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Falls in elderly people

1 Background information

Quick info:

Scope:
- prevalence and risk factors for falls
- primary prevention of falls
- examination, investigations, and referral criteria for specialist falls services
- multi factorial assessment and multidisciplinary management
- adults age 65 years and over
- linked to:
  - osteoporosis – see 'Osteoporosis' care map
  - urinary incontinence – see 'Female urinary incontinence' and 'Male lower urinary tract symptoms' care maps
  - syncope – see 'Syncope' care map
  - hip fracture – see 'Hip fracture' care map
  - head injury – see 'Head injury' care map

Out of scope:
- detailed management of specific causative conditions
- adults age 64 years and younger
- children

Definition [1]:
- unintentionally coming to rest on the ground, floor or other lower level
- patient may present with a fall, mention a previous fall during a routine check-up, or should be asked about falls at all contacts with health professionals [2]

Incidence:
- common in older people:
  - the most common [3,4]:
    - cause of serious injury in older people
    - reason for hospital attendance
  - about 30% of people age 65 years and older have a fall each year [3,5]
  - 50% of people age 80 years and older have a fall each year [3,5]
  - falls in nursing homes and hospitals are 2-3 times greater than in the community [3]
  - 10-25% of institutional falls result in fracture, laceration, or need for hospital care [3]
  - almost 650,000 falls-related A&E attendances in 1999 in the UK for people age 60 years and over [3]

Risk factors:
- **over age 65 years [3]**
  - previous fall [5] – 50% of those who fall will have another fall within the next 12 months [3]
  - environmental hazards, eg loose or slippery floor covering [3,5]
  - musculoskeletal problems [3,5], especially affecting the lower extremities, eg weakness, arthritis, etc [2]
  - dizziness [5]
  - abnormality of gait or balance [3,5]
  - visual impairment [5]
  - neurological disease, eg [1]:
    - Parkinson's disease – see 'Parkinson's disease' care map
    - stroke – see 'Stroke and transient ischaemic attack' care map
  - cognitive impairment, eg [2,3]:
    - dementia (including Alzheimer's disease) – see 'Dementia' care map
    - delirium – see 'Delirium (acute confusional state)' care map
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- cardiovascular problems, eg orthostatic hypotension, carotid sinus hypersensitivity, vasovagal syncope – consider the possibility of over treatment of blood pressure in someone with white coat hypertension [5]

- continence problems [3]
- drug therapy – hypnotics, sedatives, diuretics, antihypertensive [3,5]
- polypharmacy (four or more medications) [3]

Complications and consequences:
- fractures [3,5]:
  - about 5% of falls in older people who live in the community result in a fracture or hospitalisation
  - 10-25% of falls in nursing homes and hospitals result in a fracture
  - 86,000 hip fractures per year in the UK (95% of which results from a fall)
  - hip fractures are more common in those age 75 years and older
  - osteoporosis [2]
- psychological problems, eg fear of falling and loss of confidence in being able to move about safely [3]
- loss of mobility, leading to social isolation and depression [3]
- increase in dependency and disability [3]
- hypothermia [3]
- pressure-related injury [3]
- infection [3]
- death – the most common cause of accidental death in those age 75 years and older [3]

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.

2 Information resources for patients and carers

Quick info:
Recommended resources for patients and carers, produced by organisations certified by The Information Standard:
- ‘Falls’ (URL) from National Institute for Health and Clinical Excellence (NICE) at http://www.nice.org.uk
- ‘Falls: the assessment and prevention of falls in older people’ (PDF) from National Institute for Health and Clinical Excellence (NICE) at http://www.nice.org.uk
- ‘Prevention of Falls in the Elderly’ (URL) from Patient UK at http://www.patient.co.uk
- ‘Recurrent Falls’ (URL) from Patient UK at http://www.patient.co.uk
- The Carers Resource at http://www.carersresource.org

The following resources have been written or recommended by national policy bodies or guideline producers whose content has informed this care map:
- ‘Falls’ (URL) from Clinical Knowledge Summaries (CKS) at http://www.cks.nhs.uk
- ‘Staying steady’ (PDF) from Age UK at http://www.ageuk.org.uk

For details on how these resources are identified, please see Map of Medicine's document on Information Resources for Patients and Carers (URL).

3 Updates to this care map

Quick info:
Date of publication: 31-Oct-2013

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4 Falls in elderly people

Quick info:
Falls are common in the elderly, and their risk is increased by:

- previous fall [5] – 50% of those who fall will have another fall within the next 12 months [3]
- over age 65 years [3]
- environmental hazards, eg loose or slippery floor covering [3,5]
- musculoskeletal problems [5], especially affecting the lower extremities, eg osteoporosis, arthritis, weakness [3]
- dizziness [5]
- abnormality of gait or balance [3,5]
- visual impairment [3,5]
- neurological disease, eg [1]:
  - Parkinson's disease – see ‘Parkinson's disease’ care map
  - stroke – see 'Stroke and transient ischaemic attack' care map
  - cognitive impairment, eg [2,3]:
    - dementia (including Alzheimer's disease) – see ‘Dementia’ care map
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- delirium – see 'Delirium (acute confusional state)' care map
- cardiovascular problems, eg orthostatic hypotension, carotid sinus hypersensitivity, vasovagal syncope, postural hypotension:
  - associated with increased morbidity and mortality, in part due to the increased incidence of falls [5]
  - consider the possibility of over treatment of blood pressure in someone with white coat hypertension [5]
- continence problems [3]
- drug therapy – hypnotics, sedatives, diuretics, antihypertensive [3]
- polypharmacy (4 or more medications) [3]
- fear of falling [3]

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.

5  Presents with a fall

Quick info:
All patients over age 65 years who report any falls in the last 12 months should be asked the following [4]:
- has the patient had two or more falls in the last 12 months
- has the patient presented acutely with a fall
- does the patient have problems with walking or balance (not necessarily restricting activity)

If the patient gives a positive answer to any of the above, they should be considered at high-risk of further falls and assessed as such.

References:

6  Routine elderly check-up

Quick info:
When an elderly patient is in contact with a healthcare professional they should always be asked about their history of falls [3].

Perform a routine elderly check-up – enquire about [3,4]:
- falls in the last 6-12 months including [3,4]:
  - frequency
  - context
  - characteristics of fall(s)
- fractures since the age of 40 [2]
- nutrition and fluid intake [1]
- level of physical activity [1]
- continence [1]
- any chronic medical problems [1]
- presence of home hazards [1]
- enquire about changes in vision [2]

Assess [1]:
- mental state
- gait, balance, and mobility

Review medications and drug use [1].

References:
7 Alert features

Quick info:
Identify conditions that might require urgent admission to A&E or secondary care, including [2]:
- loss of consciousness
- head injury – see 'Head injury' care map
- swellings and tenderness
- fractures, including hip – see 'Hip fracture' care map
- neurological conditions, eg stroke – see 'Stroke and transient ischaemic attack' care map
- cardiovascular conditions:
  - arrhythmia
  - heart attack
- syncope – see 'Syncope' care map

NB: The Royal College of Physicians recommends that all appropriate patients sustaining a fragility fracture should receive a multi-factorial falls risk assessment [6].

Reference:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.

9 No falls in the last 6-12 months - review regularly

Quick info:
Perform a routine elderly check-up [3,4].
Give health promotion advice appropriate to the patient [1].

References:

10 Alert features present - consider referral to appropriate service

Quick info:
The appropriate service depends upon [1]:
- suspected clinical condition
- how ill the patient is
- the available services, especially in the community
- how quickly response is needed

Once the acute medical problem has been resolved the patient should be referred to have their falls risk reviewed and addressed [1]. Consider referral to social care for continued management at home/residential risk assessment [1].

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11 Alert features absent

Quick info:
If alert features are absent [1]:

- management of minor injuries and symptoms can occur in primary care
- the absence of alert features does not obviate the need for full history and thorough physical assessment to prevent recurrences

Reference:

12 Record falls and bone health history

Quick info:
Falls are often associated with multiple factors [3].
Ask the patient and any witness about:

- the circumstances of this fall and previous falls [5]:
  - activity at time of fall
  - where and when, especially time of day
- lightheadedness, dizziness, or loss of consciousness at time of fall [2]:
  - if patient does not remember hitting the ground, consider syncope – see 'Syncope' care map
  - elderly patients may not be aware of having lost consciousness
- enquire whether it is a recurrent problem or a single and isolated episode [5]
- consider osteoporosis [2]:
  - consider corticosteroid exposure
  - consider treatment for osteoporosis:
    - see 'Osteoporosis' care map
    - liaison with the local osteoporosis service will have referral guidelines which might include screening or assessment tools and/or clinical criteria
  - history of fragility fracture – any fracture sustained following a fall from standing height

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.
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15 Falls – initial classification

Quick info:
Patients referred down the suspected medical problem/unexplained fall route can simultaneously be referred for a multifactorial falls risk assessment if gait and balance problems are identified. They can also be referred for the multidisciplinary assessment after the medical issues have been resolved [2].

Enquire [1]:
- whether a recurrent problem or a single and isolated episode
- about reasons for fall(s) (if known)

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.

16 Suspected medical problem/unexplained falls

Quick info:
Suspect medical problem in patients with [1]:
- suspected or confirmed dizziness
- lightheadedness
- vertigo
- blackouts
- unexplained cause of the fall

Unexplained falls are usually associated with prodromal blackouts, loss of consciousness [1].
Assess for underlying cardiac, metabolic, neurological, or infectious conditions [1].

Reference:

17 Recurrent falls

Quick info:
If patient presents with recurrent falls (more than 1 in last 12 months), assess frequency of falls and any urgent injuries [1].
Carry out a multifactorial falls risk assessment [2].

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.

18 Single fall with gait/balance problem

Quick info:
If patient presents with a single or isolated fall and has gait/balance problems [1]:
- treat as with recurrent falls
- refer for multifactorial falls risk assessment

Reference:
19 Single/isolated fall with normal gait/balance

Quick info:
These patients do not need a multifactorial falls risk assessment but the circumstances of the fall may highlight specific environmental problems which may require assessment [1].
If patient presents with a single fall with a clear explanation, e.g. slipping on ice [2]:
- treat any urgent injuries with wound dressings, analgesics (oral or topical) as necessary
- assess patient's nutritional status and encourage adequate nutritional and fluid intake
- encourage physical activity up to what the patient can tolerate
- consider social care referral for continued management at home and assessment of residential hazards
- routine elderly check-up in primary care

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.

20 Routine elderly check-up

Quick info:
When an elderly patient is in contact with a healthcare professional they should always be asked about their history of falls [3].
Perform a routine elderly check-up – enquire about [3,4]:
- falls in the last 6-12 months including [3,4]:
  - frequency
  - context
    - characteristics of fall(s)
  - fractures since the age of 40 [2]
  - nutrition and fluid intake [1]
  - level of physical activity [1]
  - continence [1]
  - any chronic medical problems [1]
  - presence of home hazards [1]
  - enquire about changes in vision [2]
Assess [1]:
- mental state
- gait, balance, and mobility

Review medications and drug use [1].

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.

21 Consider referral to appropriate specialist

Quick info:
The appropriate referral depends on local service provision and may consist of the following [1]:
- geriatrician or GP with a special interest within the falls service
22 Multifactorial falls risk assessment

Quick info:
Patients with recurrent falls or a single fall with a gait and balance problem should undergo a multifactorial falls risk assessment to identify potential causes for the falls, leading to an individualised tailored multifactorial intervention. Local service provision will determine if this is performed in primary or secondary care [2]. If a medical cause for the falls is suspected, the specialist medical assessment can be performed before or alongside the multifactorial assessment [2].

Reference:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.

24 Comprehensive falls and bone health history

Quick info:
Falls are often associated with multiple factors [3]. Ask the patient about:

- the circumstances of the fall [5]:
  - activity at time of fall
  - where and when, especially time of day
- prodromal symptoms [1]:
  - lightheadedness
  - dizziness
  - headaches
  - chest pain
  - palpitations
  - visual disturbance
- probe for evidence of loss of consciousness at time of fall [3,7]:
  - if patient does not remember hitting the ground, consider syncope – see 'Syncope' care map
  - elderly patients may not be aware of having lost consciousness
  - features to suggest epilepsy, eg tongue biting, incontinence [1] – see 'Epilepsy' care map
  - sensory symptoms [1]
- enquire about the number of falls in the last year and how long the person has been falling [5]:
  - circumstances of previous falls
  - history of fragility fracture – any fracture sustained following a fall from standing height
  - ask about use of corticosteroids
  - consider treatment for osteoporosis – see 'Osteoporosis' care map

Identify other possible risk factors for falling [5]:

- conditions that affect mobility and balance:
  - arthritis
  - stroke – see 'Stroke and transient ischaemic attack' care map
  - Parkinson's disease – see 'Parkinson's disease' care map
• arrhythmias [4]
• heart failure
• visual impairment [3]
• incontinence – see ‘Female urinary incontinence’ and ‘Male lower urinary tract symptoms’ care maps
• excess consumption of alcohol
• frailty, eg physical disability and general weakness [3]
• ask about history of drug treatments [3]:
  • over the counter medication and herbal preparations
  • polypharmacy – taking four or more drugs
  • drugs that can cause postural hypotension
  • psychoactive drugs, such as benzodiazepines and antidepressants
    • especially [1]:
      • vasodilators and antihypertensives
      • diuretics
      • anticholinergics, such as oxybutynin and tolterodine
      • sedatives and hypnotics
• cognitive impairment, eg dementia (including Alzheimer's disease) [2,3] – see ‘Dementia’ care map
• footwear [2,3]
• environmental factors:
  • at home
  • in public spaces
Ask about consequences of the falls [1]:
• ability to get up off the floor
• psychological consequences of falls:
  • fear of falling
  • anxiety – see ‘Anxiety’ care map
  • depression – see ‘Depression in adults’ care map

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.

25 Reassess fall risk after intervention

Quick info:
After specialist medical intervention, assess patient and if still falling refer for multifactorial falls risk assessment [2] to identify and address future risk and individualised interventions aimed at promoting independence and improving physical and psychological function [3].
If not falling, carry out routine elderly check-up [2].

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.
26 Clinical assessment

Quick info:
Local care map design will determine which professionals perform certain parts of the clinical examination in more detail but it generally involves doctors, nurses, and therapists [2].

Examine and assess the following:

  - the Timed up and go (TUAG) test:
    - ask patient to get up from a chair without using their arms, walk 3 metres, turn around, return to the chair, and sit down without using their arms if possible
    - a walking aid can be used during the test (if the patient is already using one) and the test is timed
    - if the patient can complete the test with no difficulty, and no unsteadiness – low risk of falling
    - if TUAG takes longer than 13 seconds, further assessment is required
  - Turn 180º test:
    - from a standing position, ask the patient to turn around until they are facing the opposite direction
    - if the patient takes more than four steps – consider appropriate balance interventions

- cardiovascular assessment [5]:
  - peripheral pulses (rate and rhythm) – arrhythmias
  - carotid pulse
  - heart murmurs especially aortic stenosis
  - lying and standing blood pressure (BP) – to exclude postural hypotension [7]:
    - lying supine for 5 minutes, take BP reading, ask patient to stand, take BP at 1 minute and again at 3 minutes
    - a 20mmHg drop in the systolic, or a systolic drop of blood pressure below 90 on standing, indicates postural hypotension

- test for underlying cause of postural hypotension [5]:
  - hypovolaemia
  - prolonged bed rest
  - medication
  - neurogenic failure

- perceived functional ability and fear related to falling using appropriate tool, ie Falls Efficacy Scale - International (FES-I) [5,8]

- neurological assessment, specifically [5]:
  - coordination, leg strength, reflexes, sensation, and balance [2]
  - cognition [2]
  - abbreviated mental test (AMT) 4 screening – record the responses to [4]:
    - what year are we in?
    - what do we call this place you are in?
    - how old are you?
    - what is your date of birth?
  - an incorrect answer suggests cognitive impairment [4]
  - a score of 3 or less indicates patient requires an assessment of cognition such as mini-mental state examination (MMSE) [2]
    - 10 point AMT score
    - 30 point MMSE score

- visual assessment [3,5]:
  - include visual acuity, pin hole, and depth perception – refer to an optician if problem identified
  - examine feet and footwear [3]
  - assess nutritional status [5]
  - assess adequacy of hydration [5]
  - benign paroxysmal positional vertigo (BPPV):
    - check for dizziness while lying in bed and on moving head and neck up and down or sideways
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- home hazards, including [5]:
  - poor lighting
  - stairs
  - loose carpets or rugs
  - trailing bed clothes
  - slippery floors
  - need for safety equipment such as grab rails
  - poor heating
  - trailing wires
  - cluttered rooms
  - pets

Assess for anxiety and depression, eg Hospital Anxiety and Depression Scale (HADS), and for psychological consequences of falls, eg FES-I [2].

Determine if patient is able to summon help following a fall, eg personal pendant alarm [1].

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.

27 Individually tailored multifactorial interventions

Quick info:
All interventions need to be delivered in a timely manner. It is good practice to provide a written falls intervention plan to the patient or carer [2].

Successful multifactorial interventions which reduce risk of recurrences include [3,5]:

- strength and balance training [3]:
  - beneficial for older, community-dwelling patients with a history of recurrent falls and/or balance and gait deficit
  - ensure an appropriately trained professional prescribes to the individual patient's needs and monitors throughout
- exercise in extended care settings:
  - multifactorial interventions with exercise component – recommended for older people in extended care settings, eg care homes
- vision assessment and referral [3]
- medication review with modification/withdrawal
- home hazard assessment and safety modifications [3,5]:
  - to be carried out within a timescale agreed by the patient or carer and healthcare team
  - effective only in conjunction with follow-up and intervention, not in isolation
  - identify needs and refer to local services for equipment, aids and adaptations as necessary, eg pendant alarms, telecare [2]
  - footwear modification where indicated
  - podiatry
  - hip protectors – only some evidence of effectiveness in preventing hip fractures in older patients living in extended care settings, who are considered at high risk [3]
  - anti-slip shoe device

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• consider social work referral for increased home support

Management should follow a multi-disciplinary approach [3], including [5]:

• exercise:
  • multiple-component group exercise [9]:
    • muscle strengthening
    • balance training
    • flexibility
    • endurance
  • Tai Chi
  • multiple-component home-based exercise, eg Otago exercises
  • NB: other than for Tai Chi, there is no evidence that single category programmes are effective, eg balance training or muscle strengthening exercises alone [9]
  • vitamin D supplementation in people living in nursing care facilities [8] – there is uncertainty about the relative contribution to factor reduction and about the dose and route of administration [3]

Encourage the participation of older people in falls prevention programmes [3]:

• healthcare professionals involved in the assessment and prevention of falls should discuss what changes a person is willing to make to prevent falls
• information should be relevant and available in languages other than English
• programmes should address potential barriers such as low self-efficacy and fear of falling, and encourage activity change

Education and information giving [3]:

• individuals at risk of falling, and their carers, should be offered the following information:
  • what measures they can take to prevent further falls
  • how to stay motivated if referred for falls prevention strategies that include exercise or strength and balancing components
  • the physical and psychological benefits of modifying falls risk
  • where they can seek further advice and assistance
  • how to cope if they have a fall, including how to summon help and how to avoid a long lie
• provide written advice on falls prevention to the patient or carer – ‘Staying steady’ (PDF) from Age UK at http://www.ageuk.org.uk

NB: Involve patients and carers in decision-making about individualised falls prevention strategies – incorporate the knowledge and experience of people who have been at long-term risk of falling and have been self-managing this risk [3].

References:
[2] Contributors representing the Royal College of Physicians (RCP); 2011.
Overview

This Map of Medicine care map is regularly updated to include new, quality-assessed evidence, and practice-based knowledge from expert clinicians. Please see the Editorial Methodology section of this document for further information.

This care map was last updated on 31 January 2013.

For information on changes in the last update, see the information point entitled 'Updates to this care map' on each page of the care map.

To cite this care map, use the following format:


Accreditations

There are two levels of accreditation available to a care map:

- Accreditation of the clinical content by a relevant professional group
- Accreditation of the editorial methodology used

The clinical content of this care map is accredited by:

Royal College of Physicians

The editorial methodology used to create this care map was accredited by:

The Chief Knowledge Officer of the NHS
Editorial methodology

Map of Medicine searches for well-reputed secondary evidence when producing its care maps – systematic reviews, meta-analyses based on systematic reviews, and guidelines. The initial search for secondary literature is within Medline and EMBASE, and of websites of known producers of guidelines. Inclusion and exclusion criteria are applied to systematic reviews and meta-analyses retrieved from the searches to ensure that only high-quality information is selected, and the AGREE instrument is employed to assess the quality of guidelines.

The drafted care map is then checked by individuals with front-line clinical experience (see Contributors section of this document). Such individuals can nominate further references to be added to a care map; these are clearly marked [E] to indicate they were recommended by experienced colleagues.

Map of Medicine pathways are constantly updated in response to new evidence. Continuous evidence searching means that pathways can be updated rapidly in response to any change in the information landscape. Indexed and grey literature is monitored for new evidence, and feedback is collected from users year-round. The information is triaged so that important changes to the information landscape are incorporated into the pathways through the quarterly publication cycle.

References

This care map has been developed according to the Map of Medicine editorial methodology (http://mapofmedicine.com/whatisthemap/editorialmethodology). The content of this care map is based on:

- high-quality guidelines and policy information [3-7]
- critically appraised meta-analyses, systematic reviews, and primary literature [10,11]
- practice-based recommendations [1,2], including any literature endorsed by the contributors [8,9]

The evidence-based, practice-informed care map has been peer-reviewed by central committees within stakeholder groups.

2. Contributors representing the Royal College of Physicians (RCP); 2011. [E]

The classification employed by Map of Medicine is as follows:

[G] guideline
[M] meta-analysis
[S] systematic review
[A] randomised controlled trial
[B] nonrandomised prospective study
[C] retrospective study
[Q] cost- or decision-analysis
[P] performance measure or policy document
[E] practice-based information (expert opinion)

Contributors

Map of Medicine works with clinical stakeholders such as Royal Colleges or clinical societies to gather practice-based knowledge for its care maps. For topics where stakeholder organisations are unavailable, Map of Medicine identifies independent experts to contribute practice-based knowledge.

The following individuals have contributed to this care map:

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Conflicts of interest:
None declared

Selected members of Map of Medicine Clinical Editorial team and Fellows.

Conflicts of interest:
Conflict of interests can be found on the Map of Medicine corporate website (www.mapofmedicine.com)

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It is not the function of the Royal College of Physicians to substitute for the role of the clinician, but to support the clinician in enabling access to know-how and knowledge. Users of the Map of Medicine are therefore urged to use their own professional judgement to ensure that the patient receives the best possible care. Whilst reasonable efforts have been made to ensure the
accuracy of the information on this online clinical knowledge resource, we cannot guarantee its correctness or completeness. The information on the Map of Medicine is subject to change and we cannot guarantee that it is up-to-date.

The Chief Knowledge Officer of the NHS

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