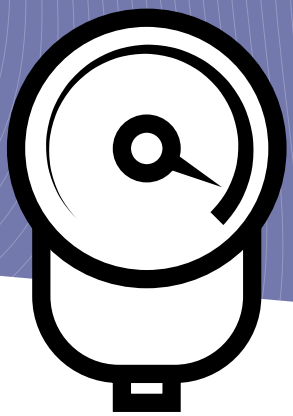

Diabetes: Blood pressure

1. Background information

- Over one quarter of adults in the UK are estimated to have a high blood pressure (BP) but because it is typically asymptomatic, many remain undiagnosed.[1]
- The prevalence of hypertension in people with diabetes is likely to be much higher.[2]
- In diabetes, hypertension increases the risks of coronary heart disease, stroke, kidney disease and retinopathy[3] and often co-exists with other cardiovascular (CV) risk factors such as albuminuria, central obesity, insulin resistance and dyslipidaemia.[2]
- CV disease is the major cause of premature mortality in those with type 2 diabetes (T2D).[4]

Current update...

In August 2019 NICE published an update to its guideline on the diagnosis and management of hypertension in adults (NG136).[5] This replaces CG127 from 2011 and overrides the guidance for blood pressure management that appears in the NICE guidelines for T2D in adults (NG28).[5] For people with diabetes and chronic kidney disease (CKD), refer to CG182.[6]

2. Process

Measure BP at least annually in a person with T2D without previously diagnosed hypertension or renal disease[5] (this is one of the nine annual care processes recommended by NICE and measured within the National Diabetes Core Audit).[7]

1 Check pulse rate and rhythm (do not use electronic BP monitor in the presence of an irregular pulse).[5]

2 Ensure the appropriate cuff size is used.[5]

3 Measure BP in both arms (if difference between arms is >15 mmHg, repeat. If difference remains >15 mmHg measure subsequent BPs in the arm with the higher reading).[5]

4 Measure standing as well as seated BP in people with hypertension and diabetes (if BP falls by 20 mmHg or more on standing review medication, measure subsequent BP with person standing and consider referral to specialist where symptoms of postural hypotension persist).[5] Postural hypotension is uncommon in diabetes but can occur secondary to autonomic neuropathy.[8]

5 Dip stick urine for haematuria using reagent strip and send first-catch specimen of urine for estimation of the albumin:creatinine ratio (ACR).[5]

6 Measure HbA_{1c}, electrolytes, creatinine, estimated glomerular filtration rate (eGFR) and lipid profile.[5]

3. Definitions/diagnosis

Hypertension is defined and classified as follows:[5]

Stage 1 Hypertension:	Clinic BP ≥140/90 mmHg	If clinic BP is between 140/90 mmHg and 180/120 mmHg offer ambulatory blood pressure monitoring (ABPM) to confirm diagnosis of hypertension. If ABPM unsuitable offer home BPM (HBPM).	ABPM/HBPM ≥135/85 mmHg
Stage 2 Hypertension:	Clinic BP ≥160/100 mmHg		ABPM/HBPM ≥150/95 mmHg
Stage 3 Hypertension (severe):	Clinic systolic BP ≥180 mmHg or clinic diastolic BP ≥120 mmHg		

Stage 1 and 2 hypertension

- ☐ Investigate for target organ damage (e.g. kidney damage, retinopathy, left ventricular hypertrophy to include 12 lead electrocardiogram).[5]
- ☐ Assess CV risk (using appropriate assessment tool such as QRisk®3).[5]

Stage 3 hypertension

- ☐ Assess for target organ damage as soon as possible.[5]
- ☐ Consider starting drug treatment immediately without ABPM/HBPM if target organ damage.[5]
- ☐ Repeat clinic BP in 7 days if no target organ damage.[5]
- ☐ Refer for same-day specialist review if: signs of retinal haemorrhage or papilloedema; life-threatening symptoms (e.g. chest pain, signs of heart failure or acute kidney injury or new-onset confusion) or suspected pheochromocytoma (e.g. labile or postural hypotension, palpitations, pallor, headache, abdominal pain or diaphoresis).[5]

4. Blood pressure targets

According to latest hypertension guideline published by NICE there is insufficient evidence to support lower BP targets for people with T2D other than in those with co-existing CKD.[5] The recommendation is to reduce and maintain BP to the following targets:

Without CKD		With CKD
Age <80 years:	Age ≥80 years:	Refer to CG182[6] which states:
Clinic BP <140/90 mmHg ABPM/HBPM <135/85 mmHg	Clinic BP <150/90 mmHg ABPM/HBPM <145/85 mmHg	Aim to keep the systolic BP <130 mmHg (target range 120 to129 mmHg) and diastolic BP <80 mmHg. This is equivalent to ABPM/HBPM <125/75 mmHg

Use clinical judgement for those with frailty or multimorbidity.[5] The QOF target for BP in those with moderate to severe frailty was removed in 2019–20 (for others there is a single target ≤140/80 mmHg). Avoiding a target for those with moderate or severe fragility reduces the risk of over treating this group and focusses on achieving better control in those likely to gain the greatest benefit.

5. Treatment

Ask about lifestyle and where appropriate offer lifestyle advice to include:[5]

- ☐ Encouraging healthy eating: a diet rich in a variety of vegetables and fruits and whole grains, healthy natural fats (olive oil, nuts, fish) and dairy (milk, yoghurt, cheese). A variety of protein 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 Approach to Stop Hypertension) recommends reducing salt intake. Standard DASH = 2300 mg sodium (6 g salt); Lower sodium DASH = 1500 mg sodium (3–4 g salt).
- ☐ Supporting individuals who are overweight to lose weight.
- ☐ Offering smoking cessation advice for smokers.
- ☐ Providing information about local initiatives that support and promote healthy lifestyle.

Discuss starting antihypertensive drug treatment in addition to lifestyle in adults <80 years with T2D and persistent stage 1 hypertension (clinic BP ≥140/90 mmHg, ABPM ≥135/85 mmHg).[5]

Recommended stepwise approach:[5]

Step 1	ACEi or ARB[a] Offer ARB in preference to an ACE in those of black African or African-Caribbean family origin
Step 2	ACEi or ARB + CCB or thiazide-like diuretic[b]
Step 3	ACEi or ARB + CCB + thiazide-like diuretic
Step 4	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 **Seek expert advice if BP is uncontrolled on optimal tolerated doses of 4 drugs**

ACEi, angiotensin-converting-enzyme inhibitor; ARB, angiotensin receptor blocker; CCB, calcium channel blocker.

Use clinical judgement for those with frailty or multimorbidity.[5]

- ☐ Refer to NICE NG 133 for advice in women with T2D who are pregnant or considering planning a pregnancy.[9]
- ☐ When using further diuretic therapy for step 4 treatment of resistant hypertension, monitor blood sodium, potassium, and renal function within 1 month of starting treatment and repeat as needed thereafter.[5]
- ☐ **Do not offer** a combination of ACEi AND ARB.[5]
- ☐ Indapamide should be used in preference to conventional thiazide diuretic such as bendroflumethiazide or hydrochlorothiazide.[5]

6. Useful resources

- **British Dietetic Association food factsheet:** Hypertension and diet: https://www.bda.uk.com/resource/hypertension-diet.html
- **British and Irish Hypertension Society:** https://bihsoc.org/ for downloadable educational booklets and list of approved home BP monitors.
- **British and Irish Hypertension Society Healthy eating diet sheet:** https://bihsoc.org/wp-content/uploads/2018/02/Healthy-Eating-Diet-Sheet-Updated-Oct-2017-JH-Final-Feb-2018.pdf
- **DASH (Dietary Approaches to Stop Hypertension):** www.dashdiet.org
- **Diabetes UK Information prescription on diabetes and blood pressure:** http://bit.ly/2JtPH23
- **QRisk3 cardiovascular risk calculator:** https://qrisk.org/three

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