

Hypertension overview

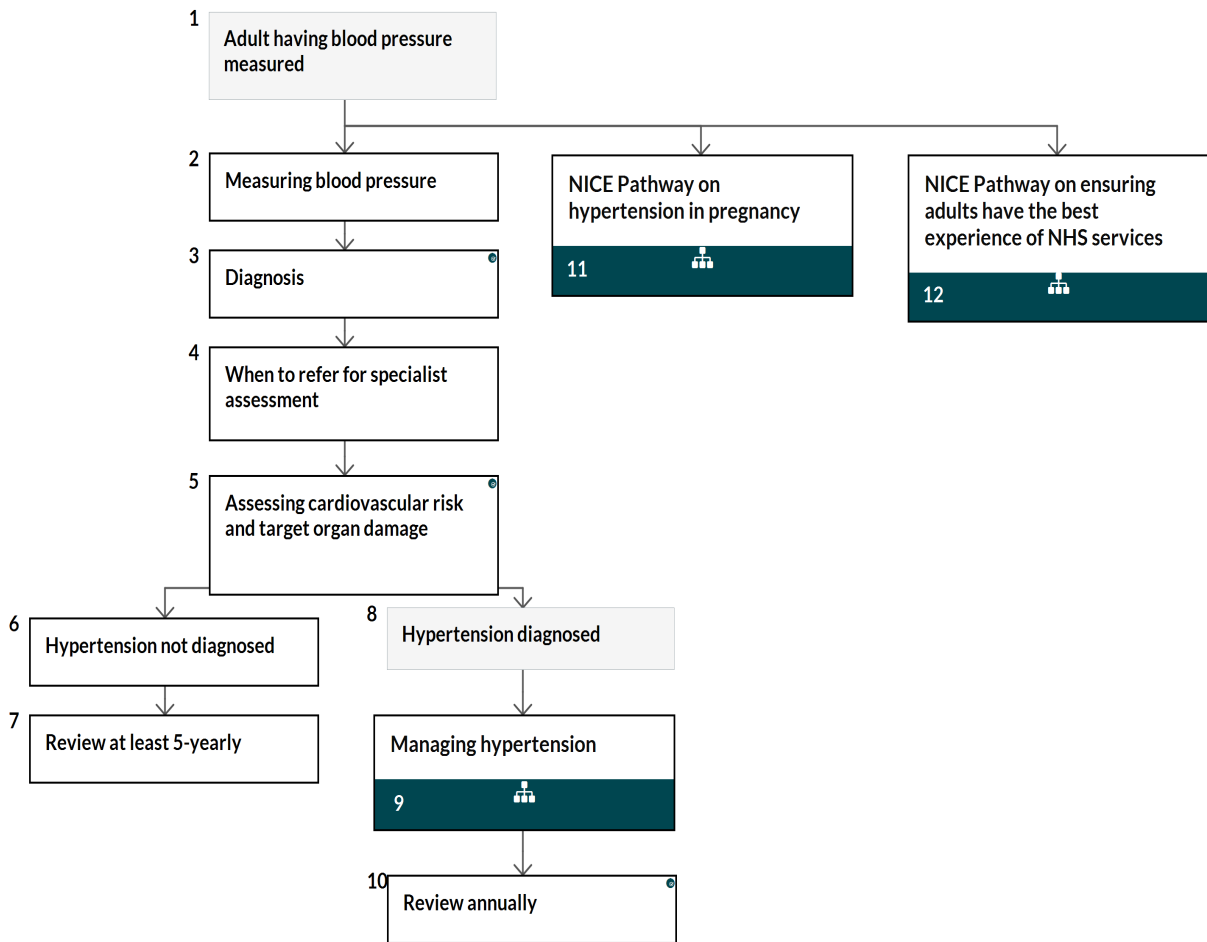
NICE Pathways bring together everything NICE says on a topic in an interactive flowchart. NICE Pathways are interactive and designed to be used online.

They are updated regularly as new NICE guidance is published. To view the latest version of this NICE Pathway see:

<http://pathways.nice.org.uk/pathways/hypertension>

NICE Pathway last updated: 18 September 2020

This document contains a single flowchart and uses numbering to link the boxes to the associated recommendations.



1 Adult having blood pressure measured

No additional information

2 Measuring blood pressure

Ensure that healthcare professionals taking blood pressure measurements have adequate initial training and periodic review of their performance.

Because automated devices may not measure blood pressure accurately if there is pulse irregularity (for example, due to atrial fibrillation), palpate the radial or brachial pulse before measuring blood pressure. If pulse irregularity is present, measure blood pressure manually using direct auscultation over the brachial artery.

Healthcare providers must ensure that devices for measuring blood pressure are properly validated, maintained and regularly recalibrated according to manufacturers' instructions. (A list of validated blood pressure monitoring devices is available on the [British and Irish Hypertension Society's website](#). The British and Irish Hypertension Society is an independent reviewer of published work. This does not imply any endorsement by NICE.)

When measuring blood pressure in the clinic or in the home, standardise the environment and provide a relaxed, temperate setting, with the person quiet and seated, and their arm outstretched and supported. Use an appropriate cuff size for the person's arm.

Annual measurement for adult with type 2 diabetes

Measure blood pressure at least annually in an adult with type 2 diabetes without previously diagnosed hypertension or renal disease. Offer and reinforce preventive lifestyle advice.

Postural hypotension

In people with symptoms of postural hypotension (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.

If the systolic blood pressure falls by 20 mmHg or more when the person is standing:

- review medication
- measure subsequent blood pressures with the person standing
- consider referral to specialist care if symptoms of postural hypotension persist.

Measuring the clinic blood pressure

When considering a diagnosis of hypertension, measure blood pressure in both arms:

- If the difference in readings between arms is more than 15 mmHg, repeat the measurements.
- If the difference in readings between arms remains more than 15 mmHg on the second measurement, measure subsequent blood pressures in the arm with the higher reading.

If blood pressure measured in the clinic is 140/90 mmHg or higher:

- Take a second measurement during the consultation.
- If the second measurement is substantially different from the first, take a third measurement.

Record the lower of the last 2 measurements as the clinic blood pressure.

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

NICE has published a [medtech innovation briefing on Lifelight First for monitoring vital signs](#).

WatchBP Home A

The following recommendations are from NICE medical technologies guidance on [WatchBP Home A for opportunistically detecting atrial fibrillation during diagnosis and monitoring of hypertension](#).

The case for adopting WatchBP Home A in the NHS, for opportunistically detecting asymptomatic atrial fibrillation during the measurement of blood pressure by primary care professionals, is supported by the evidence. The available evidence suggests that the device reliably detects atrial fibrillation and may increase the rate of detection when used in primary care. This would allow prophylactic treatment to be given to reduce the incidence of atrial fibrillation-related stroke. WatchBP Home A should be considered for use in people with suspected hypertension and those being screened or monitored for hypertension, in primary care.

People suspected of having atrial fibrillation after use of WatchBP Home A should have an electrocardiogram (ECG) in line with NICE's recommendations on [atrial fibrillation](#).

Use of WatchBP Home A in primary care is associated with estimated overall cost savings per person measured, ranging from £2.98 for those aged between 65 and 74 years to £4.26 for those aged 75 years and over. There is uncertainty about the costs and benefits for people younger than 65, however it is plausible that using the device in this group will benefit patients and the healthcare system. Cost analyses did not support the use of the device by patients in their homes.

3 Diagnosis

If clinic blood pressure is between 140/90 mmHg and 180/110 mmHg, offer ABPM to confirm the diagnosis of hypertension. See [when to refer for specialist assessment \[See page 6\]](#) and [assessing target organ damage \[See page 7\]](#) for people with a clinic blood pressure 180/110 mmHg or higher.

If ABPM is unsuitable or the person is unable to tolerate it, offer HBPM to confirm the diagnosis of hypertension.

While waiting for confirmation of a diagnosis of hypertension, carry out:

- investigations for target organ damage (see [assessing target organ damage \[See page 7\]](#)), followed by
- formal assessment of cardiovascular risk using a cardiovascular risk assessment tool (see [carry out a full risk assessment in the NICE Pathway on cardiovascular disease prevention](#)).

When using ABPM to confirm a diagnosis of hypertension, ensure that at least 2 measurements per hour are taken during the person's usual waking hours (for example, between 08:00 and 22:00). Use the average value of at least 14 measurements taken during the person's usual waking hours to confirm a diagnosis of hypertension.

When using HBPM to confirm a diagnosis of hypertension, ensure that:

- for each blood pressure recording, 2 consecutive measurements are taken, at least 1 minute apart and with the person seated **and**
- blood pressure is recorded twice daily, ideally in the morning and evening **and**
- blood pressure recording continues for at least 4 days, ideally for 7 days.

Discard the measurements taken on the first day and use the average value of all the remaining

measurements to confirm a diagnosis of hypertension.

Confirm diagnosis of hypertension in people with a:

- clinic blood pressure of 140/90 mmHg or higher **and**
- ABPM daytime average or HBPM average of 135/85 mmHg or higher.

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

NICE has produced a [visual summary on diagnosing and treating hypertension](#).

Quality standards

The following quality statements are relevant to this part of the interactive flowchart.

Hypertension in adults

1. Diagnosis – ambulatory blood pressure monitoring
2. Investigations for target organ damage

4 When to refer for specialist assessment

Refer people for specialist assessment, carried out on the same day, if they have a clinic blood pressure of 180/120 mmHg and higher with:

- signs of retinal haemorrhage or papilloedema (accelerated hypertension) or
- life-threatening symptoms such as new onset confusion, chest pain, signs of heart failure, or acute kidney injury.

Refer people for specialist assessment, carried out on the same day, if they have suspected pheochromocytoma (for example, labile or postural hypotension, headache, palpitations, pallor, abdominal pain or diaphoresis).

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

Specialist investigations for possible secondary causes of hypertension

Consider the need for specialist investigations in people with signs and symptoms suggesting a secondary cause of hypertension.

5 Assessing cardiovascular risk and target organ damage

Cardiovascular risk assessment

Use a formal estimation of cardiovascular risk to discuss prognosis and healthcare options with people with hypertension, both for raised blood pressure and other modifiable risk factors.

Estimate cardiovascular risk in line with [the NICE Pathway on identification and assessment of cardiovascular disease risk](#). Use clinic blood pressure measurements to calculate cardiovascular risk.

Tests to assess target organ damage

For guidance on the early identification and management of chronic kidney disease, see [the NICE Pathway on chronic kidney disease](#).

For all people with hypertension offer to:

- test for the presence of protein in the urine by sending a urine sample for estimation of the albumin: creatinine ratio and test for haematuria using a reagent strip
- take a blood sample to measure glycated haemoglobin (HbA1C), electrolytes, creatinine, eGFR, total cholesterol and high-density lipoprotein cholesterol
- examine the fundi for the presence of hypertensive retinopathy
- arrange for a 12-lead electrocardiograph to be performed.

If a person has severe hypertension (clinic blood pressure of 180/120 mmHg or higher), but no symptoms or signs indicating same-day referral (see [when to refer for specialist assessment \[See page 6\]](#)), carry out investigations for target organ damage as soon as possible:

- If target organ damage is identified, consider starting antihypertensive drug treatment immediately, without waiting for the results of ABPM or HBPM.
- If no target organ damage is identified, repeat clinic blood pressure measurement within 7 days.

See the NICE guideline to find out [why we made these recommendations and how they might](#)

[affect practice](#).

NICE has published a [medtech innovation briefing on Healthy.io test for home testing of urine albumin to creatinine ratio](#).

Quality standards

The following quality statement is relevant to this part of the interactive flowchart.

Hypertension in adults

2. Investigations for target organ damage

6 Hypertension not diagnosed

If hypertension is not diagnosed but there is evidence of target organ damage, consider carrying out investigations for alternative causes of the target organ damage (for information on investigations, see the NICE Pathways on [chronic kidney disease](#) and [chronic heart failure](#)).

7 Review at least 5-yearly

If hypertension is not diagnosed, measure the person's clinic blood pressure at least every 5 years subsequently, and consider measuring it more frequently if the person's clinic blood pressure is close to 140/90 mmHg.

8 Hypertension diagnosed

No additional information

9 Managing hypertension

[See Hypertension / Managing hypertension](#)

10 Review annually

Provide an annual review of care for adults with hypertension to monitor blood pressure, provide

people with support, and discuss their lifestyle, symptoms and medication.

Quality standards

The following quality statements are relevant to this part of the interactive flowchart.

Hypertension in adults

5. Review of cardiovascular disease risk factors

Air pollution: outdoor air quality and health

4. Advice for people with chronic respiratory or cardiovascular conditions

11 NICE Pathway on hypertension in pregnancy

[See Hypertension in pregnancy](#)

12 NICE Pathway on ensuring adults have the best experience of NHS services

[See Patient experience in adult NHS services](#)

Glossary

accelerated hypertension

(a severe increase in blood pressure to 180/120 mmHg or higher (and often over 220/120 mmHg) with signs of retinal haemorrhage and/or papilloedema (swelling of the optic nerve); it is usually associated with new or progressive target organ damage and is also known as malignant hypertension)

ABPM

ambulatory blood pressure monitoring

eGFR

estimated glomerular filtration rate

HBPM

home blood pressure monitoring

Target organ damage

(damage to organs such as the heart, brain, kidneys and eyes: examples are left ventricular hypertrophy, chronic kidney disease, hypertensive retinopathy or increased urine albumin:creatinine ratio)

Sources

[Hypertension in adults: diagnosis and management](#) (2019) NICE guideline NG136

[WatchBP Home A for opportunistically detecting atrial fibrillation during diagnosis and monitoring of hypertension](#) (2013) NICE medical technologies guidance 13

Your responsibility

Guidelines

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Technology appraisals

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, health professionals are expected to take these recommendations fully into account, alongside the individual needs, preferences and values of their patients. The application of the recommendations in this interactive flowchart is at the discretion of health professionals and their individual patients and do not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Commissioners and/or providers have a responsibility to provide the funding required to enable the recommendations to be applied when individual health professionals and their patients wish to use it, in accordance with the NHS Constitution. They should do so in light of their duties to

have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Medical technologies guidance, diagnostics guidance and interventional procedures guidance

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take these recommendations fully into account. However, the interactive flowchart does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Commissioners and/or providers have a responsibility to implement the recommendations, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this interactive flowchart should be interpreted in a way that would be inconsistent with compliance with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.