Hypertension: Treatment algorithm (adults)

Initial assessment and blood pressure (BP) readings

Give lifestyle advice at all steps

Yes

Diabetes, Coronary Heart Disease or Stroke

No

If BP above target value

If hypertension persistent (ie, raised BP > 140/90mmHg on THREE occasions) — measure monthly (or more frequently depending on BP)

BP >160/100mmHg or isolated systolic hypertension >160 mmHg

Commence treatment to achieve target BP

BP 140-159/ 90-99mmHg

Target organ damage*, established CVD, diabetes or 10 year CVD risk ≥ 20%

Reassess BP within 1 year

No

Reassess BP within 5 years

Blood pressure targets

- Optimal: <140/90mmHg
- In higher risk people: 130/80mmHg
(includes patients with established atherosclerotic disease, diabetes and chronic renal failure)

When to refer

- Accelerated (malignant) hypertension (grade III-IV retinopathy)
- BP > 220/120mm/Hg
- Secondary hypertension e.g. suspected Conn’s syndrome, phaeochromocytoma
- Pregnancy
- Poorly controlled hypertension
- Adverse effects to medicines

* Target organ damage includes:

- Heart failure
- Peripheral arterial disease
- Renal impairment
- Left ventricular hypertrophy
- Hypertensive or diabetic retinopathy

Refer to NICE guidelines for further information on measuring and monitoring blood pressure (Clinical Guideline 18: Hypertension — management of hypertension in adults in primary care; Clinical Guideline 34: Partial Update to Clinical Guideline 18).
Lifestyle advice
Advice on lifestyle modifications should be provided to all patients at every step. Lifestyle measures include advising patients to:
- Maintain normal weight (BMI 20–25 kg/m² for adults).
- Reduce salt intake (<6 g sodium chloride or 2.4 g Na⁺ per day).
- Limit alcohol consumption to ≤3 units/day for men and ≤2 units/day for women.
- Limit caffeinated coffee intake to less than 5 cups per day.
- Participate in regular aerobic exercise.
- Eat 5 portions of fresh fruit and vegetables each day.
- Eat 2 servings of fish per week.
- Reduce intake of total and saturated fat and cholesterol.
- Stop smoking.
- Avoid non-steroidal anti-inflammatory drugs (NSAIDs).

General prescribing advice
Most hypertensive patients will require combination therapy to achieve target blood pressure. Sub-maximal doses of two drugs result in larger blood pressure responses and fewer side effects. Combining individual agents as outlined above is preferred to prescribing combination products that do not permit easy dose titrations of the individual components. Once daily dosing is preferred. Beta-blockers can be used at an earlier stage for hypertension if there is a compelling indication (e.g., post MI, angina or increased sympathetic drive) or contraindication to other therapies. If a patient taking a beta-blocker needs a second drug, add a calcium-channel blocker rather than a thiazide-type diuretic, to reduce the patient's risk of developing diabetes.

Refer to the BNF for full prescribing information

Additional treatments
Consider other treatments for raised cardiovascular risk including lipid lowering and antiplatelet therapies.
Formulary choices

A (ACE inhibitor)

**Ramipril**

Error! Bookmark not defined. 1.25mg, orally, once daily (or 2.5mg), titrated at intervals of 1 to 2 weeks to a maximum of 10mg daily.

*Or*

**Lisinopril** 2.5mg, orally, each morning, increased to a maintenance dose of 10 to 20mg each morning. Maximum: 40mg daily.

*Ramipril is the preferred ACE inhibitor for patients with co-morbidities.*

B (angiotensin II receptor blocker)

If ACE inhibitors are not tolerated, consider using an angiotensin-II receptor blocker:

**Candesartan** 8mg, orally, once daily; adjust according to response up to 16mg daily; can be increased after 4 weeks to maximum dose 32mg daily. If the patient has renal impairment, start at a dose of 4mg daily. If the patient has hepatic impairment, start at 2mg daily.

*Or*

**Irbesartan** 150mg, orally, once daily; increased if necessary to 300mg daily. For patients who are elderly or on haemodialysis, reduce initial dose to 75mg daily.

C (Calcium-channel blocker)

**Amlodipine** 5mg, orally, once daily. Increase to 10mg daily if necessary.

*Or*

**Felodipine** 2.5 to 5mg, orally, once daily. Increase to 10mg daily if necessary.

D (Thiazide diuretic)

**Bendroflumethiazide** 2.5mg, orally, each morning.

Additional treatments

1. Beta blocker

**Atenolol** 25mg, orally, once daily. Increase to 50mg daily if required (higher doses rarely necessary).

2. Alpha blocker

**Doxazosin** 1mg, orally, once daily. Increased 2mg daily after one to two weeks, and thereafter to 4mg daily. Maximum: 16mg daily.