FaME in the UK

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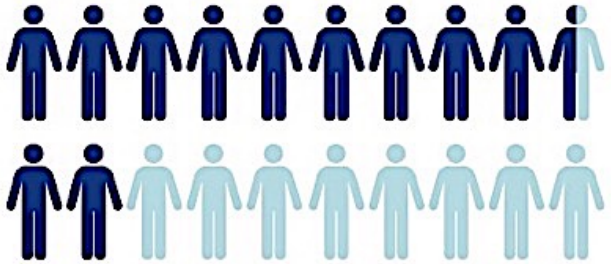
With thanks to Prof Elizabeth Orton, Unit of Lifespan and Population Health, University of Nottingham

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.

Setting the scene

95% of non-vertebral fractures
and
20% of vertebral fractures occur after a fall[69]

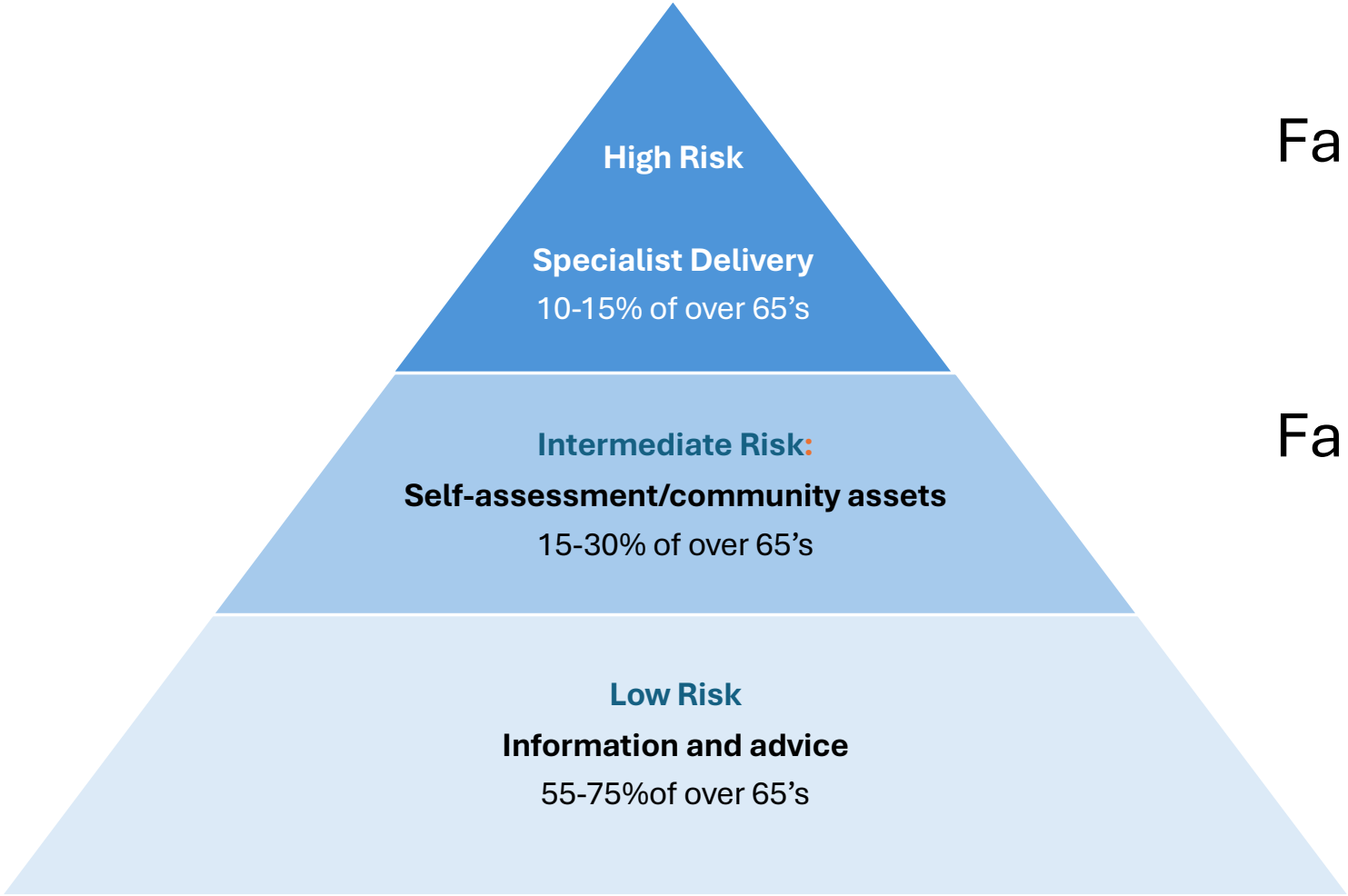


- 30-40% of older adults fall each year
  - Increases with age
- >10% ambulance call outs due to falls
  - Up to 40% not taken into hospital
    - Unable to independently floor rise
  - Long lies = poor outcomes
- Falls associated with faster functional decline / frailty progression
- Falls and frailty major reasons for receipt of care

Key Points:

The evidence for exercise to prevent falls is strong	• Type and dose of exercise is vital • Many types of exercise do not work to reduce falls **even** if they increase strength and balance • Service evaluations vs randomised controlled studies
In the UK, two main evidence based programmes	• FaME and Otago
Evidence base for Otago (brief) – secondary prevention	• Forms basis of home exercises for FaME
Evidence base for FaME – primary and secondary prevention	• FaME reduces falls rate and falls risk (in research and in real life) • FaME increases habitual physical activity • Return on Investment if delivered with fidelity

Who may need what?



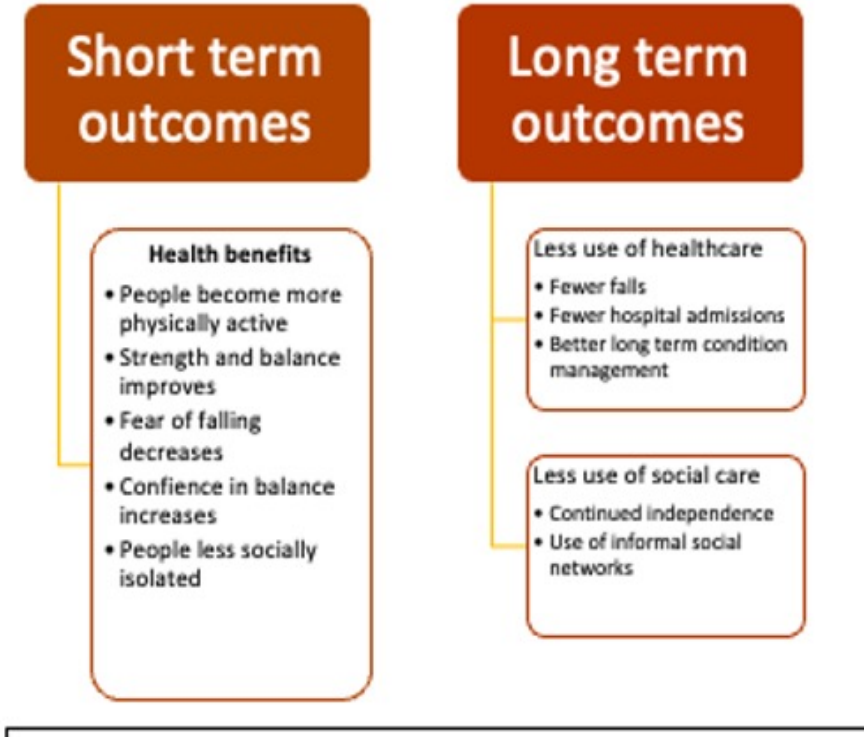
FaME / Otago

FaME / Tai Chi

S & B class / Dance / Yoga / Pilates / etc.

What is FaME?

- 24-week structured multi-component exercise programme
  - delivered by Postural Stability Instructors (PSIs)
- Group based + home based
  - Individualised tailoring - ability and support options
  - Focus on dose and progression
- Improves balance and functional strength, regains stepping reactions and skills to get up from the floor
- Builds falls self-efficacy and confidence
- Supports self management and transition onto other activity opportunities



Skelton et al. Physio Theory Practice 1999

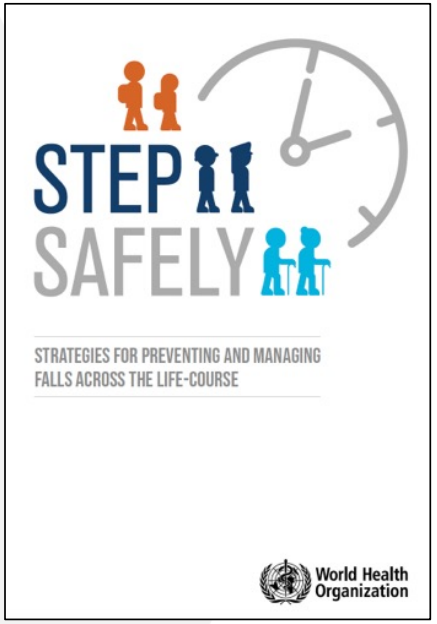
FaME

- **reduces falls rate 26[1,2]-54[3]%** (intermediate risk / high risk)
- **Increases habitual physical activity (> 105[1]-167[2] minutes per week by end of programme)**
- **Return on Investment from £2.89[4]-£13.00[5] - £50.59[6] for every £1 invested**

1. Iliffe et al. BJGP 2015 (sedentary older people at risk, 6 months)
2. Orton et al. Age Ageing 2021 (people at risk of falls, 6 months)
3. Skelton et al. Age Ageing 2005 (frequent fallers, 9 months)
4. PHE RoI 2019
5. Edin Leisure RoI 2016
6. GOPA RoI 2017

Policy context and support for FaME

- 2009 Department of Health Prevention Package recommends FaME
- 2012 RCP Audit of falls services in NHS recommend FaME
- 2015 CDC in US Cite FaME in Falls Compendium
- 2015 training of PSIs in Norway to support Sterk og stødig, (462 instructors trained in 59 Norwegian municipalities), reaching 4000 older people)
- 2017/8 Public Health England recommended FaME as cost-effective and presented Return on Investment data
- 2020 FaME Implementation Manual for Commissioners of Services endorsed by NICE
- 2021 WHO Step Safely FaME as Case Study
- 2022 World Falls Guidelines exercise recommendations



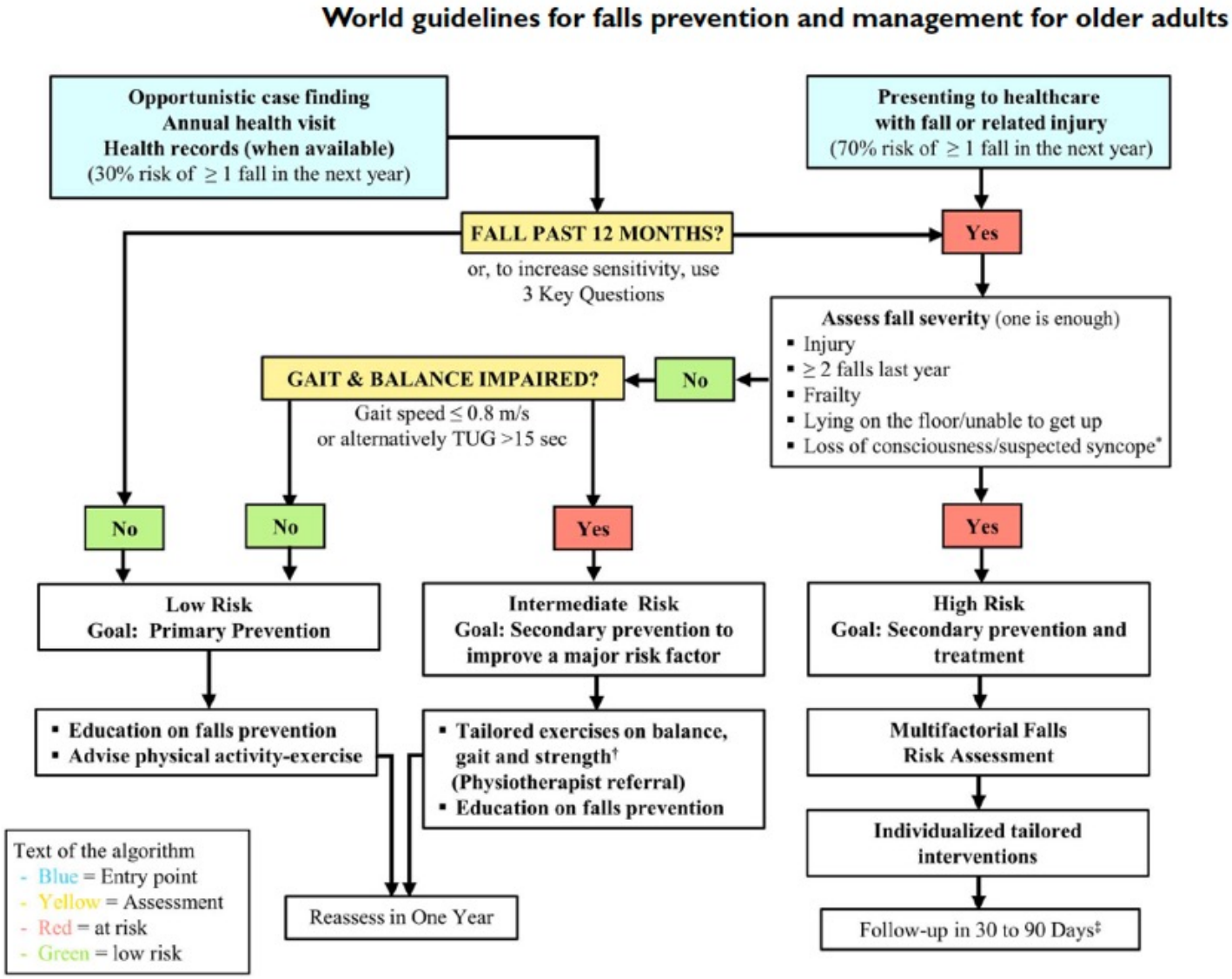
NO STATEMENTS ON AGE ONLY ON 'RISK'

INTERMEDIATE RISK

- >1 fall
- gait or balance impaired
  - Gait Speed <0.8m/s
  - TUG >15 sec

HIGH RISK

- Past fall with injury
- Multiple falls (≥2 falls) in last yr
- Inability to get up after the fall without help
- Frail



Montero-Odasso et al. Age Ageing 2022

WORLD FALLS GUIDELINES – who/what/where

- Older adults at low risk for falls
  - Should be offered education about falls prevention and exercise for general health and/or fall prevention if interested
  - Referral to local community health promotion or 'ageing well' programmes

- Older adults at intermediate risk for falls
  - Should be offered targeted exercise in order to **improve balance and muscle strength**, and reduce their fall risk

- Older adults at high risk for falls
  - Should be offered a multifactorial falls risk assessment to inform individualised tailored evidence-based interventions to reduce falls
    - Delivered by appropriately trained professionals

Montero-Odasso et al. Age Ageing 2022

The most common risk factors for falls:

- Previous history of a fall
- Advanced age
- Poor gait
- Poor balance
- Low balance confidence
- Poor functional ability
- Poor strength
- Low physical activity

"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)

➡ deconditioning, changed movement patterns, forward flexed posture, use of walking aids, avoidance of public transport, social isolation …..

SOLUTION = Strength and balance exercise ✅

Deandrea S. Epidemiology 2010

@LaterLifeTrain @GCUReaCH

The evidence for exercise in preventing falls

108 RCTs with 23,407 participants in 25 countries

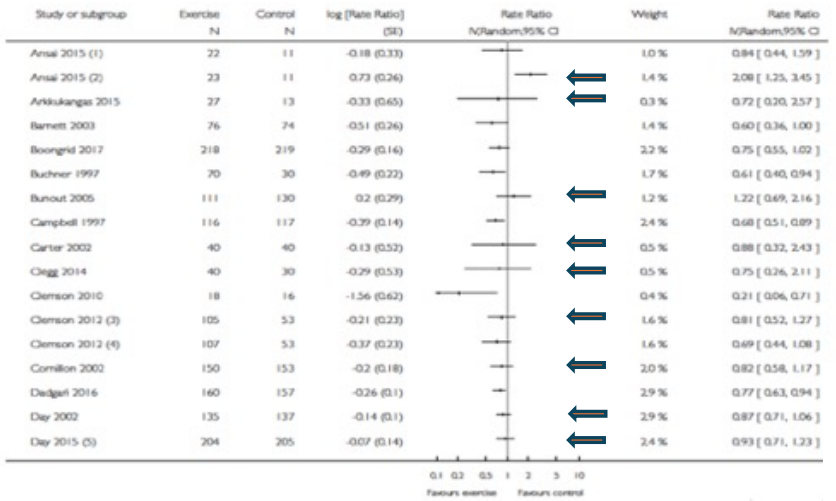
Structured supervised exercise reduces

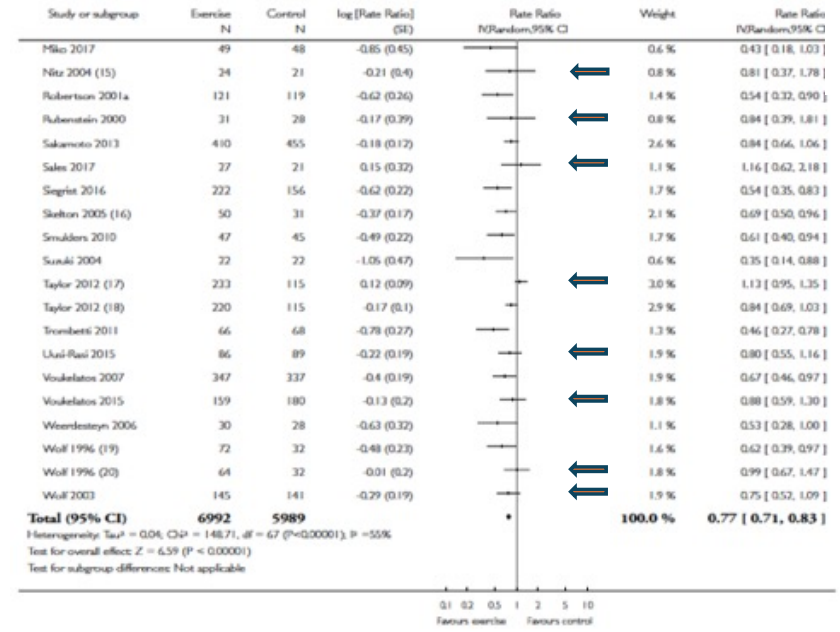
- rate of falls 23%
- number of people experiencing one or more falls 15%

- So didn't stop all people falling…
- Some exercise programmes did not reduce falls rate
  - Despite improving strength, balance or function

- Some exercise programmes increased risk!

Sherrington et al. Cochrane Review 2019





HALF these exercise studies DID NOT reduce falls rates or falls risk

DESPITE being designed by exercise specialists <u>with the aim to reduce falls</u>

Showed improvements in strength, balance or function <u>but did NOT reduce falls</u>

Sherrington et al. Cochrane Review 2019

@LaterLifeTrain @GCUReaCH

What works best to reduce falls rate?

- Functional balance and strength
  - Highly challenging + progressive
- Frequency 3 x per week (for ≥ 2 hours total)
- AT LEAST 12 WEEKS (Dose ≥ 50 hours) longer is better

➢ These types of exercise also reduce:
  - ➢ fear of falling
  - ➢ Sarcopenia & frailty

➢ **No evidence** to support physical activity (eg. walking, dance), chair-based exercise or strength training alone

EFFECTS STOP WHEN DISCONTINUE

Sherrington et al., 2008, 2016; 2019; Kendrick et al. 2014; Walston et al. 2018; Silva et al. 2017; Lee et al.; Beaudart et al. 2018

Evidence based FaME vs generic strength & balance programme

Increasing strength & balance activity by 60 minutes per week in an older population ↓ rate of falls by 6.0%

An effective falls prevention programme (2 hours per week) leads to far greater reductions in falls of between 26-54% AND increases habitual physical activity

Appropriately trained professionals

https://agile.csp.org.uk/content/referrals

- Exercise programmes should be delivered by appropriately trained professionals who can adapt exercises appropriately to functional status and co-morbidities. These professionals could be physiotherapists, exercise physiologists or kinesiologists, trained exercise instructors or other allied health professionals. We acknowledge that this will be difficult in some settings but note that the vast majority of interventions found to be effective in trials used trained providers [137, 141].

- Benefits of exercise are lost on cessation so opportunities to continue with appropriate activity at the end of the programme are important. If individuals withdraw due to concurrent health issues or caring duties, they should be encouraged to return and programmes should be modified to ensure that the difficulty level and dose are appropriate [137, 141].

A standardised 'Referral Form' for transfer of assessment and treatment information from the physiotherapist to the exercise professionals trained in Otago or FaME
- To continue to build on their exercise journey for better gains

Sherrington C et al. Cochrane Database of Systematic Reviews 2019, plus update for Global Falls Guidelines 2021; Montero-Odasso et al. Age Ageing 2022

Right programme, Right person, Right time

Different
- abilities
- needs

PRIMARY PREVENTION
LOW RISK

No history of falls, single non-injurious fall, no walking or balance problems

SECONDARY PREVENTION
INTERMEDIATE RISK

Single non-injurious fall, gait <0.8m/s or TUG >15sec

FaME ✅

SECONDARY PREVENTION
HIGH RISK

Fall with injury, multiple falls, frailty, fear of falls, unable to rise from floor

FaME ✅

Violet's story (age 78)....FaME benefits

- Fractured hip 2 years prior, recovered, but much frailer/ still falling
- Started FaME
  - Needed transport to get to class, used a walker, very sedentary, fearful, (angina, COPD, osteoporosis, type 2 diabetes, high BP)
- FaME 3 months in
  - First time to the floor since hip fracture, now using a stick, now attending local lunch club again
- FaME 6 months in
  - Got the bus to the class, uses stick outdoors only
- FaME 9 months in
  - No longer needs walking aid, uses the bath again, started playing walking netball
- Value of prolonged engagement in progressive structured exercise

FaME - led by trained PSIs

MULTI-COMPONENT > TAILORED > SKILLED DELIVERY > EVIDENCED TO REDUCE FALLS, IMPROVE QUALITY OF LIFE,

AEROBIC CAPACITY

Older people require aerobic capacity to live their lives.

Training cardiovascular fitness in standing is also a balance challenge and therefor also balance training.

A PSI requires skills to design and lead an aerobic curve to 'individuals' in a group, achieving the CV training aim whilst tailoring to reduce balance challenge.

STANDING BALANCE (DYNAMIC/ MOVING)

To improve standing balance/reactions we need to specifically target training approaches in standing dynamic balance situations.

A PSI requires skills to design and lead a standing balance training component in groups, to tailor and progress challenge for each individual and to support practice at home to achieve training dose (to reduce falls).

Seated options may be required to skill-up and progress to standing.

SEATED & STANDING STRENGTH

Improving strength requires effort and sufficiently dosed intensity and volume of training. Something is better than nothing but FaME and PSIs strive for more.

A PSI requires skills to design and develop strength progressions over time for each individual in the group and for home practise.

GETTING DOWN/UP FROM FLOOR

Getting down and up from the floor is a life skill, without it poor outcomes may result.

A PSI requires skills to support individuals and groups to learn this skill following best practice backward chaining approach.

FLOOR BASED STRENGTH, BALANCE & SKILLS

Getting down and up from the floor is a life skill, without it poor outcomes may result.

Once on the floor further strength, balance and functional movement training is included over time.

FLEXIBILITY

Getting down and up from the floor requires big ranges of motion around all key joint actions. Flexibility is essential to support comfortable movement in life and successful training of other components. It forms part of the coll down element (and supports mobility in the warm-up element).

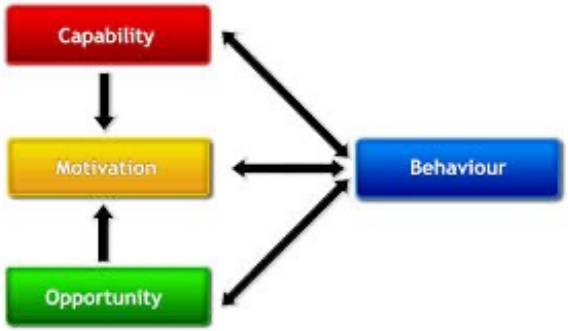
ADAPTED TAI CHI MOVES

Slowness, coordination, relaxation, hand-eye coordination through a sequence of 3-dimensional moves brings calm and often laughter.

Tai Chi may be part of an onward journey after FaME and forms part of the cool down for PSIs.

Famously effective when lead with fidelity in groups and with supported home exercise (to achieve dose)

FaME support strategies



- Referral in and transition on…..
- Education on effect of each exercise on daily living (during sessions)
- Education on the purpose of each component of exercise (during sessions)
- Follow up of non-attendance
- Weekly exercise diary discussed, goal setting and problem solving
- Peer/buddy support provided in classes and encouraged travelling together
- Social opportunities

(Skelton, 1999, 2005; Iliffe 2015, Skelton 2018; Orton 2021)

Benefits of FaME Wider than falls prevention

Psychological / Social	Fitness
Quality of Life (SF12, EQ5D-5L)[1,9,10]	Habitual Physical Activity (using PASE and CHAMPS)[1,2,8]
Concern about falling (FES-I)[1, 8,9]	Walking Speed (using 6MWT)[1]
Confidence (ConfBal/Self-efficacy)[2,3,4,6,8,9,10,12]	Balance (TUG, BBS, 1LS, FR, 4SBT)[1,4,7,8,9,10,12]
Socialisation and participation (qualitative)[1,3,11,12]	Strength (30sCR, Dynamometer)[4,7,9,12]
Risk of death (mortality 3 year post)[3]	Power (Nott Power Rig)[7]
Moving into care[3]	Bone Mineral Density Maintenance (DEXA)[5✣17]
Expectations of Exercise (OEE)[2,6,12]	Avoiding long lies (ability to get up off floor)[3,7]

1. Yeung PHCR&D 2015; 2. Iliffe HTA 2014, BJGP 2015; 3. Skelton, Age Ageing 2005; 4. Gateshead ROI 2017; 5: Skelton JAPA 2008 ✣9 month programme (not seen in 6 month programme, Duckham Age Ageing 2015); 6. Gawler AGG 2016. 7. Skelton et al. JFSF 2019. 8. Orton et al. Age Ageing 2021. 9. James et al. BMC Pubic Health 2022; 10. Christoforou et al. Disabil Rehab 2018; 11. Jayes et al. JFSF 2023; 12. Hedley et al Physio Theory Pract 2010

Developed by Skelton – FaME small scale RCT

(Research Into Ageing (Dunhill Medical Trust) 2000-2005, frequent falling women, 9 month programme)

FaME+ Clinical trials (ProAct65+) (NIHR HTA 2009-2014, sedentary older people, 6 month programme, 2 yr follow up)

FaME + PhiSICAL implementation study in East Midlands (NIHR HTA, 2016-2018, following 28 FaME programmes)
Production of the FaME Implementation Toolkit

FaME+ Rollout FLEXI (ARC National Frailty Programme, 2022-2024) Greater Manchester, Devon & Look Back at East Midlands

ProAct65+ 2008-2013

ViOlet

MIRA ExerGames

Keep On Keep Up 12+
Exercise for healthy ageing
Reason Digital
Designed for iPad
Free
View in Mac App Store

FLEXI
Falls Exercise Implementation Study

Over 4500 PSIs trained by Later Life Training since 2000

FaME – UK Survey pre-covid

- Where
  - 20% Hospital Out-patients Dept
  - 17% Leisure Centres
  - 58% Community Venues

- Self referral & Referrals from
  - Community rehabilitation services
  - GP Practices
  - Hospital
  - Other exercise programmes

- 70% rolling programmes / 30% cohort programmes

- 50% total 24 weeks
- 50% total 12 weeks, often with an option for continued paid attendance

- PSIs
  - >60% exercise instructors
  - 33% therapists

Hawley-Hague, JFSF, 2024

Implementation research questions

PhISICAL

1. Is the clinical efficacy translated into effectiveness “in the real world”?

2. Is the fidelity of the programme maintained “in the real world”?

3. What makes “real world” implementation successful??

FLEXI

1) What works to foster the adoption of FaME by commissioners?

2) What does delivery look like, and how much does it cost, ‘in the real world’?

3) What works to maintain programme fidelity and quality over time?

PhISICAL Methods

Interviews
(stakeholders, FaME providers, Class attendees)

Observations
(local and national Communities of Practice, FaME classes)

Class participant data analysis
(functional outcomes, attendance, progression)

Document analysis
(minutes, emails, meeting summaries)

Cost Analysis (FLEXI)
(training, equipment, instructor time, venue)

Consolidated Framework for Implementation Research (CFIR) and Fidelity framework (Carroll et al 2007)

Results

1. Is the clinical efficacy translated into effectiveness "in the real world"?	Yes
2. Is the fidelity of the programme maintained "in the real world"?	Largely speaking
3. What makes "real world" implementation successful??	Community of Practice Policy context Relationships Funding

FLEXI - What does delivery look like, and how much does it cost, ‘in the real world’?

Univariate (baseline – follow up):

Fall likelihood reduced $p<0.001$

TUG reduced $p<0.001$

Multivariate multilevel regression:

Longer programme (24 vs 12 weeks) = bigger improvement in TUG

likelihood of low falls concern increased

Cost per participant per session (including PSI training) costs

£17 (€20, $21)

Costs reflect smaller class sizes and additional time supporting home-based exercise and behaviour change

FLEXI - What influences programme fidelity and quality over time?

N-FIT
National FaME Implementation Team

Implementation Toolkit
Community of Practice

Longer history of delivery plus low oversight = migration of delivery over time

Adaptation is necessary but should not include ‘essential components’

When reduced falls is the outcome….

You wouldn't give a cancer patient only half the dose of chemotherapy…..

Or give them a different drug that was not known to work…..

Treat falls prevention exercise as 'treatment'

- Effective programme for outcome
- Effective dose / regularity
- Effects discontinue if stop
- Specialist exercise instructors/ physiotherapists

Sherrington et al. Cochrane Database of Systematic Reviews 2019, plus update for Global Falls Guidelines 2021

Key points

- The evidence for FaME in reducing falls and increasing physical activity is globally recognised
- Those older people who would benefit from FaME may be unable or unwilling to access current exercise opportunities
- Right programme, right person, right time
  - If Low risk, FaME not needed
  - If Intermediate or High risk, FaME is indicated
- Finding those that need FaME?
  - Have you asked if they have fallen or are concerned about falling?
- Where should they move onto after FaME?
  - To maintain gains