



CLINICAL UPDATES

Postural hypotension

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What you need to know

- Postural hypotension is a drop in blood pressure (≥ 20 mm Hg systolic and/or ≥ 10 mm Hg diastolic) that occurs within 3 minutes of standing
- Test for it in people who have symptoms of lightheadedness or dizziness on changing from lying or sitting to standing posture or those with an unexplained fall
- Age over 60 years, diabetes, Parkinson's disease, and certain medications increase the risk
- The aim of treatment is to reduce symptoms (including risk of injury) and improve quality of life, rather than trying to reduce the postural drop in blood pressure
- Evidence for both non-pharmacological and pharmacological interventions is poor, making it important to identify why a patient has postural hypotension and to address the underlying condition

Postural hypotension, also called orthostatic hypotension, is an abnormal drop in blood pressure on standing. It impairs quality of life and increases risk of falls, cardiovascular disease, depression, dementia, and death.¹⁻⁴ Early detection in patients with symptoms or certain risk factors may prevent some of these complications. Current guidelines for detecting and managing postural hypotension are varied and based on limited evidence. Primary care providers play an important role in screening and detection of postural hypotension and in helping patients make shared treatment decisions to improve symptoms and reduce risk.

Sources and selection criteria

We searched Embase, Medline, the Cochrane Central Register of Controlled Trials, and Web of Science using

the terms “orthostatic hypotension,” “postural hypotension,” “orthostatic intolerance,” and “postural intolerance.” We also used personal archived references, which included our published work and National Institute for Health and Care Excellence (NICE) guidelines.

How common is it?

The prevalence of postural hypotension increases with age. One in five community-dwelling adults over 60 years old and one in four people in long term residential care have postural hypotension, as per a systematic review and meta-analysis (26 studies, >25 000 people).⁵ Two large population based studies in the US suggest it is found in <5% of people aged 45-49 years, almost 15% in those aged 65-69 years, and over 25% of those aged >85 years.⁶

Postural hypotension is likely to be common in geriatric inpatients.^{7,8} Clinical settings, encouragement to mobilise, and frequency of testing may affect prevalence in hospitals.⁸⁻¹⁰

How is it caused?

Postural hypotension occurs with an inadequate or delayed response to fluid shifts in the body on standing. This leads to an exaggerated drop in systolic blood pressure (≥ 20 mm Hg) and/or diastolic blood pressure (≥ 10 mm Hg) on standing.⁹ Figure 1 depicts the mechanism. “Classic” postural hypotension occurs within three minutes of standing, “delayed” postural hypotension occurs after three minutes. Most studies have investigated classic postural hypotension, and less is known about delayed postural hypotension.¹¹

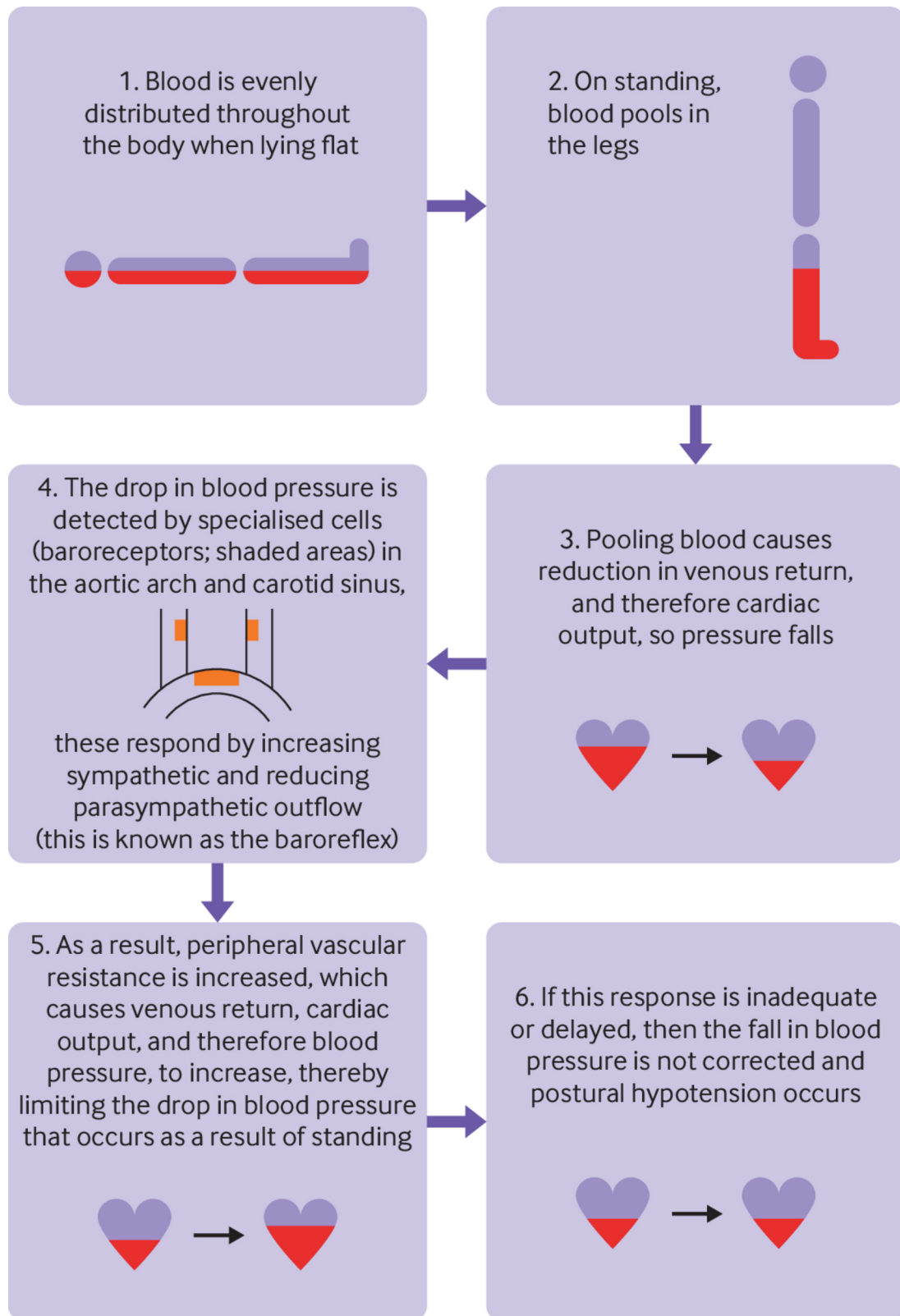


Fig 1 | The normal physiological response to change of position from lying to standing: the response is coordinated through neuronal and non-neuronal mechanisms

A coordinated response of the autonomic nervous system helps to maintain blood pressure. Box 1 lists the neurogenic or non-neurogenic conditions that may affect this response and cause postural hypotension. About a quarter of patients with diabetes

have postural hypotension, as per a systematic review and meta-analysis (21 studies, 13772 patients).¹³ High HbA1c, hypertension, and diabetic neuropathy increase its likelihood. About

a third of patients with Parkinson's disease have postural hypotension.¹⁴

Box 1: Conditions that can cause postural hypotension^{17 20}

Neurogenic causes

- *Neurodegenerative disease*—Such as Parkinson's disease, Parkinson-plus syndromes
- *Peripheral neuropathy*—Such as diabetes, vitamin B12 deficiency, renal failure, amyloidosis, rheumatological, autoimmune, and paraneoplastic conditions

Non-neurogenic causes

- *Volume depletion*—Anaemia, dehydration, haemorrhage, hyperglycaemia
- *Cardiovascular disease*—Aortic stenosis, hypertension, heart failure, atherosclerosis or vascular stiffening, arrhythmias
- *Other*—Adrenal insufficiency, physical deconditioning, ageing

Either mechanism

- *Medications*—a blockers, antihypertensives, nitrates, diuretics, selective serotonin reuptake inhibitors, tricyclic antidepressants, antipsychotics, β blockers
 - Short term: diuretic effect, impairment of vasoconstriction¹²
 - Long term or chronic: neurotoxic effects
- *Idiopathic*

Medications can cause postural hypotension as an adverse reaction. Individual susceptibility, age, comorbidities and polypharmacy determine whether a patient develops postural hypotension.^{15 16} The number of antihypertensive drugs prescribed may be more predictive of postural hypotension than an individual class of drug.¹⁷

Why does it matter?

Postural hypotension worsens physical function and impairs balance and ability to perform activities of daily living.¹⁸ Large meta-analyses reported increased risk of falls (odds ratio 1.73, 95% confidence interval 1.50 to 1.99¹), heart failure (hazard ratio 1.34, 95% CI 1.17 to 1.52¹⁹), coronary heart disease (hazard ratio 1.44, 1.18 to 1.75¹⁹), stroke (hazard ratio 1.64, 1.13 to 2.37²), atrial fibrillation (hazard ratio 1.51, 1.28 to 1.79¹⁹), and all-cause mortality (relative risk 1.50, 1.24 to 1.81²) with postural hypotension. Small studies point to an increased risk of cognitive impairment, dementia, and depression.³⁴ It is unclear if risk differs between symptomatic and asymptomatic patients and between age groups.

How do patients present?

Symptoms are triggered by changes in posture and usually resolve with lying down or sitting. Patients may present with lightheadedness or dizziness, transient loss of consciousness, or falls. **Box 2** lists symptoms of postural hypotension.²⁰ Symptoms may occur first thing in the morning, as the patient gets up from bed, or throughout the day, as they change position from lying to standing, sitting to standing or even lying to sitting. It is unclear how diagnostic these symptoms are, but if these occur in relation to changes in posture, they should prompt a check for postural hypotension.

Box 2: Presenting symptoms of postural hypotension²⁰

Common symptoms

- Lightheadedness (feeling faint)
- Dizziness (spinning sensation or feeling off balance)
- Transient loss of consciousness
- Falls

Less common, non-specific

- Blurry vision
- Visual field deficits
- Difficulty concentrating
- Cognitive slowing
- Weakness
- Fatigue
- Shortness of breath
- Chest pain
- Backache
- Lower extremity pain
- "Coathanger" headache (headache in the suboccipital region and neck pain in the posterior cervical and shoulder regions)

Some patients have no symptoms and postural hypotension is detected incidentally on clinical examination. In a small observational study, about a third had postural hypotension but were asymptomatic.^{21 22} The clinical significance of asymptomatic postural hypotension is not established.

What to cover on clinical assessment?

Ask about the nature of symptoms, their onset in relation to changes in posture and if they are persistent/recurrent or isolated. Factors such as diurnal variability, food intake, hydration, ambient temperature, prolonged recumbency, and deconditioning can affect symptoms.⁹ Seek to identify the cause(s) of postural hypotension, which may be multifactorial. Medication history is important, particularly if symptoms appeared after initiation of a drug.

Tailor clinical examination to identify features related to symptoms and probable causes. A patient with palpitations may have a murmur suggestive of structural abnormality of the heart, while a patient who describes slowness of movement and tremor may have hypomimia and rigidity, suggestive of Parkinson's disease.

Postural blood pressure measurement

The UK's National Institute for Health and Care Excellence (NICE) guidelines advise assessing for postural hypotension in patients who are symptomatic or those who present with a fall.²³

Take lying and standing blood pressure measurements and check for a drop in systolic blood pressure ≥ 20 mm Hg and/or diastolic blood pressure ≥ 10 mm Hg within three minutes of standing.²³ Measurement beyond three minutes of standing may be necessary if a patient reports symptoms occurring after this time, otherwise delayed postural hypotension may be missed. Guidelines vary widely in recommendations on how to measure postural blood pressure measurements (**table 1**). It is advisable to take multiple lying and standing measurements.

Table 1 | Guidelines regarding the measurement of blood pressure to detect postural hypotension

Guideline or source	Drop in blood pressure to diagnose postural hypotension	Specific instructions*
Updated consensus statement (2011) endorsed by American Autonomic Society, European Federation of Autonomic Societies, Autonomic Research Group of the World Federation of Neurology, and Autonomic Disorders section of the American Academy of Neurology ⁹	≥20 mm Hg systolic <i>or</i> ≥10 mm Hg diastolic	<ul style="list-style-type: none"> Record standing measurement within 3 minutes of standing, though "some patients present with symptomatic orthostatic hypotension that occurs beyond 3 minutes of standing." Number of standing measurements not specified, but the decrease in blood pressure should be "sustained."
Hypertension Canada (2018) (see supplementary material within guideline) ²⁴	Not specified	<ul style="list-style-type: none"> Measure baseline blood pressure in seated position after 5 minutes of sitting. Obtain three measurements, discard the first and average the last two. For baseline blood pressure, "supine blood pressure measurements may also be helpful in the assessment of elderly and diabetic patients." Measure standing blood pressure 2 minutes after standing and at times when symptoms of postural hypotension are reported.
UK National Institute for Health and Care Excellence (NICE): Transient loss of consciousness ('blackouts') in over 16s(2010) ²⁵	"Marked fall in blood pressure"; thresholds not specified	<ul style="list-style-type: none"> Obtain baseline measurement in the supine position, followed by "repeated measurements" while standing for 3 minutes.
NICE: Hypertension in adults (2019) ²³	≥20 mm Hg systolic	<ul style="list-style-type: none"> Obtain at least one measurement in the supine or sitting position followed by standing blood pressure after ≥1 minute of standing.
European Society of Hypertension/ European Society of Cardiology (2018) ²⁷	≥20 mm Hg systolic <i>or</i> ≥10 mm Hg diastolic	<ul style="list-style-type: none"> Baseline blood pressure may be obtained in seated position after sitting for 5 minutes. Measure three times, discard first and average the last two. Supine measurements should be "considered in subsequent visits in older people, people with diabetes, and people with other conditions in which postural hypotension may frequently occur." Measure blood pressure at 1 and 3 minutes after standing.
National Heart Foundation of Australia (2016) ²⁸	Not specified	<ul style="list-style-type: none"> Measure baseline blood pressure after sitting for several minutes. Measure at least three times and average the last two. Measure blood pressure after standing for at least 2 minutes.
American College of Cardiology/American Heart Association (2017) ²⁹	≥20 mm Hg systolic <i>or</i> ≥10 mm Hg diastolic	<ul style="list-style-type: none"> Have patient relax in a seated position (with feet flat on the floor and back supported) for >5 minutes before obtaining baseline blood pressure. Measure blood pressure in the seated position, immediately after rising, and again 1 and 2 minutes after standing.[‡]³⁰
Royal College of Physicians (UK) (2017) ³¹	≥20 mm Hg systolic <i>or</i> "A drop to below 90 mm Hg on standing even if the drop is less than 20 mmHg" <i>or</i> ≥10 mm Hg diastolic	<ul style="list-style-type: none"> Measure baseline blood pressure in supine position after lying for at least 5 minutes (one measurement) After standing, obtain one measurement "in the first minute"; second measurement "after standing for three minutes." Repeat standing measurements "if the blood pressure is still falling."

* Salient instructions from each guideline are highlighted

† Diagnosis can also be made based on these thresholds using a head-up tilt to at least 60° on a tilt table.⁹ In patients with supine hypertension, a decrease ≥30 mm Hg systolic blood pressure "may be a more appropriate criterion."⁹

‡ From the American Heart Association 2019 Scientific Statement on Measurement of Blood Pressure in Humans³⁰

For convenience or practical reasons, sitting and standing (and occasionally lying and sitting) measurements are sometimes used. The optimal thresholds for a diagnosis based on these measurements are not known.³²⁻³⁴ If an exaggerated drop in blood pressure is not found, lying and standing measurements may be more likely to detect postural hypotension. Measuring postural hypotension can be time consuming in a busy practice. Involve allied healthcare professionals in taking postural measurements on the day of the appointment, as is done in falls clinics.

Repeating measurements at a later point in time increases detection rates.¹⁰ Serial home postural blood pressure measurements (morning and evening), either by patients themselves or their carers, may be considered if feasible and the patient is sufficiently mobile. It may be inappropriate in patients with severe symptoms at high risk of falls who cannot be supported while taking measurements.

Note changes in heart rate when taking lying and standing blood pressure measurements. If postural hypotension is found, an accompanying increase in heart rate of <15 beats per minute may suggest a neurogenic cause,³⁵ and an increase in heart rate of >15 beats per minute may suggest a non-neurogenic cause.³⁵ Heart rate is a non-specific indicator of underlying cause and may not be accurate if, for example, the patient is taking a β blocker.

Whom to screen for postural hypotension?

Screening in the general population is not recommended but may be considered in certain patients. For example, NICE guidelines advise checking for postural hypotension in patients who have hypertension alongside type 2 diabetes or who have hypertension and are aged 80 years and over.²³ The American Diabetes Association recommends assessment for postural hypotension during initial evaluation of hypertension in all patients with

diabetes, and periodically at follow-up even in the absence of symptoms.³⁶ Consensus recommendations by an expert panel³⁵ suggest screening in patients suspected of, or diagnosed with, any neurodegenerative condition associated with autonomic dysfunction (such as Parkinson's disease) and in patients with peripheral neuropathies known to be associated with autonomic dysfunction (such as diabetes).

What differential diagnoses to consider?

Patients may experience similar symptoms triggered by meals in post-prandial hypotension.³⁷ Vasovagal syncope (commonly referred to as a "faint") may be accompanied by an acute drop in blood pressure when standing. It is usually precipitated by emotional stress, pain, heat, dehydration, or a period of prolonged sitting or standing³⁸ and tends to occur in younger, otherwise healthy adults. There may be prodromal symptoms such as sweating, nausea, and pallor before the transient loss of consciousness.

Carotid sinus syndrome causes syncope, near-syncope, or unexplained falls due to carotid sinus hypersensitivity. Like postural hypotension, it is more common in older people³⁹ and is difficult to distinguish clinically. The two conditions cause similar symptoms and may coexist. Tilt-table testing may help in a diagnosis. This is done in a specialist cardiology setting for patients with syncope of uncertain origin. The patient is put under positional or orthostatic stress in a controlled and monitored setting.

What are the investigations?

Investigations are chosen on a case-by-case basis because of the wide range of possible causes, but they may not be necessary if a drug related cause is suspected. Depending on the history, tests in primary care may include:

- Bloods—full blood count if the patient has chronic bleeding or anaemia, urea and electrolytes, HbA1c for diabetes, vitamin B12
- Electrocardiography—if an arrhythmia is suspected
- Echocardiogram—if a structural heart problem is suspected.

How is it managed?

The aim of treatment is to reduce symptoms and risk of injury. The aim is not to try to normalise the magnitude of the postural fall in blood pressure because its correlation with symptoms²² and the risk of complications is not established. Asymptomatic postural hypotension is not currently treated. Some patients may not meet the defined criteria for a diagnosis of postural hypotension despite having symptoms and home measurements showing a postural drop in blood pressure. Their symptoms are managed as those with confirmed postural hypotension.

Address reversible causes

Some causes of postural hypotension are permanent (such as Parkinson's disease) and cause recurring symptoms, whereas others are transient (such as anaemia) that can be corrected. Address reversible causes such as drugs, infection, dehydration, and anaemia. Consider stopping or reducing the dose of an offending drug or using a modified-release preparation. Reassess the patient after an appropriate washout period based on the pharmacokinetics and half-life of the specific drug. The withdrawn drug may be replaced by another drug, or the underlying condition may be adequately managed without the drug.

While epidemiological studies show an association between higher HbA1c and postural hypotension, it is uncertain if lowering the HbA1c reduces the incidence or severity of postural hypotension.

Conservative measures to improve symptoms

Help patients understand what postural hypotension is, what causes it, and what may make it worse (box 3). Prolonged standing, eating large meals, drinking alcohol, deconditioning, dehydration, hot environment, taking hot baths or showers, and straining^{9 20} may worsen symptoms in some patients. Box 4 lists common non-pharmacological measures that may be suggested in practice. Recent systematic reviews highlight a lack of evidence on these measures.^{20 40 41} Studies are limited in number, and most are small with short follow-up times. Lower limb and abdominal compression therapy may offer some benefit, but the evidence is of very low quality.⁴⁰

Box 3: What patients need to know

- Postural hypotension is a drop in blood pressure on standing or changing position. If you feel lightheaded or dizzy when you stand up, or if you have fallen or fainted after getting up from a sitting or lying position, you may have postural hypotension. Some people with postural hypotension feel fatigue, weakness, or trouble concentrating when changing positions.
- Postural hypotension affects about 1 in 5 (20%) of adults over the age of 60 years.
- Your GP can help diagnose it and discuss how best to treat your symptoms.
- Depending on what's causing it, postural hypotension may not be eliminated or cured completely. The goal of treatment will be to alleviate your symptoms and lower the risk of having a fall.
- Simple lifestyle changes may help relieve some symptoms, such as avoiding sudden and quick movements when changing position from sitting to standing or lying to standing.
- If lifestyle changes aren't enough to control the symptoms, prescription medication may be helpful. Choosing the right medication for you depends on your symptoms, your overall health, and other medications you may be taking.
- There is uncertainty about which treatment options work best. Certain medications (fludrocortisone, midodrine, and droxidopa) might relieve your symptoms, but the studies are small in number. If you choose to take a medication, your doctor will closely monitor your health to make sure you are benefiting from the medication, while avoiding any side effects.

Box 4: Non-pharmacological treatments for postural hypotension

- Change position slowly and in stages (from lying to sitting to standing), rather than changing from lying to standing in a swift motion
- Maintain adequate hydration
- Avoid alcohol, large meals, very warm environments, and hot showers or baths
- Sleep with the head of the bed elevated
- Exercise programmes
- Physical manoeuvres such as crossing the legs while standing and tensing the muscles in the legs and buttocks after standing
- Lower limb compression
- Abdominal binders

Referral and medications

Offer referral to a specialist if symptoms are not controlled or are persistent and frequent, or if the cause is unexplained. Specialist referral is based on the patient's age, symptoms, and medical conditions. For example, a young patient with repeated unexplained syncopal symptoms and palpitations would be referred to a

cardiologist, an older patient with bradykinesia and a shuffling gait would be referred to a neurologist, and an elderly frail patient with multimorbidity and polypharmacy with recurrent falls would be referred to a geriatrician.

Pharmacological treatment is usually started by a specialist if symptoms are not well controlled by conservative measures. Treatment may be continued or modified in primary care. Prescribing practices vary and are governed by local guidelines. In the UK, for example, the use of fludrocortisone for postural hypotension is off-label. Midodrine is indicated only for people with postural hypotension due to autonomic dysfunction, and its use for other types of postural hypotension is off-label.⁴² Droxidopa does not yet

have market authorisation for use in postural hypotension in the UK.

Fludrocortisone, midodrine, and droxidopa may each reduce some of the symptoms of postural hypotension as per systematic reviews and meta-analyses. The evidence is weak and mainly drawn from small randomised controlled trials using different outcome measures and with short follow-up.⁴³⁻⁴⁵ It is not known how long patients should try treatment before they can expect to see benefit from it. [Table 2](#) lists suggested doses and side effects of these drugs. Plan regular review with the patient and consider increasing the dose if symptoms remain poorly controlled. The drug may be discontinued if side effects worsen a patient's quality of life.

Table 2 | Summary of pharmacological treatment options for postural hypotension (based on NICE evidence summaries,^{26,42} the *British National Formulary* (BNF), electronic medicines compendium (emc), and American Autonomic Society and National Parkinson Foundation recommendations³⁵)

Medication	Mechanism of action	Dose	Common or very common adverse reactions	Other considerations
Fludrocortisone	Synthetic adrenocortical steroid that increases plasma volume by promoting sodium reabsorption	Initial dose 100 µg daily; may be increased to 200 µg daily Maximum dose of 300 µg daily not typically used because increase in side effects without additional therapeutic benefit	<ul style="list-style-type: none"> Hypokalaemia, oedema, congestive heart failure, hypertension, headache, muscular weakness, a wide range of psychiatric and psychotic reactions 	<ul style="list-style-type: none"> Monitor electrolytes closely during initiation and periodically during maintenance therapy Monitor for development of hypertension, oedema, or weight gain Use cautiously in patients with heart failure or hypertension Contraindicated in systemic infections unless specific anti-infective therapy is given Prolonged courses can increase susceptibility to infection Withdrawal after prolonged therapy must be gradual to avoid acute adrenal insufficiency People taking fludrocortisone should carry a steroid treatment card Fludrocortisone and midodrine may be used as combination therapy but this may increase risk of glaucoma and increased intraocular pressure, so requires careful monitoring
Midodrine	Prodrug of a sympathomimetic agent which increases vasoconstriction and arterial resistance	Initial dose 2.5 mg three times daily; may be increased weekly up to 10 mg three times daily	<ul style="list-style-type: none"> Piloerection, scalp itching, dysuria, supine hypertension, headache, paraesthesia, nausea, dyspepsia, stomatitis, chills, flushing, pruritus, rash, urinary retention 	<ul style="list-style-type: none"> Measure liver and renal function before treatment and at regular intervals during treatment Monitor supine and standing blood pressure Tell patients to report symptoms of supine hypertension immediately (such as chest pain, palpitations, shortness of breath, headache and blurred vision) and monitor for these Avoid concomitant use of other sympathomimetics (such as tricyclic antidepressants, antihistamines) as pronounced increase in blood pressure may occur Use cautiously in elderly patients and those with atherosclerotic heart disease Has several contraindications including severe organic heart disease (such as bradycardia, heart attack, congestive heart failure, cardiac conduction disturbances or aortic aneurysm), hypertension, acute kidney disease, severe renal impairment, serious prostate disorder, urinary retention, proliferative diabetic retinopathy, pheochromocytoma, hyperthyroidism and narrow angle glaucoma. Last dose should be taken at least 4 hours before bedtime to reduce risk of supine hypertension

Table 2 | Summary of pharmacological treatment options for postural hypotension (based on NICE evidence summaries,^{26 42} the *British National Formulary* (BNF), electronic medicines compendium (emc), and American Autonomic Society and National Parkinson Foundation recommendations³⁵) (Continued)

Medication	Mechanism of action	Dose	Common or very common adverse reactions	Other considerations
Droxidopa	Prodrug of noradrenaline; the exact mechanism of action is not known, but may be through increased circulating noradrenaline	Initial dose 100 mg three times daily; may be increased every 24-48 hours to maximum 600 mg three times daily	• Headache, nausea, dizziness, hypertension and supine hypertension, falls, urinary tract infections, syncope	<ul style="list-style-type: none"> • May exacerbate existing ischaemic heart disease, arrhythmias, and congestive heart failure • May cause or exacerbate supine hypertension • Dosing adjustments in patients with severe renal impairment are not known due to lack of data • A symptom complex resembling neuroleptic malignant syndrome has been reported (be aware of symptoms of hyperpyrexia and confusion). • Last dose should be taken at least 4 hours before bedtime to reduce risk of supine hypertension

Special considerations in hypertensive patients

Clinicians may worry that tight control of blood pressure in a hypertensive patient may cause or worsen postural hypotension.⁴⁶ It may not be necessary to compromise blood pressure targets in people with postural hypotension, rather uncontrolled hypertension may worsen postural hypotension.⁴⁶ In a large randomised controlled trial, more intensive blood pressure targets (systolic blood pressure ≤ 120 mm Hg) were not more likely to cause postural hypotension than standard targets (systolic blood pressure ≤ 140 mm Hg), but syncope was more common.⁴⁷ A recent systematic review and meta-analysis showed that lower blood pressure treatment goals decreased the risk of postural hypotension.⁴⁸

Different drug classes (such as α blockers, β blockers, calcium channel blockers, diuretics, ACE inhibitors, and angiotensin II antagonists) confer different risk of postural hypotension,¹⁷ and reports linking particular antihypertensive drugs to postural hypotension are inconsistent.¹⁵ The number of drugs taken may be more predictive of postural hypotension than individual drug classes.¹⁷

If a patient with postural hypotension is taking multiple drugs, discontinuing any one of them is likely to reduce symptoms. The choice of drug depends on the individual circumstances of a patient. For example, if a patient with heart failure who is taking a β blocker, ACE inhibitor, and α blocker develops postural hypotension, it would be reasonable to reduce the dose (or stop altogether) the α blocker in the first instance. The β blocker and ACE inhibitor are more likely to be cardioprotective and therefore important prognostically for a patient with heart failure. Reassess patients for symptoms of postural hypotension and monitor blood pressure, either through home blood pressure readings or 24 hour blood pressure monitoring.

Postural hypertension

Less common than postural hypotension, a patient's blood pressure may sometimes rise on standing.⁴⁹ Postural hypertension remains an under-appreciated clinical finding. There is no consensus on what defines an "exaggerated" increase in blood pressure. Most studies consider it an increase in systolic blood pressure ≥ 20 mm Hg. More recent definitions mirror the thresholds for postural hypotension and include an increase in diastolic blood pressure ≥ 10 mm Hg as well.⁴⁹ Its prevalence ranges

from 1.1% to almost 40%, depending on the cohort studied and definition used.⁴⁹ Some observational studies suggest it may increase risk of cardiovascular morbidity, including myocardial infarction and stroke, cardiovascular-related mortality and all-cause mortality.⁴⁹ Further research is needed on the clinical relevance of postural hypertension and the risk of adverse health outcomes to determine if postural variability of blood pressure (regardless of whether it is an increase or decrease) is a worrying clinical sign.

Questions for future research

- What are the health implications of delayed versus classic postural hypotension?
- What is the clinical significance of asymptomatic postural hypotension?
- What is the best way to measure or detect postural hypotension?
- What is the correlation between improvement in the magnitude of the drop in postural blood pressure and symptoms, and how does this translate into reduced risk of complications?
- What non-pharmacological management options are effective at reducing symptoms of postural hypotension and the risk of a fall?

Additional educational resources

- Magkas N, Tsioufis C, Thomopoulos C, et al. Orthostatic hypertension: From pathophysiology to clinical applications and therapeutic considerations. *J Clin Hypertens (Greenwich)* 2019;21:426-33
- Ricci F, De Caterina R, Fedorowski A. Orthostatic hypotension: epidemiology, prognosis, and treatment. *J Am Coll Cardiol* 2015;66(7):848-60
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- National Institute for Health and Care Excellence. Orthostatic hypotension due to autonomic dysfunction: midodrine. 2015. <https://www.nice.org.uk/advice/esnm61/chapter/Key-points-from-the-evidence>.
- The Princess Alexandra Hospital NHS Trust and West Essex Clinical Commissioning Group. Management of Orthostatic (postural) Hypotension. <https://westessexccg.nhs.uk/your-health/medicines->

[optimisation-and-pharmacy/shared-care-medicines/259-orthostatic-hypotension-shared-care-agreement/file](https://www.bmj.com/optimisation-and-pharmacy/shared-care-medicines/259-orthostatic-hypotension-shared-care-agreement/file)

Information resources for patients

- Centers for Disease Control and Prevention. *Postural hypotension: What it is and how to manage it*. https://www.cdc.gov/steady/pdf/Postural_Hypotension-print.pdf (Free patient information leaflet)

Education into practice

- What is the protocol for taking postural blood pressure measurements at your clinic?
- How would you approach a patient with postural hypotension related to a medication?

How patients were involved in the creation of this article

A patient partner through the Patient and Family Advisory Council at Beth Israel Deaconess Medical Center reviewed the manuscript and provided feedback on sections related to education, management, and goals of therapy for postural hypotension. She was instrumental in creating the box on what patients need to know. We are grateful for her input.

Contributors: AG had the idea for the article, performed the literature search, and wrote the article. All authors then reviewed and revised the content. All authors approved the final version to be published. AG is the guarantor.

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