



## PRACTICE

## GUIDELINES

# Hypertension in adults: summary of updated NICE guidance

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## What you need to know

- Discuss treatment with people with stage 1 hypertension and a 10 year risk for cardiovascular disease  $\geq 10\%$
- Choice of antihypertensive drug treatment should take into account patient preferences; a new decision aid has been produced to support this
- Consistently maintain blood pressure below target, rather than aim for a target
- Existing blood pressure targets have not been lowered; the benefits and harms of lowering them could not be fully determined from current evidence
- Asymptomatic, severe hypertension ( $\geq 180/120$  mmHg) does not require same day specialist review, but investigations for target organ damage should be carried out as soon as possible
- The guideline now makes recommendations for people with type 2 diabetes

Hypertension is a leading global cause of morbidity and mortality. More than 25% of the adult UK population has hypertension, and in about 30% blood pressure remains uncontrolled.<sup>1</sup> In August, the National Institute for Health and Care Excellence (NICE) published its updated guideline on the diagnosis and management of hypertension. The guideline reviews further evidence that has emerged since it was last updated in 2011 from randomised trials investigating the initiation, monitoring, and choice of antihypertensive treatment. The scope of the updated guideline has increased to also include people with type 2 diabetes, but does not make recommendations for people with chronic kidney disease, established cardiovascular disease, or hypertension in pregnancy.

This article summarises the most recent recommendations from NICE and includes information considered to be most relevant to primary care clinicians. Key changes to current practice include offering drug treatment to people at a lower threshold

for 10 year risk of cardiovascular disease, emphasis on maintaining blood pressure below target, and clarifying criteria for same day specialist review in people with accelerated hypertension.

## Recommendations

NICE recommendations are based on systematic reviews of best available evidence and explicit consideration of cost effectiveness. When minimal evidence is available, recommendations are based on the guideline committee (GC)'s experience and opinion of what constitutes good practice. Evidence levels for the recommendations are given in italics in square brackets.

## Diagnosing hypertension

Diagnosis of hypertension involves initial clinic blood pressure measurements followed by measurements at home to confirm the diagnosis (infographic, fig 1).

The previous guideline recommended measuring blood pressure in both arms, and repeating initial clinic blood pressure measurements if there is a difference of 20 mmHg between arms. This update has reduced this cut off to 15 mmHg, in line with evidence to suggest that even a small difference between arms could be associated with an increased risk of cardiovascular disease or vascular damage.

## Treating hypertension

### Lifestyle interventions

Lifestyle interventions are recommended for people with hypertension (**box 1**). If blood pressure is not reduced sufficiently with lifestyle interventions alone, start medication

in combination with lifestyle interventions, taking into account the patient's individual needs.

#### Box 1: Lifestyle interventions (not updated)

- Offer lifestyle advice to people with suspected or diagnosed hypertension, and continue to offer it periodically
- Ask about diet and exercise patterns, because a healthy diet and regular exercise can reduce blood pressure. Offer appropriate guidance and written or audiovisual materials to promote lifestyle changes
- Ask about alcohol consumption and encourage a reduced intake if the person drinks excessively, because this can reduce blood pressure and has broader health benefits. See the recommendations for practice in the NICE guideline on alcohol use disorders: prevention
- Discourage excessive consumption of coffee and other caffeine rich products
- Encourage people to keep their dietary sodium intake low, either by reducing or substituting sodium salt, as this can reduce blood pressure
- Do not offer calcium, magnesium, or potassium supplements as a method for reducing blood pressure
- Offer advice and help to smokers to stop smoking. See the NICE guideline on stop smoking interventions and services
- Inform people about local initiatives by, for example, healthcare teams or patient organisations that provide support and promote healthy lifestyle change, especially those that include group work for motivating lifestyle change
- Recommendations were not updated other than a review of the evidence for relaxation therapies. The available randomised trial data were not sufficient to determine the benefit or harms of these interventions, and recommendations for relaxation therapies were removed from the guideline. Evidence from the previous guideline was based on short term blood pressure changes, and there was no evidence of a direct benefit to people with hypertension, such as improving quality of life or reducing cardiovascular events.

## Starting antihypertensive drug treatment

Discuss people's preferences for treatment or no treatment, and use clinical judgment when considering treatment for people with frailty or multimorbidity. Offer treatment to all people with stage 2 hypertension (160/100-179/119 mmHg). For those with stage 1 hypertension (140/90-159/99 mmHg), evidence from randomised trials showed a benefit of treatment,<sup>2,3</sup> and health economic modelling found that treating people with stage 1 hypertension with a 10% cardiovascular disease risk was cost effective because of reductions in cardiovascular events, therefore:

- Discuss starting antihypertensive drug treatment, in addition to lifestyle advice, with adults under 80 with persistent stage 1 hypertension who have one or more of the following:
  - o target organ damage (box 4)
  - o established cardiovascular disease (box 4)
  - o renal disease
  - o diabetes
  - o an estimated 10 year risk of cardiovascular disease of 10% or more.

(Updated recommendation) [Based on moderate to very low quality randomised trial data and original economic modelling]
- Consider antihypertensive drug treatment in addition to lifestyle advice for adults under 60 with stage 1 hypertension and an estimated 10 year risk below 10%. Bear in mind that 10 year cardiovascular risk may underestimate the lifetime probability of developing cardiovascular disease. [Based on very low quality non-randomised data, the experience and opinion of the GC, and on original economic modelling]

- Consider antihypertensive drug treatment in addition to lifestyle advice for people over 80 with stage 1 hypertension if their clinic blood pressure is over 150/90 mmHg. Use clinical judgement for people with frailty or multimorbidity. [Based on the experience and opinion of the GC]
- For adults under 40 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. [Based on the experience and opinion of the GC]

#### Box 4: Definitions

##### Established cardiovascular disease

Medical history of stroke or transient ischaemic attack, heart attack, angina, narrowed peripheral arteries, or an interventional procedure. Cardiovascular disease is a general term for conditions affecting the heart or blood vessels. It is usually associated with a build up of fatty deposits inside the arteries (atherosclerosis) and an increased risk of blood clots. It can also be associated with damage to arteries in organs such as the brain, heart, kidneys, and eyes through deposition of glassy material within the artery walls (arteriosclerosis). Cardiovascular disease is one of the main causes of death and disability in the UK, but it can often be prevented by leading a healthy lifestyle.

##### Stage 1 hypertension

Clinic blood pressure ranging from 140/90 mmHg to 159/99 mmHg and subsequent ambulatory blood pressure daytime average or home blood pressure monitoring average blood pressure ranging from 135/85 mmHg to 149/94 mmHg.

##### Stage 2 hypertension

Clinic blood pressure of 160/100 mmHg or higher but less than 180/120 mmHg and subsequent ambulatory blood pressure daytime average or home blood pressure average of 150/95 mmHg or higher.

##### Stage 3 or severe hypertension

Clinic systolic blood pressure of 180 mmHg or higher or clinic diastolic blood pressure of 120 mmHg or higher.

##### Target organ damage

Damage to organs such as the heart, brain, kidneys, and eyes. Examples are left ventricular hypertrophy, chronic kidney disease, hypertensive retinopathy, or increased urine albumin: creatinine ratio

##### Accelerated hypertension

A severe increase in blood pressure to 180/120 mmHg or higher (and often over 220/120 mmHg) with signs of retinal haemorrhage and/or papilloedema (swelling of the optic nerve). It is usually associated with new or progressive target organ damage and is also known as malignant hypertension

## Choosing antihypertensive drug treatment

A new patient decision aid has been developed by NICE to facilitate discussions with patients about different types of treatment, taking into account factors such as side effects, contraindications, and the number of tablets taken per day.<sup>4</sup> The recommended sequence for medication titration is summarised in the infographic. Insufficient evidence was identified to recommend dual antihypertensive therapy when starting treatment.

## Blood pressure targets

Some international guidelines have reduced their blood pressure targets on the basis of recent randomised trials including the large multicentre US based SPRINT and ACCORD trials.<sup>5,6</sup> Both trials compared systolic blood pressure treatment targets of 140 mmHg with more intensive targets of 120 mmHg. Both trials included people with established cardiovascular disease and chronic kidney disease, therefore were not fully applicable to this guideline. A subgroup analysis of SPRINT that excluded

people with chronic kidney disease found a benefit of the lower blood pressure targets for people without type 2 diabetes, in terms of reducing mortality and cardiovascular events. However, the lower blood pressure target was also associated with a greater risk of harms such as acute kidney injury and hypotension. As the trial was stopped early, the long term implications of these harms were unclear. In addition, the evidence was not fully applicable to UK clinical practice because of differences in the methods for measuring blood pressure: the trial used automated measurement set on a time delay and an isolated rest period, which results in lower blood pressure readings than in routine UK clinical practice.<sup>7</sup> A lower systolic blood pressure target of 120 mmHg in the trial would not equate to the same blood pressure target in UK practice. The evidence therefore was unclear and insufficient to determine the benefits and harms of lowering existing blood pressure targets. A subgroup analysis of ACCORD that excluded people with established cardiovascular disease also found no benefit of a lower blood pressure target for people with type 2 diabetes.

Recommendations therefore reflect this, and focus on reducing and maintaining blood pressure below the existing target of 140 mmHg when the person is subsequently monitored, as this is not achieved in approximately 35% of people.<sup>1</sup>

- Reduce clinic blood pressure to below 140/90 mmHg and maintain that level in adults under 80 with hypertension
- Reduce clinic blood pressure to below 150/90 mmHg and maintain that level in adults over 80 with hypertension.

*(Updated recommendation) [Based on moderate to very low quality randomised data and based on the experience and opinion of the GC]*

## Monitoring blood pressure

People with hypertension need review and monitoring to assess their response to treatment, and to ensure that their blood pressure remains below target. As discussed above, the update recommends to “reduce clinic blood pressure to below” target, rather than “aim for a target” as per the 2011 guideline. Evidence was insufficient to strongly recommend blood pressure monitoring at home, so instead recommendations advise the use of home monitoring in people who choose to self-monitor their blood pressure. Evidence on telemonitoring was limited, and did not determine any additional benefits for patient outcomes. As a result, this was not recommended.

- Use clinic blood pressure measurements to monitor the response to lifestyle changes or drug treatment
- Advise people who choose to self-monitor their blood pressure to use home blood pressure monitoring (box 2)
- Consider ambulatory or home blood pressure monitoring, in addition to clinic blood pressure measurements, for people with hypertension identified as having a white coat effect or masked hypertension.

*[Based on low to very low quality evidence and based on the experience and opinion of the GC]*

### Box 2: Monitoring blood pressure

- When using ambulatory or home blood pressure monitoring to examine the response to treatment in adults with hypertension, use the average blood pressure level taken during the person's usual waking hours. Reduce and maintain blood pressure at the following levels:
  - below 135/85 mmHg for adults under 80
  - below 145/85 mmHg for adults over 80
- Measure standing and seated 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 notable postural drop (more than 20 mmHg in systolic blood pressure) or symptoms of postural hypotension, treat to a blood pressure target based on standing blood pressure
- For people who choose to use home blood pressure monitoring, 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 home blood pressure monitoring are 5 mmHg lower than for clinic measurements.

- Provide an annual review of care for adults with hypertension to monitor blood pressure, provide support, and discuss lifestyle, symptoms, and medication *[Not updated]*
- For adults 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 of blood pressure or if current drug treatment is not appropriate because of microvascular complications or metabolic problems *[From the previous guideline on type 2 diabetes in adults guideline (NICE guideline NG28)]*

See box 2 for further details on how to monitor blood pressure.

## Identifying who to refer for same day specialist review

Asymptomatic, severe hypertension ( $\geq 180/120$  mmHg) does not require same day specialist review. The previous guideline recommended immediate treatment for people with severe hypertension regardless of other signs and symptoms. However, referring everyone based on blood pressure alone may result in a large volume of accident and emergency referrals when only a small proportion have life threatening cases of accelerated hypertension. It is not clear to many clinicians which patients with extreme blood pressures need to be seen in secondary care urgently. This guideline has therefore clarified the criteria for those who do require treatment to be started immediately in the community versus those who require same day specialist review (including those with accelerated hypertension, suspected pheochromocytoma, or life threatening symptoms) (box 3). These updated recommendations reflect that target organ damage investigations can be carried out quickly by non-specialists to aid decision making and determine who may need urgent referral or treatment. Evidence in this area was lacking, therefore these recommendations were based on consensus. The committee took into account the advantages and disadvantages of same day referral and the balance between identifying people who need urgent treatment against unnecessary use of resources.

**Box 3: Identifying accelerated hypertension: assessing for same day review**

- Refer people for specialist assessment, carried out on the same day, if they have a clinic blood pressure of 180/120 mmHg and higher with 0 signs of retinal haemorrhage or papilloedema (accelerated hypertension) or
  - o life threatening symptoms such as new onset confusion, chest pain, signs of heart failure, or acute kidney injury
- If a person has severe hypertension (clinic blood pressure of 180/120 mmHg or higher) but no symptoms or signs indicating same day referral, carry out investigations for target organ damage as soon as possible:
  - o If target organ damage is identified, consider starting antihypertensive drug treatment immediately, without waiting for the results of ambulatory or home blood pressure monitoring
  - o If no target organ damage is identified, repeat clinic blood pressure measurement within seven days
- Refer people for specialist assessment carried out on the same day if they have suspected pheochromocytoma (for example, labile or postural hypotension, headache, palpitations, pallor, abdominal pain, or diaphoresis)

## Implementation

Lowering the cardiovascular risk based threshold for starting treatment in those with stage 1 hypertension will mean additional people require treatment and monitoring, although data suggest that approximately half of those who are newly recommended treatment are already receiving it in primary care.<sup>8</sup> Treating the additional patients will require additional primary care consultations but will lead to reduced numbers of cardiovascular events. Investment will be needed to implement ambulatory blood pressure monitoring in primary care settings that do not currently offer it (despite being a recommendation of the 2011 guideline). Clinical and economic evidence shows ambulatory blood pressure monitoring to be cost saving in the longer term through improved accuracy of diagnosis, thus avoiding unnecessary medication for those wrongly diagnosed as hypertensive and avoiding cardiovascular events in those wrongly diagnosed as normotensive. The guideline committee acknowledges that costs and savings may not always fall on the same setting (primary versus secondary care).

## Further information on the guidance

### Methods

- This guidance was developed by the National Guideline Centre in accordance with NICE guideline development methods (<https://www.nice.org.uk/media/default/about/what-we-do/our-programmes/developing-nice-guidelines-the-manual.pdf>)
- A Guideline Committee was established by the National Guideline Centre, which incorporated healthcare and allied healthcare professionals (one hypertension specialist nurse, two physicians with an interest in hypertension, one primary care nurse, two general practitioners, one elderly care physician, one commissioner, one senior pharmacist) and two lay members. In addition, the committee had one co-opted member (one diabetologist)
- Review questions were developed based on key clinical areas of the scope. Systematic literature searches, critical appraisals, evidence reviews, and evaluations of cost effectiveness, where appropriate, were completed for all review questions included within the update
- Quality ratings of the evidence were based on GRADE methodology ([www.gradeworkinggroup.org/](http://www.gradeworkinggroup.org/)). These relate to the quality of the available evidence for assessed outcomes or themes rather than the quality of the study
- The scope and draft of the guideline went through a rigorous reviewing process, in which stakeholder organisations were invited to comment; the committee took all comments into consideration when producing the final version of the guideline
- A formal review of the need to update a guideline is usually undertaken by NICE after its publication. NICE will conduct a review to determine whether the evidence base has progressed substantially to alter the guideline recommendations and warrants an update
- The guideline is available from the NICE website <https://www.nice.org.uk/guidance/ng136>

### Future research

The following areas were identified where more evidence was required. Further evidence could help to inform future recommendations and ensure people are receiving the best possible treatment

- Which automated blood pressure monitors are suitable for people with hypertension and atrial fibrillation?
- In adults under 40 with hypertension (with or without type 2 diabetes), what are the appropriate risk and blood pressure thresholds for starting treatment?
- What is the optimum blood pressure target for people over 80 with treated primary hypertension?
- Are there subgroups of people with hypertension who should start on dual therapy?
- What is the clinical and cost effectiveness of relaxation therapies for managing primary hypertension in adults in terms of reducing cardiovascular events and improving quality of life?
- Which people with extreme hypertension (220/120 mmHg or higher) or emergency symptoms should be referred for same day hospital specialist assessment?

### How patients were involved in the creation of this article

Committee members involved in this guideline update included lay members who contributed to the formulation of the recommendations summarised here.

### Guidelines into practice

Do you use ambulatory blood pressure monitoring (or home monitoring if ambulatory monitoring isn't suitable or tolerated) to diagnose hypertension?

Do you offer drug treatment to people with stage 1 hypertension (who have no other risk factors) if they have a 10 year cardiovascular disease risk below 20%?

Do you check that people with hypertension maintain a blood pressure that is below their target?

**Guideline Committee members** Elizabeth Clark, Elizabeth Denver, Mark Glover, Judith Magowan, Terry McCormack, Irene McGill, Richard McManus, Lucy Pollock, Mark Shapley, Alison Warren and Bryan Williams (until 10/10/2018).

**Competing interests** We declare the following interests based on NICE's policy on conflicts of interests (available at <https://www.nice.org.uk/Media/Default/About/>)

Who-we-are/Policies-and-procedures/code-of-practice-for-declaring-and-managing-conflicts-of-interest.pdf)

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National Institute for Health and Care Excellence 2019 Hypertension in adults: diagnosis and management. Available from <https://www.nice.org.uk/guidance/ng136>

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Figure

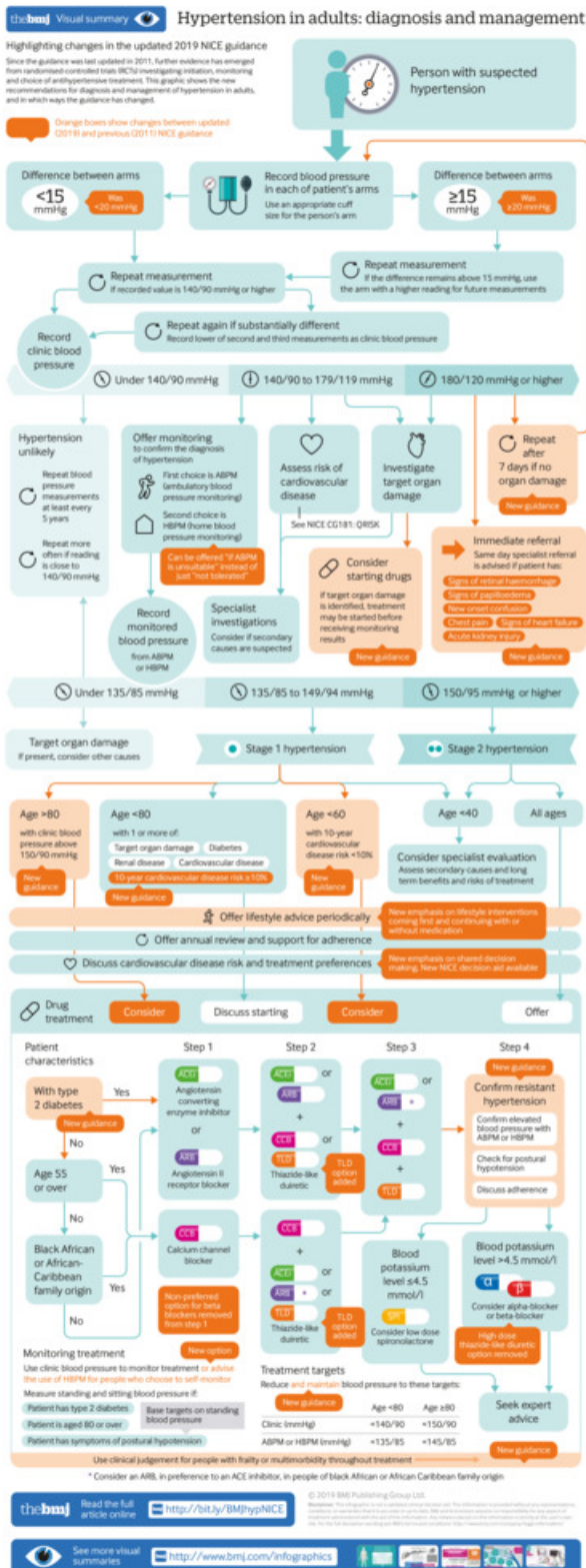


Fig 1 Infographic: Hypertension in adults: diagnosis and management

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