



## Measuring blood pressure

- Measure BP at least annually in a person without previously diagnosed hypertension or renal disease.
- Use validated equipment.
- Select the correct cuff size (refer to table).
- Promote a relaxed and temperate environment.
- Measure BP in both arms.
- Check pulse rate and rhythm. Do not use electronic BP monitor in the presence of an irregular pulse
- Measure BP in both arms. Repeat if difference between arms is >15 mmHg and, if difference remains >15 mmHg, use the arm with the higher reading for subsequent BP measurements.
- In people with hypertension and diabetes, measure standing as well as seated BP. If BP falls

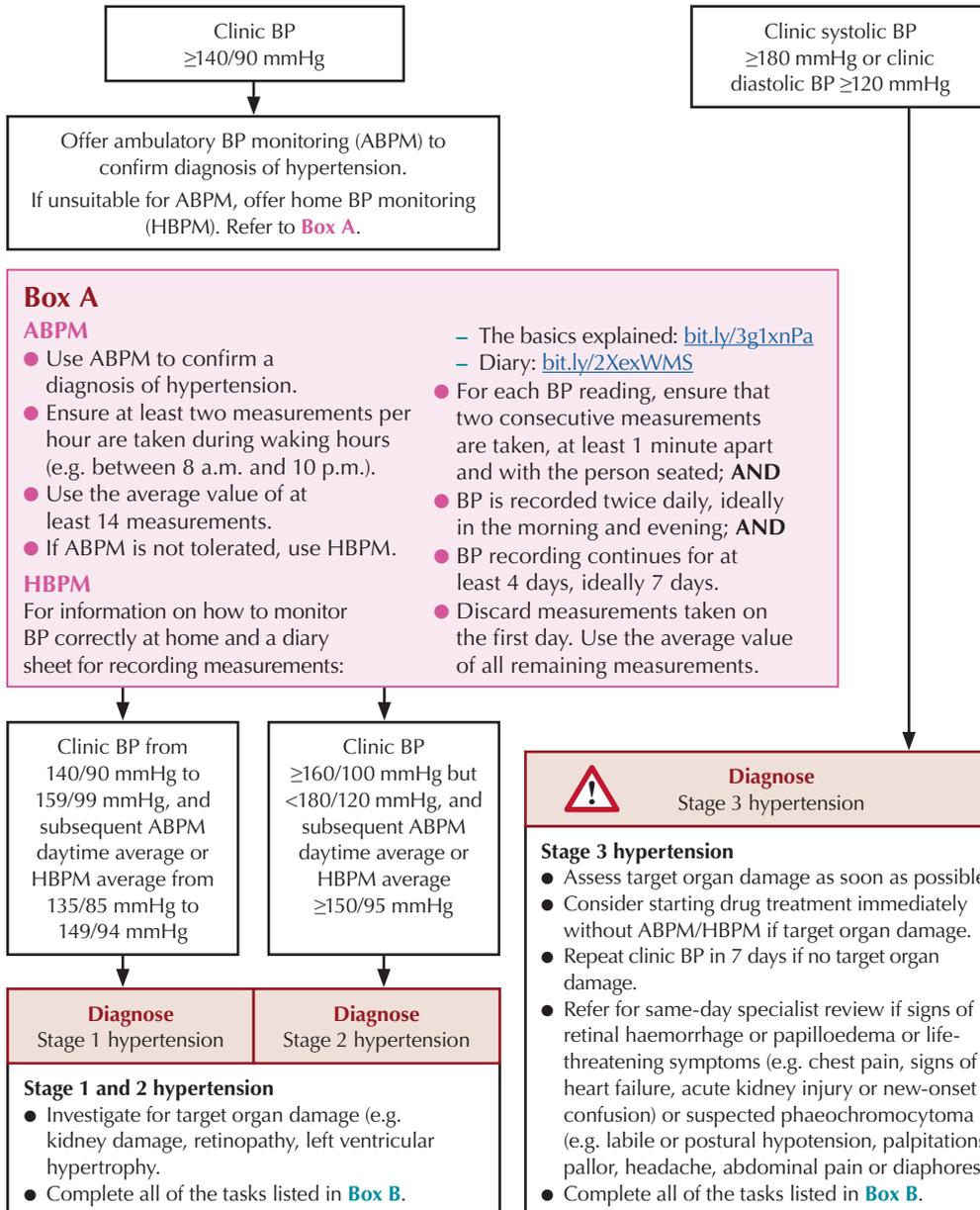
by  $\geq 20$  mmHg on standing, review medication, measure subsequent BP with person standing, and consider referral to a specialist where symptoms of postural hypotension persist

- Postural hypotension can occur secondary to autonomic neuropathy.<sup>5</sup>

Upper arm measurement	Cuff size
17–22 cm (6.75–8.75")	Small
22–32 cm (8.75–12.5")	Medium
32–42 cm (12.5–16.5")	Large

The bladder should fit around at least 80% of the arm, but not more than 100%. Measure around the upper arm at the midpoint between the shoulder and elbow.

## Diagnosing hypertension



## What and why

- This document does not cover people with type 1 diabetes, children or women during pregnancy.
  - Hypertension is twice as common in people with diabetes and co-existence of these conditions significantly increases the risk for coronary heart disease, left ventricular hypertrophy, congestive heart failure and stroke.<sup>1</sup>
  - Nationally, nearly a third of people with diabetes who have had a blood pressure (BP) measurement recorded in the previous 12 months are deemed to have uncontrolled BP.<sup>2</sup>
  - NICE updated *Hypertension in adults: diagnosis and management* (NG136) in 2019.<sup>3</sup> This guidance overrides the BP recommendations that appeared in *Type 2 diabetes in adults* (NG28), published in 2015.
  - According to NG136, for a person with diabetes the preferred BP targets are:
    - <80 years <140/90 mmHg
    - ≥80 years <150/90 mmHg
  - For those with diabetes and chronic kidney disease (CKD), refer to NICE *Chronic kidney disease in adults: assessment and management\** (CG182).<sup>4</sup> The preferred target is:
    - 120–129/<80 mmHg
- \*Updated guidance is due for publication in July 2021.

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## Box B

### At diagnosis

- Code hypertension.
- Record height, weight, BMI, smoking status, family history of heart disease.
- Take baseline U&E, eGFR, lipids, TSH and LFT.
- Obtain urine specimen (dipstick to check for haematuria and send for ACR).
- Use results above to calculate CV risk using QRisk<sup>®</sup>3 tool. If QRisk3 >10%, offer statin (refer to [www.nice.org.uk/guidance/CG181](http://www.nice.org.uk/guidance/CG181)).
- Arrange non-urgent 12-lead ECG (to assess for LVH).
- Examine the fundi for the presence of hypertensive retinopathy.

# Blood pressure targets

According to latest NICE guideline on hypertension (NG136), there is **insufficient evidence to support the previously recommended lower BP targets for people with type 2 diabetes, other than for those with co-existing CKD**. The recommendation is to reduce and maintain BP to the following targets:

	Clinic	ABPM/HBPM
<b>BP target 18–79 years</b>	<140/90 mmHg	<135/85 mmHg
<b>BP target ≥80 years</b>	<150/90 mmHg	<145/85 mmHg
<b>BP in people with CKD</b>	120–129/ <80 mmHg	–

 Consider appropriate BP target level in special circumstances (e.g. those at risk of falls or postural hypotension, or with frailty, reduced life expectancy or polypharmacy).

Be mindful of low BP and consider reduction of treatment if a person's systolic BP <110 mmHg.

For adults <40 years, consider seeking specialist evaluation of secondary causes of hypertension, as appropriate.

## Useful resources

- British and Irish Hypertension Society (BIHS) educational resources and list of approved home BP monitors: <https://bihsoc.org>
- BIHS healthy eating diet sheet: <https://bit.ly/2ZoZWYX>
- DASH (Dietary Approaches to Stop Hypertension): [www.dashdiet.org](http://www.dashdiet.org)
- Diabetes UK Information Prescription on diabetes and blood pressure: <http://bit.ly/2tPH23>
- QRisk3 cardiovascular risk calculator: <https://qrisk.org/three>
- How to help people with diabetes stop smoking: <https://bit.ly/3j2hSsk>

## Abbreviations

ABPM=ambulatory blood pressure monitoring; ACEi=angiotensin-converting enzyme inhibitor; ACR=albumin-to-creatinine ratio; ARB=angiotensin receptor blocker; BP=blood pressure; CCB=calcium channel blocker; CKD=chronic kidney disease; CV=cardiovascular; ECG=electrocardiogram; eGFR=estimated glomerular filtration rate; HBPM=home blood pressure monitoring; LFT=liver function tests; LVF=left ventricular hypertrophy; RAS=renin-angiotensin system; TSH=thyroid stimulation hormone; U&E=urea and electrolytes

## References

- Grossman A, Grossman E (2017) Blood pressure control in type 2 diabetic patients. *Cardiovasc Diabetol* **16**: 3
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- Vinik AI, Maser RE, Mitchell BD, Freeman R (2003) Diabetic autonomic neuropathy. *Diabetes Care* **26**: 1553–79
- NICE (2016) *Cardiovascular disease: risk assessment and reduction, including lipid modification* (CG181): [www.nice.org.uk/guidance/CG181](http://www.nice.org.uk/guidance/CG181)

# Treatment

## Lifestyle advice

- Ask about lifestyle. Where appropriate, offer lifestyle advice that includes healthy eating:
  - A diet rich in a variety of vegetables, fruits and whole grains.
  - Healthy natural fats (olive oil, nuts and fish) and dairy (milk, yoghurt and cheese).
  - A variety of proteins, including seafood, lean meat, poultry, eggs, legumes, soy, seeds and nuts.
  - Limit sugar-sweetened foods and drinks, refined carbohydrates and processed foods.
- The DASH (Dietary Approaches to Stop Hypertension) eating plan recommends reducing salt intake.
- Standard DASH=2300 mg/day sodium (6 g salt); lower sodium DASH=1500 mg/day sodium (3–4 g salt).
- Support individuals who are overweight to lose weight.
- Offer smoking cessation advice to smokers (see **Useful resources**).
- Provide information about local initiatives that support and promote a healthy lifestyle.

## When to start/consider

### antihypertensive drug treatment

- Discuss individual CV disease risk and preferences for treatment, including no treatment, and explain the risks and benefits before starting antihypertensive drug treatment.
- Continue to offer lifestyle advice and support them to make lifestyle changes.
- Offer antihypertensive drug treatment in addition to lifestyle advice to adults of any age with persistent stage 2 hypertension. Use clinical judgement for people of any age with frailty or multimorbidity.
- Discuss starting antihypertensive drug treatment, in addition to lifestyle advice, with adults aged <80 years with persistent stage 1 hypertension who have diabetes.
- Consider antihypertensive drug treatment in addition to lifestyle advice for people aged >80 years with stage 1 hypertension, if their clinic blood pressure is over

150/90 mmHg. Use clinical judgement for people with frailty or multimorbidity.

### Special groups

- For choice of hypertensive agent in people with CKD, see NICE guideline on [chronic kidney disease in adults](#).
- For women considering pregnancy or who are pregnant or breastfeeding, manage hypertension in line with the recommendations on management of pregnancy with chronic hypertension, and on antihypertensive treatment while breastfeeding in NICE guideline on [hypertension in pregnancy](#).
- For adults aged <40 years with hypertension, consider seeking specialist evaluation of secondary causes of hypertension and a more detailed assessment of the long-term balance of treatment benefit and risks.

## Stepwise approach to the pharmacological management of hypertension in adults with type 2 diabetes

- Offer people with isolated systolic hypertension (systolic BP ≥160 mmHg) the same treatment as people with both raised systolic and diastolic BP.

<b>Step 1</b>	ACEi or ARB Consider ARB in preference to an ACEi in adults of black African or African–Caribbean family origin.
<b>Step 2</b>	ACEi or ARB + CCB or thiazide-like diuretic
<b>Step 3</b>	ACEi or ARB + CCB + thiazide-like diuretic
<b>Step 4</b>	Confirm resistant hypertension: confirm elevated BP with ABPM or HBPM, check for postural hypertension and discuss adherence. Consider seeking expert advice or adding low-dose spironolactone if blood potassium level is ≤4.5 mmol/L, or alpha-blocker or beta-blocker if blood potassium level is >4.5 mmol/L. <b>Seek expert advice if BP is uncontrolled on optimal tolerated doses of four drugs.</b>

## Hypertension prescribing tips

- Do not offer a combination of ACE inhibitor and ARB.
- Indapamide should be used in preference to a conventional thiazide diuretic, such as bendroflumethiazide or hydrochlorothiazide.
- During intercurrent illness, especially where there is risk of dehydration, consider withholding ACEi/ARBs and diuretics until recovered.
- Measure serum potassium concentrations and estimate the glomerular filtration rate (GFR) before starting RAS antagonists.
- Repeat these measurements between 1 and 2 weeks after starting RAS antagonists, and after each dose increase.
- Do not routinely offer ACEi or ARB if pre-treatment serum potassium concentration is >5.0 mmol/L and STOP if it rises to ≥6.0 mmol/L.
- Following the introduction or dose increase of RAS antagonists, do not modify the dose unless either the GFR decrease from pre-treatment baseline is >25% or serum creatinine increase from baseline is >30%.