Management of Hypertension

See separate Hypertension and Hypertension in Pregnancy articles. This article is based primarily on current guidelines in the UK from the National Institute for Health and Care Excellence (NICE), namely the Clinical Guideline, the Hypertension Pathway and the Quality Standard for hypertension in adults[1, 2, 3].

Lifestyle interventions[4]

Discuss lifestyle measures in patients undergoing assessment for, or treatment of, hypertension. Inform about any local initiatives, and supplement advice with leaflets or audiovisual information.

Healthy diet

Advice from NICE includes:

- Weight reduction should be suggested if necessary, to maintain an ideal body mass index (BMI) of 18.5-24.9 kg/m^2[5]. Offer a diet sheet and/or dietetic appointment. Dietary self-help (eg, dieting clubs, for which there may be local referral options) may be appropriate. Encourage physical activity alongside dietary changes. NICE guidelines for obesity make further recommendations about pharmaceutical and surgical options where appropriate.
- Use of wholegrain varieties of starchy food (eg, rice, pasta, bread) where possible.
- Reduction of saturated fats, and increasing mono-unsaturated fats, using olive or rapeseed oils and spreads.
- Reduction in sugar intake and that of foods containing refined sugars.
- Eating at least five portions of fruit and vegetables per day.
- Eating at least two portions of fish per week, including a portion of oily fish.
- Eating at least 4-5 portions of unsalted nuts, seeds and legumes per week.
- Reducing any excessive caffeine consumption.
- Low dietary salt (see section below).
- Keeping alcohol within current national recommended levels. (Currently no more than 14 units per week for men and women, spread through the week, with at least two days alcohol-free[6].)
- Calcium, magnesium or potassium supplements are not recommended.

Stopping smoking

Patients should stop smoking (offer help ± nicotine replacement therapy). See separate Smoking Cessation article.

Encouraging exercise

- Make physical activities part of everyday life (eg, walk or cycle to work, use the stairs instead of the lift, walk at lunchtime) and build in enjoyable activities to leisure time every week (eg, walking, cycling, gardening, swimming, aerobics, etc).
- Minimise sedentary activities (eg, limit television watching or sitting at a computer or playing video games).
- Once more, look for local activities, join a sporting group, take advantage of taster sessions and get used to exercising regularly, ideally several times a week.

Salt[7, 8]

- Salt reduction to 4.4 g per day results in a reduction of ~4/2 mm Hg in blood pressure (BP).
- Guidelines recommend that we should have no more than 5-6 grams of salt per day.
- Patients should be advised not to add salt to food and to avoid processed foods.
- Food labelling is making it easier to determine the salt content of food.
Starting treatment[1,8]

Consider treating immediately if BP in clinic is ≥180/110 mm Hg; otherwise, consider after results of ambulatory blood pressure monitoring (ABPM) or home blood pressure monitoring (HBPM), blood tests and cardiovascular risk assessment are available.

Diagnose hypertension if the average of ABPM or HBPM readings is ≥135/85 mm Hg, (ignore first-day readings and average the rest - see separate Hypertension article).

- Stage 1 hypertension - clinic readings ≥140/90 mm Hg and ABPM/HBPM ≥135/85 mm Hg.
- Stage 2 hypertension - clinic readings ≥160/100 mm Hg and ABPM/HBPM ≥150/95 mm Hg.

Antihypertensive treatment should be commenced in people aged under 80 years with stage 1 hypertension plus signs of end-organ damage (known cardiovascular or renal disease), or with diabetes mellitus or a 10-year cardiovascular disease (CVD) risk ≥20%. Treatment in mild hypertension without target-organ damage or cardiovascular risk remains contentious[9].

Treatment should be started in all patients (any age) with stage 2 hypertension. Treat isolated systolic hypertension in the same way.

### Initial antihypertensive choices

- **If the patient is young (≤55 years) and non-black, start with:**
  - (A) angiotensin-converting enzyme (ACE) inhibitor or low-cost angiotensin-II receptor antagonist (AIIRA) - also called an angiotensin receptor blocker (ARB).
  - A beta-blocker may be appropriate in younger adults if an ACE inhibitor is not tolerated, in women who may become pregnant or if there is evidence of increased sympathetic drive. Beta-blockers were the B in the previous ABCD hypertension advice but are no longer preferred treatment, as evidence suggests they are inferior to other agents in terms of outcome[10].

- **If the patient is aged >55 years or a black person of African or Caribbean family origin, use:**
  - (C) calcium-channel blocker (CCB).
  - (D) thiazide-like diuretic if CCB not suitable. Chlortalidone (12.5-25.0 mg once daily) or indapamide (1.5 mg modified-release once daily or 2.5 mg once daily) are specifically recommended choices.

### Step 2 choices

- (A+C) ACE inhibitor or AIIRA with CCB.
- Use an ACE inhibitor/AIIRA and a thiazide-like diuretic (D) if CCB is not tolerated (or if there is any evidence of heart failure).
- If initially started on a beta-blocker, add a CCB rather than a thiazide-like diuretic second-line (reduce diabetic risk).
- Consider an AIIRA rather than an ACE inhibitor with a CCB in black people of African or Caribbean origin.

### Step 3 choices

- (A+C+D) ACE inhibitor or AIIRA and a CCB and a thiazide-like diuretic (chlortalidone or indapamide).

### Step 4 choices

- Consider a fourth agent or referral for specialist advice.
- (A+C+D) ACE inhibitor or AIIRA and a CCB and a thiazide-like diuretic plus a further diuretic (higher-dose thiazide-like diuretic or spironolactone, depending on potassium). Monitor renal function and electrolytes.
- If the higher-dose diuretic is not tolerated, consider an alpha-blocker or a beta-blocker, or seek expert advice.

The combination of an ACE inhibitor with an AIIRA is not recommended for the treatment of hypertension.

The PATHWAY-2 trial, published in 2015, suggested that spironolactone is the most effective fourth-line agent for resistant hypertension[11]. A drug safety update from the Medicines and Healthcare products Regulatory Agency (MHRA) in 2016 warns of the risk of hyperkalaemia when an ACE inhibitor or AIIRA is combined with spironolactone[12]. Routine use of this combination is not recommended but where it is, the lowest possible dose should be used and electrolytes monitored closely.
Treatment targets

Current targets\[^{1,8}\]

- People aged <80 years: clinic <140/90 mm Hg, ABPM/HBPM <135/85 mm Hg.
- People aged ≥80 years: clinic <150/90 mm Hg, ABPM/HBPM <145/85 mm Hg.

Monitor regularly with BP checks plus appropriate blood tests (eg, U&E and renal function on ACE inhibitor). Consider cholesterol-lowering treatment if CVD risk is ≥20%. See separate Lipid-regulating Drugs article. Further ABPM/HBPM may be needed to avoid overtreatment due to 'white coat hypertension'.

Latest research

Recent research tends to suggest more aggressive treatment targets may be appropriate in future.

- The Systolic Blood Pressure Intervention Trial (SPRINT) study, published in 2015, showed that a target of below 120 mm Hg rather than below 140 mm Hg for systolic blood pressure led to significant reduction in deaths and cardiovascular events, albeit with an increased incidence of adverse events\[^{13}\].
- A systematic review and meta-analysis published in the Lancet in 2016 (but not including the SPRINT study) also showed a significant reduction in cardiovascular events with more intensive treatment\[^{14}\].

Benefits of treating hypertension

Research continues to demonstrate the significant benefits of lowering high blood pressure. A large 2016 systematic review and meta-analysis showed\[^{15}\]:

- Each 10 mm Hg reduction of systolic blood pressure was associated with an overall relative reduction in risk of major cardiovascular event of 20%, and a reduction of mortality of 13%.
- There was no evidence of a level of BP reduction below which there is not further benefit.
- There was no evidence of increased risk at lower BP levels.
- CCBs were most effective in reducing the risk of stroke, whereas diuretics were most effective in reducing the risk of heart failure.

Self-monitoring may result in better BP control\[^{16}\].

Specialist referral

Refer if hypertension is difficult to control in spite of the steps above\[^{17}\].

Consider seeking specialist evaluation of patients aged <40 years who appear to have stage 1 hypertension without target organ damage or diabetes, either for exclusion of secondary causes of hypertension or a more detailed assessment of cardiovascular risk, as standard assessments can underestimate the lifetime risk in these people\[^{1,8}\].

Hypertension in the context of multimorbidity

Multimorbidity is increasingly the norm. One UK-based study found that two thirds of people with hypertension have a co-morbidity\[^{18}\]. Those with multimorbidity tend to be excluded from trials, making it difficult to determine optimum management. Management needs to be tailored to the individual, and NICE has developed guidelines to aid in the assessment and management of those with multimorbidity\[^{19}\].
A 2016 paper in the British Medical Journal (BMJ) collates advice from the disease-specific NICE guidelines to make recommendations about choices in these conditions, which may represent different choices from those in the hypertension NICE guidelines [20]:

- Chronic heart failure: people would normally already be on A and a beta-blocker. Add D, and if still not controlled, refer for specialist advice to consider spironolactone.
- Diabetes: A is first-line in type 1 and type 2. Add D as second-line and C as third-line. For type 2 diabetes, if of black African or Caribbean origin, use A + D or A + C first-line.
- Atrial fibrillation: if rate control is needed, add a beta-blocker (but not sotalol) or a rate-limiting CCB such as diltiazem. If on amlodipine, change to a rate-limiting CCB such as diltiazem.
- Chronic kidney disease: treatment depends on whether there is diabetes or not and on the albumin:creatinine ratio (ACR). A would normally be the first choice.

Further reading & references

- Hypertension in pregnancy; NICE Clinical Guideline (August 2010, updated 2011)

1. Hypertension: management of hypertension in adults in primary care; NICE Clinical Guideline (August 2011)
2. Hypertension overview; NICE Pathway August 2011
3. Hypertension; NICE Quality Standards, March 2013
5. Obesity identification assessment and management of overweight and obesity in children young people and adults; NICE Clinical Guideline, (November 2014)
8. Guidelines for the management of arterial hypertension; ESH/ESC Clinical Practice Guidelines, European Society of Cardiology (2013)

- Drug Safety Update; Medicines and Healthcare products Regulatory Agency (MHRA) February 2016
- Multimorbidity: clinical assessment and management; NICE Guidance (September 2016)

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