

## Appendix A

### List of NICE recommendations mentioning “postural hypotension” or “orthostatic hypotension”

Guideline	Rec No	Recommendation
Hypertension in adults (NG136)	1.1.5	In people with symptoms of <b>postural hypotension</b> (falls or postural dizziness): measure blood pressure with the person either supine or seated measure blood pressure again with the person standing for at least 1 minute before measurement. [2004, amended 2011]
Hypertension in adults (NG136)	1.1.6	If the systolic blood pressure falls by 20 mmHg or more when the person is standing: review medication measures subsequent blood pressures with the person standing, consider referral to specialist care if symptoms of <b>postural hypotension</b> persist. [2004, amended 2011]
Hypertension in adults (NG136)	1.4.16	Measure standing as well as seated blood pressure (see recommendation 1.1.6) in people with hypertension and: with type 2 diabetes or with symptoms of <b>postural hypotension</b> or aged 80 and over. In people with a significant postural drop or symptoms of <b>postural hypotension</b> , treat to a blood pressure target based on standing blood pressure. [2019]
Hypertension in adults (NG136)	1.4.47	Before considering further treatment for a person with resistant hypertension: Confirm elevated clinic blood pressure measurements using ambulatory or home blood pressure recordings. Assess for <b>postural hypotension</b> . Discuss adherence (see recommendation 1.4.40). [2019]
Hypertension in adults (NG136)	1.5.3	Refer people for specialist assessment, carried out on the same day, if they have suspected pheochromocytoma (for example, labile or <b>postural hypotension</b> , headache, palpitations, pallor, abdominal pain or diaphoresis). [2019]
Chronic Heart Failure (NG106)	1.4.5	Measure blood pressure before and after each dose increment of an ACE inhibitor. Follow the recommendations on measuring blood pressure, including measurement in people with symptoms of <b>postural hypotension</b> , in the <a href="#">NICE guideline on hypertension in adults</a> . [2018]

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Chronic Heart Failure (NG106)	1.4.9	Measure blood pressure after each dose increment of an ARB. Follow the recommendations on measuring blood pressure, including measurement in people with symptoms of <b>postural hypotension</b> , in the <a href="#">NICE guideline on hypertension in adults</a> . [2018]
Chronic Heart Failure (NG106)	1.4.17	Measure blood pressure before and after each dose increment of an MRA. Follow the recommendations on measuring blood pressure, including measurement in people with symptoms of <b>postural hypotension</b> , in the <a href="#">NICE guideline on hypertension in adults</a> . [2018]
IV fluid therapy in adults (CG174)	1.2.2	<p>Assess the patient's likely fluid and electrolyte needs from their history, clinical examination, current medications, clinical monitoring and laboratory investigations: History should include any previous limited intake, thirst, the quantity and composition of abnormal losses (see Diagram of ongoing losses), and any comorbidities, including patients who are malnourished and at risk of refeeding syndrome (see Nutrition support in adults [NICE clinical guideline 32]).</p> <p>Clinical examination should include an assessment of the patient's fluid status, including: pulse, blood pressure, capillary refill and jugular venous pressure presence of pulmonary or peripheral oedema presence of <b>postural hypotension</b>. Clinical monitoring should include current status and trends in: NEWS fluid balance charts weight. Laboratory investigations should include current status and trends in: full blood count urea, creatinine and electrolytes.</p>
Metastatic spinal cord compression (CG75)	1.6.4.2	Symptomatic <b>postural hypotension</b> in patients with MSCC should be managed initially by patient positioning and devices to improve venous return (such as foot pumps and graduated compression/anti-embolism stockings). Avoid overhydration which can provoke pulmonary oedema.

Guideline	Rec No	Recommendation
ME/CFS (NG206)	1.17.1	Be aware that people with severe or very severe ME/CFS may experience the following symptoms that significantly affect their lives, including their mobility, emotional wellbeing and ability to interact with others and care for themselves: severe and constant pain, which can have muscular, arthralgic or neuropathic features hypersensitivity to light, sound, touch, movement, temperature extremes and smells extreme weakness, with severely reduced movement reduced ability or inability to speak or swallow cognitive difficulties that limit the person's ability to communicate and take in written or verbal communication sleep disturbance such as unrefreshing sleep, hypersomnia and altered sleep pattern gastrointestinal difficulties such as nausea, incontinence, constipation and bloating neurological symptoms such as double vision and other visual disorders, dizziness orthostatic intolerance and autonomic dysfunction, such as postural orthostatic tachycardia syndrome (POTS) and <b>postural hypotension</b> .
Rehabilitation after traumatic injury (NG211)	1.11.6	Before starting weight-bearing exercises, be aware of the effects of low blood pressure (for example, <b>postural hypotension</b> or vasovagal syncope [fainting]) and monitor the person for hypotensive symptoms when starting therapy.
Rehabilitation after traumatic injury (NG211)	1.15.20	Be aware that most people who have had a spinal cord injury will develop <b>orthostatic hypotension</b> , which can affect their participation in rehabilitation. Consider interventions to optimise blood pressure, for example, medication review, graduated positioning, abdominal binders and compression stockings.
Suspected neurological conditions (NG127)	1.2.1	For adults with sudden-onset dizziness and a focal neurological deficit such as vertical or rotatory nystagmus, new-onset unsteadiness or new-onset deafness: if the person has diabetes, check for and treat hypoglycaemia if the person does not have diabetes, or treating hypoglycaemia does not resolve the symptoms, and benign paroxysmal positional vertigo or <b>postural hypotension</b> do not account for the presentation, refer immediately to exclude posterior circulation stroke, in line with the NICE guideline on stroke and transient ischaemic attack in over 16s.

Guideline	Rec No	Recommendation
Suspected neurological conditions (NG127)	1.2.4	Refer immediately adults with sudden-onset acute vestibular syndrome in whom benign paroxysmal positional vertigo or <b>postural hypotension</b> do not account for the presentation, in line with local stroke pathways, if a healthcare professional with training and experience in the use of the HINTS test is not available.
Suspected neurological conditions (NG127)	1.20.3	Be aware that in older children (usually aged over 8 years), dizziness related to change in posture is often caused by <b>postural hypotension</b> .
TLoC in over 16s (CG109)	1.2.1.1	Suspect <b>orthostatic hypotension</b> on the basis of the initial assessment when: there are no features suggesting an alternative diagnosis and the history is typical. If these criteria are met, measure lying and standing blood pressure (with repeated measurements while standing for 3 minutes). If clinical measurements do not confirm <b>orthostatic hypotension</b> despite a suggestive history, refer the person for further specialist cardiovascular assessment. If <b>orthostatic hypotension</b> is confirmed, consider likely causes, including drug therapy, and manage appropriately (for example, see the NICE guideline on falls in older people: assessing risk and prevention).
TLoC in over 16s (CG109)	1.2.3.1	Refer all people with TLoC (apart from the exceptions below) for a specialist cardiovascular assessment by the most appropriate local service. Exceptions are: people with a firm diagnosis, after the initial assessment, of: uncomplicated faint situational syncope <b>orthostatic hypotension</b> people whose presentation is strongly suggestive of epileptic seizures.
TLoC in over 16s (CG109)	1.3.1.2	For people with suspected structural heart disease, investigate appropriately (for example, cardiac imaging). Because other mechanisms for syncope are possible in this group, also consider investigating for a cardiac arrhythmic cause (as described in recommendation 1.3.2.4), and for <b>orthostatic hypotension</b> (often caused/exacerbated by drug therapy – see recommendation 1.2.1.1) or for neurally mediated syncope (see recommendations 1.3.2.5 and 1.3.2.6).

Guideline	Rec No	Recommendation
TLoC in over 16s (CG109)	1.5.4.2	For people with <b>orthostatic hypotension</b> : explain the mechanisms causing their syncope discuss and review possible causes, especially drug therapy discuss the prognostic implications and treatment options available advise people what to do if they experience another TLoC.
Ectopic pregnancy and miscarriage (NG126)	1.3.4	Be aware that ectopic pregnancy can present with a variety of signs on examination by a healthcare professional. Signs of ectopic pregnancy include: more common signs: pelvic tenderness adnexal tenderness abdominal tenderness other reported signs: cervical motion tenderness rebound tenderness or peritoneal signs pallor abdominal distension enlarged uterus tachycardia (more than 100 beats per minute) or hypotension (less than 100/60 mmHg) shock or collapse <b>orthostatic hypotension</b> . [2012]
Type 1 diabetes in adults (NG17)	1.13.12	Do not allow concerns over potential side effects to inhibit advising and offering the necessary use of any class of drugs, unless side effects become symptomatic or otherwise clinically significant. In particular: do not avoid selective beta-blockers for adults on insulin if these are indicated low-dose thiazides may be combined with beta-blockers when prescribing calcium channel antagonists, only use long-acting preparations ask adults directly about potential side effects of erectile dysfunction, lethargy and <b>orthostatic hypotension</b> with different drug classes. [2004, amended 2015]
Type 1 diabetes in adults (NG17)	1.15.19	When prescribing antihypertensive medicines, take care not to increase the risk of <b>orthostatic hypotension</b> from the combined effects of sympathetic autonomic neuropathy and blood pressure lowering medicines. [2004]
Type 1 diabetes in adults (NG17)	1.15.21	When managing the symptoms of autonomic neuropathy, include specific interventions for the manifestations encountered (for example, for abnormal sweating and <b>postural hypotension</b> ). [2004, amended 2015]
Type 2 diabetes in adults (NG28)	1.8.12	For adults with type 2 diabetes and autonomic neuropathy who are taking tricyclic drugs and antihypertensive drug treatments, be aware of the increased likelihood of side effects such as <b>orthostatic hypotension</b> . For guidance on safe prescribing of antidepressants (such as tricyclic

Guideline	Rec No	Recommendation
		drugs) and managing withdrawal, see NICE's guideline on medicines associated with dependence or withdrawal symptoms. [2009]
Parkinson's disease (NG71)	1.5.8	If a person with Parkinson's disease has developed <b>orthostatic hypotension</b> , review the person's existing medicines to address possible pharmacological causes, including: antihypertensives (including diuretics) dopaminergics anticholinergics antidepressants. [2017]
Parkinson's disease (NG71)	1.5.9	Consider midodrine for people with Parkinson's disease and <b>orthostatic hypotension</b> , taking into account the contraindications and monitoring requirements (including monitoring for supine hypertension). [2017]
ADHD (NG87)	1.8.12	If a person taking guanfacine has sustained <b>orthostatic hypotension</b> or fainting episodes, reduce their dose or switch to another ADHD (attention deficit hyperactivity disorder) medication. [2018]

## Appendix B

### Evidence base and considerations of current recommendations in the Hypertension and TLoC guidelines

1. There was minimal evidence related to postural hypotension in the evidence review conducted more than 10 years ago in the TLoC guideline ([page 128, and page 184-185](#)) and the Hypertension guideline ([page 42](#)).

2. The following are the relevant information from the TLoC guideline:

*“There was low to very low-quality evidence from one study on the predictors for orthostatic hypotension based on the ESC guidelines”. The study evaluated was van Dijk et al 2008, which evaluated the accuracy of determining the cause of TLoC in patients with TLoC.*

*“The GDG also drew on their experience and noted that there are different definitions of orthostatic hypotension, with a range of definitions used in the recent literature. In the absence of a full literature review of orthostatic hypotension, including in people who have not necessarily had TLoC, the GDG decided to state in their recommendation the basic method of measuring orthostatic hypotension (supine followed by three minutes of repeated measurements in an upright position). This approach should be taken only for people who are suspected, on the basis of history, to have orthostatic hypotension, and who do not have features suggesting an alternative diagnosis.*

*The GDG did not consider it desirable to routinely carry out supine and standing blood pressure measurements, which could be time consuming. The GDG recognised that some people who had a suggestive history of orthostatic hypotension would not necessarily have positive results on this simple test, but rather than recommending alternative approaches that they had not reviewed, preferred to refer the person with suspected orthostatic hypotension for further specialist cardiovascular assessment. [Alternative approaches might involve tilt testing with beat-to-beat blood pressure monitoring in order to detect transient initial orthostatic hypotension or delayed orthostatic hypotension].*

*The GDG noted that orthostatic hypotension can be caused by some medications and indicated in their recommendation that if the condition is diagnosed, causes including drug therapy should be investigated. When describing further management following a diagnosis, the GDG took into consideration their concerns that a person with low blood pressure should be treated accordingly and not be sent home, possibly to be alone. This aspect is covered by the NICE Falls guideline<sup>150</sup> and the GDG wished to cross refer to this guidance.”*

3. Considerations for how blood pressure should be measured was mentioned in ([page 42](#)) of the 2011 version of the full guideline in the [Hypertension Guideline \(NG136\)](#) and on [page 22 of the evidence review for blood pressure targets in the 2019 version.](#)

For the considerations of how blood pressure should be measured, this was documented:

*“Standardising the environment in which blood pressure measurements are made reduces variation and enhances the interpretation of a series of readings taken over time. A quiet, comfortable location at normal room temperature is optimal. Ideally, the patient should not need to pass urine, not recently have eaten, smoked or taken caffeine or exercise. Allowing the patient to rest at least five minutes before measurement is also advised. Blood pressure readings tend to increase as patients move from the supine to standing position. The change may not be significant, but it is traditional for measurements to be taken whilst seated. Certain patients demonstrate a significant lowering of blood pressure when standing (postural hypotension)”*



## **Appendix C: Topic expert feedback**

### ***Terminology and standardisation of measurement methods***

All topic experts agreed that only one term should be used. The criteria for diagnosis should be the same across both guidelines. Four respondents preferred 'postural hypotension', as it is more widely used now. One cardiologist preferred 'orthostatic', as this is more related to the change of blood pressure when 'standing' (the upright posture) rather than other postural issues.

### ***How to blood pressure should be measured***

#### ***Evidence base***

All topic experts agreed that there is limited evidence, and recommendations have been made based on expert consensus and how things were taught. One topic expert mentioned some limited data is suggesting that the threshold for diagnosing postural hypotension should be different when measured in the seated position.

#### ***Risk of missing postural hypotension (in elderly people)***

Three topic experts pointed out there is a risk of missing postural hypotension diagnosis in elderly people when measuring blood pressure changes from a seated to standing position (rather than from lying down to standing), while two experts did not think there is a risk. Two of the topic experts pointed out that blood pressure should be measured in the lying down position if postural hypotension is suspected. One topic expert is unaware of evidence to suggest a significant number of cases of postural hypotension is currently missed but was concerned that if patients were missed, there are implications on the choice of medications and symptom management. However, another topic expert pointed out there is a potential that cases have been missed because there is a discrepancy in the number of postural hypotension cases diagnosed within the NHS versus what is expected epidemiologically.

#### ***Measurement position (seated or supine)***

Three topic experts thought the Hypertension (NG136) guideline should continue with the option of allowing either seated or supine blood pressure measurement. They explained that the seated to standing position is the

most used position in primary care due to the relative convenience, and this method should be able to detect most cases. The evidence should be reviewed to investigate whether blood pressure changes for seated to standing measurements should have a lower threshold. If postural hypotension was not detected and the measurement was done in the seated position, the blood pressure should be measured again in the lying down position if there is a 'high level of clinical suspicion'. One topic expert also pointed out that the main cause for missing postural hypotension detection is patients are not being checked for it (standing blood pressure is seldom taken).

Two other topic experts disagreed that the recommendations in the Hypertension (NG136) guideline should allow for the options of seated or supine blood pressure measurement if postural hypotension is suspected. One topic expert pointed out that a seated blood pressure measurement is the main evidence base for the treatment target of hypertension, rather than a supine blood pressure measurement. Therefore, the guideline should be clearer that seated blood pressure should be normally carried out unless postural hypotension is suspected. If there is a suspicion of postural hypotension, blood pressure measurement taken in the lying down position is more appropriate.

### ***Changing criteria for measurement and definition***

4. There were variations in opinions on what should be changed:
  - Two topic experts wanted to change the duration of standing before blood pressure is measured. One mentioned it should be standardized across both the TLOC (CG109) and Hypertension (NG136) guidelines; another said *both* the 1-minute and 3-minute measurements should be done.
  - One topic expert wanted the thresholds in both guidelines to be standardised to 20 mmHg.

- Two topic experts wanted more than one criterion changed. Both did not specify what changes are needed in the survey. One of them clarified that changes should involve the measurement positions and timing of measurement when standing up ('within three minutes of getting up'). Another topic expert said the criteria across both guidelines should be harmonised.
- No one had any specific comments about changing the criteria for the management of postural hypotension if diagnosed.

### ***Implementation issues (if guidelines are changed)***

Two of the topic experts (with primary care expertise and experience) suggested that there will be implementation issues if there is a specification to measure blood pressure only in the supine position, or if standing time is increased from 1 minute to 3 minutes. These are the reasons provided:

- Supine blood pressure measurement is not currently done in the primary care
- There is insufficient time to perform repeat measurements and 'equipment' (facilities to allow the patient to lie down) may not be available in primary care
- There is no evidence about detecting postural blood pressure changes if self-measured or done at home