



## Measure the blood pressure

- Check pulse rate and rhythm.
- Do not use electronic BP monitor in the presence of an irregular pulse.
- Measure BP at least annually in a person without previously diagnosed hypertension or renal disease.
- Ensure the appropriate cuff size is used. 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.
- Measure BP in both arms.

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

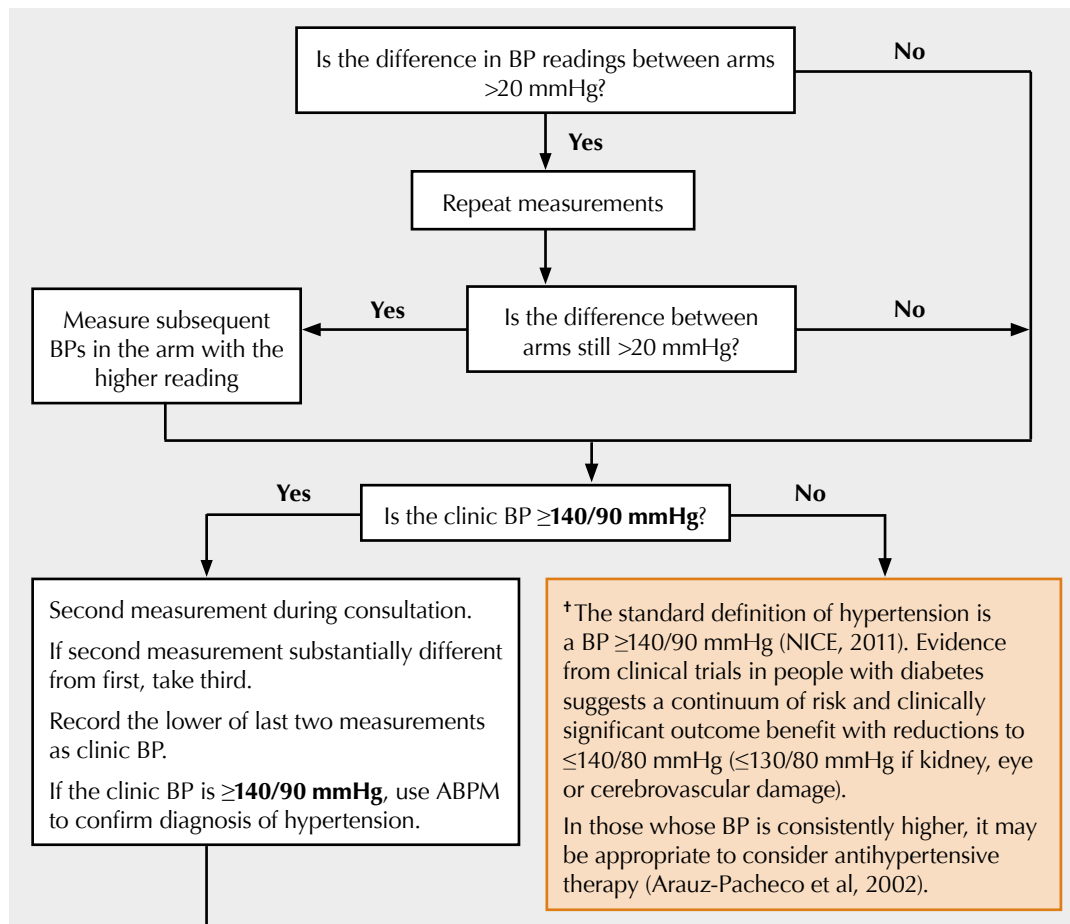
### About this series

The aim of the “How to” series is to provide readers with a guide to clinical procedures and aspects of diabetes care that are covered in the clinic setting.

### What and why

- 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 (Grossman and Grossman, 2017).
- In a person with diabetes, the preferred BP target is  $\leq 140/80$  mmHg or  $\leq 130/80$  mmHg if there is kidney, eye or cerebrovascular damage.
- Regardless of age, first-line antihypertensive drug treatment in people with diabetes should be a once-daily, generic angiotensin-converting enzyme (ACE) inhibitor (for exceptions see **Box B**).

**Citation:** Diggle J (2018) How to diagnose and treat hypertension in diabetes. *Diabetes & Primary Care* 20: 89–90



## Confirm the diagnosis

**⚠ Do NOT use clinic BP to diagnose hypertension**

### Using ABPM

- Ensure at least two measurements per hour are taken during waking hours.
- Calculate the average value of at least 14 measurements during waking hours.
- If ABPM is not tolerated, use HBPM.

### Using HBPM

- Record BP twice daily (in the morning and evening).
- For each recording, take two consecutive measurements at least 1 minute apart with the person seated.
- Continue to measure BP for at least 4 days (but ideally for 1 week).
- Discard measurements taken on the first day and use the average value of all remaining measurements to confirm a diagnosis of hypertension.

Defining hypertension	Blood pressure categories		
	Stage 1	Stage 2	Severe*
Clinic BP	$\geq 140/90$ mmHg	$\geq 160/100$ mmHg	$\geq 180/110$ mmHg
ABPM or HBPM	$\geq 135/85$ mmHg	$\geq 150/95$ mmHg	

\*For those with severe hypertension, DO NOT wait for results of ABPM or HBPM (see over page).



HOWEVER, if clinic BP  $>130/80$  mmHg or ambulatory BP average  $>125/75$  mmHg, refer to † in the algorithm above.

### 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 early morning first-catch urine specimen (dipstick and send for ACR).
- Use results above to calculate CV risk using QRisk<sup>3</sup> tool. If QRisk3 >10%, offer statin (refer to <http://bit.ly/2NWRiks>).
- Arrange non-urgent ECG (to assess for LVF).

### In patients with severe hypertension (i.e. $\geq 180/110$ mmHg)

- DO NOT wait for results of ABPM or HBPM.
- Start antihypertensive treatment immediately.
- Refer to specialist care the same day if there are signs of papilloedema and/or retinal haemorrhage, or suspected phaeochromocytoma.

### Box A. Lifestyle interventions

Offer advice on:

- Physical activity (and weight management).
- Alcohol consumption.
- Diet (e.g. DASH eating plan).
- Caffeine and salt intake.
- Smoking cessation advice.
- Initiatives to provide support and promote lifestyle change – referral to health trainer, if appropriate.

### Treatment targets

- In a person with diabetes, the preferred target is  $\leq 140/80$  mmHg [*135/78 mmHg<sup>†</sup>*].
- However, if there is CKD/proteinuria, retinopathy or cerebrovascular disease, the target is  $\leq 130/80$  mmHg [*125/78 mmHg<sup>†</sup>*].

<sup>†</sup> Ambulatory equivalents have not been defined (Head et al, 2010), but are likely to be slightly lower. Suggested guide levels appear bracketed in italics.



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.

If lifestyle measures (see **Box A**) do not reduce BP to  $\leq 140/80$  mmHg ( $\leq 130/80$  mmHg if there is kidney, eye or cerebrovascular damage), offer antihypertensive drug treatment to all those with diabetes and Stage 1 hypertension or above, regardless of QRisk3 value (refer to **Box B**).

### References

- Arauz-Pacheco C et al (2002) The treatment of hypertension in adults with diabetes *Diabetes Care* **25**: 134–47
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- Grossman A, Grossman E (2017) Blood pressure control in type 2 diabetic patients. *Cardiovasc Diabetol* **16**: 3
- Head GA et al (2010) Definition of ambulatory blood pressure targets for diagnosis and treatment of hypertension in relation to clinic blood pressure: prospective cohort study. *BMJ* **340**: c1104
- NICE (2011) *Hypertension in adults: diagnosis and management* (CG127). NICE, London ([www.nice.org.uk/guidance/cg127](http://www.nice.org.uk/guidance/cg127))
- NICE (2014) *Cardiovascular disease: risk assessment and reduction, including lipid modification* (CG181). NICE, London ([www.nice.org.uk/guidance/CG181](http://www.nice.org.uk/guidance/CG181))
- NICE (2017) *Type 2 diabetes in adults: management* (NG28). NICE, London ([www.nice.org.uk/guidance/ng28](http://www.nice.org.uk/guidance/ng28))
- UK Prospective Diabetes Study Group (1998) Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. *BMJ* **317**: 703–13

### Box B. NICE drug treatment recommendations

#### 1<sup>st</sup>-line therapy: ACE inhibitor or ARB

Once-daily, generic ACE inhibitor **irrespective of age**. Exceptions: people of African–Caribbean descent (offer an ACE inhibitor plus either a diuretic or a generic CCB) or women for whom, after informed discussion, there is a possibility of becoming pregnant (a CCB should be the first-line blood pressure-lowering therapy).

For a person with continuing intolerance to an ACE inhibitor (other than renal deterioration or hyperkalaemia), substitute with an angiotensin II-receptor antagonist (ARB).

**Do not use an ACE inhibitor and ARB in combination.**

Titrate dose every 14 days. Monitor potassium levels and renal function according to **Box C**.

#### 2<sup>nd</sup>-line therapy: ACE inhibitor or ARB plus CCB<sup>§</sup> or Diuretic<sup>†</sup>

#### 3<sup>rd</sup>-line therapy: ACE inhibitor or ARB plus CCB<sup>§</sup> and Diuretic<sup>†</sup>

<sup>§</sup>Consider amlodipine 5 mg initially, increasing dosage as required.

<sup>†</sup>Consider a thiazide-like diuretic (e.g. indapamide).

#### 4<sup>th</sup>-line therapy:

If BP is not reduced to the individually agreed target with triple therapy, consider adding:

#### Alpha-blocker or Beta-blocker or Spironolactone

Consider referral for specialist advice if BP is still not well controlled with optimal doses of four antihypertensive agents.

### Box C. Renal and potassium monitoring

Do not initiate an ACE inhibitor or ARB if pre-treatment serum potassium is  $>5.0$  mmol/L.

Stop ACE inhibitor or ARB if serum potassium is  $\geq 6.0$  mmol/L and other drugs known to promote hyperkalaemia have been discontinued.

Following the introduction or dose increase of ACE inhibitor or ARB, do not modify the dose unless:

- eGFR decrease from pre-treatment baseline is  $>25\%$ , **OR**
- serum creatinine increase from baseline is  $>30\%$

### Ongoing monitoring

Monitor the BP of a person who has attained and consistently remained at his or her BP target every 4–6 months and check for possible adverse effects of antihypertensive therapy, including the risks from unnecessarily low BP.

### Useful resources

- 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/2JtPH23>
- QRisk3 cardiovascular risk calculator: <https://qrisk.org/three>
- Low-salt dietary advice: <http://bit.ly/2K39uWa>

### Author

Jane Diggle, Specialist Practitioner Practice Nurse, West Yorkshire, and co-Vice-Chair of the PCDS.

### Abbreviations

ABPM=ambulatory blood pressure monitoring; ACE=angiotensin-converting enzyme; ACR=albumin to creatinine ratio; 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 function; TSH=thyroid stimulation hormone; U&E=urea and electrolytes