

## Postural (orthostatic) hypotension

This is summarised from a BMJ review of the topic ([BMJ 2021;373:n922](#)).

### What are we talking about?

A drop in BP when going from lying/sitting to standing **that is accompanied by symptoms**.

The BMJ gave 8 different definitions from 8 different guidelines. In practice, most of us will follow the recommendation in the NICE hypertension guidance:

- **A drop of  $\geq 20$ mmHg in SYSTOLIC BP on standing for 1 minute (from sitting/lying)** (NICE NG 136, 2019).

To look for this:

- **Take the blood pressure sitting or lying. Stand the patient up and check BP after they have been standing for at least a minute.**

However, if there has been a **loss of consciousness**, you might want to follow the NICE guidance on transient loss of consciousness (NICE CG 109, 2010) which recommends:

- Measure BP while lying down, then stand and do repeated BP readings for 3 mins. Unfortunately, NICE does not specify what a 'significant' BP drop is in the context of transient loss of consciousness.

The BMJ article also stresses the importance of measuring the pulse as well as the BP – something not mentioned in the NICE hypertension guidance. More on that later!

### Why does it matter?

Postural hypotension:

- Puts people at risk of falls.
- Impairs quality of life.
- Increases the risk of CVD (coronary heart disease, heart failure, stroke, AF), depression, dementia and death.

### Pathophysiology

On standing, blood pools in the legs. This reduces venous return to the heart, so cardiac output and blood pressure fall. Baroreceptors around the aortic arch and carotid sinus detect this and trigger the baroreflex (increase sympathetic drive, reduce parasympathetic drive), resulting in increased peripheral resistance, increasing venous return and correcting things.

If these mechanisms are impaired by drugs, diseases or ageing, postural hypotension develops.

### Presenting symptoms

Symptoms commonly occur first thing in the morning on getting out of bed, but may also occur during the day.

Establish whether this was a single isolated episode or a regular issue.

Common symptoms	Less common and less specific symptoms
<ul style="list-style-type: none"> <li>• Dizziness:               <ul style="list-style-type: none"> <li>◦ Light-headedness (feeling as if will faint).</li> <li>◦ Rotational dizziness.</li> </ul> </li> <li>• Falls.</li> <li>• Transient loss of consciousness.</li> </ul>	<ul style="list-style-type: none"> <li>• Visual symptoms: blurry vision/visual field defects.</li> <li>• Cognitive symptoms: difficulty concentrating, cognitive slowing.</li> <li>• Weakness or fatigue.</li> <li>• Shortness of breath, chest pain, backache, lower extremity pain (presumably due to insufficient arterial supply).</li> <li>• 'Coat-hanger headache' (headache across the shoulder, up the back of the neck and into the suboccipital region – presumably also caused by insufficient arterial supply).</li> </ul>

**NOTE: 'orthostatic' hypotension that does not correct on lying flat is NOT orthostatic hypotension!**

## Who might have it?

- Obviously, those who present with **classical symptoms**.
- In addition, the NICE guidance on hypertension recommends that we look for it in those with hypertension who:
  - **Are aged  $\geq 80y$**  (prevalence may be as high as 25% in those over 85y!).
  - **Have type 2 diabetes**.
- It may also be sensible to consider it in those with **autonomic dysfunction** such as Parkinson's disease **or autonomic neuropathies**, even in the absence of symptoms.

## Causes

- Try to establish (and treat if possible) the cause. Remember that some people will have several causes.
- Identifying reversible factors is particularly important as these can be modified (e.g. physical deconditioning, volume depletion, drugs).
- Causes are often separated into neurogenic and non-neurogenic. On standing, the pulse should rise as part of the compensatory mechanisms. If this is absent, this may indicate a neuropathic (neurogenic) cause, BUT this isn't definitive and can be affected by other factors, e.g. beta-blockers may inhibit a heart rate rise.
  - Postural hypotension with an **increase in heart rate of  $< 15bpm$  suggests a neuropathic cause** (defective adrenergic vasoconstriction/autonomic failure) (Tip to remember this: '*Dodgy nerves don't increase heart rate*').

Neuropathic causes (often referred to as neurogenic)	Other causes	Drugs causes
<ul style="list-style-type: none"> <li>• Neurodegenerative disease, e.g. Parkinson's disease.</li> <li>• Peripheral neuropathy:               <ul style="list-style-type: none"> <li>◦ Diabetes.</li> <li>◦ B12 deficiency.</li> <li>◦ Renal failure.</li> <li>◦ Rheumatological.</li> <li>◦ Autoimmune.</li> <li>◦ Amyloidosis.</li> <li>◦ Paraneoplastic states.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Physical deconditioning.</li> <li>• Ageing.</li> <li>• Alcohol.               <ul style="list-style-type: none"> <li>◦ Short term through diuresis and impaired vasoconstriction.</li> <li>◦ Long term through neurotoxic effects.</li> </ul> </li> <li>• Adrenal insufficiency.</li> <li>• Idiopathic.</li> <li>• Volume depletion:               <ul style="list-style-type: none"> <li>◦ Dehydration.</li> <li>◦ Anaemia.</li> <li>◦ Haemorrhage.</li> </ul> </li> <li>• Cardiovascular:               <ul style="list-style-type: none"> <li>◦ Hypertension.</li> <li>◦ Heart failure.</li> <li>◦ Aortic stenosis.</li> <li>◦ Atherosclerosis or vascular stiffening.</li> <li>◦ Arrhythmias.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Cardiovascular:               <ul style="list-style-type: none"> <li>◦ Antihypertensives (number of antihypertensives prescribed might be more important than drug class).</li> <li>◦ Nitrates.</li> <li>◦ Diuretics.</li> <li>◦ Alpha-blockers.</li> <li>◦ Beta-blockers.</li> </ul> </li> <li>• Psychiatric:               <ul style="list-style-type: none"> <li>◦ SSRIs.</li> <li>◦ Tricyclics.</li> <li>◦ Antipsychotics.</li> </ul> </li> </ul>

## Differential diagnosis

- Post-prandial hypotension.
- Vasovagal syncope:
  - Look for the 3Ps: provoking factors (e.g. in a hot room, having blood taken); posture (e.g. standing still); prodrome (building sensation that they are going to pass out).
  - Usually in a younger population.
- Carotid sinus syndrome:
  - Can cause syncope or near syncope.
  - More common in older people.
  - Difficult to distinguish clinically from postural hypotension. Tilt table testing helps distinguish between the two.

## Investigations

- Examination: targeted to look for probable causes.
- Bloods:

- o FBC (anaemia), renal function, HbA1c (diabetes), B12 (peripheral neuropathy).
- ECG if arrhythmia suspected.
- Echocardiogram if structural heart problem suspected, e.g. murmur.

## Management

Key principles:

- Aim of treatment is to reduce symptoms and reduce risk of injury, NOT to reduce the drop in blood pressure. Why? There is a poor correlation between the degree of drop, the symptoms people feel and the chance of complications such as falls. Treat the patient not the BP!
- Asymptomatic postural hypotension does not need treating.

In practice, this means:

- Treat reversible causes: drugs, infection, anaemia, dehydration. Hypotension in diseases such as Parkinson's may be untreatable.
  - o With drugs, consider stopping, reducing the dose or swapping to longer-acting versions (if available).
  - o For those on antihypertensives, the number of drugs taken may be more important than the class. When deciding which antihypertensive to stop, look at other comorbidities, e.g. if they have diabetes, stop other antihypertensives before stopping the ACE/ARB.
- Simple lifestyle changes.
- Refer if persistent, frequent symptoms or the cause is unexplained.
  - o Who to refer to? Depends on age of patient and what you think the underlying cause is: younger people may well have a cardiac cause; older people with any features of Parkinson's should be referred to neurology; older people with multi-morbidity should be referred to gerontology.
- Drug treatment: if suggested by the specialist.

### Which lifestyle changes can help?

- Change position slowly and avoid sudden changes in posture (from lying/sitting to standing).
- Avoid things that are likely to make it worse:
  - o Prolonged standing.
  - o Large meals, alcohol and dehydration.
  - o Hot environments or hot baths/showers.
  - o Straining on the toilet (may make the symptoms worse in some).
- Deconditioning worsens symptoms so physical activity may help.
- If standing, crossing the legs and tensing the muscles in the legs/buttocks may help.
- Sleep with head of bed elevated.
- Lower limb compression and abdominal binders have been suggested, but there is limited evidence for this.

### Drug treatment

Usually started by a specialist after an appropriate work-up. The evidence for any of these treatments is weak.





<b>Fludrocortisone</b> <i>Action: increases plasma volume by promoting sodium reabsorption</i>	
<b>Dose</b>	<b>Common side-effects</b>
Initially 100mcg daily. May be increased to 200mcg. Maximum dose (300mcg) is rarely used because of increased side-effects without additional therapeutic benefit. <ul style="list-style-type: none"> <li>• Caution in those with heart failure or hypertension.</li> <li>• <b>Can cause adrenal suppression – do not stop suddenly and ensure patient carries a Steroid Emergency Card.</b></li> </ul>	<ul style="list-style-type: none"> <li>• Hypokalaemia.</li> <li>• Oedema, heart failure.</li> <li>• Hypertension.</li> <li>• Headache.</li> <li>• Muscle weakness.</li> <li>• Psychiatric symptoms, including psychosis.</li> </ul>
<b>Monitoring</b>	
<ul style="list-style-type: none"> <li>• Monitor electrolytes 'closely' during initiation and periodically during maintenance therapy (frequency of monitoring not defined in BNF or SPC).</li> <li>• Monitor for hypertension, oedema and weight gain.</li> </ul>	
<b>Midodrine</b> <i>Action: sympathomimetic. Increases vasoconstriction. Usually used in those with autonomic dysfunction</i>	
<b>Dose</b>	<b>Common side-effects</b>
Initially 2.5mg three times daily.	<ul style="list-style-type: none"> <li>• Pruritis, itchy scalp, rash, piloerection.</li> </ul>

<p>May be increased in weekly increments to 10mg three times daily. Last dose should be taken at least 4h before bedtime to avoid supine hypertension.</p> <ul style="list-style-type: none"> <li>• Avoid use with other sympathomimetics (e.g. tricyclics, anti-histamines) as may cause very high BP.</li> <li>• Caution in elderly/those with atherosclerotic heart disease.</li> </ul>	<ul style="list-style-type: none"> <li>• Dysuria, urinary retention.</li> <li>• Headache.</li> <li>• Paraesthesia.</li> <li>• Nausea, dyspepsia.</li> <li>• Stomatitis.</li> <li>• Chills/flushing.</li> </ul>
<p><b>Monitoring</b></p>	
<ul style="list-style-type: none"> <li>• Check renal function and LFTs before initiation and at regular intervals during treatment (interval not specified).</li> <li>• Monitor supine and standing BP.</li> <li>• Patient must report symptoms of supine hypertension (chest pain, palpitations, shortness of breath, headache, blurred vision).</li> </ul>	

### **Asymptomatic postural hypotension**

The BMJ article says that the clinical significance of asymptomatic postural hypotension isn't known and is not usually treated. We shouldn't screen for postural hypotension in the general population. However, NICE asks us to screen for postural hypotension in those with hypertension who have type 2 diabetes or who are 80y or older. WHY?

This is to avoid overtreatment. In those with hypertension who also have postural hypotension, we should aim for the same BP target (140/90, unless  $\geq 80y$  when the target is 150/90, etc.), but this target should always be based on the STANDING blood pressure to avoid overtreatment.

	<p><b>Postural (orthostatic) hypotension</b></p> <ul style="list-style-type: none"> <li>• Commonly presents with: <ul style="list-style-type: none"> <li>◦ Dizziness (light-headedness or rotational dizziness).</li> <li>◦ Falls.</li> <li>◦ Transient loss of consciousness.</li> </ul> </li> <li>• Important to identify because it puts people at risk of falls, impairs quality of life and increases the risk of CVD, depression, dementia and death.</li> <li>• Take the blood pressure sitting or lying. Stand the patient up and check BP after they have been standing for at a least a minute. A drop of <math>\geq 20</math>mmHg in <u>systolic BP with symptoms</u> is significant.</li> <li>• If, during this time, heart rate doesn't increase significantly (<math>&lt; 15</math>bpm), the cause is more likely to be neurogenic (defective adrenergic vasoconstriction/autonomic failure). Heart rate rises above 15bpm suggest a non-neurogenic cause.</li> <li>• Many causes, often multifactorial.</li> <li>• The important thing is to identify and manage reversible/treatable causes, especially: drugs, infection, anaemia, dehydration.</li> <li>• Simple lifestyle changes can reduce symptoms: <ul style="list-style-type: none"> <li>◦ Change position slowly and avoid sudden changes in posture (from lying/sitting to standing).</li> <li>◦ Avoid things that are likely to make it worse such as prolonged standing, large meals/alcohol, hot environment, including hot baths/showers.</li> </ul> </li> <li>• Deconditioning worsens symptoms so physical activity may help.</li> <li>• Refer if persistent, frequent symptoms or the cause is unexplained.</li> <li>• Drug treatment sometimes initiated on advice of secondary care.</li> </ul>
	<p>Do you have a system for getting sitting/standing blood pressures done?</p> <p>Do you routinely ask about postural hypotension symptoms in those at risk?</p> <p>Do you routinely measure sitting and standing BP in those NICE recommends (those with symptoms, and hypertensive people with type 2 diabetes or those <math>\geq 80</math>y)?</p>
	<p><b>Useful resources:</b></p> <p><i>Websites (all resources are hyperlinked for ease of use in Red Whale Knowledge)</i></p> <p><a href="#">PoTS UK</a></p>
	

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