

Falls in older people – An overview for the acute physician

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Key Learning Points

- Falls are common among older adults with substantial socioeconomic impact
- Aetiology is typically multifactorial - falls are rarely 'simple'
- A fall may be the only manifestation of acute illness
- Assessment should be comprehensive and individualised
- A multi-interventional, multidisciplinary, specialist led service promotes an improved outcome.

Abstract

Falls are common amongst older adults inflicting a substantial socioeconomic burden. Aetiology is often multifactorial. Comprehensive individualised assessment is pivotal to direct effective interventions.

We provide an overview of falls and highlight an approach for acute physicians who will increasingly encounter this mode of presentation in an ageing population.

Background

Definitions

Falls are one of the giants in geriatric medicine. The definition of a fall has been standardised to 'an unexpected event in which the participant comes to rest on the ground, floor or lower level'.¹

Syncope may be a cause of falls but the two terms are not interchangeable. Syncope is defined as 'transient loss of consciousness due to transient global cerebral hypoperfusion characterised by rapid onset, short duration and spontaneous complete recovery'.²

Epidemiology

Falls are common in older people. Of those living in the community, 30% of the over 65's and 50% of the over 80's fall annually.³ Incidence rates are even higher in those in residential care and in hospital inpatients.^{4,5} Older adults who fall once are twice as likely to fall again within a year.^{3,6,7,8,9}

Impact

Injury is the fifth leading cause of death in older people, with the majority of fatalities caused by falls.^{6,10,11}

A fifth of falls require medical attention with 5% resulting in a fracture and up to 10% causing other serious injuries including head injuries, dislocations, contusions and lacerations.^{6,10,12,13,14} Those who acquire fall related injuries have an increased need for institutional care.¹⁵

Falls adversely impact on quality of life.¹⁶ Fear of falling is well recognised in older people and can

result in loss of confidence, social withdrawal, activity limitation and isolation.^{3,17}

As well as a human cost, falls place a large financial burden on the National Health Service. Approximately 86,000 hip fractures occur each year in the U.K., the majority resulting from a fall, with an estimated annual cost of £1.7 billion.¹⁸

Acute physicians are destined to encounter patients who fall increasingly as a consequence of an ageing population. Knowledge of predisposing risk factors coupled with an approach to recognising and targeting these in all cases is essential.

What are the causes of falls?

Falls are almost always multifactorial with more than 400 recognised risk factors. These can be classified into intrinsic and extrinsic factors as outlined in Figure 1.¹⁷

Unsurprisingly, falls risk increases as risk factors accumulate.^{19,20} Those with four or more identifiable risk factors are approximately three times more likely to fall than those with no more than one risk factor.²⁰

How should a patient be assessed following a fall?

Screening

The National Institute of Clinical Excellence recommend that medical practitioners practice opportunistic screening by routinely asking all older people whether they have fallen in the past year and specifically about the frequency, context and characteristics of the event(s).²⁹

The following modes of presentation should raise suspicion that an individual may have fallen and necessitate an inquisitive work-up:

- 'Collapse query cause'
- 'Found on floor'
- Hypothermia
- Pressure sores
- Rhabdomyolysis
- Soft-tissue injury
- Fracture

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Intrinsic

- A personal history of falls⁶
- Increasing age²¹
- Acute illness
 - Falls may be the only manifestation
- Comorbid disease:
 - Prevalence of falls increases with increasing chronic disease burden²² with cardiovascular disease, obstructive airways disease, arthritis and depression each increasing risk by 32%²²
- Medications & polypharmacy
 - Use of more than four medications (of any type) is an independent risk factor.^{3,21} Sedatives (including ethanol), psychotropics, antihypertensives, diuretics and cardiac glycosides are particularly hazardous^{20,23}
- Impaired mobility and gait^{4,11,20}
 - Muscle weakness, impaired sensation, balance deficits, orthopaedic abnormalities and foot deformities promote risk
- Vitamin D deficiency
 - Common in institutionalised adults and associated with muscle weakness and gait disturbance¹⁷
- Cognitive impairment²⁴
 - Risk independent of severity
- Visual impairment^{25,26,27}

Extrinsic

- Inappropriate footwear²⁸
- Unsuitable walking aid
- Environmental hazards

Figure 1. Intrinsic and extrinsic risk factors for falls.

History

Diagnosis hinges on good history-taking. Patient recollection can be inaccurate. Collateral history may be invaluable.

The clinician should attempt to distinguish between a fall (and identify predisposing factors), syncope and an epileptiform event. We advocate enquiring about circumstances prior to, during and after the event. It is important to enquire about previous episodes irrespective of whether or not these have required medical attention.

A thorough medication and alcohol history is mandatory.

Examination

Although the history can be utilised to focus examination, all systems warrant assessment. Special attention should be given to the following:¹¹

- Heart rate and rhythm
- Cardiac murmurs (in particular of aortic valve stenosis)
- Orthostatic hypotension*
- Neurological impairment
- Cognitive assessment
- Visual acuity
- Gait and muscle strength
- Feet

*A fall in systolic blood pressure of >20mmHg or in diastolic blood pressure of >10mmHg from baseline after standing for 3-minutes²

Investigations

We recommend the following baseline work-up in all cases:

- Blood tests
 - Glucose, full blood count, electrolytes, liver biochemistry, C-reactive protein
- Electrocardiogram
- Plain chest radiograph
- Urinalysis

Potential further investigations are outlined in figure 2 but should be tailored to the individual.

What management should be initiated following a fall?

It is vital to remember that older adults who fall often have several predisposing factors. Thus, comprehensive assessment to identify and target each contributant is paramount.

There is a strong evidence-base to support the use of patient-centred, multi-intervention strategies. By



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Suspected cardiac dysrhythmia	Extended cardiac monitoring
Cardiac murmur	Transthoracic echocardiogram
Unexplained syncope	Cardiac monitoring, tilt table testing
Head injury, seizure, neurological deficit	Neuroimaging, LP, EEG
Confusion	Neuroimaging, LP, EEG, B ¹² , folate, thyroid function, bone profile
Peripheral neuropathy	B ¹² , folate, thyroid function, bone profile, EMG
Suspected sepsis	Blood / urine / sputum cultures Further imaging
Renal impairment or long lie	Creatinine kinase, urinary myoglobin
Possible thromboembolic disease	ABG, V/Q or CTPA

Figure 2. Additional investigations which may be considered in particular scenarios. ABG - Arterial blood gas; CTPA - CT pulmonary angiogram; EEG - Electroencephalogram; EMG - Electromyogram; LP - Lumbar puncture; V/Q - Ventilation / Perfusion scan.

Intervention	% Fall Risk Reduction
• Strength and balance training	15-50% ^{11,13,30,34,35,36,37}
• Vitamin-D replacement therapy	16-50% ^{38,39,40}
• Reduction in psychotropic medication	66% ⁴¹
• Early cataract surgery	34% ⁴²
• Cardiac pacemaker	58% ⁴³
• Home hazard modification	33% ¹³

Figure 3. Interventions shown to reduce the incidence of falls.

synchronously targeting intrinsic and extrinsic risk factors, falls risk can be reduced by up to 45%.^{8,10,13,,30,31,33}

Figure 3 summarises specific interventions with proven benefit. Strength and balance training is worthwhile in all cases. Long-term cholecalciferol supplementation should be reserved for those at risk of deficiency. An attempt should be made to rationalise medications with a view to withdrawing culprit agents and reducing the burden of polypharmacy. Cardiac pacing is indicated for those with high-grade conduction defects and those with cardio-inhibitory carotid sinus hypersensitivity.

Not all factors are modifiable so risk can never be completely abolished.

All frontline services should have access to a specialist multidisciplinary falls service led by a healthcare professional with appropriate skills and experience in order to optimise the outcome.

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