State of the Evidence:

Falls Prevention

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VERSION CONTROL

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Contents

1 INTRODUCTION

State of the Evidence: Falls Prevention

A request was received by the Knowledge & Intelligence Team (KIT), asking for a narrative review of Falls Exercise Prevention delivery models (see Appendix 7.1). The intention was for the narrative review to follow-on from a health equity audit for falls that was in development at that time, the two together to inform the recommissioning of the falls prevention service for Derbyshire.

2 METHODS

An initial scoping exercise was undertaken to assess the volume and quality of evidence available on falls prevention interventions for community dwelling older adults and the models that can be used to deliver these.

A number of databases were searched, including the new NHS Knowledge and Library Hub, Scopus (available on trial at the time), PubMed, Medline, CINHAL and Google Scholar. The search terms used in the initial scoping exercise were: 'fall(s)', 'prevention', 'intervention(s)', 'older adults' and 'community dwelling' (see PICOS framework, Appendix 7.2). The searches were limited by language (English), date (2013 – 2022) and publication type (academic journals, reviews and reports) and the results, with abstracts, were exported and sifted for relevance.

3 RESULTS

The evidence base on falls and falls prevention is huge, with in excess of 900,000 articles identified by the initial searches.

Preliminary examination of this large body of literature revealed that there were a large number of individually named delivery models for falls prevention interventions already running in community settings across the UK, and many other countries. It also revealed considerable variation in the content of specific delivery models, ranging from single component interventions, such as exercise or education programmes, to programmes consisting of multiple interventions delivered in combination. The individual interventions that might make up a multi component programme included elements such as environmental, behavioural and physical risk factor identification, blood pressure screening, medication management, dietary interventions, vision improvement, home modification and more.

Preliminary examination of the information available on the various delivery models also revealed that evidence of effectiveness was very variable, and that comparisons between models with widely differing characteristics were likely to be problematic. Of particular concern at that point, were indications that the evidence around multifactorial / multimodal / multi component interventions was inconsistent and inconclusive.

The decision was therefore made to investigate high-level, pre-appraised sources of evidence only in the first instance. The key information uncovered in the course of these searches is summarised below.

3.1 Key Points

- The most recent falls-related Clinical Guideline (CG161) produced by NICE dated from 2013; an update of this is not due to be published until 2024[1].

- In 2019, NICE published a surveillance report[2] for CG161; this concluded that new evidence published between that reviewed for the production of CG161 and February 2019 would be likely to have an impact on the recommendations made for eight out of the eleven topic areas covered by CG161, including falls risk identification, strength and balance training and multifactorial preventative interventions.

- The Cochrane Library includes six reviews published between 2005 and 2019, plus three responses to clinical questions, all related to falls prevention interventions[3]. However, in March 2019 an evidence briefing[4] was published by the National Falls Prevention Coordination Group (NFPCG), which was hosted by Public Health England at that time. The evidence briefing recommended that no changes in clinical practice, policy, commissioning or service provision decisions relating to multifactorial falls prevention interventions should be made on the basis of two Cochrane reviews published in 2018. This placed significant limits on the usability of this high-level evidence, since one of these reviews concerned multifactorial and multi component interventions for falls prevention in older people living in the community.

- The concerns raised about this high quality review of multifactorial / multi component prevention interventions also served as an alert to the potential for other high-level reviews of similar interventions to be similarly problematic.

- Also uncovered in the searches of high-level evidence sources, was information about an ambitious global initiative to establish a Falls Guideline Task Force[5] dedicated to creating standardised recommendations for falls prevention and management with worldwide consensus from experts in the field; the suggested publication date for the preliminary findings from this Group was summer 2021.

- A number of summary publications providing details about named falls prevention interventions and programmes were available from organisations such as the WHO[6], CDC[7] and, in the UK, PHE[8], OHID[9] and various third sector organisations such as Age UK[10] and the Centre for Aging Better[11]. Some of these publications referenced published evaluations of the named interventions. Consideration was given to whether these publications might fulfil the requirements of the original request; however, questions remained about the quality of the evidence underpinning some of the delivery models included.

- A search of trials registries (e.g. International Clinical Trials Registry Platform, European Union Clinical Trials Register, International Standard Randomised Controlled Trial Number Registry, ClinicalTrials.gov, Cochrane Central Register of Controlled Trials) identified several hundred published protocols for research into falls and falls prevention, covering the full spectrum of falls related topics from risk factor identification to specific preventative interventions and programmes.

- A rapid desktop search for falls prevention interventions delivered by UK local authorities revealed a range of approaches, ranging from no falls prevention provision to detailed locally specific models, with no overall consensus on best practice.

4 DISCUSSION

It was clear, from the breadth and depth of the published evidence base on falls prevention, that a review of the primary evidence for falls prevention delivery models would require the resources of a multi person team based on a university setting and was therefore beyond the scope of what could be achieved by KIT.

There were also concerns about the inconsistent and inconclusive nature of the evidence base, particularly around the content and effectiveness of multifactorial / multi component interventions. Consideration was therefore given to whether a tabular synthesis of delivery models could be produced, rather than a narrative review, using solely pre-appraised sources of evidence. Consideration was also given to whether this approach would provide the quality of evidence required on which to base robust decisions around the recommissioning of falls prevention services in Derbyshire.

To this end, a desktop review of summary publications providing details of published falls prevention delivery models was carried out. Wherever possible the published evidence for the named delivery models was also obtained and reviewed. From this exercise it was determined that, although it would be possible to produce a tabular synthesis of the publicly available information for named delivery models, there remained questions around the evidence of effectiveness for each and whether valid comparisons could be made across models offering a variety of different components.

5 CONCLUSIONS

After careful consideration of all of the available information, it was concluded that an attempt to produce any kind of summary review of the information available for falls prevention delivery models had significant potential to mis-lead or mis-direct commissioning decisions because of the large volume of evidence, the diversity of models and the questions raised by NICE and the NFPCG around the quality of the evidence.

An alternative approach was therefore sought in order to provide quality evidence to support commissioning decisions. The decision was taken to focus on which elements of falls prevention interventions delivered in the community were supported by a robust evidence base.

The initial search results were reviewed again, this time seeking evidence for the effectiveness of the individual components of falls prevention programmes. It was concluded that robust evidence exists to demonstrate that the following are effective at preventing falls amongst community dwelling older adults:

▶ Strength training – consisting of functional exercises and individualised resistance training, progressing in intensity[12-24].

▶ Balance training – consisting of specific dynamic balance training exercises or may be a component of an exercise programme [22,25-28]; Tai Chi, in particular, is recommended for those who have not yet fallen[29-31].

▶ Social activity – as a component of a strength and balance training programme, this fosters compliance and engagement [32-35] with the exercise programme, whilst also improving physical and mental wellbeing [36,37].

These interventions should be delivered in line with the CMO's Guidelines[38] for physical activity for older adults. The exercises should be tailored to the individual and should be appropriately progressive; they should be carried out over three or more sessions per week for a minimum of 12 weeks[22,]; wherever

possible sessions should be continued over longer periods for greater effect and to maintain the gains achieved[14,15,22,24,].

There is emerging evidence[32,39-41] that social activity alone may reduce the risk of falling, although the mechanism by which this occurs has not yet been clarified. Given this, and the known positive impact of social activity on mental wellbeing[37,41], the importance of this component of a falls prevention programme in achieving the outcomes sought should not be underestimated.

In addition to these evidence-based interventions for falls, there is also a common-sense approach that needs to be considered. For example, educating older people about falls prevention is an obvious thing to do, whether or not evidence exists to prove that this intervention alone reduces the rate of falls. Similarly, educating people about hazards in the home that increase their risk of falling is an obvious thing to do. If people are not aware that their risk of falling increases as they age and are not aware that there may be hazards in their homes that further increase their risk of falling, they will not have the information they need to be able to independently assess or manage their risks.

In summary, this piece of work followed a circuitous path from what appeared to be straightforward request for a narrative review of delivery models for falls prevention interventions to the delivery of a very different product which is, in effect, a set of evidence-based best practice recommendations. It was therefore felt that obtaining external validation of the work undertaken, and conclusions reached, would enable a quality assurance step to be incorporated.

Accordingly, opportunities were sought for gaining the view of an academic working in the field of falls prevention. This was obtained via existing links with the University of Nottingham, through which we were able to gain the support of Dr Liz Orton, Associate Professor in Public Health, who has published extensively in the field of falls prevention and exercise.   In discussions with Dr Orton, we were able to both confirm the findings of the scoping searches and verify that the final conclusions about what is currently known to be effective for falls prevention for older people living in the community are robust.

Having sought independent confirmation, our conclusions were further verified with the publication of the first peer reviewed world guidelines for the prevention and management of falls in older adults in December 2022[43]. These guidelines are the culmination of three years of work by a Global Falls Guideline Task Force[44]. The Task Force was established in 2019 and is made up 96 multidisciplinary experts from 39 countries across 5 continents, with representation from 36 scientific and academic societies. It was created with the aim of developing a robust framework for falls prevention and providing expert recommendations to healthcare and other professionals about which interventions should be offered to older people as part of a person-centred approach to preventing and managing falls.

The summary table of recommendations included in the publication[41] has been reproduced in Appendix 7.3 for ease of access. On first inspection, the greater majority of the recommendations made by the Task Force appear to relate to interventions more usually delivered via primary or secondary healthcare services than via population level interventions commissioned or delivered by Public Health. However, without an established local pathway for the delivery of falls prevention services, it is challenging to determine how the recommendations made by the Task Force should be implemented, and by which of the many organisations potentially involved in falls prevention.
Translating research findings into practice at scale is always challenging. It can be difficult to successfully implement interventions proven to be effective in small scale trials in the wider population setting. Collaboration between commissioner and provider services, and across the relevant healthcare disciplines, is essential for successful translation of evidence into practice. The work of the Task Force has provided a

framework for implementation that can support the development of an integrated approach to falls prevention and crucially, the establishment of a local pathway for delivery.

It is hoped that the work of the experts who make up the Falls Guideline Task Force will continue to clarify the evidence on falls prevention as it emerges, particularly that on the selection of effective multifactorial and multi component interventions, to enable better progress to be made on falls prevention for older people wherever they live.

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State of the Evidence: Falls Prevention

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7 APPENDICES

7.1 Initial Request

From: Knowledge and Intelligence Team <Kit@derbyshire.gov.uk>
Sent: 22 November 2021 11:40
To: Benjamin Cooper (Adult Social Care and Health) <Benjamin.Cooper@derbyshire.gov.uk>
Subject: Thank you for your email

KIT Contact Form

Following receipt of this request, a member of KIT will contact you promptly to set up a short scoping meeting and agree timescales.

Requester: Ben Cooper

Tel No:

Timescales
Project start date:

Completion Date for Work:

Other dates: (e.g. meetings/events):

Please provide the following as background information for the initial discussion.

Brief Description/Project Outline: Strictly No Falling is currently in a commissioning cycle, with the target date for the new service to be in place of April 2023. As part of the recommissioning process, a Health Equity Audit has been conducted that is due to report early in the new year, though interim results have been reported. As a follow-up of this Ellie has requested an review of Falls Exercise Prevention delivery models takes place. I've looked at the portfolio and think this is likely to need to take the form of a narrative review.

I am aware there are other evidence reviews currently taking place. We have flexed the commissioning deadlines to account for this so the review can commence in April.

Public Health Lead: Caroline Mackie

PH Workstream/Matrix Group Name:

7.2 PICOS Framework

Search topic:	Falls prevention – delivery models		
Question	Search Term	Synonyms	Exclusions

Population	Older adults (aged 65 years and over)		Specific subgroups, e.g. Parkinson's, MS, dementia, urinary incontinence, CVA, etc
Intervention	Falls prevention service(s) Delivery model(s)	Service model(s)	Care Home based interventions
			Hospital linked interventions, e.g. emergency department discharge post-fall, etc
	Programme(s)	Exercise(s) +/- therapy	
		Class(es)	
		Postural stability	Programmes addressing individual risk elements, e.g. polypharmacy, vitamin D deficiency, etc
		Balance	
		Multi-factorial	
		Multi-modal	Programme tailored to individual risk characteristics, e.g. visual impairment, etc
	Intervention(s)	Technology / technologies	
		Implementation	
			? Non-exercise based – e.g. environmental interventions, education programmes, awareness, etc
	Prevention	Primary and/or secondary	
	Community-Based	On-line / web-based	
Comparator	N / A		
Outcome(s)	**Primary**	**Secondary**	**Tertiary**
	Increased strength and balance, coupled with awareness of falls risks and prevention	Increased social engagement, connection, support / Cognitive stimulation	Decreased social isolation, loneliness
Setting	UK, Europe, US, Canada, New Zealand,		

Inclusion / exclusion criteria: e.g.	
Period	Jan 2019 -July 2022
Language(s)	English
Age group(s)	Age 65 years and over (?Aged 50-64 years) (?Aged 60 and over, aged 75/80 and over)
Gender	All
MeSH headings	Accidental falls Prevention and control
Level of evidence	? Higher – systematic reviews, UK national guidelines. ? RCTs
Other (inc) Identified intervention programmes	**Otago, FaME**, **Stepping On**, **Matter of Balance**, **Tai Ji Quan-Moving for Better Balance**, Tai Chi Prime, STEEP, **STEADI**, CareFall, DanSE, Zumba Gold, Bingocize, Nijmegen, Community Aging in Place – Advancing Better Living for Elders (CAPABLE), Healthy Steps for Older Adults, **Healthy Steps in Motion**, Stay Active and Independent for Life (SAIL), **Enhance Fitness**, LiFE and aLiFE, FallsTalk, FallScape, Fit & Strong!, LIFE and gLIFE, TOM,

13

7.3 List of recommendations from the World Falls Guidelines, by Working Group

WG/domains	Area or Domain	Recommendation	Grade
WG 1 Gait and Balance Assessment Tools to Assess Risk for Falls	Stratification	We recommend including gait speed for predicting falls risk.	1A
		As an alternative the Timed Up and Go Test can be considered, although the evidence for fall prediction is less consistent.	1B
	Assessment	We recommend that Gait and Balance should be assessed.	1B
WG 2 Polypharmacy, Fall Risk Increasing Drugs, and Falls	Assessment	We recommend assessing for fall history and the risk of falls before prescribing potential fall risk increasing drugs (FRIDs) to older adults.	1B
	Assessment	We recommend the use of a validated, structured screening and assessment tool to identify FRIDs when performing a medication review or medication review targeted to falls prevention in older adults.	1C
	Intervention	We recommend that medication review and appropriate deprescribing of FRIDs should be part of multidomain falls prevention interventions.	1B
	Intervention	We recommend that in long-term care residents, the falls prevention strategy should always include rational deprescribing of fall-risk-increasing drugs.	1C
WG 3 Cardiovascular Risk Factors for Falls	Assessment	We recommend, as part of a multifactorial falls risk assessment, that a cardiovascular assessment that initially include cardiac history, auscultation, lying and standing orthostatic blood pressure, and surface electrocardiogram should be performed.	1B
	Assessment	In the absence of abnormalities on initial cardiovascular assessment, no further cardiovascular assessment is required, unless syncope is suspected (i.e. recurrent unexplained falls).	1C
	Assessment	We recommend that the further cardiovascular assessment for unexplained falls should be the same as that for syncope, in addition to the multifactorial falls risk assessment.	1A
	Intervention	We recommend that management of orthostatic hypotension should be included as a component of multidomain intervention in fallers.	1A
	Intervention	We recommend that interventions for cardiovascular disorders identified during assessment for risk of falls should be the same as that for similar conditions when associated with syncope, in the addition to other interventions based on the multifactorial falls risk assessment.	1B
WG 4 Exercise Interventions for Prevention of Falls and Related Injuries	Exercise Intervention	We recommend exercise programmes for fall prevention for community-dwelling older adults which include balance challenging and functional exercises (e.g. sit-to-stand, stepping), with sessions three times or more weekly which are individualised, progressed in intensity for at least 12 weeks and continued longer for greater effect.	1A
	Exercise Intervention	We recommend inclusion, when feasible, of Tai Chi and/or additional individualised progressive resistance strength training.	1B
	Exercise Intervention	We recommend individualised supervised exercise as a falls prevention strategy for adults living in long-term care settings.	1B
	Exercise Intervention	We recommend that adults with PD at an early to mid-stage and with mild or no cognitive impairment are offered individualised exercise programmes including balance and resistant training exercise	1A
	Exercise Intervention	We conditionally recommend that adults after a stroke participate in individualised exercise aimed at improving balance/strength/walking to prevent falls	2C
	Exercise Intervention	We recommend that adults after sustaining a hip fracture participate in individualised and progressive exercise aimed at improving mobility (i.e. standing up, balance, walking, climbing stairs) as a fall prevention strategy.	1B
	Exercise Intervention	We conditionally recommend that such programmes after a hip fracture be commenced as in-patients and be continued in the community.	2C (In-patients) & 1A (Community)
	Intervention	We recommend that community-dwelling adults with cognitive impairment (mild cognitive impairment and mild to moderate dementia) participate in exercise to prevent falls, if willing and able to do so.	1B
WG 5 Falls in Hospitals and Care Homes	Hospital Assessment	We recommend that hospitalised older adults >65 years of age have a multifactorial falls risk assessment. We recommend against using scored falls risk screening tools in hospitals for multifactorial falls risk assessment in older adults.	2B
	Hospitals management and interventions	We recommend that tailored education on falls prevention should be delivered to all hospitalised older adults (≥65 years of age) and other high-risk groups.	1A
	Hospitals management and interventions	We recommend that personalised single or multidomain falls prevention strategies based on identified risk factors or behaviours (or situations) be implemented for all hospitalised older adults (≥65 years of age), or younger individuals identified by the health professionals as at risk of falls.	1C (Acute care) & 1B (Sub-acute care)
	Care homes assessment	We recommend against falls risk screening to identify care home residents at risk for falls and we recommend that all residents should be considered at high risk of falls.	1A
	Care homes assessment	We recommend performing a multifactorial falls risk assessment at admission to identify factors contributing to fall risk and implementing appropriate interventions to avoid falls and fall-related injuries in care home resident older adults.	1C
	Care homes assessment	We recommend conducting a post-fall assessment in care home residents following a fall in order to reassess fall risk factors, adjust the intervention strategy for the resident and avoid unnecessary transfer to acute care.	E

14

WG/domains	Area or Domain	Recommendation	Grade
	Care Homes Management and Interventions	We recommend a multifaceted approach to falls reduction for care home residents including care home staff training, systematic use of a multidomain decision support tool and implementation of falls prevention actions	1B
	Care homes management and interventions	We recommend against the use of physical restraints as a measure for falls prevention in care homes.	1B
	Care homes management and interventions	We recommend nutritional optimisation including food rich in calcium and proteins, as well as vitamin D supplementation as part of a multidomain intervention for falls prevention in care home residents.	1B
	Care homes management and interventions	We recommend including the promotion of physical activity (when feasible and safe) as part of a multidomain falls prevention intervention in care homes.	1C
WG 6 Cognition and Falls	Cognition Assessment	We recommend that routine assessment of cognition should be included as part of multifactorial falls risk assessment in older adults.	1B
	Cognition Assessment	We recommend including both the older adult's and caregiver's perspectives, when creating the individual falls prevention care plans for adults with cognitive impairment since this strategy has shown better adherence to interventions and outcomes.	1C
WG 7 Falls and PD and Related Disorders	Assessment	We conditionally recommend a falls risk assessment for older adults with PD, including a self-report 3-risk factor assessment tool, which includes a history of falls in the previous year, FOG in the past month, and slow gait speed	2B
	Management and Intervention	We conditionally recommend that older adults with PD be offered multidomain interventions	2B
	Management and Intervention	We recommend that adults with PD at an early to mid-stage and with mild or no cognitive impairment are offered individualised exercise programmes including balance and resistance training exercise.	1A
	Management and Intervention	We conditionally recommend exercise training, targeting balance and strength, be offered to people with complex phase PD if supervision by a physiotherapist or other suitably qualified professional is available.	1C
WG 8 Falls and Technology	Assessment and Interventions	We conditionally recommend using telehealth and/or smart home systems (when available) in combination with physical exercise as part of the falls prevention programmes in the community.	2C
	Interventions	Current evidence does not support the use of wearables for falls prevention. Emerging evidence show that when wearables are used in exercise programmes to prevent falls, they may increase participation.	2C
WG 9 Falls in Low- and Middle-Income Countries	Implementation	Local context needs to be considered when implementing fall prevention programmes in LMIC.	1B
	Assessment	We conditionally recommend prioritising assessments of risk factors for cognitive impairment, obesity including sarcopenic obesity, diabetes, lack of appropriate footwear and environmental hazards as falls risk factors in LMIC	2C
	Assessment	We conditionally recommend that in LMIC settings clinicians and caregivers use validated tools that are freely available in their country of residence to assess mobility, dependent on resource availability.	E
WG 10 Multifactorial Assessment and Interventions for Falls (Environment recommendations informed by the ad hoc expert group on Environment and Falls)	Multifactorial Assessment	We recommend multiprofessional, multifactorial assessment should be offered to community-dwelling older adults identified to be at high risk of falling, to guide tailored interventions.	1B
	Multidomain Interventions	We recommend multidomain interventions, informed by a multiprofessional, multifactorial falls risk assessment, should be offered to community-dwelling older adults identified to be at high risk of falling.	1B
	Multifactorial (Environmental) Assessment	We recommend identification of an individual's environmental hazards where they live and an assessment of their capacities and behaviours in relation to them, by a clinician trained to do so, should be part of a multifactorial falls risk assessment.	1B
	Multifactorial (Environmental) Interventions	We recommend modifications of an older adult's physical home environment for fall hazards that consider their capacities and behaviours in this context, should be provided by a trained clinician, as part of a multidomain falls prevention intervention.	1B
WG 11 Older Adults' Perspectives on Falls	Stratification	We recommend clinicians should routinely ask about falls in their interactions with older adults.	1A
	Assessment	As part of a comprehensive fall assessment, clinicians should enquire about the perceptions the older adult holds about falls, their causes, future risk, and how they can be prevented.	1B
	Interventions	A care plan developed to prevent falls and related injuries should incorporate the goals, values and preferences of the older adult.	1B
WG 12 Concerns about Falling and Falls	Assessment	We recommend including an evaluation of concern about falling in a multifactorial falls risk assessment of older adults	1B
	Assessment	We recommend using a standardized instrument to evaluate concerns about falling such as the Falls Efficacy Scale International (FES-I) or Short FES-I in community-dwelling older adults.	1A
	Assessment	We recommend using the FES-I or especially the Short FES-I for assessing concerns about falling in acute care hospitals or long-term care facilities.	1B
	Assessment	We recommend exercise, cognitive behavioural therapy and/or occupational therapy (as part of a multidisciplinary approach) to reduce fear of falling in community-dwelling older adults.	1B

EXTRACTED FROM: Montero-Odasso et al, World guidelines for falls prevention and management for older adults: a global initiative[41].

15