001, PHE 2017, Desveaux JAPA 2016*



# Support and Encouragement



A programme is more than a series of exercises

- Examples from successful falls and exercise programmes
- A range of strategies that support participants eg.
  - Goal setting and self monitoring
  - Overcoming obstacles and difficulties (lapses/relapses)
  - Educating the participant
  - Highlighting successes
  - Providing individual and group support



# Fear of Falling



- Fear and lack of confidence in balance predict
  - Deterioration in physical functioning
  - Decreases in physical activity, indoor and outdoor
  - Increase in fractures
  - Admission to Institutional Care

*“It’s the fear that restricts me. In my mind I know that I can’t [walk outside]. The fear of falling and not having the strength to go out, that stops me from going out...”*

(Female, 60yrs)

*(Arfken 1994, Vellas 1997, Cumming 2000, Horne 2011)*



# Activity Compensation?



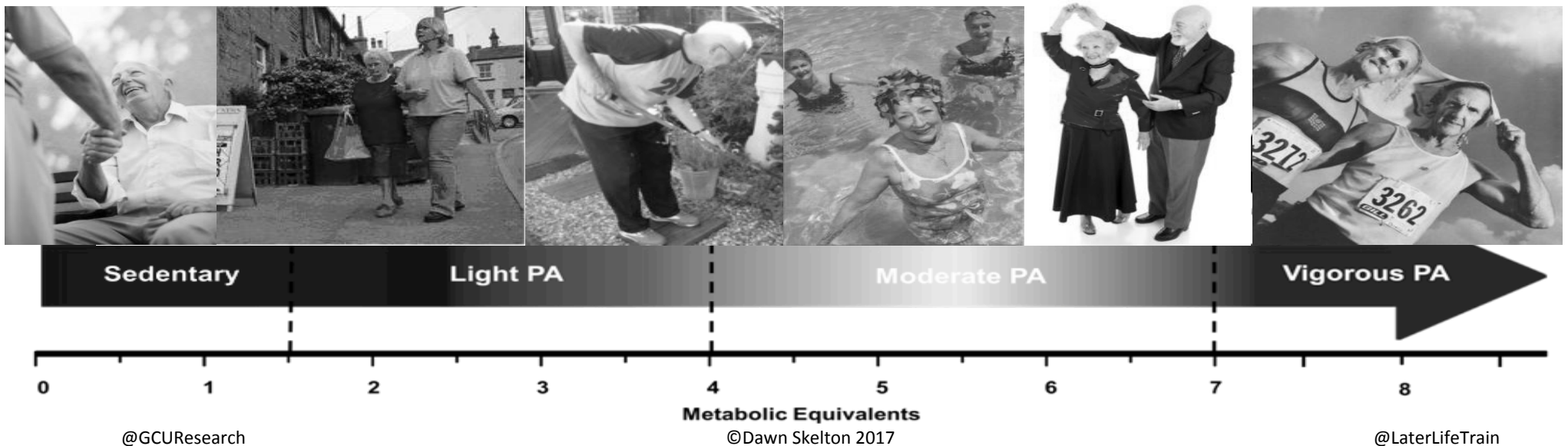
- Frailer older people **compensate** by being less physically active because they are doing strength and balance exercise (fatigue, perception of energy, lack of understanding)
- We have to have the conversation – these exercises have to be in addition to moving more often...
- **Sedentary behaviour** leads to poor outcomes, independent of ‘activity’ behaviour!
  - linked to musculoskeletal pain and can affect quality of life, social inclusion and engagement



# What is sedentary behaviour?



Any waking activity characterized by very low energy expenditure *and* a sitting or reclining posture.





# Sedentary behaviour health risks



In **older adults** (>60 years old), sedentary behaviour has been found to be significantly associated with:

- Higher plasma glucose
- Higher BMI and waist:hip ratio
- Higher cholesterol
- Reduced muscle strength
- Reduced bone density
- Frailty & falls

*Copeland, Dogra (2017) Brit J Sports Med, Gennuso et al (2013) Med Sci Sports Exerc.; Skelton (2001) Age Ageing; Chastin et al (2014) Bone*  
@GCUResearch

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# Are we doing harm to older patients?



- On average patients are in an **upright** position for only 70 minutes per day
  - Stroke Patients in a **rehabilitation ward** spent only 8.3% of their day in an upright position
  - Care home residents spend at least 80% of their day sitting
- 
- We are providing the wrong messages about movement and encouraging fear and functional decline

*Barber (2014) JAPA; Egerton T et al. (2006) Hong Kong Physio J  
Skelton (2014) Agility (CSP); Grant et al (2010) JAPA*



# Hospital harm



- Hospital admission in past 12 months single most **predictive risk for functional decline** in community dwelling older people
  - fall of 10 points on the Barthel Index and/or 2 instrumental activities of the Lawton Index
- Rates of **functional decline** after hospital discharge range from **10% to 50%**.
- Patient safety taking precedence? Some felt movement was unsafe without physiotherapy input
- No mobility action plans?
- Will **#endPJP** deal with this?

Arnaud et al. 2016 Arch Geront Geriat; Buurman et al. Plos One 2011; Helvik et al. Arch Geront Geriat 2013); Krumholz, NEJM 2013; Resnick et al. Inter J Ortho Trauma Nurs 2015; Brown et al. JAGS 2009







# Hospital harm



- Comparisons of functional assessment at baseline and day 2 of hospitalization in 71 patients over the age of 74 years demonstrated declining ability in mobility, transfer, toileting, feeding, and grooming
- Use of a walker was associated with a 2.8 times increased risk for decline in ADL function by the time of hospital discharge
- Prolonged bed rest in hospital leads to a reduction in physical activity on discharge and increases fear of falling

*Sands et al. J Gerontol A Biol Sci Med Sci 2003*  
*Shelton et al. Am J Manag Care 2000*  
*Kortebein et al. J Gerontol A Biol Sci Med Sci. 2008*  
*Edmonds & Smith, Age Ageing 2014*



# Function Focused Care (FFC)



- FFC measured by the Restorative Care Behavior Checklist - a continuously scaled observed measure of patient involvement in activities associated with functional independence and physical activity
  - Less functional decline than found among patients not exposed to this type of encouragement
- UK study looked at outcomes of 1022 hospital episodes and whether patients saw a physiotherapist within 24 hours or after 24 hours of admission
  - LOS – 6.7 days (early assessment) vs 10 days (late assessment)  $p < 0.001$
  - Formal care on discharge – 20% (early assessment) vs 27% (late assessment)  $p = 0.016$

*Boltz et al. Geriatr Nurs 2012*  
*Hartley et al. J Geriatr Phy Ther 2017*



# Service Improvement in Lanarkshire



'I enjoy the activity passport. It's encouraging me to do more on the ward. I'm doing my exercises regularly. I've not been well and was keen to get back to using my passport. I can see my progress over time.'



Lianne.mcinally  
@nhs.net





# Falls in Hospital

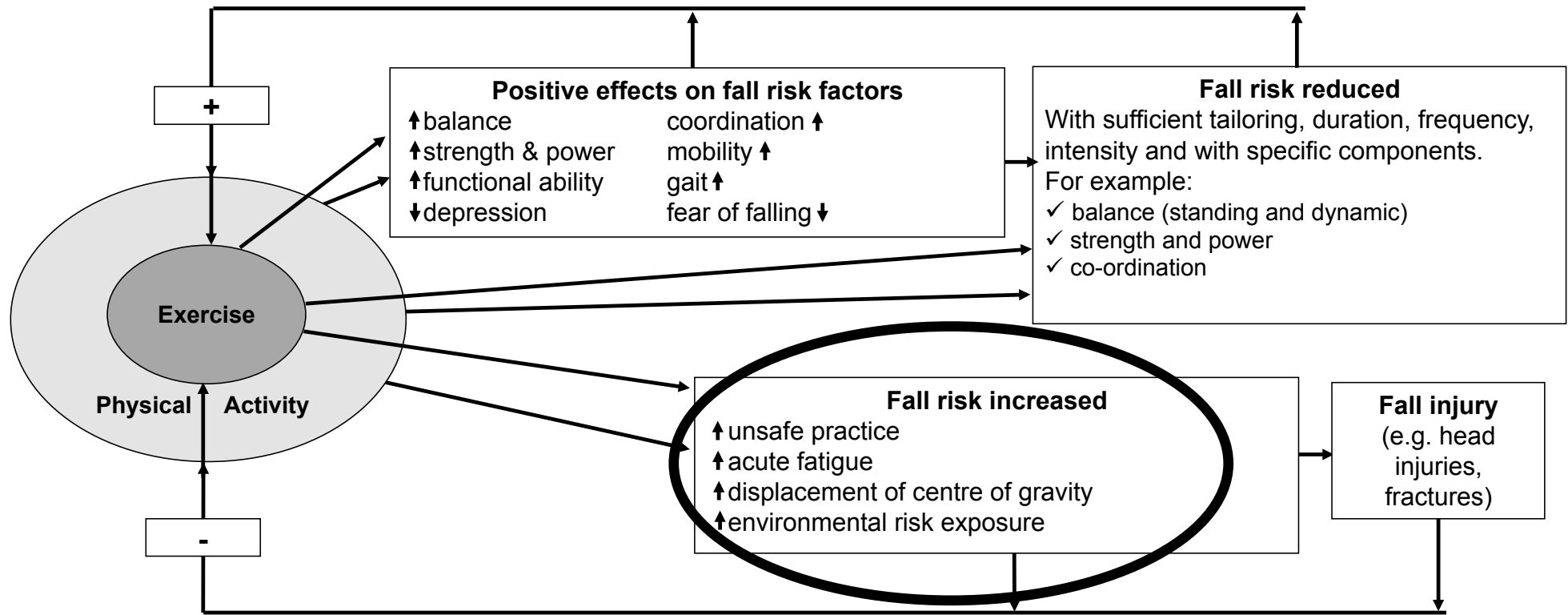


- In-hospital falls
  - 8 rehabilitation units, 50 week period
  - N=3606, MMSE score > 23/30
- Intervention
  - Individualised education based on principles of changes in health behaviour in addition to usual care
  - Feedback to staff on patients goals, ward environment, perceived barriers to engagement in falls prevention strategies, mobility plans.
- **Fewer falls** ARR 0.60; **fewer injurious falls** ARR 0.65; **fewer fallers** AOR 0.55. No difference in length of stay.

*Hill et al. Lancet. 2015*



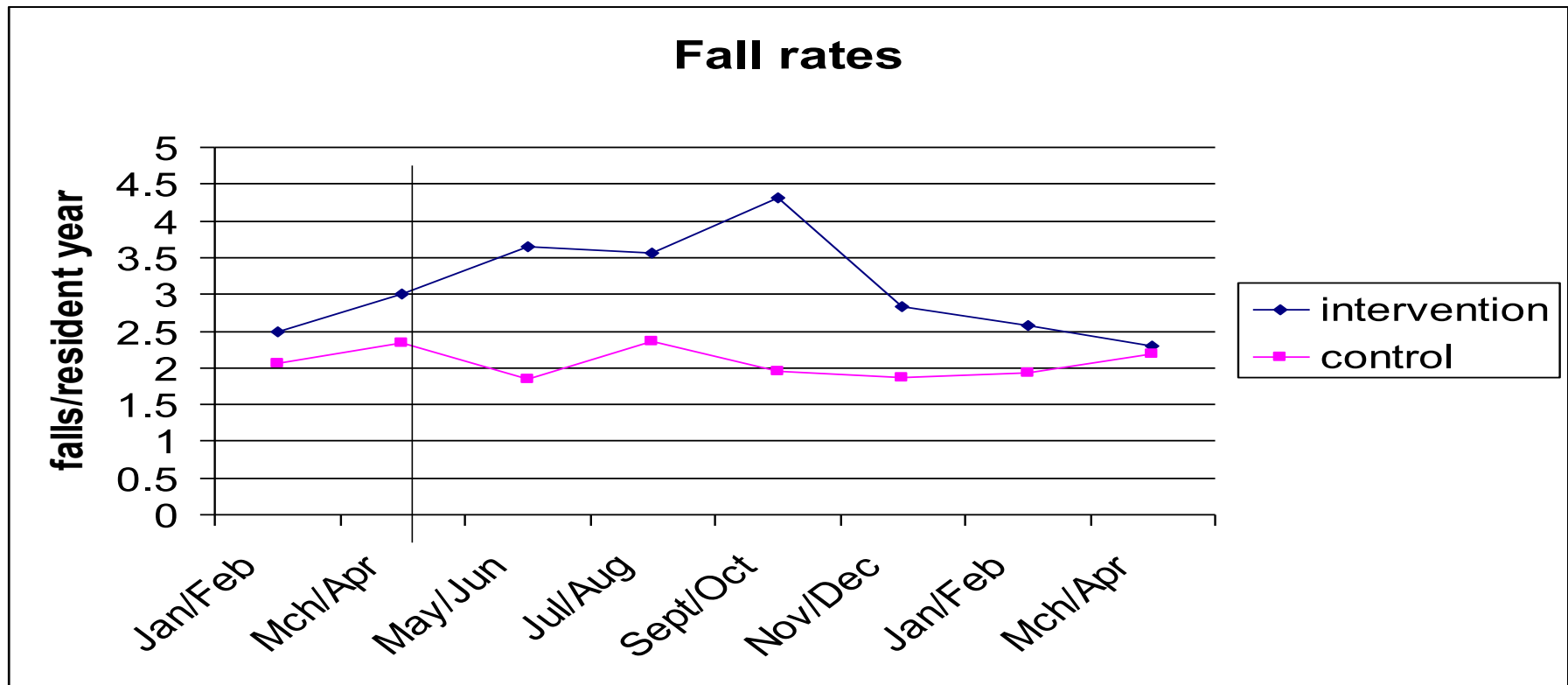
# When things go wrong?



Adapted from Skelton, 2001, Age Ageing



# Risky intervention?



Care home intervention including increasing low intensity physical activity.  
et al. 2004.

Kerse



# Frailty & Exercise



- Care is needed when working with the frailest!
- Frailty index applied to participants in an exercise programme.
  - Those considered frail had RR 2.95 (95% CI 1.64 to 5.32 for a fall compared to those considered pre-frail who decreased risk of falls RR 0.39 (95% CI 0.18 to 0.88) *Faber et al 2006*
- Three trials have reported more falls in the intervention groups DURING the intervention.
  - There is a risk of a persons confidence increasing before they have improved balance and strength to cope with increased exposure to risk *Mulrow 1994, Barreca 2004, Kerse 2004*
  - In Stroke patients, practicing sit to stand manoeuvre without then training gait and mobility, increased falls.... *Barreca 2004*



# Falls on discharge from hospital



- N=340 people average age 81.2 yrs, 70% had fallen in last year
- Home exercise, 20-30 mins x 6/week (WEBB programme)
  - Physiotherapist home visits, 10 times over 12 months.
- Outcomes
  - Improvement in mobility but **INCREASE IN FALLS (40%)!!**
- Why?
  - Mostly unsupervised, was those who walked faster at discharge who fell more
  - Poor adherence (60% still exercising at 12 months)
  - Average medications = 7 (cf. Otago studies 2-3)

*Sherrington et al. PLOSOne. 2014*

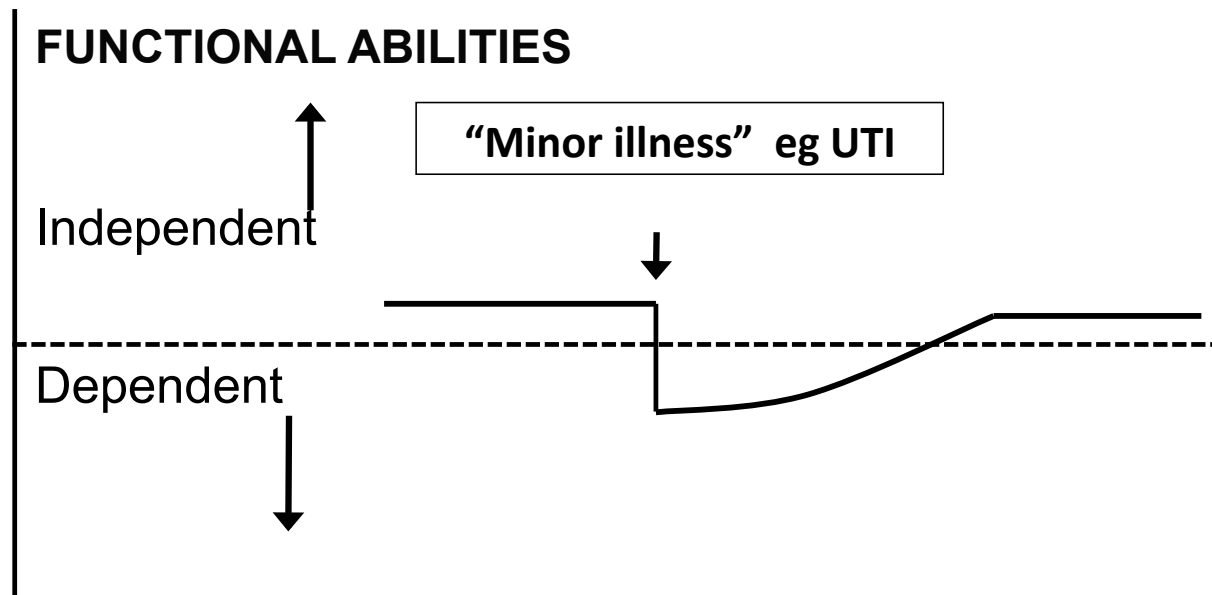




# Frailty - a loss of physiological reserve



## Frailty syndromes (and falls) present in crisis



(Clegg, Young, Rockwood Lancet 2013)

If people are that close to their threshold they can easily cross it again with deconditioning.

Need effective supervision if frail.

Need to remember that when they stop exercising they will decline in function.



# Men/Women fall differently



- Real life falls captured on video in LTC facilities (1738 falls; 231 men/298 women)
  - Men > women fall from loss of support with an external object (OR 1.37)
  - Men > women fall from seated (OR 1.42) or while rising (OR 1.49)
  - Men < women fall from tripping (OR 0.72) or while walking (OR 0.61)
- Independent in ADLs and intact cognition > falls while walking
- Poor ADL function and cognition > falls while seated or while rising
- Poor ADL function and more medications (particularly diuretics) > falls from loss of support from external object
- **Different strategies needed for different populations within LTC**

*Yang et al. J Am Med Dir Assoc 2017*



# Falls and Fragility pathways



## RightCare Pathway: Falls and Fragility Fractures

*RightCare Pathways provide a national case for change and a set of resources to support Local Health Economies to concentrate their improvement efforts where there is greatest opportunity to address variation and improve population health.*

**Commissioners** responsible for **Falls and Fragility Fractures** for their population should

- ✓ focus on the three **priorities for optimisation**
  - **Falls prevention**
  - **Detecting and Managing Osteoporosis**
  - **Optimal support after a fragility fracture**
- ✓ work across the system to ensure that schemes to deliver the **higher value interventions** are in place
  - **Targeted case-finding** for osteoporosis, frailty and falls risk
  - **Strength and balance training** for those at low to moderate risk of falls
  - **Multi-factorial intervention** for those at higher risk of falls
  - **Fracture liaison service** for those who have had a fragility fracture,
- ✓ use the Falls Prevention Consensus Statement and Resource Pack, especially the **implementation checklist** – there are links to the relevant sections throughout this resource

**£59m. could be saved on emergency admissions due to falls for those 65 years and over if CCGs achieved the rate of the lowest 5 of their peers**

**£37m could be saved on hospital admissions for hip and thigh injuries if CCGs achieved the rate of the lowest five of their peers.**



# Adding falls risk screening to an osteoporosis service

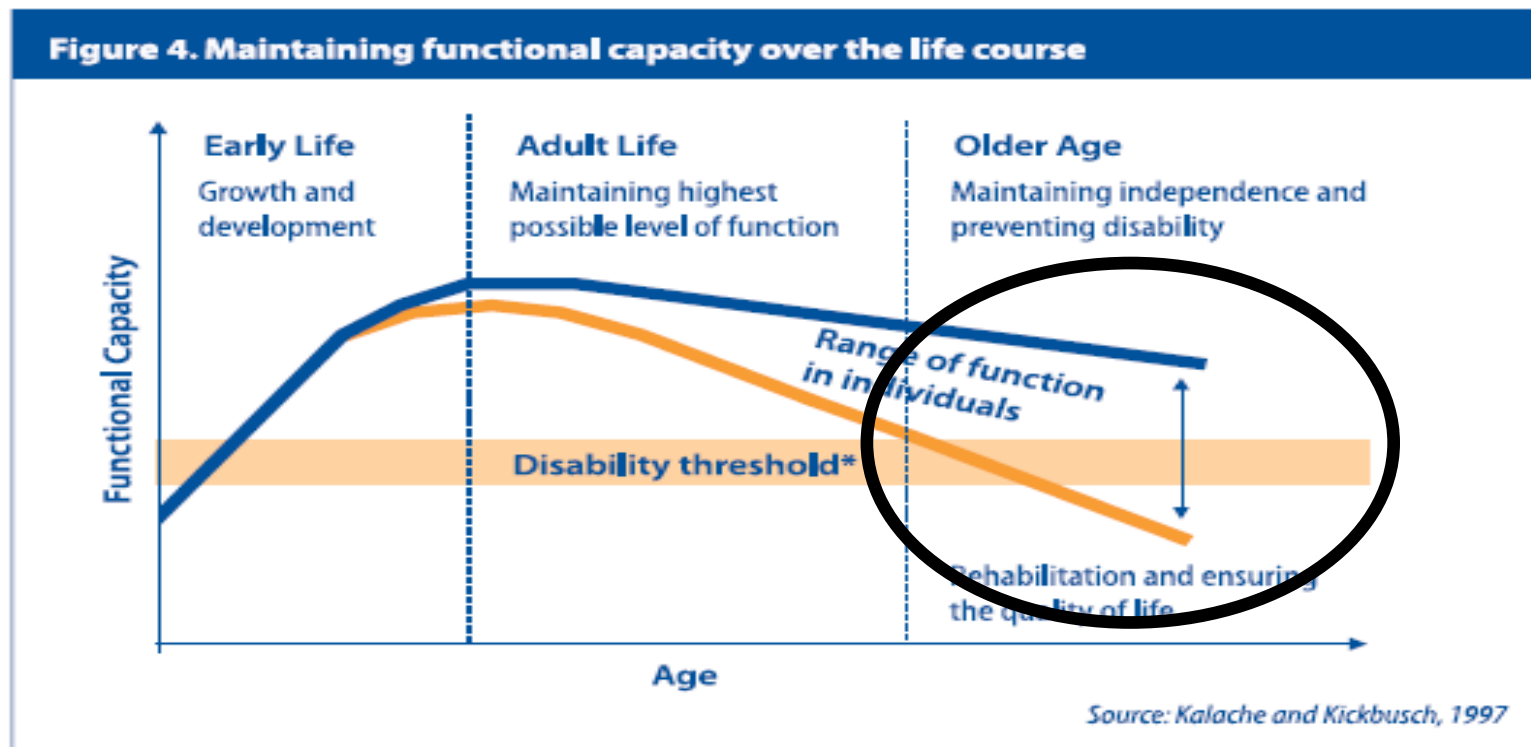


- Fallers should be screened for falls risk. Those seen in fracture clinics should be screened for falls risk
  - Why is it still not that common...**is it worth it and does it take too much time?**
- Screening took 1/3 of the time typically allotted for traditional PT evaluations and did not interfere with clinic workflow
- 40% of those screened reported fell in last year
  - Half had 2 or more falls
- 50% had lower extremity strength impairment or balance difficulty
  - 40% below norms on performance tests
- Most who selected group exercise programmes adhered
  - only a quarter who chose supervised or non-supervised home exercise programmes adhered

*Ritchey et al. Arch Osteoporos 2017*



# Sit less move more Strength & Balance by stealth?



- Two ways of thinking about ‘sitting less’
  - Reduce time spent sitting
  - Break up periods of sitting (‘sitting bouts’)



**SOS Study** – over 12 weeks, adding 10-15 sit to stands a day improved ‘TUG’ and 30s chair rise ability

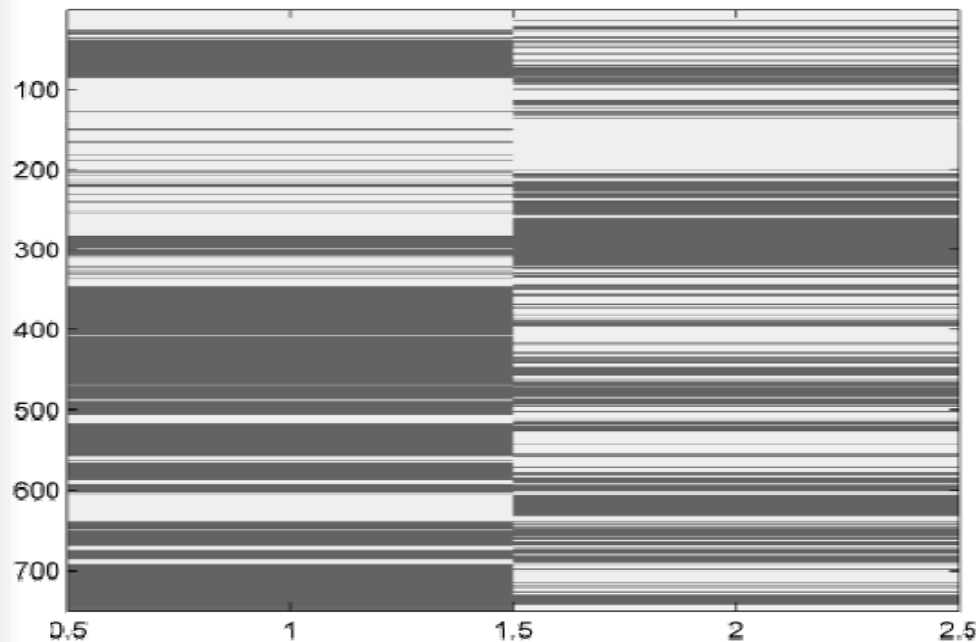
# Patterns of sedentary behavior are also important

 Sedentary  
CPM < 100

 Not sedentary  
CPM 100+

'Prolonger'

'Breaker'

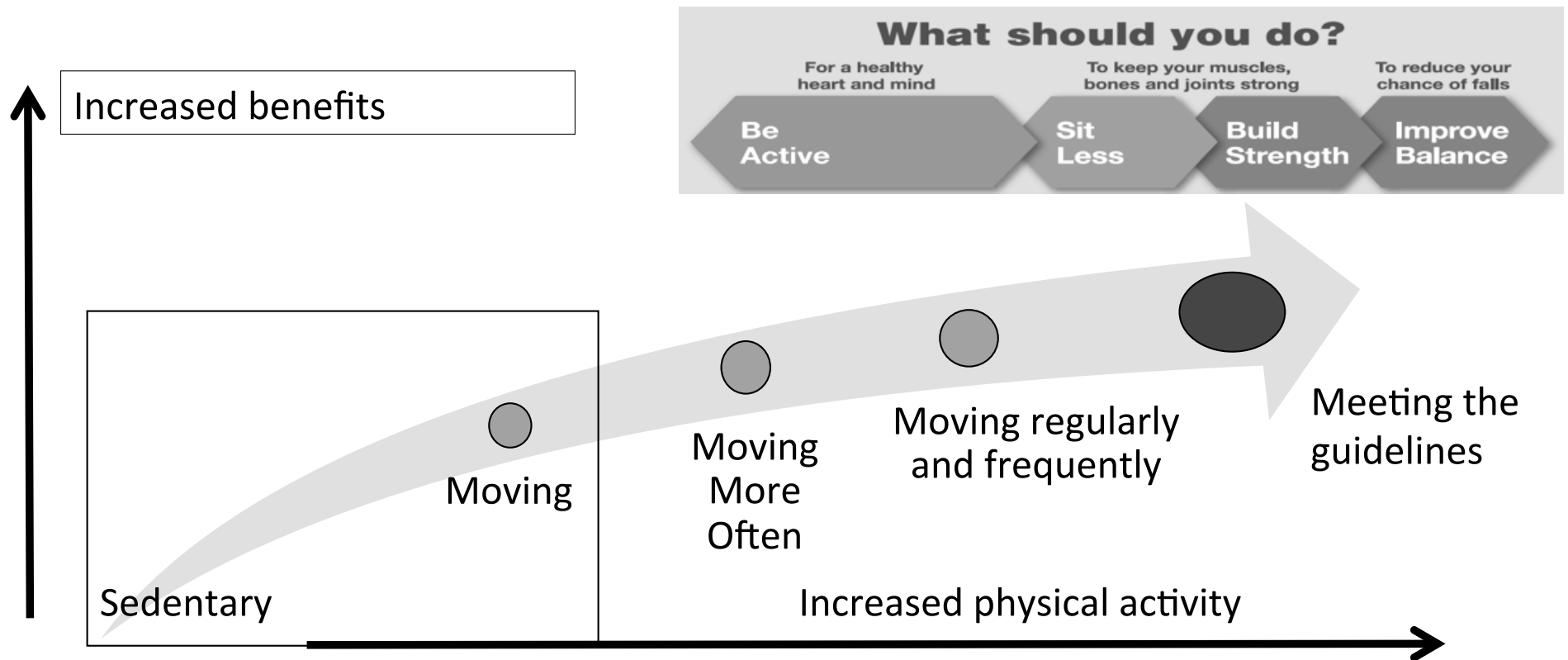


These participants have exactly the same sedentary time

More breaks from sitting time associated with lower average waist circumference, BMI, triglycerides, and 2-hr plasma glucose



# Achieving activity guidelines







# Start by Sitting Less!



**Sit Less MOVE MORE**  
Feel good!

**Why should I sit less?**

- Stops you feeling stiff and sore
- Makes you more mentally alert
- Boosts your energy

**Sitting less can help me...**

- Do things more easily
- Stay healthy
- Keep my bones and muscles strong
- Stay independent

**Try to get up every 20 minutes morning, afternoon and evening**

**STANDING**

- You only need to be on your feet for a few minutes to make a difference

**WHEN WATCHING TV**

- Get up during the adverts
- Do some housework

**AROUND THE HOUSE**

- Move around when on the phone
- Stand to read
- Stand while the kettle is boiling
- Go out in the garden

**GO OUT EVERYDAY**

- Go for a short walk
- Meet a friend
- Play a sport
- Visit a place of interest

Find a balance between sitting and being on your feet

**When could I sit less?**  
Tick times when you think you could sit less

MORNING AFTERNOON EVENING

**Some ideas for sitting less**  
Circle things you could do to sit less this week

Go for a short walk	Feed the birds
Play a sport	Walk around bus shelter
Walk instead of taking car/bus	Water the house plants
Do something during TV adverts	Visit a place of interest
Stand to read	Move between rooms
Get on bus at a stop further away	Join/attend a club or group
Meet a friend	Use the stairs
Set a computer reminder to get up	Do some housework watching TV
Stand while on the phone	Stand while kettle is boiling
Do some gardening	Switch on some music and dance

My own idea for sitting less:

**Some sitting is good for you...**

- Sitting with friends
- Recharging your batteries
- Doing hobbies

**Remember...**  
You only need to be on your feet for a few minutes to make a difference

**How can I sit less?**  
Example: Go for a walk

1	2	3	4	5
M	T	W	T	F
S	S	S	S	S

For more ideas see: [www.pathsforall.org.uk](http://www.pathsforall.org.uk)

Did I succeed in doing one each day? Y  N   
How many will do each day next week? 1 2 3 4 5

**Sit Less MOVE MORE**  
Feel good!

**When am I sitting most?**  
Tick the time when you sit most

MORNING AFTERNOON EVENING

Breaking long spells of sitting throughout the day is good for your health and wellbeing - even if you're physically active

Try to get up every 20 minutes morning, afternoon and evening

[Claire.fitzsimons@ed.ac.uk](mailto:Claire.fitzsimons@ed.ac.uk)

@GCUResearch

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@LaterLifeTrain



# Singing from the same song sheet!

## Balance

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- If you avoid activities that make you feel 'wobbly' you will get more 'wobbly'
- You can only improve balance if you do things that make you feel 'wobbly'
  - so that your brain and body practice at keeping you upright
- Emphasise potential life-changing benefits, (eg. maintain independence, play with the grandchildren, live life to the full)
- REFER TO AN EB EXERCISE PROGRAMME!



# Consistent Messaging Strength



- We need strong muscles to
  - Maintain independence
  - Play with our grandchildren
  - Care for someone
  - Fight infection
  - Protect our joints and bones
  - Protect our brains and memory
  - Stay warm
- Pain is NEVER good but muscle discomfort after exercise is (DOMs)
- Need to continue..... Use it or lose it!



Acknowledgment: John Sheerin



# Minimum Effective Prescription?



	FRAIL	PRE-FRAIL
DOSE	Volume – 12 weeks Intensity – Strength – at least 60% 1RM Time – 45-60 mins per session	Volume – 12 weeks Intensity – Strength - at least 60% 1RM
FREQUENCY	2 x per week	3 x per week
TYPE	Strength Training, Balance Training, Functional and purposeful	Strength, balance and aerobic training. Functional and purposeful
PROGRESSION  (DOMs = delayed onset muscle soreness)	Strength - Start with body weight, progress to bands or weights, without DOMs for first few weeks (progress resistance/weight at least every 2 weeks) Balance – start chair based, well supported. Progress carefully.	Strength - Bands/weights. (progress resistance/weight at least every 2 weeks) Balance – move to unsupported and highly challenging ASAP (supervised) Aerobic – interval training, build slowly.
DELIVERER	Physiotherapist or Specialist Exercise Instructor	Specialist Exercise Instructor, Fitness Leader



# Finally....



- All 'contacts' with older people need to reinforce the **sit less move more often** message
- Strength and Balance Exercise most appropriate for quick wins with frailer patients
- Exercise Interventions for those most at risk →
  - Respect the evidence base on intensity/dose/duration/deliverer
  - ✓ just like you would a 'drug'!
- Raise awareness of physical activity guidelines
  - Amongst professionals and older people! (to help prevent frailty)





# Questions?



**ProFouND**  
Prevention of Falls Network for Dissemination

The Evidence is Clear!

Falls can be prevented!

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<http://www.gcu.ac.uk/seniorsusp/>

<http://profound.eu.com/>



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