Falls Prevention Intervention Factsheets

Content

Generic guidance and implementation guidelines

Implementation Guidance

Target group:
Older people living in the community (see individual factsheets alongside this guidance).

Multifactorial interventions:
Multifactorial interventions assess an individual's risk of falling, and then carry out individualised treatment or arrange referrals to reduce the identified risks. Multifactorial interventions often comprise the components described below. They are complex interventions and need to be carried out by specific health care professionals working together in a multidisciplinary process. Overall, current evidence shows that this type of intervention reduces the number of falls but not the number of people falling. This suggests that they are particularly recommended for people who have recurrent falls.

Exercise:
Selected group and home-based exercise containing progressive balance exercises and strength training effectively reduce the number of falls and the number of people falling. The programmes with the best evidence are the Otago Exercise Programme (OEP), Tai Chi, and the Falls Management Exercise programme (FaME -sometimes called PSI). Evidence suggests that new programmes such as Lifestyle integrated Functional Exercise (LiFE) might achieve similar or even better results.

Exercise alone has been demonstrated to be effective for persons after a first fall /with lower risk of falling. Overall, exercise interventions reduce fall-related fractures. Exercise must be challenging, progressive and regular, last more than 50 hours, and the regimen should be adhered to in the long term to be effective.

Medication and medical intervention:
Taking vitamin D supplements may be effective in reducing falls in people with low vitamin D levels in the blood before treatment. This needs to be carefully discussed with the responsible physicians.

Some medications increase the risk of falling. Gradual withdrawal of psychotropic medication (e.g. benzodiazepines, Zolpidem) for improving sleep, reducing anxiety and treating depression has been shown to reduce falls.

Insertion of a pacemaker can reduce falls in people with frequent falls associated with carotid sinus hypersensitivity and cardiac dys-/arrhythmias. Treatment of specific underlying causal factors, specific therapy, medication reviews and prescription modification programmes can also be effective in reducing the risk of falling, e.g. in people who fall because of hypervolemia (restoring haemodynamic stability) or orthostatic hypotension (discontinuing medication).

Home and environment:
Interventions to improve home safety appear to be effective for people at high risk of falling, particularly those with severe visual impairment. They should be carried out by suitable qualified health care professionals usually occupational therapists.

Feet and Footwear:
Feet and Footwear assessments followed by podiatric care, foot and ankle exercises and provision of appropriate footwear can reduce the number of falls in people with disabling foot pain.

Vision and vision aids:
Adjustment of optical aid / spectacles (wearing single lens instead of multifocal glasses when outdoors if already active outdoors) and cataract surgery can reduce falls.

Falls detection and prevention technologies:
Focussing on the positive message of maintaining independence is more likely to lead to successful uptake of Personal Emergency Response Systems (PERS) and ICT-devices

Acute and long-term-care:
The same guidance relating to community dwelling older adults applies to acute and long-term-care settings. A key component for falls prevention is the implementation of a proactive organisational strategy that includes leadership, careful monitoring, supportive risk managment and change agent.

Implementation guidelines for fall prevention interventions:
Falls are everyone's business as there are multiple factors associated with them. Therefore establishing links between acute, community and primary health and social care services, the voluntary sector, charities and private companies is very important.

It is beneficial to assess the older person in their own environment as you are more likely to identify underlying problems and understand their needs. If the team assessing the older person also carries out the interventions, success and uptake is more likely.

Follow-up any referrals to other services to ensure action has been taken, communication with all other services is important.

Further information (e.g. leaflets) should be discussed with the older per- son and personalised to their needs (not just handed out).

One size does not fit all. Ensure that the older person knows that the intervention is tailored to their needs. They are more likely to be motivated to comply with it.

Older people may have specific goals they want to achieve. Assisting them to set these goals and then work towards them will help them understand the importance of the changes they want to make and increase their confidence.

Older people can be easily put off engaging in a falls prevention programme if something goes wrong e.g. transport does not turn up, they were not told a session was cancelled. Ensure good communication is maintained at all times.

Engage family members and friends where possible as these can be a key source of support.

Give feedback to the older person's general practitioner, as positive affirmation from them can support action from the patient.

Ensure you follow the older person up either by phone call or preferably in person to monitor their progress. Give feedback on their progress, highlighting what they have achieved, it will help with motivation and it will also provide evidence for commissioners (funders of services).

When promoting your service focus on the positive action that older people can take to promote healthy ageing, rather than falls prevention itself.

Here are some suggestions:
If an older person is highly fearful of falls and proactively seeks advice about preventing falls then you can talk to them about risk management and prevention of falls.

For all other older people do not initially talk about risk and reducing their risk of falling, they are unlikely to identify themselves as being at risk. You may want to invite them to an 'ageing well' assessment rather than a 'falls' assessment.

Instead talk about:
How strength and balance training will improve their function e.g. Getting up and down stairs more easily and how it will help them to maintain their independence.

How practising techniques for getting down and up from the floor means that they can play with their grandchildren.

How being given a full health assessment and tailored advice gives them the knowledge and opportunity to take control of the situation and promote their own health and well-being (for the future if they do not see an issue now).

How interventions you can offer will help them to manage their health conditions e.g. osteoporosis, arthritis, Parkinson's, stroke.

Consider getting other older adults who have had positive experiences of your service to share their thoughts and support others, peer support can be very effective.

What does not work?
There is no evidence of an effect of cognitive behavioral interventions on the rate of falls. Trials testing interventions to increase knowledge and educate about fall prevention alone did not significantly reduce the rate of falls.

Links and Resources:
www.profound.eu.com

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Exercise

Many older people experience balance deficits and a reduction in muscular strength and power, due to ageing and to medical conditions and impairments that make movement less appealing. Yet, these are the two most important modifiable falls risk factors and can be influenced by a regular exercise training programme. Programmes must be tailored to the individual, be intensive enough to challenge balance and increase strength, progress in intensity and challenge over time, and last a sufficient duration, in order to be effective and to reduce the risk of falls.

What works?
Exercise is included in nearly all effective multiple interventions. To engage older people the emphasis should be primarily on strength and balance and healthy, active ageing and rather than falls prevention.

Programmes with multiple categories of exercise:
Multiple-component group and home-based exercise programmes (e.g. evidence based programmes such as Otago, FaME, LiFE), usually containing at least balance and strength training, have been proven to reduce falls. Other categories of exercise that can be included in multi-component exercise interventions include 3D training (constant repetitive unsupported movement through all three spatial planes) like Tai Chi and square stepping, general physical activity like walking groups, flexibility training or endurance training. The LiFE-programme comprises of balance and strength exercises embedded into daily activities of living and effectively reduces the rate of falls.

Exercise only interventions:
Multiple-component group exercise (eg. FaME) significantly reduces rate of falls and risk of falling, as does multiple-component home-based exercise (eg. Otago, LiFE). For Tai Chi, the reduction in rate of falls bordered on statistical significance but Tai Chi does significantly reduce risk of falling.

The greatest relative effects of exercise on fall rates are seen in programmes that included a combination of a higher total dose of exercise (greater than 50 hours over the trial period) and challenging balance exercises (exercises conducted while standing in which people aimed to stand with their feet closer together or on one leg, minimize use of their hands to assist, and practice controlled movements of the center of mass) and did not include a walking program.

Multiple Interventions:
A study with "multifaceted" podiatry (customised ortheses, footwear re- view, falls prevention education), including foot and ankle exercises has been demonstrated to be as effective for preventing falls in older people with disabling foot pain.

Who can help older people with exercise?
Physiotherapists, sport scientists and specialist exercise instructors, who are appropriately trained in delivering falls prevention exercise programmes.

Assessment tools
Participants should be carefully assessed before intervention to ensure the correct type of programme is chosen and that the programme is tailored to their needs.
Appropriate assessment tools should be chosen to show progress, eg.

- Berg Balance Scale to assess balance
- Timed Up and Go to assess balance and mobility
- Short Physical Performance Battery to assess balance and strength
- Senior Fitness Test to assess balance, strength and endurance
- FES-I to assess fear of falling

What does not work?
There is no evidence for chair-based exercises in reducing falls. Brisk walking is not recommended for those at high risk of falls and can increase risk of falls for older people. Programmes that are only delivered for a short period of time may increase confidence without sufficiently improving strength and balance and reducing risk.

Summary
In order to be effective, exercise programmes must be challenging, progressive, at sufficient dosage and continued over time, they should:

- Focus on improving muscle strength/power of the lower limbs, ankles and feet
- Challenge balance in a standing position and/or gait (eg sideways, backwards walking)
- Exercise should be progressive and tailored to participants needs (help them to meet specific goals they have set, designed to consider health conditions)
- Be carried out 2-3 times a week
- At least 50 hours of strength and balance exercise should be carried out over a minimum of 3 months. Ideally exercise should be continued for maintenance of reduced risk
- Be delivered by instructors specially trained in one of the following evidence based programmes (Regular contact and feedback from the instructor is helpful)

Evidence based programmes

Otago Exercise Programme (OTAGO)
For the exercise booklet in a variety of languages please go to: *www.profound.eu.com/otago-exercise-program*

For further information on the Otago Home Exercise Programme, visit *www.cdc.gov/homeandrecreationalsafety/pdf/cdc_falls_compendium_ lowres.pdf*

Or *www.acc.co.nz/PRD_EXT_CSMP/groups/external_providers/docu- ments/publications_promotion/prd_ctrb118334.pdf*

For information about Cascade Training in Otago across Europe, visit *www.profound.eu.com/about/wp5-best-practice-exercise-regimen-net- work-development*

Falls Management Exercise programme (FaME)
For the exercise booklet in a variety of languages please go to: *www.profound.eu.com/strength-and-balance-home-exercise-booklet-for- older-people-english*

For further information on the FaME exercise programme, visit *www.cdc.gov/homeandrecreationalsafety/pdf/cdc_falls_compendium_ lowres.pdf*

Or *www.laterlifetraining.co.uk/fame-rationale-for-an-exercise-programme- to-prevent-falls*

Lifestyle integrated Functional Exercise (LiFE)
www.profound.eu.com/life-lifestyle-integrated-functional-exercise-reduc- ing-falls-and-improving-function
Or *purl.library.usyd.edu.au/sup/9781743320372trove.nla.gov.au/work/190816170?selectedversion=NBD52778501*

Square stepping
For more information about this programme including the evidence base please go to: *square-step.org/en/home.html*

Tai Chi
You can find out more about Tai Chi, Taijiquan and Qigong across Europe, visit *taiji-europa.eu* and *www.tcfe.org*

Links and Resources:
Links related to exercise and falls
www.profound.eu.com
www.ageuk.org.uk/Documents/EN-GB/For-professionals/Research/Falls_ Prevention_Guide_2013.pdf

Other resources related to exercise and falls:
Gait, balance and functional training
www.profound.eu.com/video-clip-of-stronger-seniors-balance-exer- cise-programme-english

Strength/resistance training
www.profound.eu.com/exercises-online-strengthening-video-english

Square Stepping Exercise
www.youtube.com/watch?v=IfCD7qB2I1k

Assessments
www.profound.eu.com/three-simple-assessment-tests-to-assess-the-patients-risk-for-falling

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Vision and falls

Impaired or low vision is an independent risk factor for falls in older people and unfamiliar glasses with a new vision correction or impaired vision affected by medication can increase the risk of older people falling. Many eye diseases such as cataract, age related macular degeneration, glaucoma and vascular eye disease are common in older people. Age related loss of contrast sensitivity and depth perception can cause balance problems.

When regular wearers of multifocal glasses were given single lens glasses falls were significantly reduced in the subgroup that regularly took part in outside activities. Conversely, there was a significant increase in out- side falls in intervention group participants who took part in little outside activity. New environments and a change in glasses or first prescription of glasses can increase the risk of falls during the first weeks because of altered and unfamiliar vision. This highlights the education role that optometrists and ophthalmologists can play.

Cataracts have been associated with increased risk of falls and fall related injury. First eye cataract surgery is a successful treatment that has been shown to reduce the risk of falling and fall related injuries.

Age related macular degeneration (AMD) is the most common form of age related vision loss in Europe. Currently there is no curative treatment for dry AMD, however compensating strategies have been tested. In people with very low vision and macular degeneration home visits by occupational therapists have been shown to reduce falls. A key element is the adaptation of the home environment and behavioural strategies for safe negotiation of the internal and external environment.

For patients suffering from glaucoma, diabetes and/or vascular eye disease or vision loss such as hemianopia no specific fall prevention programs have been tested so far. The treatment should be coordinated using best clinical practice and vision rehabilitation principles.

What works?

- Identifying new visual problems and ensuring spectacles are appropriate by testing visual acuity and glasses prescription every year
- Cataract surgery
- Occupational therapy
- Home safety and behavioural modifications for older people with very low vision such as AMD

Caution

- During the first days and weeks after a vision correction (e.g. new or changed prescription of eyeglasses or following cataract surgery) risk of falls can increase
- Using multifocal or bifocal lenses in new environments can increase the risk of falls
- There can be side effects of medication affecting visual acuity or adaptation

Who can help older people with their vision

- Ophtalmologists
- Optometrists
- Occupational therapist

Assessment tools

- Eye chart for testing visual acuity (e.g. Snellen chart)
- Melbourne Edge Test (MET) for testing contrast sensitivity

Links and Resources

www.profound.eu.com

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Bone health

In older people, bone health is an important risk factor for fractures. Osteopenia and Osteoporosis, characterised by low bone mineral density (BMD), lead to bone fragility. Low vitamin D status is associated with a variety of negative skeletal consequences including osteomalacia, Reduced BMD, impaired calcium absorption and secondary hyperparathyroidism. Falls risk should be taken into consideration when assessing whether or not to commence medication for osteoporosis. Bone health and fracture risk should be considered in a falls assessment.

What works?

- Vitamin D (see factsheet vitamin D) and calcium supplementation is effective in reducing bone loss, falls and osteoporotic fractures
- Vitamin D (1000-2000 IU/day; target levels: 50 nmol/L)
- Calcium (1000 to 1500 mg/day; if possible by nutrition intake, rather than tablets)

Nutrition/ lifestyle:

- Adequate calorie intake (Body Mass Index > 20 kg/m²)
- 1 g/kg body weight of protein per day
- Sufficient nutritional intake of Vitamin B12 (2,4 µg/day) and folic acid (400 µg/day)
- Cessation from smoking

Consideration of withdrawal of medication altering bone health. Such as, glucocorticoids, glitazones, proton-pump inhibitors and antiepileptics in consultation with your doctor

Evidence based anti-osteoporotic drugs (Bisphosphonates, denusomab, strontium ranelate, parathyroid hormone peptides)

Reduce the risk of vertebral fracture when given with calcium and vitamin D supplements

Recommended for (see clinical guidelines in resources section or local Osteoporosis guidelines)

- Women with a prior fragility fracture, who should be considered for treatment without the need for further risk assessment
- Fragility vertebral fractures (single level 2 or 3 [moderate to severe], multiple level 1-3 [mild to severe])
- Fragility pertrochanteric fracture
- Fragility femoral neck fracture and T-score < -2,0 SD
- Therapy with glucocorticoids over > 3 month and T-score < -1,5 SD or fragility vertebral fractures
- Femoral neck T-score to –2,5 SD (dependent on age and gender)

Identification and treatment of secondary causes of bone loss e.g. hypogonadism (low testosterone levels), reducing glucocorticoid medications, reducing alcohol consumption

Bone-health exercise programmes combined with fall prevention/exercise (see factsheet Exercise)

- Meta-analysis results suggest a relatively small statistically significant, but possibly important, effect of exercise on bone density compared with control groups. Exercise has the potential to be a safe and effective way to avert bone loss and reduce the risk of fracture
- Require a duration of 12 month and weight-bearing components to show effects on bone mineral density
- Weight-bearing components are successful in proven osteoporosis and / or after fractures
- Weight-bearing and resistance training with challenging balance exercises enhance bone and muscle health and improve functional ability

- A combination of weight-bearing impact exercise (jogging, stair-climb- ing, jumping activities) and progressive resistance training (PRT) is effective for maintaining bone mineral density (BMD) and preventing bone loss at clinically relevant sites such as the hip and spine

Who can help older people with impaired bone health?

- General physician, geriatrician, bone health specialist / endocrinologists / specialist osteoporosis nurse
- Consulting pharmacist
- Physiotherapists, sport scientists and exercise instructors, who are appropriately trained in delivering bone health and falls prevention exercise programs

Assessment tools

- European and/or national guidance for osteoporosis
- Bone mineral density (BMD) using dual-energy X-ray absorptiometry (DXA)
- X-ray (thoracic and lumbar spine) if vertebral fractures are suspected after clinical examination
- World Health Organization's Fracture Risk Assessment Tool (FRAX®)
- QFracture® which uses falls risk in the algorithm
- Blood testing for differential diagnosis and specific treatment

Caution

Non-adherence to treatment with specific anti-osteoporosis drugs is a substantial problem. Medication can be inconvenient to take and unpleasant. Recommendation to monitor adherence.

Links and Resources

Links related to bone-health *www.iofbonehealth.org/europe-guidelines*

The WHO fracture risk assessment tool: *www.shef.ac.uk/FRAX*

QFracture risk tool: *www.qfracture.org*

www.nice.org.uk/guidance/ta160 www.nice.org.uk/guidance/cg146

Also see guidelines on osteoporosis collected at *www.profound.eu.com/guidelines/*

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Vitamin D

Low blood levels of vitamin D are associated with falls and some fall-related fractures. In many industrialised countries older people have modest to severe vitamin D deficiency. More than 70% of people in their 80s living in northern Europe suffer from vitamin D deficiency. This is caused by a combination of factors, such as nutritional deficiency, reduced renal function and skin atrophy. It is aggravated by a reduced sun exposure either through being housebound or institutionalised, seasonal lack of sun exposure due to weather (especially autumn/ winter) and lack of sunlight because of cultural factors (clothing which covers the skin from the sun). Severe vitamin D deficiency causes myopathy, loss of muscle strength and reduced bone health. Moderate deficiencies are linked to osteoporosis and impaired balance.

What works?

Taking vitamin D supplements may be effective in reducing falls in people with low blood levels of vitamin D. Maintaining adequate vitamin D levels, especially during winter, can be achieved through:

- Adequate sun exposure (face and arms), without sunscreen, of about 30 min in the middle of the day (depending on clothing, skin type, latitude and season). Longer periods should be avoided to limit the risk of skin cancer
- Adequate nutritional intake from cod liver oil and fatty fish such as salmon, tuna or mackerel, beef liver, eggs, sardines and mushrooms
- When endogenous synthesis is missing (vitamin D from sun exposure), adequate vitamin D intake is estimated as 800 IU per day
- Supplementation with cholecalciferol for those at high risk of deficiency may require higher doses and should be discussed with the physicians.
- Supplementation can be taken as a weekly dose in drop form or a daily dose as a sweet. Both options are particularly suitable for older people in long-term care

Caution

- Overdosage of cholecalciferol is possible (but rare), leading to hypercalcaemia.
- Calcium levels must be monitored after four weeks to identify hypercalcemia and possible hyperparathyroidism
- Large doses of cholecalciferol should not exceed 30,000 IU per week and should not be given for more than 10 weeks for a total of 300,000 IU.
- Check for contraindications
- Relevant reduction of dermal vitamin D synthesis through sun protection.

Who can help older people with their low vitamin D levels

- General physician
- Geriatrician
- Bone health specialist /endocrinologist
- Consulting pharmacist

Assessment tools

Blood levels of vitamin D (Target: Serum-25-Hydroxy-Vitamin D > 20 ng/ ml (50 nmol)

References

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Home & Environment

Numerous home and environmental factors, identified from reports on older fallers and structured observations, have been associated with falls in older people. Recent research considers environmental hazards as a modifiable external factor. The key factor is the relationship between the person's physical competence level and environmental stressors, e.g. an older person with some level of compromise of competence will fall at a lower level of perturbation than a younger or fitter older person. The level of risk of environmental hazards is influenced by lifestyle, risk taking, behaviour and exposure to environmental stressors, e.g. exposure to icy pavements, rooms with low lighting.

Some home safety assessment and modification interventions, alongside behavioural intervention, have been demonstrated to be effective in reducing both number of falls and number of people falling. Home safety assessment and modification appears to be effective for people at higher risk of falling (previous history of falls), particularly those with severe visual impairment. In a multifactorial intervention the home modification component should be implemented by occupational therapists and other trained specialist after a careful assessment of the personal environment.

What works? (important components of environmental modifications)

- Adjustments to ergonomic height of furniture (e.g. bed, chair, toilet seat)
- Adequate stability of furniture
- Barrier-free homes
- Handrails /holds
- Even and non-slip floorcoverings with optimised levels of friction
- Type of surface on which an older person falls, as this may reduce fall-related injuries (e.g. carpeted floors)
- Sufficient light and contrast in dark areas and at night, particularly on stairs
- Removal of trip hazards
- Urban planning considering the needs of older people (places to rest, even pathways/ pavements, ramps etc.)

What does not work?

Home safety assessment and modification alone / as a single component intervention. (Effective interventions have been accompanied by education, training with transfers and provision of mobility aids).

Caution

- There is little high-level scientific evidence for modification of the built home environment as a method of reducing the risk of injury
- Active people living with more environmental hazards are more likely to fall than frail people. Risk of falling is even increased in active people depending on their perception of risk and their outside participation. Frail people are more likely to fall because of their own limitations
- Compliance issues are also caused by the stigmatising effects of home modifications (e.g. grab rails), and the perceived challenge to health and independence. Low financial or education status can also impact on older people's understanding of the need for home modification, limiting implementation (community and education programmes may help)

Who can help older people with home safety

- Occupational therapists (interventions appear to be more effective when carried out by an occupational therapist)
- Other trained specialist

Assessment tools

Home hazard checklists, such as Westmead Home Safety Assessment, HomeFast, EnableAge

Links and resources

Westmead assessment tool
www.google.com/url?url=https://www.maa.nsw.gov.au/getfile.aspx-%3FType%3Ddocument%26ID%3D44479%26ObjectType%3D3%26Ob- jectID%3D3919&rct=j&frm=1&q=&esrc=s&sa=U&ei=OQMSVK2qE8H-VPIawgNAE&ved=0CCYQFjAC&usg=AFQjCNEL_Ny70wKn-qEEB- ZDdsKjudqCQ-A

HomeFast assessment tool
www.bhps.org.uk/falls/documents/HomeFast.pdf

EnableAge assessment tool
www.enableage.arb.lu.se/pub.html

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Footwear & Protective Clothing

Footwear is very personal and can be culturally determined. Inappropriate footwear can increase the risk of slips, trips and falling and some certain shoes can decrease the base of support. An increased risk of falls has been linked to poor fitting shoes, slippers with a lack of heel support and high heeled shoes. Walking barefoot or with only stockings or socks indoors is also associated with an increased risk of falls.

Hip protectors can reduce the risk of fracture for older people living in nursing or residential care settings but has little effect for community dwelling older people due to low compliance.

What works?

- Footwear counselling- where older people are counselled on the spe- cific identified hazardous features of their footwear and are provided with a handout on what constitutes a safe shoe
- There is some evidence for the use of a non-slip device (Yaktrax® walker) on outdoor shoes in hazardous winter conditions
- There is a reduction in rate of falls in people for people with disabling foot pain receiving "multifaceted podiatry" (customised orthoses, foot- wear review, foot and ankle exercises, fall prevention education, and "usual podiatry care")
- Protective clothing such as hip protectors for older persons with high risk of fracture

Caution

Inappropriate footwear has been defined as a heel height >4.5 cm, or any two of the following:

- no fixation
- no heel counter (plastic or leather insert at the heel upper of the shoe)
- a heel counter that could be compressed greater than 45 degrees
- a fully worn or smooth sole
- or a shoe heel width narrower than the participant's heel by at least 20%.

Older people may not want to wear appropriate footwear or hip protectors because they do not fit with their personal identity. Having to wear sensible and practical footwear or hip protectors can identify them as 'a faller' and may cause issues with self-esteem and stigma.

Who can help older people with footwear

- Podiatry services
- Orthopedic specialist for severe deformities
- Trained nursing staff

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Falls detection and prevention technologies

There are a number of Information and Communication Technologies (ICTs) aimed at falls prevention, fall detection and alarms for use in case of a fall, that can alert professionals or carers if a fall occurs or if falls risk increases. There are also a range of ICT interventions which have been created or adapted to be pro-active in preventing falls, such as those which provide strength and balance training to older adults in the prevention of falls e.g. exergames, Wii-fit, Kinect.

What works?

Personal Emergency Response Systems can help to reduce a long lie (lying on the floor for long periods of time can cause serious health complications) and allow help to be called quickly to the person who has fallen. However, there is evidence that people often do not press the alarms for fear of being a burden or nuisance. There is an emergence of automatic alarms that do not require the person to press them.

Simple touchscreen interfaces and other easy to use technologies have been more readily accepted than those that are more complex and multi-faceted.

Focusing on the possibility of maintaining independence is more likely to lead to successful uptake of PERS and ICT-devices.

Caution

- This is an emerging area and the evidence is currently not robust and is lacking completely in many areas, but this is changing rapidly
- The main issues with use of ICT devices in the home are related to adoption and use of the systems; older adults need to understand the value and potential of the technologies on offer and receive suitable training and support in using them
- Evidence is weak around the use of virtual reality and gaming systems for the promotion of physical activity. Emerging evidence suggests that games should be designed specifically for and with older adults
- Evidence is weak around the effective use of bed alarms in hospitals

Who can help older people with ICT

- Occupational therapists/physiotherapists
- Social services and social care providers
- Sheltered and assisted housing providers
- Providers of telecare and telehealth equipment and services

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Falls and acute care

Falls and fall related injuries are very common in accident & emergency (A&E) services (Close 1999). Falls trigger many hospital admissions, not only to trauma services, and they are quite common during the time of hospital treatment. A fall during the inpatient period will often lead to an increase in the length of stay (LoS) and increase costs. Around 5 % of severe fall related injuries occur in acute care (Oliver 2010).

The most recent Cochrane review states that a considerable proportion of falls can be prevented during the stay (Cameron 2012). However, not all studies have succeeded in reducing falls despite major efforts (Barker 2016). A recent milestone study from Australia (Hill 2015) has addressed some of the shortcomings of former studies.

Most successful trials have achieved positive results for patients with LoS periods of longer than one week. A consistent finding is the role of precipitating (time dependent) factors such as fluctuating attention caused by delirium and functional deterioration due to acute intercurrent problems such as dehydration, fever etc. Impaired self-perception improvement can also lead to an increase in non-assisted or non-supervised activities which are major causes of falls (Oliver 2010).

This factsheets summarises the understanding of fall prevention for older persons in acute care settings. Aspects regarding A&E are addressed in the factsheets for persons living at home or long-term care. A second aspect is the prevention of falls after discharge which is equally important.

Falls in acute care and what can be done to reduce falls

Most strategies that have been described in the single risk factor ProFouND fact sheets for community dwelling older persons apply in the acute care setting. Immediate medication review to avoid orthostatic hypotension, conservative strategies for psychotropic medications, identification of vision impairment, training of safe transfer strategies, and ensuring appropriate footwear are relevant factors. Progressive strength and balance exercise, vitamin D supplementation and bone health interventions have no immediate effect but action should be taken, including recommendations or post-discharge referral should be made. The key component for fall prevention is the implementation of a proactive organisational strategy that includes leadership, careful monitoring, supportive risk management, change agent.

What works?

- Patient and linked staff education programmes (Hill 2015)
- Accident and Emergency identification of fallers with a planned secondary visit to develop a fall prevention plan such as a Fall and Fracture Liaison Service (Close 1999)
- Post-discharge planning of fall prevention (GEM-HIT, Cumming)

Caution

- Simple screening tools are not recommended for fall preventions purposes in acute care
- The appointment of fall liaison specialists can lead to a withdrawal of staff commitment by others

Who can help older people with fall prevention and acute care facilities?

- Geriatricians: development, implementation and evaluation
- Specialised nurse practitioners: development, implementation and evaluation
- Specialised physiotherapists: goal setting, transfer strategy, walking aid, post-discharge planning
- Specialised occupational therapist: assistive devices, environmental adaptations

Assessment tools:

Different assessment instruments have been developed. The replication of measurement has been mostly disappointing (Oliver 2010).

Links and resources
Workbook:
http://www.med.monash.edu.au/physio/staff/files/srtp.pdf

Videos:
https://www.youtube.com/channel/UCT7sYTGgu2tbcktv2fYG4HQ
https://www.youtube.com/watch?v=zlJgXkvELPg&index=1&list=PLJUbV7WX-EFhmazYlSTTzAwSUqpQIJBGq

Website:
http://www.med.monash.edu.au/physio/staff/thaines.html

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Institutional long-term care (LTC) and fall prevention

Falls and fall related injuries are common, important and costly. Less than 6 % of the older population live in long-term care in Europe, however about 20 – 25 % of severe fall related injuries occur in LTC. On the resident level they can have detrimental effects on walking and sit-to-stand transfers, psychological measures such as fear of falling and cause pain even without fractures. Two falls per resident can be expected per annum. Almost all residents with walking capacity are at risk of falling. Programmes should be implemented that have sufficient reach and sustainability. Ensuring mobility and safety are equally important goals for residents, families and staff members. In the past a misunderstood emphasis on safety alone has led to perverse intervention to avoid falls such as restraints. The most recent Cochrane review concludes that a considerable proportion of falls can be prevented (Cameron 2012). This factsheet summarises the most relevant components of fall prevention for older persons in LTC.

What can be done to reduce falls

Single risk factor strategies that have been described in the fact sheets for community dwelling older persons mostly apply for LTC. In order to be effective the strategies must be combined and adapted in a sensible manner. The Cochrane review clearly states that multifactorial approaches are needed in LTC. The priorities are often different. This requires an interdisciplinary approach of licensed care, nursing aides, medical care, physiotherapy, other health care professionals and managers. Components such as regular medication review, adapted ergonomics of furniture, maintenance of and training with walking aides, proper footwear, appropriate lighting should be part of a general risk management and safe mobility strategy. More than 50 % of falls in LTC occur in transfer situations like sit-to-stand or stand-to-sit maneuvers. Therefore, safe transfer strategies should be a core part of care giving routines. Urinary incontinence management, compensation of vision loss, ensuring adequate fluid intake and nutrition are part of a good nursing practice and thereby relevant in this context.

Exercise programmes are part of a state-of-the art facility enhancing safe mobility. Best practice programme examples are the Swedish High-Intensity Functional Exercise (HIFE) programmes (Toots 2016) or the Ulm fall prevention programme. Physical activity is stimulated by meaningful activities.

LTC fall prevention programmes need leadership and evaluation. Implementation without an organisational commitment and strategy are less effective. This strategy includes quality improvement strategies, risk management and critical incident reporting.

What works?

The land mark studies supported by systematic reviews have used multifactorial programmes including explicit organisational leadership, regular staff training, systematic monitoring, discussion of severe fall related injuries, regular exercise classes, medication review, and environmental adaptations. Required is a sustainable strategy, often over several years.

Caution

- Exercise interventions without interdisciplinary components have often had no effect or even negative effects (Kerse 2004).
- Activity restriction or even restraints to prevent falls are not justified. Restrictive approaches can have severe side effects such as functional loss
- Vitamin D supplementation and bone health intervention are still under debate for the LTC setting and should be discussed on an individual basis. There is no evidence for mostly bedridden residents
- Hip protector and other protectors (e.g. helmets) are not a generally recommended strategy in LTC but are useful in frequent fallers such as atypical Parkinsons' disease or epileptic patients with recurrent seizures. This should be individually assessed and personal support is needed

Who can help older people with fall prevention and long-term care facilities?

Licensed nurses and nurse's aides are key in the sustainable fall prevention in LTC

Other professions are needed to develop, assess and improve the programmes

- Geriatricians: programme development and evaluation
- Specialised nurse practitioners: development and implementation of programmes
- Specialised physiotherapists: exercise programmes, walking aids
- Specialised occupational therapists: assistive devices, environmental adaptations
- General physicians: medication review focusing on psychotropics and orthostatic hypotension
- Consulting pharmacists: medication review

Assessment tools

Simple scales for risk factors at admission are not useful and not recommended. Their predictive capacity is low. Assessment should be part of a comprehensive process. Risks change over time. The first weeks after admission are a high risk period that requires additional attention, support and reassurance. Assessment requires the analysis of the build environment and the care processes based on the continuous analysis of fall reports.

Other resources related to long-term care and falls

http://www.sfu.ca/tips/mission.html videos on real falls in LTC
https://www.youtube.com/watch?v=MjNkxCBZI5c video on hip protector guidance

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