NICE National Institute for Health and Care Excellence

NICE Pathways

Treatment steps for hypertension

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: November 2021

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

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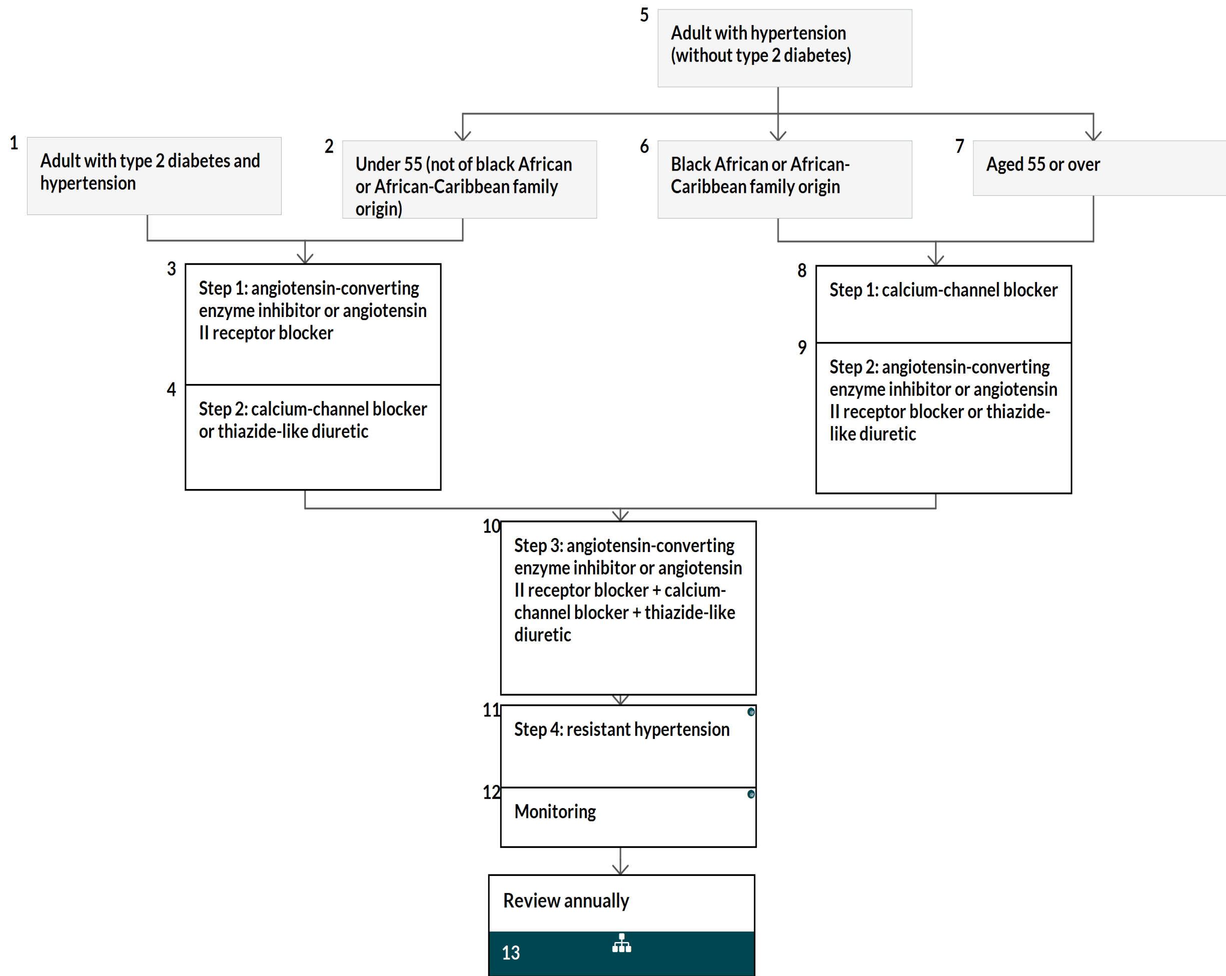

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1 Adult with type 2 diabetes and hypertension

No additional information

2 Under 55 (not of black African or African-Caribbean family origin)

No additional information

3 Step 1: angiotensin-converting enzyme inhibitor or angiotensin II receptor blocker

Offer an ACE inhibitor or an ARB[1] to adults starting step 1 antihypertensive treatment who:

- have type 2 diabetes and are of any age or family origin (see also choosing antihypertensive drug treatment for adults of black African or African-Caribbean family origin) **or**
- are aged under 55 but not of black African or African-Caribbean family origin.

If an ACE inhibitor is not tolerated, for example because of cough, offer an ARB to treat hypertension.

Do not combine an ACE inhibitor with an ARB to treat hypertension.

See the NICE guideline to find out why we made these recommendations and how they might affect practice.

4 Step 2: calcium-channel blocker or thiazide-like diuretic

Before considering next step treatment for hypertension discuss with the person if they are taking their medicine as prescribed and support adherence in line with the NICE Pathway on medicines optimisation.

If hypertension is not controlled in adults taking step 1 treatment of an ACE inhibitor or ARB, offer the choice of 1 of the following drugs in addition to step 1 treatment:

- a CCB **or**
- a thiazide-like diuretic.

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[1] In 2007, the MHRA issued a drug safety update on ACE inhibitors and angiotensin II receptor antagonists: not for use in pregnancy that states 'Use in women who are planning pregnancy should be avoided unless absolutely necessary, in which case the potential risks and benefits should be discussed'. There is also a 2009 MHRA safety update for ACE inhibitors and angiotensin II receptor antagonists: use during breastfeeding and related clarification: ACE inhibitors and angiotensin II receptor antagonists.

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See the NICE guideline to find out why we made these recommendations and how they might affect practice.

5 Adult with hypertension (without type 2 diabetes)

No additional information

6 Black African or African-Caribbean family origin

No additional information

7 Aged 55 or over

No additional information

8 Step 1: calcium-channel blocker

Offer a CCB to adults starting step 1 antihypertensive treatment who:

- are aged 55 or over and do not have type 2 diabetes **or**
- are of black African or African-Caribbean family origin and do not have type 2 diabetes (of any age).

If a CCB is not tolerated, for example because of oedema, offer a thiazide-like diuretic to treat hypertension.

If there is evidence of heart failure, offer a thiazide-like diuretic and follow the NICE Pathway on chronic heart failure.

If starting or changing diuretic treatment for hypertension, offer a thiazide-like diuretic, such as indapamide in preference to a conventional thiazide diuretic such as bendroflumethiazide or hydrochlorothiazide.

For adults with hypertension already having treatment with bendroflumethiazide or hydrochlorothiazide, who have stable, well-controlled blood pressure, continue with their current treatment.

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See the NICE guideline to find out why we made these recommendations and how they might affect practice.

9 Step 2: angiotensin-converting enzyme inhibitor or angiotensin II receptor blocker or thiazide-like diuretic

Before considering next step treatment for hypertension discuss with the person if they are taking their medicine as prescribed and support adherence in line with the NICE Pathway on medicines optimisation.

If hypertension is not controlled in adults taking step 1 treatment of a CCB, offer the choice of 1 of the following drugs in addition to step 1 treatment:

- an ACE inhibitor **or**
- an ARB **or**
- a thiazide-like diuretic.

If hypertension is not controlled in adults of black African or African-Caribbean family origin who do not have type 2 diabetes taking step 1 treatment, consider an ARB, in preference to an ACE inhibitor, in addition to step 1 treatment.

See the NICE guideline to find out why we made these recommendations and how they might affect practice.

10 Step 3: angiotensin-converting enzyme inhibitor or angiotensin II receptor blocker + calcium-channel blocker + thiazide-like diuretic

Before considering next step treatment for hypertension:

- review the person's medications to ensure they are being taken at the optimal tolerated doses **and**
- discuss adherence (see step 2 treatments).

If hypertension is not controlled in adults taking step 2 treatment, offer a combination of:

- an ACE inhibitor or ARB (see choosing antihypertensive drug treatment) for people of black African or African-Caribbean family origin), **and**
- a CCB **and**

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- a thiazide-like diuretic.

See the NICE guideline to find out why we made these recommendations and how they might affect practice.

11 Step 4: resistant hypertension

If hypertension is not controlled in adults taking the optimal tolerated doses of an ACE inhibitor or an ARB plus a CCB and a thiazide-like diuretic, regard them as having resistant hypertension.

Before considering further treatment for a person with resistant hypertension:

- Confirm elevated clinic blood pressure measurements using ambulatory or home blood pressure recordings.
- Assess for postural hypotension.
- Discuss adherence (see step 2 treatments).

For people with confirmed resistant hypertension, consider adding a fourth antihypertensive drug as step 4 treatment (see below) or seeking expert advice[1].

Consider further diuretic therapy with low-dose spironolactone[2] for adults with resistant hypertension starting step 4 treatment who have a blood potassium level of 4.5 mmol/l or less. Use particular caution in people with a reduced eGFR because they have an increased risk of hyperkalaemia.

When using further diuretic therapy for step 4 treatment of resistant hypertension, monitor blood sodium and potassium and renal function within 1 month of starting treatment and repeat as needed thereafter.

Consider an alpha-blocker or beta-blocker for adults with resistant hypertension starting step 4 treatment who have a blood potassium level of more than 4.5 mmol/l.

If blood pressure remains uncontrolled in people with resistant hypertension taking the optimal tolerated doses of 4 drugs, seek specialist advice.

See the NICE guideline to find out why we made these recommendations and how they might affect practice.

[1] In 2007 the MHRA issued a drug safety update on ACE inhibitors and angiotensin II receptor antagonists: not for

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use in pregnancy that states 'Use in women who are planning pregnancy should be avoided unless absolutely necessary, in which case the potential risks and benefits should be discussed'. There is also a 2009 MHRA safety update for ACE inhibitors and angiotensin II receptor antagonists: use during breast feeding and related clarification: ACE inhibitors and angiotensin II receptor antagonists.

[2] At the time of publication (August 2019), not all preparations of spironolactone have a UK marketing authorisation for this indication. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the GMC's Prescribing guidance: prescribing unlicensed medicines for further information.

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Interventional procedures

NICE has published guidance on percutaneous transluminal radiofrequency sympathetic denervation of the renal artery for resistant hypertension with **special arrangements** for clinical governance, consent, and audit or research.

NICE has published guidance that implanting a baroreceptor stimulation device for resistant hypertension should be used **only in the context of research**.

Quality standards

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

Hypertension in adults

6. Referral to a specialist for people with resistant hypertension

12 Monitoring

Monitoring response to treatment

Use clinic blood pressure measurements to monitor the response to lifestyle changes or drug treatment in people with hypertension.

Measure standing as well as seated blood pressure (see measuring blood pressure) in people with hypertension and:

- with type 2 diabetes **or**
- with symptoms of postural hypotension **or**
- aged 80 and over.

In people with a significant postural drop or symptoms of postural hypotension, treat to a blood pressure target based on standing blood pressure.

Advise people with hypertension who choose to self-monitor their blood pressure to use HBPM. (NHS England is supporting the use of HBPM through the blood pressure@home scheme.)

Consider ABPM or HBPM, in addition to clinic blood pressure measurements, for people with hypertension identified as having a white-coat effect or masked hypertension (in which clinic and non-clinic blood pressure results are conflicting). Be aware that the corresponding

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measurements for ABPM and HBPM are 5 mmHg lower than for clinic measurements (see diagnosis for diagnostic thresholds).

For people who choose to use HBPM, provide:

- training and advice on using home blood pressure monitors
- information about what to do if they are not achieving their target blood pressure.

Be aware that the corresponding measurements for HBPM are 5 mmHg lower than for clinic measurements (see diagnosis for diagnostic thresholds).

See the NICE guideline to find out why we made these recommendations and how they might affect practice.

Blood pressure targets

Reduce clinic blood pressure to below 140/90 mmHg and maintain that level in adults with hypertension aged under 80.

Reduce clinic blood pressure to below 150/90 mmHg and maintain that level in adults with hypertension aged 80 and over. Use clinical judgement for people with frailty or multimorbidity, (see also, the NICE Pathway on multimorbidity).

When using ABPM or HBPM to monitor the response to treatment in adults with hypertension, use the average blood pressure level taken during the person's usual waking hours (see diagnosis). Reduce and maintain blood pressure at the following levels:

- below 135/85 mmHg for adults aged under 80
- below 145/85 mmHg for adults aged 80 and over.

Use clinical judgement for people with frailty or multimorbidity (see also, the NICE Pathway on multimorbidity).

See the NICE guideline to find out why we made these recommendations and how they might affect practice.

Treatment review when type 2 diabetes is diagnosed

For an adult with type 2 diabetes on antihypertensive drug treatment when diabetes is diagnosed, review blood pressure control and medications used. Make changes only if there is poor control or if current drug treatment is not appropriate because of microvascular

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complications or metabolic problems.

Quality standards

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

Hypertension in adults

4. Blood pressure targets

13 Review annually

See Hypertension / Hypertension overview / Review annually

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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

masked hypertension

(clinic blood pressure measurements are normal (less than 140/90 mmHg), but blood pressure measurements are higher when taken outside the clinic using average daytime ambulatory blood pressure monitoring or average home blood pressure monitoring measurements)

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 blood pressure measurements at the time of diagnosis)

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Sources

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

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

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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.

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