

## Hypertension overview

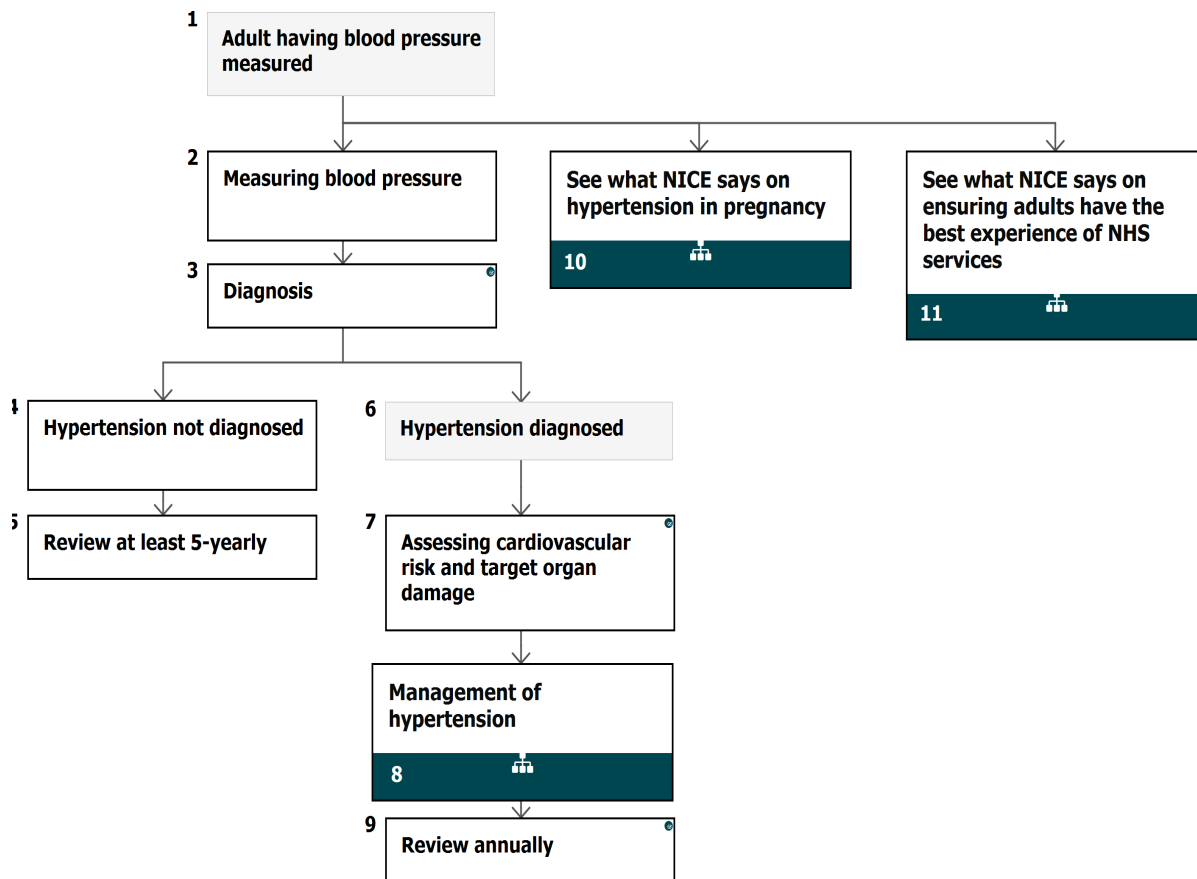
NICE Pathways bring together everything NICE says on a topic in an interactive flowchart. NICE Pathways are interactive and designed to be used online.

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: 27 February 2019

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

Healthcare professionals taking blood pressure measurements need 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.

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.

If using an automated blood pressure monitoring device, ensure that the device is validated and an appropriate cuff size for the person's arm is used. (A list of validated blood pressure monitoring devices is available on the [British Hypertension Society's](#) website. The British Hypertension Society is an independent reviewer of published work. This does not imply any endorsement by NICE.)

### 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 prior to 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 20 mmHg, repeat the measurements.
- If the difference in readings between arms remains more than 20 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 two measurements as the clinic blood pressure.

### 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 the clinic blood pressure is 140/90 mmHg or higher, offer ABPM to confirm the diagnosis of hypertension.

If a person is unable to tolerate ABPM, HBPM is a suitable alternative to confirm the diagnosis of hypertension.

If the person has severe hypertension, consider starting antihypertensive drug treatment immediately, without waiting for the results of ABPM or HBPM.

While waiting for confirmation of a diagnosis of hypertension, carry out investigations for target organ damage (such as left ventricular hypertrophy, chronic kidney disease and hypertensive retinopathy) and a formal assessment of cardiovascular risk using a cardiovascular risk assessment tool (see [assessing cardiovascular risk and target organ damage \[See page 6\]](#)).

When using ABPM to confirm a diagnosis of hypertension, ensure that at least two 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, two 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.

Refer the person to specialist care the same day if they have:

- accelerated hypertension, that is, blood pressure usually higher than 180/110 mmHg with signs of papilloedema and/or retinal haemorrhage **or**
- suspected pheochromocytoma (labile or postural hypotension, headache, palpitations, pallor and diaphoresis).

Consider the need for specialist investigations in people with signs and symptoms suggesting a secondary cause of 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 Hypertension not diagnosed

If hypertension is not diagnosed but there is evidence of target organ damage such as left ventricular hypertrophy, albuminuria or proteinuria, consider carrying out investigations for alternative causes of the target organ damage.

#### 5 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.

#### 6 Hypertension diagnosed

No additional information

#### 7 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 NICE's recommendations on [identification and](#)

assessment of risk in cardiovascular disease prevention. Clinic blood pressure measurements must be used in the calculation of cardiovascular risk.

### Tests to assess target organ damage

For guidance on the early identification and management of chronic kidney disease, see what NICE says 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 plasma glucose, electrolytes, creatinine, eGFR, serum total cholesterol and HDL cholesterol
- examine the fundi for the presence of hypertensive retinopathy
- arrange for a 12-lead electrocardiograph to be performed.

For people aged under 40 years with stage 1 hypertension and no evidence of target organ damage, cardiovascular disease, renal disease or diabetes, consider seeking specialist evaluation of secondary causes of hypertension and a more detailed assessment of potential target organ damage. This is because 10-year cardiovascular risk assessments can underestimate the lifetime risk of cardiovascular events in these people.

For guidance on managing left ventricular dysfunction, see treating chronic heart failure due to left ventricular systolic dysfunction in NICE's recommendations on chronic heart failure.

### Quality standards

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

#### Hypertension in adults

2. Investigations for target organ damage
3. Statin therapy

## 8 Management of hypertension

See Hypertension / Management of hypertension

**9 Review annually**

Provide an annual review of care 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

**10 See what NICE says on hypertension in pregnancy**

[See Hypertension in pregnancy](#)

**11 See what NICE says on ensuring adults have the best experience of NHS services**

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



## Glossary

### **ACE inhibitor**

angiotensin-converting enzyme inhibitor

### **ARB**

angiotensin II receptor blocker

### **CCB**

calcium-channel blocker

### **ABPM**

ambulatory blood pressure monitoring

### **eGFR**

estimated glomerular filtration rate

### **HBPM**

home blood pressure monitoring

### **Severe hypertension**

clinic systolic blood pressure is 180 mmHg or higher or clinic diastolic blood pressure is 110 mmHg or higher

### **Stage 1 hypertension**

clinic blood pressure 140/90 mmHg or higher and subsequent ambulatory blood pressure monitoring daytime average or home blood pressure monitoring average blood pressure 135/85 mmHg or higher

### **Stage 2 hypertension**

clinic blood pressure 160/100 mmHg or higher and subsequent ambulatory blood pressure

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monitoring daytime average or home blood pressure monitoring average blood pressure 150/95 mmHg or higher

### **White-coat effect**

a discrepancy of more than 20/10 mmHg between clinic and average daytime ambulatory blood pressure monitoring or average home blood pressure monitoring measurements at the time of diagnosis

### **Sources**

[Hypertension in adults: diagnosis and management](#) (2011 updated 2016) NICE guideline CG127

[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.

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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.