

## Nursing Practice Practice educator Vital signs

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Orthostatic hypotension can increase patients' risk of falls. Careful assessment is needed so that treatment and management strategies can be implemented

# Effect of orthostatic hypotension on falls risk

ORTHOSTATIC HYPOTENSION: PART 1 OF 2

### In this article...

- Causes and symptoms of orthostatic hypotension (OH)
- The link between OH and falls
- How to detect OH by measuring blood pressure

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**Abstract** Windsor J et al (2016) Orthostatic hypotension 1: effect of orthostatic hypotension on falls risk. *Nursing Times*; 112: 43/44, 11-13. Orthostatic hypotension (OH) occurs frequently in older patients, particularly when they are in hospital. It can cause lightheadedness, unsteadiness and falls. Nurses should understand the physiology of OH, and how to assess, monitor and treat it in relation to falls assessment and management. The first article in this two-part series focuses on OH, how it contributes to falls, and how nurses can identify and manage it. Part 2 ([nursingtimes.net/Hypotension2Nov9](http://nursingtimes.net/Hypotension2Nov9)) details the anatomy and physiology of blood pressure, highlighting why its regulation is so important.

Falls in hospitals are the most common patient safety incidents – more than 250,000 are reported in hospital trusts in England and Wales every year, which equates to nearly 700 a day (National Patient Safety Agency, 2010). Put another way, patient falls make up two-fifths of all reported patient safety incidents (NPSA, 2010).

Falls have both a human and financial cost: for individual patients, the consequences range from distress and loss of confidence to injuries that can cause pain and suffering, loss of independence and, occasionally, death. In addition, relatives

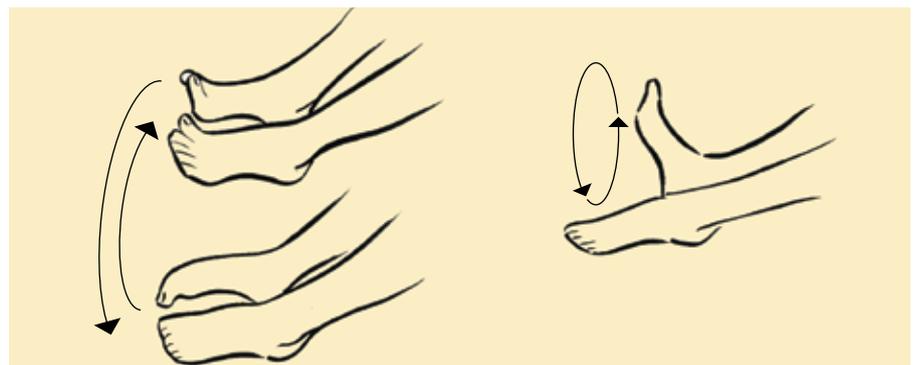
and hospital staff may often feel anxiety and guilt after a fall. The costs for health-care providers can include additional treatment, increased lengths of stay, increased care costs on discharge, complaints and, in some cases, litigation. Almost a decade ago the annual cost of treating falls in England and Wales was estimated to be £15m (NPSA, 2007); these costs are likely to be greater now.

Falls prevention in hospitals is challenging and a careful balance has to be struck between patient safety, autonomy to make their own decisions about care and risk and also issues of privacy and dignity. Although national guidance is available (National Institute for Health and Care Excellence, 2013), evidence suggests many organisations struggle to put it into practice. A recent national audit demonstrated that although many organisations had falls prevention policies in place, there was no association between what those policies included and the assessments and interventions patients actually received once they were admitted to

### 5 practice points

- 1 Know how orthostatic hypotension can contribute to falls
- 2 Understand who is at risk of orthostatic hypotension
- 3 Consider person-specific fall risks when developing interventional fall care plans
- 4 Do not use a falls risk prediction tool for inpatients
- 5 Make sure inpatients aged over 65 are offered a multifactorial falls risk assessment

FIG 1. CALF PUMP EXERCISES



Performing calf pump exercises before standing up can reduce orthostatic hypotension

hospital (Royal College of Physicians, 2015; Stevenson, 2015).

### Identifying patients at risk of falls

Patients in hospital are at increased risk of falling. Many are older people and have multiple pre-existing health problems that make them vulnerable to falls; this risk can be compounded by their acute illness, its treatment, and the fact that they are in an unfamiliar environment (Oliver et al, 2010).

In mental health care settings, patients with dementia may have a greater risk of falling associated with wandering, restlessness, and dementia-related gait disturbance and syncope/presyncope (Shaw, 2002). Additionally, the prevalence of delirium in patients over 65 in acute general hospitals has been found to be as high as one in three (British Geriatrics Society and Royal College of Physicians, 2006), making the falls prevention management of patients with impaired cognition and restlessness a challenge in all inpatient settings.

NICE (2013) published guidance on falls risk factors, the effectiveness for interventions and prevention in hospitals. A key recommendation is that hospitals stop using falls risk prediction tools – which aim to calculate patients' risk of falling ('at risk/not at risk' or 'low/medium/high risk') – due to their ineffectiveness in accurately discriminating between those with the potential to fall and those who will not fall. In addition, it has been argued that such tools may create a false dependence on scores at the expense of good clinical judgment (Haines et al, 2007). Instead, NICE advises that all patients aged 65 (and those aged 50-64 years who are considered clinically to be at risk) be offered a comprehensive multifactorial falls assessment (NICE, 2013) to prompt staff to identify and act on common reversible fall risks and formulate personalised intervention plans. A falls assessment should promptly address patients' identified individual risk factors for falling that can be treated, improved or managed during a hospital stay (Box 1).

### Orthostatic hypotension

Orthostatic hypotension (OH) is an abnormal decrease in systolic blood pressure (BP) within three minutes of standing, and has been defined as:

- » Systolic drop of >20mmHg or diastolic drop of >10mmHg and/or related symptoms;
- » Decrease in systolic BP to <90mmHg (Freeman et al, 2011; The Task Force for the Diagnosis and Management of

Syncope of the European Society of Cardiology, 2009).

It is a common disorder, particularly in older people, with symptoms ranging from visual disturbances and dizziness to syncope. Characteristic symptoms of OH include lightheadedness, visual blurring, dizziness, general weakness, fatigue, cognitive slowdown, leg buckling, 'coathanger' ache (in the shoulders and neck), and gradual or sudden loss of consciousness – as such, OH can cause falls with injuries (Lahrman et al, 2011). However, some older people do not experience symptoms, while others who fall may not remember having had the symptoms immediately beforehand, meaning that OH might be missed if not part of a structured assessment (Petkar et al, 2006).

Changing from a lying to standing position causes approximately 500ml of blood to pool in the lower extremities due to gravity. In a healthy person this is counteracted by the autonomic nervous system, which increases the heart rate, cardiac contractility and vascular tone, thereby regulating the BP to maintain adequate cerebral perfusion. Inadequate physiological response to such postural changes, especially in older people, can lead to an abnormally large drop in BP, resulting in symptoms that can increase the risk of falls. These symptoms normally resolve on returning to a seated or supine position.

Studies have reported the prevalence of OH in patients who are not acutely unwell as being 5-30% (Low, 2008), as high as 60% in patients with Parkinson's disease (Senard et al, 2001) and up to 70% of people living in care homes (Freeman et al, 2011; Lahrman et al, 2011). It is estimated that about 0.2% of people aged over 75 years are admitted to hospitals with problems relating to OH (Gibbons et al, 2010).

A recent national audit (Royal College of Physicians, 2015) identified that less than 16% of patients admitted with an acute illness had an assessment of postural BP. It appears, therefore, that opportunities are being missed to identify and manage this common potential risk factor for falls in older hospitalised patients.

Decreased autonomic function associated with normal ageing can cause OH, but in hospitals it is more commonly related to acute illness, dehydration, delirium and certain types of medications in common usage among older patients (Gibbons et al, 2010). Many different drug groups can cause OH including antihypertensives, diuretics, antidepressants, antipsychotics and those used to treat Parkinson's disease.

### BOX 1. FALLS RISK FACTORS

- Sensory impairment, especially vision and hearing
- Cognitive impairment, especially delirium and dementia
- Falls history (causes, consequences and fear of falling)
- Gait disturbances, postural instability, mobility and/or balance problems
- Continence problems
- Footwear or foot ill health
- Health problems that affect falls risk, such as stroke and Parkinson's disease
- Polypharmacy, plus 'culprit' medications that increase the risk of falls, such as antihypertensives, diuretics, antidepressants, antipsychotics
- Bone health assessment looking for osteopaenia, osteoporosis and lifestyle risks that predispose to reductions in general bone health
- Syncope assessment following suspected collapses or blackouts
- Orthostatic hypotension

Other causes of OH are:

- » Low intravascular volume (blood or plasma loss, fluid or electrolyte loss);
- » Impaired cardiac function due to structural heart disease;
- » Vasodilatation due to use of street drugs or alcohol.

Disorders such as dementia, multiple system atrophy or diabetic autonomic neuropathy are also often associated with OH.

Normally a drop in BP on standing is regulated by a physiological response called the baroreceptor reflex (see Part 2 for more detail on this reflex). However, this response can be delayed in older patients or, for example, those with extensive periods of immobility – patients who have been in bed for long periods are particularly prone to OH (NICE, 2015a). A transient low BP can lead to dizziness, postural instability and even a momentary loss of consciousness, which makes these patient groups more prone to falls. However, OH may be asymptomatic in some people and often after a fall, they may not be able to recall preceding symptoms. As the majority of hospital falls (80-90%) are reported as unwitnessed (NPSA, 2007), there is no certainty as to their cause or whether they were related to BP.

Patients with diabetic autonomic neuropathy may be more likely to fall as a result of OH (Mankovsky et al, 2003), and a study

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by Gray-Miceli et al (2012) found that many older nursing home residents did not report dizziness before falls, making it even more important for nurses to be vigilant. As a matter of good practice, health professionals should ensure that any patient who is at risk of falling, or who has fallen, should have their BP assessed at admission and after a fall (NICE, 2015b); the procedure to follow is outlined in Box 2.

### Managing OH

To successfully manage OH, nurses should:

- » Discuss a management/treatment strategy with the medical team and patient;
- » Rectify dehydration as necessary, which may include increasing oral intake or intravenous fluids if this is not possible;
- » Review medications to identify potential culprit medications;
- » Advise patients to avoid hurrying and remind them to use the call bell to get help to transfer/mobilise;
- » Consider supervision/observation needs for patients who may not be able to remember to call for help;
- » Advise patients when getting out of bed – particularly first thing in the morning or to go to the toilet at night – to safely sit on the edge of the bed with their legs hanging down for a few minutes before standing;
- » Advise patients that, before rising from a chair or, once standing still, before moving away, they should perform calf pump exercises (Fig 1) for a few moments;
- » Advise patients to avoid situations that cause vasodilation that will lower BP, such as having very hot baths or showers, or getting overheated in a warm room.

### Conclusion

Falls may be avoided with increased attention to the influences of altered BP. Nurses should take special care when patients are assessed to be at risk of falling. Opportunities should be created to discuss the risks and possible consequences from falling due to OH and how to take preventive measures. It is recommended that assessment for OH be incorporated into all basic falls assessments, care plans and educational programmes for care staff. **NT**

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## BOX 2. TAKING POSTURAL OR LYING AND STANDING BLOOD PRESSURE

- 1 Explain the procedure to the patient
- 2 Ask the patient to lie as flat as possible for at least five minutes before measurement
- 3 Measure blood pressure and pulse rate while patient is lying down
- 4 Ask patient to stand up, helping as necessary or using their normal mobility aid as required
- 5 Ensure patient remains close enough to bedside to sit down safely and quickly should severe symptoms occur or patient is unable to continue
- 6 Measure blood pressure (BP) and pulse rate immediately upon standing (or within 1 minute), then again at 3 minutes after standing
- 7 If BP is still dropping or symptoms persist (and patient can continue), repeat BP reading
- 8 Notice and document symptoms of dizziness, lightheadedness, vagueness, pallor, visual disturbance, increased postural sway, feelings of weakness (especially in legs), palpitations, shoulder or neck ache
- 9 Safely assist patient to sit down once procedure is complete
- 10 Inform medical team if there is a positive result. A positive result is:
  - A drop in systolic BP of 20mmHg or more (with or without symptoms)
  - A drop to <90mmHg systolic BP on standing even if the drop is less than 20mmHg (with or without symptoms)
  - A drop in diastolic BP of 10mmHg with symptoms (although clinically much less significant than a drop in systolic BP)
- 11 Advise patient of results and, if orthostatic hypotension is suspected, of immediate actions to prevent falls and/or unsteadiness

When carrying out the procedure, use a manual sphygmomanometer if possible. Automated sphygmomanometers may show repeated error messages. This may be due to the computerised algorithm that cannot overcome the dynamic readings associated with falling blood pressure and/or irregular heart rate (O'Brien et al, 2003).

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- Part 2: the physiology of blood pressure regulation, 9 November ([nursingtimes.net/Hypotension2Nov9](http://nursingtimes.net/Hypotension2Nov9))

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