

Falls in older adults

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Abstract

Falls are very common in older people, and for some the consequences are devastating. The clinical assessment, management and investigation of patients who present with falls can be challenging for non-specialists, and multiple guidelines and algorithms have been published to aid this. This article has been prepared as a concise reference that reviews the most recent evidence and covers the medical competencies on falls outlined in the *Curriculum for General Internal Medicine (Acute)* of the Federation of Royal Colleges of Physicians of the UK. As in the curriculum, the emphasis is on the acute setting. Important topics covered include the epidemiology of falls, definition and classification, causes and risk factors, cumulative effect of risk factors and concept of individual falling threshold, physical and psychosocial consequences of falling, medical falls assessment in acute settings, differentiation between falls and syncope, principles of multifactorial falls assessment and intervention, teamwork and communication skills, and evidence-based strategies for prevention, including the latest developments in falls prevention research.

Keywords Accidental falls; diagnosis; disease management; evidence-based medicine; explained fall; geriatric assessment; practice guidelines as topic; prevention; quality of life; syncope; unexplained fall

Falls: how common are they?

Falls are the most frequent cause of unintentional injuries in elderly people (aged ≥ 65 years), and are the leading cause of emergency admission loss of functional ability, independence, quality of life and injury-related death. In the community, the proportion of people who sustain at least one fall over a 1-year period varies between 28% and 35% in those aged >65 years and 32–42% in those aged >75 years, with 15% of older people falling at least twice. Incidence rates in hospitals are higher, and

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Key points

- Recognition of the differential diagnosis of falls, syncope and epilepsy is important
- Falls and syncope may occur in same patients
- Diagnose the cause and assess the risk factors for falling *at the same time* – remember that falls are generally *multifactorial*
- Rationalize the use of medications as many falls are iatrogenic
- In the acute setting, follow the principles of basic trauma life support and use the history and basic investigations (e.g. electrocardiography, blood tests) to actively look for cardiovascular causes
- *Loss (or near-loss) of consciousness, unexplained, intrinsic, injurious and/or recurrent* are all 'red flag' terms that point to the need for a multifactorial falls assessment and intervention programme, particularly a cardiovascular assessment
- Be familiar with the American Geriatrics Society and British Geriatrics Society falls prevention guidelines
- There are three essentials for successful fall management: *communication, policies and procedures, and teamwork*

in long-term care settings approximately 30–50% of people fall each year, with 40% falling recurrently.

In the UK, as many as 250,000 falls and >1000 fractures are recorded each year, as reported by the Royal College of Physicians in their autumn report 2012. A Danish study in 2015 that included national hospital data showed that the rate of fall-related major injuries increased $>11\%$ between 2007 and 2012. Patients with dementia have a tenfold higher rate of falls than non-demented individuals in the community. The combination of high frequency and high susceptibility to injury in older people makes falling a syndrome of particular importance in clinical geriatric medicine. In the Irish longitudinal study of ageing (TILDA), a population study of adults aged ≥ 50 years (mean age 62 years), up to 5% experienced syncope, 24% had at least one fall and 10% had an unexplained fall in 1 year. The operational costs for fallers who are seriously injured during their hospital stay are higher than for non-fallers, and their length of stay is >6 days longer. Non-injurious falls are also associated with substantially raised costs through increased lengths of hospital stay.

Definition and classification¹

Despite the lack of standardization, a commonly used definition of a fall is that used in the most recent American Geriatrics Society (AGS) and British Geriatrics Society (BGS) falls prevention guidelines: a fall is an *unexpected* event in which the participant comes to rest on the ground, floor or lower level *without known loss of consciousness* (www.profound.eu.com;

www.americangeriatrics.org). This is similar to the 2004 National Institute for Health and Clinical (now Care) Excellence (NICE) and World Health Organization definition. Falls can be classified according to their self-reported mechanism (explained or unexplained), objective mechanism (extrinsic or intrinsic), severity (non-injurious or injurious) and frequency (single or recurrent).

Epidemiology

Around 40–60% of falls lead to injuries, 30–50% of these being minor, 5–6% major (excluding fractures) and 5% fractures. Falls account for 90% of hip and wrist fractures and 60% of head injuries. Injuries are the fifth most common cause of death in older people, and falls are the most common cause of injury-related death in persons aged >75 years.

More than 600,000 fall-related accident and emergency attendances occur each year in the UK in persons >60 years of age, 66% of which occur in individuals >75 years. In recent data from the National Center for Health Statistics (NCHS-2015), 55% of all unintentional injury deaths among adults aged ≥65 years were due to falls. The age-adjusted fall injury death rate among adults ≥65 years nearly doubled from 2000 to 2013. These falls result in over 200,000 admissions to hospital, 78% of which are in people >75 years of age. The Global Burden of Disease Study 2010 reported that, between 1990 and 2010, falls increased in rank from the 24th to the 15th leading cause of US disability-adjusted life years (DALYs), with a >50% increase in DALYs. With ageing societies, the healthcare impacts and cost of falls are increasing worldwide. Many healthcare providers have developed multi-disciplinary implementation programmes for falls prevention (e.g. www.ncoa.org).

Pathology and pathogenesis

The ultimate cause(s) or precipitant(s) of a fall should be assessed in the context of individual risk factors for falling. Risk factors can be classified as *intrinsic*, which are associated with physical difficulties and poor health (e.g. muscle weakness, balance and/or gait disorders, cognitive impairment or dementia, neurocardiovascular instability, visual deficits, infection), or *extrinsic*, associated with an active lifestyle and more often environmental hazards, surface irregularities and seasonal variations (e.g. poor lighting, loose carpets).

It is crucially important to appreciate the interactive and synergistic effects between risk factors. There is often more than one possible risk factor for a fall, and attributing a cause can be difficult. Falls mostly occur as a result of a ‘perfect storm’ of accumulation of risk factors. It is therefore suggested that all known risk factors be modified to gain maximum preventive benefit. The evidence for avoiding ‘culprit’ medications, especially sedatives and hypnotics, is strong. The use of night sedation should be carefully considered, particularly as falls in older inpatients have a peak incidence just before midnight. Unexplained falls may be caused by underlying cardiac arrhythmia or hypovolaemic syndrome.

Course of disease, implications in old age

The consequences of falling include mobility impairment, disability, dependency, social isolation and psychological

problems, including fear of falling (FOF), anxiety, loneliness and depression. Many older fallers are unable to get up without assistance, which is a marker of poor prognosis. A prolonged period of recumbency on the floor may lead to hypothermia, dehydration, rhabdomyolysis, aspiration pneumonia and pressure sores.

FOF is part of the so-called *post-fall syndrome* and has recently been the focus of extensive research. Around one-third of older people develop FOF after a fall, and those with FOF have a worse prognosis in terms of reduced activities of daily living, loss of self-efficacy and self-confidence, activity avoidance, lower quality of life and increased institutionalization.

A major mediating factor between falls and fractures in older people is osteoporosis. There is a strong inverse relationship between bone density and fracture risk, with a two- to threefold increase in fracture incidence for each standard deviation reduction in bone mineral density. The relation between bone density and fracture risk is comparable to that between blood pressure and incidence of stroke, and closer than that between serum cholesterol and myocardial infarction.

Fall risk screening and assessment

Screening is used to identify individuals with fall risk who require enhanced supervision and a comprehensive fall risk assessment. One of the most researched tools for fall risk screening is the St Thomas Risk Assessment Tool in Falling Elderly Inpatients (STRATIFY), which recently was shown to have a 91% sensitivity and 60% specificity. GP computer systems carry this tool. Falls risk assessment is a more detailed process than screening and is used to identify underlying risk factors.

Many assessment tools use a dichotomous classification (present or absent) for each risk factor; for example, the Prevention of Falls in the Elderly Trial (PROFET) tool contains screening and assessment components. Others include a graded categorization (nil, mild, moderate, high risk) for each risk factor, as in the Falls Risk for Hospitalised Older People (FRHOP) tool and HOMEFIRST assessment incorporating NICE guidelines from 2004 (www.rospe.com). It is important that screening and assessment are applied by professionals who have the skills to deliver a comprehensive assessment coupled with modification of risk factors (i.e. cardiovascular assessment, modification of culprit medication).

Diagnosis: history and physical examination

The emergency response to a fall must follow the principles of basic trauma life support.

A *primary survey* should be conducted looking for problems with the airway, breathing and circulation, followed by assessment of disability (i.e. level of consciousness, targeted neurological examination) and exposure (e.g. signs indicative of injury such as an externally rotated and shortened leg typical of a hip fracture).

The *secondary survey* consists of an ‘AMPLE’ history including allergies, medications (with special attention to culprit medications), past medical history, last meal and events prior to injury. A full history of the circumstances and symptoms surrounding the fall is important, as these can point to a specific aetiology or narrow the differential diagnosis. Reports from witnesses are important as 25–30% of older patients with

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