fip ADVANCING PHARMACY WORLDWIDE

EDUCATIONAL GUIDE:

SUPPORTING PHARMACISTS WITH UNCONTROLLED HYPERTENSION CARE

COLOPHON

Educational guide: Supporting pharmacists with uncontrolled hypertension care.

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DISCLAIMER

The toolkit is designed to support pharmacists in their interactions with patients. It does not account for specific national regulations. The roles and responsibilities of pharmacists varies across jurisdictions. Users must ensure compliance with relevant national laws and professional codes, including national drug regulations, data privacy, and professional and ethical conduct.

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PURPOSE

The FIP *Supporting patients with uncontrolled hypertension: A toolkit for pharmacists* aims to establish a sustainable and resilient care model where pharmacists act as long-term partners in the management of uncontrolled hypertension. Beyond identifying new cases or making early referrals, this model supports active collaboration with patients with uncontrolled hypertension to stabilise blood pressure, improve outcomes, and strengthen community-based care.

The toolkit is intended for pharmacists and pharmacy team members with an interest in cardiovascular health.

It contributes to advancing **FIP Development Goal 15 - People Centred Care**

CONTENTS

1. LEARNING OBJECTIVES

UPON SUCCESSFUL COMPLETION OF THIS CONTINUING EDUCATION GUIDE, YOU WILL BE ABLE TO:

- Understand uncontrolled hypertension and its impact on global and individual health.
- Define uncontrolled hypertension and its clinical criteria.
- Identify the risk factors for uncontrolled hypertension (modifiable and non-modifiable).
- Recognise common symptoms and the “silent” progression of hypertension, including uncontrolled hypertension.
- Understand blood pressure measurement techniques and diagnostic tools.
- Describe pharmacological and non-pharmacological treatment options for uncontrolled hypertension.
- Recognise the pharmacist’s role in patient education, medication adherence, and monitoring.

2. GLOBAL BURDEN OF HYPERTENSION

- Hypertension is more than high blood pressure
- Global burden of hypertension
- Practice reflection
- Feedback

HYPERTENSION IS MORE THAN HIGH BLOOD PRESSURE

Hypertension, and particularly uncontrolled hypertension, commonly referred to as high blood pressure, is a medical condition characterised by consistently elevated pressure within the blood vessels.[1]
However, hypertension is more than just a number on a blood pressure cuff—it's a silent threat to the entire body!

A GLOBAL HEALTH CRISIS

High systolic blood pressure contributes to over 10 million deaths each year, many of which are preventable.[1]
Despite the impact, four in five people with hypertension remain inadequately treated.[1]

A PREVENTABLE CONDITION

A large number of deaths caused by hypertension can be prevented by addressing common risk factors. These include adopting a healthy diet that is low in sodium and rich in potassium, and ensuring access to effective treatment. Improving hypertension care, particularly uncontrolled hypertension, not only saves lives but also supports stronger primary health care systems.[1]

Hypertension affects 1 in 3 adults worldwide.[2]

1. World Health Organization (WHO). Global report on hypertension: the race against a silent killer. Geneva: WHO, 2023. Available at: https://www.who.int/publications/i/item/9789240081062.
2. World Health Organization (WHO). First WHO report details devastating impact of hypertension and ways to stop it [Internet]. 19 September 2023 [accessed: 10 July 2025]. Available at: https://www.who.int/news/item/19-09-2023-first-who-report-details-devastating-impact-of-hypertension-and-ways-to-stop-it.

GLOBAL BURDEN OF HYPERTENSION

- Globally, hypertension is a major and growing health concern. According to the Global Burden of Disease (GBD) Study 2021, approximately 10.9 million people worldwide died from high SBP (HSBP) in 2021, accounting for 226 million disability adjusted life years (DALYs).[1]
- While genetics cannot be changed, hypertension is largely preventable through lifestyle and environmental factors.[2]
- The burden is especially high in low- and middle-income regions due to changing lifestyles, limited health care access, and rising rates of obesity and diabetes, leading to increased risks of uncontrolled hypertension. Young men are disproportionately affected, with cardiovascular diseases being the leading cause of HSBP-related death and disability even at early ages.[1]

- Despite stable age-standardised rates, the overall number of affected individuals is rising due to population growth and aging.
- Over 1.4 billion people worldwide live with hypertension, yet despite widespread identification, most countries are failing to achieve adequate blood pressure control, leaving the majority of patients uncontrolled — with only about 1 in 5 (approximately 20%) achieving control.[3,4]
- Without targeted action, the global health, economic, and social burden of hypertension is expected to escalate.
- Hypertension represents a worldwide health challenge.

1. He C, Lu S, Yu H, et al. Global, regional, and national disease burden attributable to high systolic blood pressure in youth and young adults: 2021 Global Burden of Disease Study analysis. BMC Med. 2025;23(1):74. DOI:10.1186/s12916-025-03918-1.
2. Carey RM, Muntner P, Bosworth HB, Whelton PK. Prevention and control of hypertension: JACC Health Promotion Series. J Am Coll Cardiol. 2018 Sep 11;72(11):1278–1293. doi: 10.1016/j.jacc.2018.07.008.
3. NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019. The Lancet. 2021;398(10304):957–980. DOI: 10.1016/S0140-6736(21)01330-1
4. World Health Organization (WHO). 23 September 2025. Global report on hypertension 2025: High stakes - turning evidence into action. Available at: https://www.who.int/publications/i/item/9789240115569

PRACTICE REFLECTION

Reflecting on your own practice, take a moment to answer the question below.

Do you speak to your patients about their risk of hypertension and its management, including uncontrolled hypertension?

A Yes. I consistently discuss hypertension risk and/or management with my patients at a level I'm happy with.

B Yes. I occasionally discuss hypertension risk and/or management with my patients,
but I would like to do more to help my patients with hypertension, particularly uncontrolled hypertension.

C No. Discussing hypertension is not part of my typical practice.

D No. I am unsure of where to start.

FEEDBACK

While most pharmacists and pharmacy team members would like to answer A, many may not. They may only occasionally speak to their patients with uncontrolled hypertension and/or they may not know where to start.

This educational guide is part of a comprehensive toolkit designed to enhance pharmacist-patient interactions while minimising the impact on daily workload and workflow.
It offers practical approaches to initiate conversations about hypertension and make each interaction with patients count.

The good news is that the Uncontrolled Hypertension Pharmacy Toolkit is now available for community pharmacists.

This educational guide is one component of the Pharmacy Toolkit.

Explore practical strategies for impactful patient interactions in this educational guide.

3. UNDERSTANDING UNCONTROLLED HYPERTENSION

- Stages of hypertension
- What is uncontrolled hypertension?
- Contributing factors
  - Comorbidities
  - Non-adherence
  - Potential exacerbators and inducers
- Risk factors
- Symptoms

STAGES OF HYPERTENSION

Stages and definitions of hypertension vary across international organisations. Below are two examples.

Blood pressure categories according to the American Heart Association[1]

Blood pressure category	Systolic mmHg (upper number)		Diastolic mmHg (lower number)
Normal	Less than 120	and	Less than 80
Elevated	120-129	and	Less than 80
High Blood Pressure (Hypertension) Stage 1	130-139	or	80-89
High Blood Pressure (Hypertension) Stage 2	140 or higher	or	90 or higher
Hypertensive Crisis	Higher than 180	and/or	Higher than 120

Hypertension stages according to the European Society of Hypertension[2]

Hypertension disease staging	Other risk factors, HMOD, CVD or CKD	BP (mmHg) grading			
		High-normal SBP 130–139 DBP 85–90	Grade 1 SBP 140–159 DBP 90–99	Grade 2 SBP 160–179 DBP 100–109	Grade 3 SBP ≥ 180 DBP ≥ 110
Stage 1	No other risk factors	Low risk	Low risk	Moderate risk	High risk
	1 or 2 risk factors	Low risk	Moderate risk	Moderate to high risk	High risk
	≥3 risk factors	Low to moderate risk	Moderate to high risk	High risk	High risk
Stage 2	HMOD, CKD grade 3, or diabetes mellitus	Moderate to high risk	High risk	High risk	Very high risk
Stage 3	Established CVD or CKD grade ≥4	Very high risk	Very high risk	Very high risk	Very high risk

BP: Blood pressure
DBP: Diastolic Blood Pressure
SBP: Systolic Blood Pressure

CKD: Chronic kidney disease
CVD: Cardiovascular diseases
HMOD: Hypertension-mediated organ damage

1. American Heart Association. What is high blood pressure? [Internet]. [accessed: 25 July 2025]. Available at: https://www.heart.org/en/health-topics/high-blood-pressure/the-facts-about-high-blood-pressure.
2. Kreutz R, Brunstrom M, Burnier M, et al. 2024 European Society of Hypertension clinical practice guidelines for the management of arterial hypertension. Eur J Intern Med. 2024;126:1-15. 10.1016/j.ejim.2024.05.033.

WHAT IS UNCONTROLLED HYPERTENSION?

Uncontrolled hypertension refers to blood pressure that remains above the target level (typically 130/80 mmHg or higher) despite being on prescribed medication and addopting lifestyle modifications. According to the 2025 American Heart Association/American College of Cardiology (AHA/ACC) Guidelines, uncontrolled hypertension is defined as an average blood pressure that exceeds the patient's target despite appropriate pharmacological therapy and lifestyle changes.[1]

This condition is common and serious. The World Health Organization reports that more than 1.4 billion adults worldwide live with hypertension, but fewer than one in five have their blood pressure under control.[2] Persistent high blood pressure can damage the heart, brain, kidneys, and blood vessels, leading to heart attack, stroke, kidney failure, and vision loss.

Uncontrolled hypertension can result from various causes — including missed medication doses, ineffective treatment, or lifestyle and system-related barriers such as high salt intake, limited access to medicines, or infrequent follow-up.

Blood pressure is the result of two forces:

- Systolic blood pressure (SBP) is described as the pressure exerted on the arteries when the heart contracts and pumps blood. It is the higher value in a blood pressure reading.[3]
- Diastolic blood bressure (DBP) is defined as the pressure in the arteries when the heart is at rest between beats, refilling with blood. It represents the lower value in a blood pressure measurement.[3]

Uncontrolled hypertension is a critical risk factor for cardiovascular diseases, contributing to damage in the heart, brain, kidneys and other organs.[4]

To learn more about cardiovascular diseases visit the FIP webpage at:
https://ncd.fip.org/cardiovascular-diseases/

1. 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2025 Sep 16;152(11):e114-e218. DOI: 10.1161/CIR.0000000000001356
2. World Health Organization (WHO). 23 September 2025. Global report on hypertension 2025: High stakes - turning evidence into action. Available at: https://www.who.int/publications/i/item/9789240115569
3. American Heart Association. The facts about high blood pressure [Internet]. [accessed: 10 July 2025]. Available at: https://www.heart.org/en/test-pages/exp-editor-content-mysteriously-disappearing/the-facts-about-high-blood-pressure.
4. World Health Organization (WHO). Hypertension – overview [Internet]. [accessed: 31 May 2025]. Available at: https://www.who.int/health-topics/hypertension#tab=tab_1.

CONTRIBUTING FACTORS

Uncontrolled hypertension often has multiple causes. Recognising these factors early enables pharmacists and doctors to collaborate with patients to take practical steps to regain control, such as adjusting medication, streamlining regimens, improving lifestyle habits and arranging regular reviews.[1]

1. Medication-related:

- ☐ Missed or irregular doses
- ☐ Complex treatment schedules
- ☐ Side effects or cost concerns
- ☐ Drug interactions (e.g., painkillers, decongestants)

2. Lifestyle-related:

- ☐ High salt intake
- ☐ Tobacco or alcohol use
- ☐ Physical inactivity
- ☐ Stress or poor sleep
- ☐ Excess weight

3. Monitoring-related:

- ☐ Irregular or infrequent blood pressure checks
- ☐ Incorrect measurement technique (cuff size, timing, posture)
- ☐ Lack of home or ambulatory blood pressure monitoring
- ☐ Not recording or sharing readings with healthcare providers

4. Health-system and access factors:

- ☐ Difficulty obtaining or refilling medicines
- ☐ Limited follow-up or continuity of care
- ☐ Lack of equipment or resources for self-monitoring
- ☐ Inadequate treatment adjustment despite high readings

5. Co-morbidities:

- ☐ Cardiovascular disease (e.g., heart disease or stroke)
- ☐ Obesity
- ☐ Diabetes (high blood sugar)
- ☐ Dyslipidaemia
- ☐ Chronic kidney disease
- ☐ Thyroid disorders and sleep apnoea

1. Portuguese Pharmaceutical Society. Hypertension: control and prevention. [Internet]. 25 November 2024. [accessed: 03 July 2025]. Available at: https://www.ordemfarmaceuticos.pt/pt/noticias/detalhes.php?id=3409.

COMORBIDITIES

Many hypertensive patients live with multiple comorbidities that affect treatment and outcomes[1].

COMMON COMORBIDITIES[1]

- Coronary artery disease (CAD): There is a strong link between coronary artery disease (CAD) and hypertension, contributing to 25–30% of acute heart attacks.
- Stroke: Hypertension is the most important risk factor for ischemic or hemorrhagic stroke.
- Heart failure (HF): Hypertension is a risk factor for the development of HF with reduced ejection fraction (HFrEF), and with preserved ejection fraction (HFpEF).
- Chronic kidney disease (CKD): Hypertension is a major risk factor for the development and progression of albuminuria and any form of CKD.
- Chronic obstructive pulmonary disease (COPD): Hypertension is the most frequent comorbidity in patients with COPD.

UNCOMMON COMORBIDITIES[1]

- Rheumatic diseases
- Psychiatric conditions

- The number of comorbidities increases with age, with the prevalence of uncontrolled hypertension and other diseases.[1]
- Uncommon comorbidities are often underestimated and frequently treated with medicines, often self-prescribed and possibly interfering with BP control.[1]
- Some treatments for comorbidities may interfere with BP control.[1]
- Both common and uncommon comorbidities should be carefully identified and managed according to current evidence.[1]

1. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI: 10.1161/HYPERTENSIONAHA.120.15026.

COMORBIDITIES

COMMON COMORBIDITIES AND COMPLICATIONS

This table summarises blood pressure targets and preferred treatment strategies for common comorbidities.[1]

COMORBIDITY	BP TARGET	PREFERRED TREATMENTS	ADDITIONAL NOTES / RECOMMENDATIONS
 **Coronary artery disease (CAD)**	BP should be lowered if ≥140/90 mm Hg and treated to a target <130/80 mm Hg (<140/80 in elderly patients).	RAS blockers, β-blockers irrespective of BP levels with or without CCBs.	• Lifestyle changes and antiplatelet treatment with acetylsalicylic acid are recommended
 **Stroke**	BP should be lowered if ≥140/90 mm Hg and treated to a target <130/80 mm Hg (<140/80 in elderly patients).	RAS blockers, CCBs, diuretics.	• Stroke can be largely prevented by BP control. • Lipid-lowering treatment is mandatory with a LDL-C target <70 mg/dL. • Antiplatelet treatment is routinely recommended for ischemic stroke, but not haemorrhagic stroke
 **Heart failure**	BP should be lowered if ≥140/90 mm Hg and treated to a target <130/80 mm Hg but >120/70 mm Hg.	RAS blockers, β-blockers, mineralocorticoid receptor antagonists, ARNI.	• Lifestyle changes are recommended. • For more information, please refer to the Heart Failure Pharmacy Toolkit.
 **Lipid disorders**	BP should be lowered as in the general population, preferentially with RAS-inhibitors	BP should be lowered as in the general population, preferentially with RAS-inhibitors (ARB, ACE-I) and CCBs.	• Serum triglyceride lowering should be considered if >200 mg/dL

LDL-C: low-density lipoprotein cholesterol, RAS: renin-angiotensin system, CCBs: calcium channel blockers, ARNI: angiotensin receptor-neprilysin inhibitors, ARB:angiotensin AT-1 receptor blocker, ACE: angiotensin converting enzyme.

1. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI:10.1161/HYPERTENSIONAHA.120.15026.

COMORBIDITIES

OTHER RELEVANT COMORBIDITIES

This table summarises blood pressure targets and preferred treatment strategies for other relevant comorbidities.[1]

COMORBIDITY	BP TARGET	PREFERRED TREATMENTS	ADDITIONAL NOTES / RECOMMENDATIONS
Chronic kidney disease (CKD)	BP should be lowered if ≥140/90 mm Hg and treated to a target <130/80 mm Hg (<140/80 in elderly patients).	• RAS-inhibitors are first-line because they reduce albuminuria in addition to BP control. • CCB and diuretics can be added.	• eGFR, microalbuminuria and blood electrolytes should be monitored • For more information, please refer to the CKD Pharmacy Toolkit.
COPD	BP should be lowered if ≥140/90 mm Hg and treated to a target <130/80 mm Hg (<140/80 in elderly patients).	• ARB, and CCB and/or diuretic; while beta blockers (ß1 -receptor selective) may be used in selected patients (e.g., CAD, HF).	• Tobacco cessation is mandatory. • Avoid air pollution.
Diabetes mellitus	BP should be lowered if ≥140/90 mmHg and treated to a target <130/80 mm Hg (<140/80 in elderly patients)	• RAS inhibitors + CCB and/or thiazide-like diuretic	• The treatment should include a statin in primary prevention if LDL-C >70 mg/dL
Metabolic syndrome	Patients with hypertension and metabolic syndrome are at high risk. Diagnosis requires separate evaluation of each component, and treatment focuses on lifestyle changes alongside blood pressure control and management of additional cardiovascular risk factors.		

eGFR: estimated glomerular filtration rate. RAS: renin-angiotensin system, CCBs: calcium channel blockers, ARB:angiotensin AT-1 receptor blocker, CAD: coronary artery disease, LDL-C: low-density lipoprotein cholesterol.

1. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI:10.1161/HYPERTENSIONAHA.120.15026.

COMORBIDITIES

OTHER RELEVANT COMORBIDITIES

This table summarises blood pressure targets and preferred treatment strategies for other relevant comorbidities.[1]

COMORBIDITY	BP TARGET	PREFERRED TREATMENTS	ADDITIONAL NOTES / RECOMMENDATIONS
 Inflammatory rheumatic diseases (IRD)	BP should be lowered as in the general population	• RAS-inhibitors (evidence of an overactive RAAS) and CCBs	• Underlying diseases should be managed by aiming to reduce inflammation and to limit the use of high doses of NSAIDs.
 Psychiatric disorders	BP should be lowered as in the general population	• RAS inhibitors and diuretics (fewer interactions with antidepressants); use CCBs/alpha1-blockers cautiously in orthostatic hypotension.	• Consider interaction risks, ECG and postural BP changes; use β-blockers (except metoprolol) for drug-induced tachycardia.

RAAS: renin angiotensin aldosterone system, CV cardiovascular, ECG: electrocardiogram, RAS: renin-angiotensin system, CCBs: calcium channel blockers.

1. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI: 10.1161/HYPERTENSIONAHA.120.15026.

NON-ADHERENCE

Pharmacists should recognise that non-adherence is a key contributor to uncontrolled hypertension. It involves more than medicines alone and may include challenges with lifestyle modification, blood pressure monitoring, or attendance at follow-up visits. Identifying these triggers early allows pharmacists to address barriers through counselling, education, and ongoing support.

TRIGGERS OF NON-ADHERENCE

Cost or availability issues (affordability concerns or medication stock shortages)

Forgetfulness (missed doses or inconsistent medication routines)

Adverse effects (such as dizziness, fatigue, cough, or swelling)

Limited understanding of treatment importance (uncertainty about the need for long-term therapy)

Complex treatment schedules (multiple daily doses or complicated regimens)

Lack of motivation or support (limited follow-up or absence of feedback)

Psychological factors (stress, low mood, or mental fatigue affecting prioritisation)

Cultural or belief-related influences (preference for traditional or alternative remedies)

POTENTIAL EXACERBATORS AND INDUCERS

Certain medications and substances can raise blood pressure or reduce the effectiveness of antihypertensive treatments.

Their impact varies by individual, with greater effects seen in older adults, those with high baseline BP, on BP-lowering therapy, or with kidney disease.[1]

Several medications and substances have been associated with increases in blood pressure, though their effects can vary greatly between individuals. The impact may be more significant in patients with pre-existing hypertension or those on antihypertensive therapy[1].

Nonsteroidal anti-inflammatory drugs (NSAIDs):

- Nonselective NSAIDs can cause an average increase of around 3/1 mmHg in blood pressure.
- Celecoxib shows little to no change, though small increases (up to 3/1 mmHg) have been reported.
- Aspirin does not appear to raise blood pressure.
- NSAIDs may also interfere with the effectiveness of renin angiotensin aldosterone system inhibitors and beta blockers.[1]

Antidepressants:

- SNRI (selective norepinephrine and serotonin reuptake inhibitors) may increase blood pressure by 2/1 mmHg.
- Tricyclic antidepressants have been associated with a risk of developing hypertension.
- SSRIs (selective serotonin reuptake inhibitors) do not typically raise blood pressure.[1]

Combined oral contraceptive pill:

- High-dose oestrogen (>50 mcg of oestrogen and 1–4 mcg progestin) are linked to an approximate increase of 6/3 mmHg in blood pressure.[1]

Herbal and other substances:

- Some natural or herbal products have also been linked to increased blood pressure, especially in high doses. These include ma-huang (ephedra), ginseng, liquorice, St. John's wort, and yohimbine.[1]

Acetaminophen:

- Frequent, almost daily use of acetaminophen increases the likelihood of hypertension by about 1.34 times.[1]

Other medications and substances:

- Steroids, antiretroviral therapy (inconsistent evidence), sympathomimetics (such as pseudoephedrine, cocaine, and amphetamines), serotonergic antimigraine agents, recombinant human erythropoietin, calcineurin inhibitors, antiangiogenic agents and kinase inhibitors, 11β-hydroxysteroid dehydrogenase type 2 inhibitors.[1]

1. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI:10.1161/HYPERTENSIONAHA.120.15026.

RISK FACTORS

Several factors can increase a patient's risk of uncontrolled hypertension.

Being aware of these factors can help patients better understand their individual risk.[1]

Non-modifiable factors + Modifiable factors

1. American Heart Association. Know your risk factors for high blood pressure [Internet]. [accessed: 8 July 2025]. Available at: https://www.heart.org/en/health-topics/high-blood-pressure/know-your-risk-factors-for-high-blood-pressure.

NON-MODIFIABLE RISK FACTORS

Some risk factors for hypertension cannot be modified, but recognising them—such as age, family history, gender, ethnicity, and chronic kidney disease—can help guide early detection and management.[1]

RISK FACTORS	DESCRIPTION
 Family history	• Having parents or close relatives with high blood pressure increases an individual's risk of developing hypertension.[1]
 Age	• Risk increases with age due to reduced blood vessel elasticity.[1] • However, hypertension can also occur in children.[1]
 Gender	• Men under 65 tend to have a higher likelihood of developing high blood pressure than women.[1] • From age 65, women are more likely to develop high blood pressure.[1]
 Ethnicity	• Black, Hispanic and Asian adults, particularly men, have higher rates of hypertension.[1] • These differences may be influenced by cultural, dietary, systemic, and historical factors.[1]
 Chronic kidney disease	• Hypertension may result from kidney disease.[1] • Having hypertension also may cause kidney damage.[1] • Around 30% of patients with hypertension also have chronic kidney disease (CKD), which increases the risk of adverse cardiovascular events and cerebrovascular outcomes, such as stroke.[2]

1. American Heart Association. Know your risk factors for high blood pressure [Internet]. [accessed: 8 July 2025]. Available at: https://www.heart.org/en/health-topics/high-blood-pressure/know-your-risk-factors-for-high-blood-pressure.
2. Chronic Kidney Disease Pharmacy Toolkit [Internet]. 2023 [accessed: 18 August 2025]. Available at: https://ncd.fip.org/ckd-toolkit/

MODIFIABLE RISK FACTORS

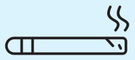
Unlike genetic or age-related risks, modifiable factors—such as diet, physical activity, weight, and alcohol use—can be managed to improve blood pressure control.[1]

RISK FACTOR	DESCRIPTION	EFFECTS
 Lack of physical activity	• A lack of physical activity (sedentary lifestyle) increases the risk of high blood pressure.	• Negatively affects heart and circulatory health.
 Unhealthy diet	• Diets high in sodium, calories, saturated and trans fats, or sugar increase the risk of high blood pressure.	• Raises blood pressure risk.
 Overweight or obesity	• Excess weight places extra strain on the heart and circulatory system.	• Increases risk of cardiovascular disease, diabetes, and high blood pressure.
 Excessive alcohol use	• Regular heavy alcohol consumption can lead to serious health problems.	• Can cause heart failure, stroke, arrhythmia, and increased blood pressure.

1. American Heart Association. Know your risk factors for high blood pressure [Internet]. [accessed: 8 July 2025]. Available at: https://www.heart.org/en/health-topics/high-blood-pressure/know-your-risk-factors-for-high-blood-pressure.

MODIFIABLE RISK FACTORS

Certain health conditions and unhealthy lifestyle habits can increase the risk of uncontrolled hypertension, and addressing these factors is key to blood pressure control.[1]

RISK FACTORS	DESCRIPTION	EFFECTS
 Sleep apnea	• Obstructive sleep apnoea may increase the risk of developing high blood pressure.	• Common in people with resistant hypertension.
 High cholesterol	• More than half of people with high blood pressure also have high cholesterol.	• Increases risk of heart-related complications.
 Diabetes	• Most people with diabetes also develop high blood pressure.	• Makes blood pressure harder to manage.
 Tobacco use	• Tobacco use raises blood pressure and damages arteries.	• Increases risk of heart disease; secondhand smoke is also harmful.
 Stress	• Excessive stress may raise blood pressure directly or lead to unhealthy behaviours such as poor diet, inactivity, tobacco use, or alcohol consumption.	• Poor stress management can raise blood pressure, cause body tension and headaches, affect mental health, and lead to unhealthy behaviours.

1. American Heart Association. Know your risk factors for high blood pressure [Internet]. [accessed: 8 July 2025]. Available at: https://www.heart.org/en/health-topics/high-blood-pressure/know-your-risk-factors-for-high-blood-pressure.

SYMPTOMS

- Patients with uncontrolled hypertension may experience symptoms including:[1]
  - Severe headaches
  - Chest pain
  - Dizziness or light-headedness
  - Difficulty breathing
  - Nausea and/or vomiting
  - Blurred vision or other vision changes
  - Anxiety
  - Confusion
  - Buzzing in the ears
  - Nosebleeds
  - Abnormal heart rhythm

Pharmacist action:

- Regular monitoring is essential, as hypertension is often asymptomatic until serious complications occur.
- A reading ≥180/120 mmHg is dangerously high and may require urgent medical attention.[2]
- If a patient presents with BP ≥180/120 mmHg without symptoms, pharmacists should:
  - Ask the patient to rest for 5 minutes and re-measure
  - If the BP remains elevated, refer the patient to their healthcare provider for possible treatment adjustment

Emergency referral:

- If BP ≥180/120 mmHg with any of the following symptoms, pharmacists should advise immediate referral to emergency services (call emergency number):
  - Severe headache
  - Difficulty breathing
  - Intense chest, back, or abdominal pain
  - Numbness, weakness, or difficulty speaking
  - Sudden vision changes
- Do not delay referral or wait to see if BP lowers spontaneously. Immediate action is essential.[2]

1. World Health Organization (WHO). Hypertension [Internet]. 16 March 2023 [accessed: 8 July 2025]. Available at: https://www.who.int/news-room/fact-sheets/detail/hypertension.
2. National Heart, Lung, and Blood Institute (NHLBI). High blood pressure symptoms [Internet]. 25 April 2024. [accessed: 10 July 2025]. Available at: https://www.nhlbi.nih.gov/health/high-blood-pressure/symptoms.

ACT NOW

- **Some patients may not fully understand the risks of uncontrolled hypertension.**
- **Pharmacists play a vital role in raising awareness about hypertension and its potential consequences if not properly managed.**

KEY ACTIONS FOR PHARMACISTS:

1. Provide clear, accurate, and up-to-date educational materials addressing common questions:
    - What is hypertension?
    - What are the risk factors?
    - What complications can arise from unmanaged hypertension that leads to uncontrolled hypertension?
    - How does hypertension affect daily life?

2. Use patient-friendly language when explaining medical terms and procedures, for example:
    - **“High blood pressure”** instead of “hypertension” (where appropriate)
    - **“Blood pressure monitoring”** instead of “BP measurement”

3. Educate patients on the silent nature of hypertension and uncontrolled hypertension, and emphasise the importance of:
    - Regular check-ups
    - Adherence to prescribed treatments
    - Lifestyle changes to reduce risk

4. Guide patients to primary care services for further evaluation and management when necessary.

Uncontrolled hypertension can significantly impact patients' quality of life, but early detection, continuous monitoring, and lifestyle changes can greatly reduce risks.

ACT NOW

PHARMACIST'S ROLE INCLUDES:

- Supporting treatment decisions by considering comorbidities when advising on medicine use and patient monitoring
- Reinforcing agreed individual treatment goals (BP, LDL-C, HbA1c, etc.) during counselling and follow-up
- Monitoring adherence and side effects
- Recognising potential medication interactions
- Reinforcing lifestyle advice and patient education

By educating patients and encouraging proactive management, pharmacists can help reduce the burden of uncontrolled hypertension and improve health outcomes.

Educate on hypertension risks and risks of uncontrolled hypertension

Provide clear, easy-to-read materials about hypertension and its potential impact on health.

Explain key concepts

Use simple language to explain terms like systolic and diastolic blood pressure.

Encourage regular monitoring

Guide patients to monitor their blood pressure regularly and track changes.

Promote lifestyle changes

Emphasise the importance of healthy diet, exercise, and stress management in controlling blood pressure.

Referral to primary care

Ensure patients with uncontrolled hypertension are referred for further management.

4. PHARMACISTS' ROLE IN THE MANAGEMENT OF UNCONTROLLED HYPERTENSION

- Evidence and impact
- Resources for hypertension care
- Pharmacists' role in symptom management
- Pharmacists' role in supporting self-care strategies

EVIDENCE AND IMPACT

The World Health Organization (WHO) recommends that hypertension treatment can be managed not only by physicians but also by other health professionals, including appropriately trained and authorised pharmacists, especially uncontrolled hypertension.
When working under established management protocols and physician oversight, pharmacists can make significant contributions to hypertension care.[1]

Care models involving pharmacists have proven effective in areas such as blood pressure measurement, patient education, medication dispensing, follow-up monitoring, and telemonitoring.

Evidence demonstrates that pharmacist-supported care leads to meaningful reductions in both systolic and diastolic blood pressure. Moreover, collaborative models that include pharmacists are associated with high patient satisfaction and improved medication adherence.[1]

The active participation of pharmacists in hypertension management, in particular uncontrolled hypertension, not only improves clinical outcomes but can also reduce health care system costs. Particularly among high-risk patients, pharmacist–physician collaborative care has been identified as one of the most cost-effective strategies when adjusted for quality of life.[1]

These findings suggest that increasing the responsibilities of pharmacists in uncontrolled hypertension treatment may positively impact both individual patient outcomes and broader health care systems.[1]

1. World Health Organization (WHO). Guideline for the pharmacological treatment of hypertension in adults. Geneva: WHO; 2021. Available at: https://iris.who.int/bitstream/handle/10665/344424/9789240033986-eng.pdf.

EVIDENCE AND IMPACT

Medication adherence in treatment for hypertension, particularly uncontrolled hypertension, is often suboptimal. Evidence from multiple studies demonstrates that pharmacist-led education and counselling significantly improves patients' adherence. In a review of twenty studies, pharmacists who provided regular follow-up and guidance on medication use consistently achieved positive results in adherence.[1]

Beyond supporting adherence, some studies indicate that granting pharmacists prescribing authority for hypertension can lead to substantial improvements in treatment outcomes.[2] This expanded scope enables quicker and more direct adjustments to therapy, reducing delays in patient care.

Overall, these findings confirm that pharmacists' active involvement—whether through adherence support or prescribing—contributes to more effective blood pressure control and offers valuable benefits to healthcare systems in the management of conditions such as uncontrolled hypertension.[2]

1. Reeves L, Robinson K, Adunlin G, et al. Pharmacist interventions in the management of blood pressure control and adherence to antihypertensive medications: a systematic review of randomised controlled trials. J Pharm Pract. 2020;34(3):1-13. DOI: 10.1177/0897190020903573.
2. Tsuyuki RT, Houle SKD, Charrois TL, et al. Randomized trial of the effect of pharmacist prescribing on improving blood pressure in the community: the Alberta Clinical Trial in Optimizing Hypertension (RxACTION). Circulation. 2015;132(2). DOI: 10.1161/CIRCULATIONAHA.115.015464.

THERE ARE RESOURCES TO HELP!

SUPPORT FOR PHARMACY ACROSS THE HYPERTENSION CARE SERVICES JOURNEY

1

Recognition of the value of hypertension care services in the pharmacy but don't know where to start.

- Chronic disease service framework e-learning module

2

Assessment of the pharmacy team's readiness and preparation for hypertension care services initiation.

- Chronic disease service implementation checklist
- FIP knowledge and skills reference guide for professional development in cardiovascular diseases

3

Evaluation of the pharmacy's demographic to assess focus of hypertension care services

- Pharmacy management computer system
- Team knowledge of patient population and risk factors

4

Team training on hypertension

- Educational Guide: Supporting pharmacists with uncontrolled hypertension care
- FIP Cardiovascular diseases: A handbook for pharmacists
- FIP knowledge and skills reference guide for professional development in cardiovascular diseases

5

Team training on hypertension (particularly uncontrolled hypertension)

- Educational Guide: Supporting pharmacists with uncontrolled hypertension care
- FIP Cardiovascular diseases: A handbook for pharmacists
- FIP knowledge and skills reference guide for professional development in cardiovascular diseases

6

Promotion of the chronic diseases care services to patients and colleagues

- Service promotion poster
- Prescriber service promotion letter

7

Implementation of the hypertension care services in your pharmacy, specifically uncontrolled hypertension

- Assessment Tool: Identifying and monitoring uncontrolled hypertension
- Patient information leaflet: Let's talk about uncontrolled hypertension
- Primary care referral letter for uncontrolled hypertension

PHARMACISTS' ROLE IN SYMPTOM MANAGEMENT

Although hypertension is often referred to as a "silent" condition,[1] some patients may experience symptoms that can become serious if left untreated. Pharmacists play a crucial role in raising symptom awareness, monitoring changes, and facilitating appropriate referral when necessary.

During pharmacy visits, pharmacists should discuss with patients any symptoms that may indicate uncontrolled hypertension, even in those already taking antihypertensive medication, with a focus on identifying new or worsening signs.

Encouraging patients to recognise and report these symptoms promptly is vital for the prevention of complications. Pharmacy teams should pay particular attention to individuals with persistently uncontrolled blood pressure, worsening symptoms despite treatment, or signs of poor medication adherence.

Supportive strategies for symptom monitoring may include:

- Using the assessment tool to evaluate symptoms
- Providing the patient information leaflet
- Preparing and sending the primary care referral letter.

Pharmacists are also well placed to educate patients and caregivers on:

- The asymptomatic nature of hypertension and the importance of regular blood pressure checks.
- Recognising signs of hypertensive urgency or emergency and knowing when to seek immediate care.
- The importance of adhering to prescribed medications.
- Reducing salt intake and maintaining a heart-healthy lifestyle.
- The role of stress management and physical activity in blood pressure control.

Improving patients' awareness of symptoms and encouraging regular monitoring should be an integral part of hypertension management , particularly uncontrolled hypertension in pharmacy practice. Strengthening pharmacist-patient communication around symptom recognition can support better treatment outcomes and reduce the risk of hypertension-related complications.

1. World Health Organization (WHO). Global report on hypertension: the race against a silent killer. Geneva: WHO, 2023. Available at: https://www.who.int/publications/i/item/9789240081062.
2. World Health Organization (WHO). Hypertension [Internet]. 16 March 2023 [accessed: 8 July 2025]. Available at: https://www.who.int/news-room/fact-sheets/detail/hypertension.

PHARMACISTS' ROLE IN SUPPORTING SELF-CARE STRATEGIES

- Self-care strategies have been increasingly recognised as a valuable component in the long-term management of hypertension.
- Pharmacists can encourage patients to actively monitor their own blood pressure and understand how to respond to changes, contributing to better overall blood pressure control and reducing the risk of complications.
- This approach may be particularly beneficial for individuals at higher cardiovascular risk, where maintaining optimal blood pressure levels is especially important.[1]

Pharmacists can support patients with uncontrolled hypertension by:[2]

- Reinforcing adherence to prescribed medication and explaining potential side effects.
- Providing lifestyle advice, such as reducing salt intake, engaging in regular physical activity, tobacco cessation, healthy diet, and stress management.
- Promoting home blood pressure monitoring and ensuring correct measurement technique.
- Encouraging patients to understand their blood pressure targets and latest readings.
- Advising on warning signs that require medical review (e.g., dizziness, ankle swelling).
- Referring patients to reliable resources and patient support tools.

A patient-centred approach is essential: recognising and addressing barriers to self-care—such as anxiety, depression, or cognitive impairment—can improve patients' motivation, engagement, and adherence to treatment.

1. The Pharmaceutical Journal, PJ. Self-management effective for people with hypertension [Internet]. 2021 [accessed: 25 July 2025]. Available at: https://pharmaceutical-journal.com/article/news/self-management-effective-for-people-with-hypertension. n
2. Girvin B, Murray C. Hypertension: pharmacological management. The Pharmaceutical Journal, PJ, January 2024, Vol 312, No 7981;312(7981). DOI:10.1211/PJ.2023.1.204574.

ACT NOW

KEY ACTIONS FOR PHARMACISTS:

- Encourage patients to bring the blood pressure monitoring log included in the FIP Uncontrolled Hypertension Toolkit's patient information leaflet to each pharmacy or clinic visit for review, helping to identify patterns and optimise treatment decisions.
- Invite patients to partner with you and their primary care team (e.g., doctor, nurse, nurse practitioner) to co-create a personalised plan for lowering blood pressure and reducing cardiovascular risk, using the referral letter included in the FIP Uncontrolled Hypertension Toolkit.
- Organise short "Know Your Numbers" sessions to explain target blood pressure ranges, why achieving them matters, and how patients can monitor their own progress.
- Offer regular follow-up (in person, by phone, or digitally) to reinforce lifestyle changes, review blood pressure trends, and adjust support as needed.

5. SCREENING AND ASSESSMENT

- Routine tests
- Additional tests
- Blood pressure measurement
  - Office blood pressure measurement
  - Home blood pressure measurement
  - 24-hour ambulatory blood pressure measurement
- White coat hypertension
- Masked hypertension

SCREENING AND ASSESSMENT

- Hypertension is often a **silent condition**, progressing without noticeable symptoms, often to uncontrolled hypertension. Early detection and timely treatment are essential to reducing long-term vascular damage and cardiovascular risk.
- Screening helps shorten the delay between detection and initiation of treatment.
- For screening to be effective, it should take place in health care settings where blood pressure is measured accurately and where appropriate treatment can be initiated.[1]
- Primary care is the preferred setting for hypertension screening and management.
- Community pharmacists, being accessible and often the first port-of-call for people living with hypertension, can play a collaborative role with general practitioners to ensure continuity of care and adequate monitoring for BP control.

By routinely measuring blood pressure, pharmacists can play a key role in early detection and ensure patients at risk are referred for appropriate medical evaluation.

- Blood pressure should be measured opportunistically in adults during routine primary care visits.

- If blood pressure is within normal range → repeat periodically (e.g., annually).

- If elevated → reading should be followed by immediate evaluation and, if needed, initiation of treatment.[1]

- Blood pressure measurement conducted in a clinical or office setting is typically the primary method for diagnosing hypertension and monitoring its progression.[2]
- A diagnosis should ideally not be based on a single office visit whenever feasible.
- Typically, 2 to 3 visits spaced 1 to 4 weeks apart (depending on the BP readings) are necessary to confirm hypertension.
- However, if the blood pressure is ≥180/110 mmHg and there is clear evidence of cardiovascular disease (CVD), the diagnosis may be made after just one visit.[2]

1. World Health Organization (WHO). Global report on hypertension: the race against a silent killer. Geneva: WHO, 2023. Available at: https://www.who.int/publications/i/item/9789240081062.
2. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI:10.1161/HYPERTENSIONAHA.120.15026.

ROUTINE TESTS RECOMMENDED FOR PATIENTS WITH UNCONTROLLED HYPERTENSION

ROUTINE TEST[1]	CLINICAL UTILITY[1]
Fasting blood glucose (and HbA1c if fasting blood glucose is elevated)	• To assess CVD risk and comorbidities.
Serum lipids: total cholesterol, LDL, HDL, non-HDL cholesterol, triglycerides	• To assess CVD risk.
Blood sodium and potassium, haemoglobin and/or haematocrit, calcium, and TSH	• To screen for secondary hypertension causes such as primary aldosteronism, Cushing's syndrome, polycythemia, hyperparathyroidism, and hyperthyroidism.
Blood creatinine and eGFR; urinalysis and urinary albumin-to-creatinine ratio	• To assess CVD risk, hypertension-mediated organ damage (HMOD). • To guide treatment choices. • To screen secondary hypertension (renoparenchymal and renovascular).
12-lead electrocardiogram (ECG)	• To assess HMOD (e.g., left atrial enlargement, left ventricular hypertrophy). • To assess irregular pulse and comorbidities such as atrial fibrillation or previous acute myocardial infarction.

1. McEvoy JW, McCarthy CP, Bruno RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024;45(38):3912–4011. DOI: https://doi.org/10.1093/eurheartj/ehae178.

ADDITIONAL TESTS RECOMMENDED FOR PATIENTS WITH UNCONTROLLED HYPERTENSION

OPTIONAL TEST[1]	CLINICAL UTILITY[1]
Echocardiography	• To assess HMOD (hypertensive heart disease). • To assess established CVD (previous acute myocardial infarction, heart failure). • To assess thoracic aorta dilation.
Coronary artery calcium (CAC) by cardiac computed tomography (CT) or carotid or femoral artery ultrasound imaging	• To assess HMOD (atherosclerotic plaque).
Large artery stiffness (carotid–femoral or brachial–ankle pulse wave velocity)	• To assess HMOD (arterial stiffness).
High-sensitivity cardiac troponin and/or N-terminal pro-brain natriuretic peptide (NT-proBNP)	• To assess HMOD.
Ankle–brachial index	• To assess established CVD (lower-extremity arterial disease).
Abdominal ultrasound	• To assess established CVD (abdominal aneurysm)
Fundoscopy	• To assess HMOD (hypertensive retinopathy). • To diagnose hypertensive emergency/malignant hypertension (haemorrhages and exudates, papilloedema)

1. McEvoy JW, McCarthy CP, Bruno RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024;45(38):3912–4011. DOI: https://doi.org/10.1093/eurheartj/ehae178.

BLOOD PRESSURE MEASUREMENT

Blood pressure is measured using non-invasive methods and can be classified as:[1]

- Office blood pressure: defined as the measurement on the arm over the brachial artery taken during a healthcare visit, is generally used for diagnosing hypertension.[1]

- Out-of-office blood pressure: can be determined by ambulatory or home blood pressure measurement (ABPM/HBPM). ABPM and HBPM can be used to identify white coat or masked hypertension. Out-of-office measurement is often used for monitoring hypertension control and titration of blood pressure-lowering medicines.[1]
  - ABPM assesses blood pressure during routine daily activities.
  - HBPM assesses blood pressure at specific times during the day and night.

Both ABPM and HBPM are required to confirm the diagnosis of elevated blood pressure either in untreated or treated patients with grade 1 hypertension.[1]

Both office and out-of-office BP measurements are necessary to classify hypertension.

Description of BP measurement based on office and out-of-office BP measurement criteria

	SBP/DBP mmHg
Office blood pressure[2]	≥130 and/or ≥80
Ambulatory BP measurement	
• 24h average	≥130 and/or ≥80
• Day time (or awake) average	≥135 and/or ≥85
• Night time (or asleep) average	≥120 and/or ≥70
Home BP measurement	≥135 and/or ≥85

Classification of hypertension using office and out-of-office blood pressure measurements

CLASSIFICATION	OFFICE BP	OUT-OF-OFFICE BP
Normotension	Not raised	Not raised
Sustained hypertension	Raised	Raised
White-coat hypertension	Raised	Not raised
Masked hypertension	Not raised	Raised

1. International Pharmaceutical Federation (FIP). Cardiovascular diseases: A handbook for pharmacists. The Hague: FIP, 2022. Available at: https://www.fip.org/file/5251.
2. 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2025 Sep 16;152(11):e114-e218. DOI: 10.1161/CIR.0000000000001356

OFFICE BLOOD PRESSURE MEASUREMENT

CONDITIONS

- Measurements should be performed in a quiet, comfortable room.
- Prior to measurement, ensure the patient has avoided tobacco use, caffeine, and physical activity for at least 30 minutes, has emptied their bladder, and has been seated to rest for 3–5 minutes.
- Both the patient and the healthcare professional should refrain from speaking before, during, and between measurements.[2]

SEATED POSITION

- The patient's arm should rest on the table with the elbow at heart level; the back should be supported by the chair; legs should remain uncrossed and feet flat on the floor.[2]

DEVICE

- A validated electronic (oscillometric) upper-arm cuff device is recommended.
- Alternatively, other calibrated devices may be used.[2]

CUFF

- The size should be selected according to the patient's arm circumference: smaller cuffs may overestimate blood pressure, while larger cuffs may underestimate it.
- For manual auscultatory devices, the inflatable bladder of the cuff should cover 75–100% of the arm circumference. For electronic devices, follow the device's guidelines.[2]

1. International Pharmaceutical Federation (FIP). Cardiovascular diseases: A handbook for pharmacists. The Hague: FIP, 2022. Available at: https://www.fip.org/file/5251.
2. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI: 10.1161/HYPERTENSIONAHA.120.15026.

OFFICE BLOOD PRESSURE MEASUREMENT

MEASUREMENT AND INTERPRETATION

- At every visit, measure the blood pressure three times with a 1-minute interval between readings.[1]
- Calculate the average of the last two readings.[1]
- If the first reading is <130/85 mmHg, no further measurements are needed.[1]
- If blood pressure readings from 2-3 office visits are consistently ≥130/80 mmHg, it is indicative of hypertension.[2]

PLAN BASED ON OFFICE BLOOD PRESSURE LEVELS

This table outlines the recommended follow-up actions based on different office blood pressure levels.[1]

OFFICE BLOOD PRESSURE LEVELS (MMHG)	ACTION PLAN
<130/85	• Re-measure within 3 years (1 year in those with other risk factors)
130–159/85–99	• If possible, confirm with out-of-office blood pressure measurement (due to the high chance of white coat or masked hypertension). • Alternatively, confirm with repeated office visits
>160/100	• Confirm within a few days or weeks

Pharmacists must understand proper measurement practices to support accurate diagnosis and effective management.

1. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI: 10.1161/HYPERTENSIONAHA.120.15026.
2. 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2025 Sep 16;152(11):e114-e218. DOI: 10.1161/CIR.0000000000001356

HOME BLOOD PRESSURE MEASUREMENT

Guidance on best practices for home blood pressure measurement is outlined below.[1]

1

Condition

Same as for office BP.

2

Position

Same as office BP.

3

Device-Cuff

- Validated electronic (oscillometric) upper-arm cuff.
- Based on individual arm size.

4

Measurement protocol

- 3-7 day monitoring, morning & evening (before medication if on treatment).
- Two readings, 5 min rest, 1 min between.
- Long-term: 1-2 readings per week or month.

5

Interpretation

Average home BP ≥135/85 mmHg (excluding day 1) indicates hypertension.

1. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI: 10.1161/HYPERTENSIONAHA.120.15026.

24-HOUR AMBULATORY BLOOD PRESSURE MEASUREMENT

Ambulatory blood pressure monitoring is for evaluating blood pressure patterns over 24 hours.[1]

1

Condition

Routine working day.

2

Position

- Avoid heavy activity.
- Arm should remain still during measurements.

3

Device-Cuff

Same as home BP.

4

Measurement protocol

- 24-hour monitoring at 15-30 min intervals.
- At least 20 valid daytime readings & 7 night time readings required.

5

Interpretation

- 24-hour BP ≥130/80 mmHg: hypertension.
- Day time BP ≥135/85 mmHg, night time BP ≥120/70 mmHg hypertension.

1. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI: 10.1161/HYPERTENSIONAHA.120.15026.

WHITE COAT HYPERTENSION

- Patients with white coat hypertension are at an intermediate cardiovascular risk, positioned between those with normal BP and those with sustained hypertension.
- The diagnosis requires confirmation through repeated office and out-of-office BP measurements.
- If their overall cardiovascular risk is low and no hypertension-mediated organ damage (HMOD) is present, pharmacological treatment may not be necessary.
- These patients should be monitored with lifestyle changes, as they may eventually progress to sustained hypertension requiring medical treatment.[1]

MASKED HYPERTENSION

- Patients with masked hypertension face a cardiovascular risk similar to individuals with sustained hypertension.
- The diagnosis should also be confirmed with repeated office and out-of-office BP measurements.
- In many cases, masked hypertension may necessitate medical treatment to normalise BP outside the office setting.[1]

Early detection of white-coat hypertension and masked hypertension can prevent progression to hypertension-mediated organ damage. Early detection also allows timely pharmacological and nonpharmacological interventions.[2]

1. Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334–1357. DOI:10.1161/HYPERTENSIONAHA.120.15026.
2. International Pharmaceutical Federation (FIP). Cardiovascular diseases: A handbook for pharmacists. The Hague: FIP, 2022. Available at: https://www.fip.org/file/5251.

6. MANAGEMENT OF UNCONTROLLED HYPERTENSION

- Management goals
- Reduce the risk of cardiovascular events
- Quick buys for prevention and control of hypertension and other non-communicable diseases
- Non-pharmacological management
  - Weight reduction and healthy diet
  - Restriction of sodium intake
  - Increase of potassium intake
  - Physical activity
  - Alcohol consumption and other beverages
  - Tobacco cessation
  - Stress management
  - Minimise exposure to air pollution
- Pharmacological treatment options
- Medication optimisation

MANAGEMENT GOALS

Uncontrolled hypertension can lead to stroke, heart attack, heart failure, kidney damage, and other complications.[1] Prompt and effective management of uncontrolled hypertension is crucial to reduce life-threatening risks, slow disease progression, and improve quality of life. The main objectives of treatment are to control blood pressure, prevent organ damage, minimise cardiovascular risk, and lessen the health care burden through comprehensive and sustained strategies.

Treatment threshold for uncontrolled hypertension patients:[2]

SBP ≥ 130 mmHg

DBP ≥ 80 mmHg

- Achieve target blood pressure levels
- Reduce the risk of cardiovascular events
- Prevent or reverse target organ damage
- Improve quality of life and promote sustainable lifestyle changes
- Pharmacological management of hypertertension

1. World Health Organization (WHO). 23 September 2025. Global report on hypertension 2025: High stakes - turning evidence into action. Available at: https://www.who.int/publications/i/item/9789240115569
2. 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2025 Sep 16;152(11):e114-e218. DOI: 10.1161/CIR.0000000000001356

REDUCE THE RISK OF CARDIOVASCULAR EVENTS

KEY POINTS FOR PHARMACISTS

- Patients with SBP ≥130 or DBP ≥80 mmHg are usually high risk and treatment can be started immediately, no risk assessment required.[1]
- Pharmacists should consider comorbidities such as diabetes or kidney disease. If assessment may delay care, treatment should begin first, with risk assessment during follow-up.[2]

PREVENT OR REVERSE TARGET ORGAN DAMAGE

- Pharmacological treatment for hypertension should be initiated no later than four weeks after diagnosis.
- If blood pressure is very high (e.g., SBP ≥160 mmHg or DBP ≥100 mmHg) or there is evidence of target organ damage, treatment should be started without delay.
- In the presence of target organ damage, initiating treatment at a DBP of ≥90 mmHg should be considered.

CLINICAL SIGNIFICANCE

- Risk assessment can help avoid unnecessary treatment.
- In low-resource settings, delays caused by extra screening steps may lead to treatment gaps.
- Pharmacists can play a key role in ensuring timely treatment and in supporting ongoing risk management during follow-up.[2]

IMPROVE QUALITY OF LIFE

Quality of life is an important consideration in antihypertensive treatment because most patients are asymptomatic before starting medication and may become symptomatic due to side effects, which they do not welcome.

1. 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2025 Sep 16;152(11):e114-e218. DOI: 10.1161/CIR.0000000000001356
2. World Health Organization (WHO). Guideline for the pharmacological treatment of hypertension in adults. Geneva: WHO; 2021. Available at: https://iris.who.int/bitstream/handle/10665/344424/9789240033986-eng.pdf

QUICK BUYS FOR PREVENTION AND CONTROL OF HYPERTENSION AND OTHER NON-COMMUNICABLE DISEASES

WHAT ARE QUICK BUYS?[1]

- Evidence-based, cost-effective interventions that can produce measurable public health impact within five years.
- Designed to align with political and planning cycles.

ROLE OF PHARMACISTS:

- Accelerate progress towards the 2030 Sustainable Development Goal of reducing premature NCD mortality by one-third.[1]
- Address misconceptions that non-communicable diseases (NCDs) interventions take too long to show results.[1]

EXAMPLE OF QUICK BUYS INTERVENTIONS INCLUDE:[1]

- Tobacco control
- Alcohol reduction
- Promotion of healthy diet
- Increasing physical activity
- Management of cardiovascular disease
- Diabetes care
- COPD interventions

Quick buys are not necessarily “quick wins”—they may require policy or system changes, but provide rapid, demonstrable benefits and are cost-effective tools to reduce the NCD burden.[1]

1. Galea G, Ekberg A, Ciobanu A, et al. Quick buys for prevention and control of noncommunicable diseases. Lancet Reg Health Eur. 2025 Mar 24;52:101281. doi: 10.1016/j.lanepe.2025.101281.

NON-PHARMACOLOGICAL MANAGEMENT

- Unhealthy lifestyles are a major cause of elevated blood pressure and hypertension in adults, leading to serious cardiovascular and overall health consequences.[1]
- Pharmacists play a key role in guiding patients toward lifestyle changes that improve blood pressure control and overall quality of life.
- The following areas are essential for patient counselling:

Weight reduction and diet

Visceral obesity increases hypertension risk. Weight loss—through healthy diets (e.g., Mediterranean or the Dietary Approaches to Stop Hypertension [DASH]), lifestyle changes, or certain medications can lower blood pressure and improve overall cardiovascular health.[1]

Sodium and potassium

Reducing sodium and increasing potassium intake can significantly lower blood pressure and cardiovascular risk, with recommendations tailored to individual health conditions.[1]

Physical activity

Regular physical activity lowers blood pressure, reduces hypertension risk, and improves quality of life. Pharmacists can encourage activity and reduce sedentary behaviour.[2]

Alcohol consumption and other beverages

Alcohol, certain energy drinks, and sugary beverages can raise blood pressure and cardiovascular risk, whereas coffee and tea do not appear to have a harmful effect.[1]

Tobacco cessation

Tobacco use raises blood pressure and cardiovascular risk. Quitting can help lower blood pressure and improve cardiovascular and overall health.[1]

Stress management

Chronic stress may contribute to higher blood pressure.[3] Pharmacists can support patients by promoting healthy habits, resilience, and effective stress-management strategies.

Air pollution

Air pollution can increase the risk of hypertension and cardiovascular disease, making both personal actions and large-scale policy measures important for prevention.[4]

1. McEvoy JW, McCarthy CP, Bruno RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024;45(38):3912–4011. DOI: https://doi.org/10.1093/eurheartj/ehae178.
2. World Health Organization (WHO). Global report on hypertension: the race against a silent killer. Geneva: WHO, 2023. Available at: https://www.who.int/publications/i/item/9789240081062.
3. American Heart Association. Managing stress to control high blood pressure [Internet]. Last reviewed: 7 May 2024 [accessed: 12 August 2025]. Available at: https://www.heart.org/en/health-topics/high-blood-pressure/changes-you-can-make-to-manage-high-blood-pressure/managing-stress-to-control-high-blood-pressure.
4. World Health Organization (WHO). Global report on hypertension: the race against a silent killer. Geneva: WHO; 2023. Available at: https://www.who.int/publications/i/item/9789240081062.

WEIGHT REDUCTION AND HEALTHY DIET

WEIGHT REDUCTION AND IMPACT ON HYPERTENSION

- Visceral obesity is common and associated with the development of hypertension.
- Average weight loss of 5 kg can reduce systolic BP by ~4.4 mmHg and diastolic BP by ~3.6 mmHg.
- In individuals with a body mass index (BMI) of 40 kg/m^2, a 13% weight loss is linked to a 22% reduction in hypertension risk.
- Losing 5–10% of initial body weight can improve BP, glucose, and lipid metabolism, and may reduce premature mortality.
- Long-term weight loss is challenging. Maintaining stable weight during middle age is a practical and important strategy to help prevent future increases in blood pressure associated with obesity.

Quick Buy recommendations for diet and weight management:[2]

- Implement policies promoting healthy diets: food reformulation, front-of-pack labelling, healthy public food procurement.
- Mass media campaigns and protection from harmful marketing (especially for children).
- Support breastfeeding.

EVIDENCE-BASED DIETARY APPROACHES

- Mediterranean diet and the DASH diets are recommended to lower blood pressure and reduce cardiovascular risk.
- When combined with weight loss, physical activity, and low sodium intake, the DASH diet has an added effect on reducing blood pressure.
- Medications like orlistat provide a modest systolic blood pressure reduction (2.6 mmHg), whereas GLP-1 receptor agonists (e.g., semaglutide) can lead to a 12.4% weight loss and a 5.1 mmHg reduction in systolic blood pressure.

For more information on how pharmacists can support patients with nutrition and weight management, visit the FIP website.

1. McEvoy JW, McCarthy CP, Bruno RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024;45(38):3912–4011. DOI: https://doi.org/10.1093/eurheartj/ehae178.
2. World Health Organization (WHO). Tackling NCDs: best buys and other recommended interventions for the prevention and control of noncommunicable diseases [Internet]. 2nd ed. Geneva: World Health Organization; 2024 [accessed: 16 August 2025]. Available at: https://iris.who.int/bitstream/handle/10665/376624/9789240091078-eng.pdf?sequence=1.

SODIUM AND POTASSIUM INTAKE

RESTRICTION OF SODIUM INTAKE:[1]

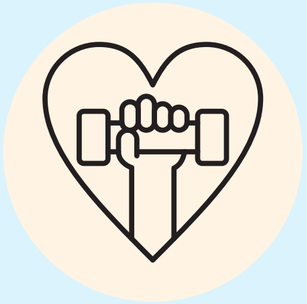
- Reducing high sodium intake can lower the risk of cardiovascular disease (CVD) events by up to ~20%, particularly in populations with elevated salt consumption.
- The main health benefit is lowering blood pressure (BP); women generally show greater sensitivity than men.
- Daily sodium intake is recommended to be approximately 2 grams or less (about 5 grams of salt, roughly one teaspoon).
- A more feasible target for the general population could be 2–4 grams of sodium per day.
- Processed and pre-prepared foods account for the majority of sodium consumed in most diets.
- Evidence supporting the benefits of sodium reduction is strong, even when intake remains above 2 g/day.

INCREASE OF POTASSIUM INTAKE:

- Consuming potassium-rich fruits and vegetables lowers BP and may reduce CVD risk, with potentially stronger effects in women.[1]
- WHO suggests a potassium intake of at least 90 mmol/day (3510 mg/day) for adults.[2]
- A lower sodium-to-potassium ratio is associated with greater BP reduction.[1]
- In hypertensive patients with high sodium intake, increasing potassium intake should be considered.[1]
- Potassium intake can be increased using potassium-enriched salt substitutes or by consuming more potassium-rich foods.[1]
- In patients with advanced chronic kidney disease (CKD) or those on potassium-sparing medications, potassium intake should be restricted and serum levels monitored carefully.[1]

1. McEvoy JW, McCarthy CP, Bruno RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024;45(38):3912–4011. DOI: https://doi.org/10.1093/eurheartj/ehae178.
2. World Health Organization (WHO). Increasing potassium intake to reduce blood pressure and risk of cardiovascular diseases in adults – e-Library of Evidence for Nutrition Actions (eLENA) [Internet]. 9 August 2023 [accessed: 12 August 2025]. Available at: https://www.who.int/tools/elena/interventions/potassium-cvd-adults.

PHYSICAL ACTIVITY



- Physical activity provides both short- and long-term physiological benefits that reduce the risk of hypertension.
- Regular physical activity lowers blood pressure in individuals with normal or high-normal values and slows the progression of cardiovascular disease in people with hypertension, while also improving quality of life.
- Physically active individuals with hypertension have been shown to reduce systolic blood pressure by approximately 12 mmHg and diastolic blood pressure by approximately 6 mmHg compared to inactive individuals.[1]
- Conversely, prolonged sedentary behaviour is associated with increased all-cause and cardiovascular mortality. If current inactivity levels persist, nearly 240 million new, preventable cases of hypertension could occur globally between 2020 and 2030.[1]

Definition and types of physical activity:[1]

- WHO defines physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure.
- It includes all forms of movement during leisure time, commuting, work, or household tasks.
- Both moderate- and vigorous-intensity activities contribute to improved health.
- Common forms of physical activity include walking, cycling, playing sports, and active recreation and play, and they can be enjoyed by people of all skill levels.

- Pharmacists play an important role in promoting physical activity through community-based health counselling and direct patient engagement.
- They can provide information on appropriate types of physical activity, raise awareness through brief interventions, and educate patients about the risks of physical inactivity.
- Moreover, pharmacists can support the implementation of national guidelines and campaigns aimed at increasing physical activity by informing patients and encouraging participation.

For more information on
how pharmacists can support patients
with physical activity,
visit the FIP website.

1. World Health Organization (WHO). Global report on hypertension: the race against a silent killer. Geneva: WHO, 2023. Available at: https://www.who.int/publications/i/item/9789240081062.
2. World Health Organization (WHO). Physical activity – fact sheet [Internet]. 2024 Jun 26 [accessed: 18 Aug 2025]. Available at: https://www.who.int/news-room/fact-sheets/detail/physical-activity.

ALCOHOL CONSUMPTION AND OTHER BEVERAGES

ALCOHOL:

Short-term effects:[1]

- Low dose (<14g): No effect on blood pressure (BP) within 6 hours.
- Medium dose (14–28g): May transiently lower both systolic and diastolic BP.
- High dose (>30g): Lowers BP for up to 12 hours, but increases systolic BP by 3.7 mmHg and diastolic BP by 2.4 mmHg after 13 hours.

Long-term effects:[1]

- No protective effect of chronic alcohol consumption against hypertension.
- Even low-dose alcohol (10g/day) increases hypertension risk by 14% in men.
- A weekly limit of 100g of pure alcohol is recommended for both men and women.
- Avoiding alcohol entirely, where possible, may be the healthiest choice.

COFFEE AND TEA:

- Coffee consumption is not associated with a higher risk of hypertension; higher intake may even be linked to a reduced risk.[1]
- Tea may have beneficial effects on BP, although evidence remains inconclusive.[1]

ENERGY DRINKS:

- Energy drinks high in caffeine and taurine can increase BP.[1]
- May cause acute or chronic cardiovascular issues, particulary in young adults.[1]

SUGAR-SWEETENED AND ARTIFICIALLY SWEETENED BEVERAGES:

- Consuming two or more servings per day of sugar-sweetened drinks increases coronary artery disease risk by 35% in women.[1]
- In the EPIC (European Prospective Investigation into Cancer and Nutrition) study, both sugar- and artificially-sweetened drinks were linked to higher all-cause mortality.[1]
- Among children and adolescents, sugar-sweetened beverages raise systolic BP and increase the risk of hypertension.[1]
- Free sugar intake, especially from sugary beverages, should not exceed 10% of total daily energy intake.[1]

For more information on how pharmacists can support patients in reducing or avoiding alcohol consumption, visit the FIP website.

Quick Buy recommendation: For alcohol use reduction and cessation, increasing excise taxes, restricting advertising, limiting retail availability, and providing brief psychosocial interventions are examples of WHO ‘Best Buy’ interventions.[2]

1. McEvoy JW, McCarthy CP, Bruno RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024;45(38):3912–4011. DOI: https://doi.org/10.1093/eurheartj/ehae178.
2. World Health Organization (WHO). Tackling NCDs: best buys and other recommended interventions for the prevention and control of noncommunicable diseases [Internet]. 2nd ed. Geneva: World Health Organization; 2024 [accessed: 16 August 2025]. Available at: https://iris.who.int/bitstream/handle/10665/376624/9789240091078-eng.pdf?sequence=1.

TOBACCO CESSATION

- Tobacco use is one of the most significant preventable risk factors for the development of cardiovascular diseases (CVD), premature death, and disability worldwide.[1]
- The European Society of Cardiology (ESC) recommends complete tobacco cessation, initiating supportive care, and referring patients to structured tobacco cessation programmes, as tobacco use is a strong and independent risk factor for CVD, cardiovascular events, and all-cause mortality.[2]
- The effects of electronic cigarettes (e-cigarettes) on blood pressure (BP) remain unclear, but emerging evidence suggests they may increase BP.[2]
- According to current ESC guidelines, tobacco cessation is strongly recommended to reduce CVD risk and improve overall health.[2]
- Pharmacists play an essential role in supporting individuals who wish to quit tobacco and maintain abstinence. Their knowledge and accessibility place them in a strong position to provide evidence-based guidance, appropriate medicines and continuous support for those aiming to overcome tobacco addiction and dependence.

Quitting tobacco use is one of the most effective measures to prevent major cardiovascular disease (CVD) events at the individual level, likely by improving vascular health.[2]

For more information on how pharmacists can support patients with tobacco use, visit the FIP website.

Quick Buy recommendation: For tobacco use reduction and cessation, implement the relevant WHO 'Best Buy' interventions, such as increasing excise taxes, using graphic health warnings, and eliminating exposure to second-hand smoke.[3]

1. International Pharmaceutical Federation (FIP). Supporting tobacco cessation and the treatment of tobacco dependence: a handbook for pharmacists [Internet]. The Hague: FIP; 2023 [accessed: 12 August 2025]. Available at: https://www.fip.org/file/5553.
2. McEvoy JW, McCarthy CP, Bruno RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024;45(38):3912–4011. DOI: https://doi.org/10.1093/eurheartj/ehae178.
3. World Health Organization (WHO). Tackling NCDs: best buys and other recommended interventions for the prevention and control of noncommunicable diseases [Internet]. 2nd ed. Geneva: World Health Organization; 2024 [accessed: 16 August 2025]. Available at:https://iris.who.int/bitstream/handle/10665/376624/9789240091078-eng.pdf?sequence=1.

STRESS MANAGEMENT

- Although stress alone is not considered a direct cause of sustained hypertension, chronic stress contributes to elevated cardiovascular risk through persistent activation of the sympathetic nervous system and by reinforcing unhealthy behaviours such as tobacco use, alcohol consumption, insufficient sleep, or overeating.
- While short-term “fight or flight” responses only raise blood pressure temporarily, chronic stress can keep the body in a heightened state for extended periods, potentially harming cardiovascular health.[1]
- Stress management strategies, including mindfulness, relaxation techniques, breathing exercises, yoga, and cognitive-behavioural approaches, can help reduce blood pressure indirectly by promoting healthier lifestyles and reducing sympathetic overactivity.

Pharmacists can encourage patients to manage stress through healthy lifestyle choices such as regular physical activity, adequate sleep, limiting alcohol, avoiding tobacco use, and maintaining a balanced diet. They can also promote resilience by fostering social connections, practising relaxation techniques, building supportive relationships, and encouraging activities that bring joy and gratitude.

For more information on how pharmacists can support patients with stress management, visit the FIP website.

1. American Heart Association. Managing stress to control high blood pressure [Internet]. Last reviewed: 7 May 2024 [accessed: 12 August 2025]. Available at: https://www.heart.org/en/health-topics/high-blood-pressure/changes-you-can-make-to-manage-high-blood-pressure/managing-stress-to-control-high-blood-pressure.

MINIMISE EXPOSURE TO AIR POLLUTION

- Air pollution is a major global health risk, responsible for an estimated 6.7 million deaths annually, with 99% of the population exposed to unsafe air quality.[1]
- Long-term exposure to fine particulate matter (PM2.5) is associated with an increased risk of high blood pressure and other cardiovascular diseases, such as ischaemic heart disease and stroke, particularly among people with pre-existing cardiovascular or respiratory conditions, obesity, or low socioeconomic status.[1]
- Improving air quality offers an important opportunity to prevent hypertension and other non-communicable diseases, requiring both personal-level actions and large-scale policy measures in sectors like energy, transport, and urban development.[1]
- Pharmacists can advise patients on strategies to reduce exposure to air pollution, including adjusting the location, timing, and type of outdoor activities.[2]

For more information on how pharmacists can support patients in reducing air pollution exposure, visit the FIP website.

1. World Health Organization (WHO). Global report on hypertension: the race against a silent killer. Geneva: WHO; 2023. Available at: https://www.who.int/publications/i/item/9789240081062.
2. Kreutz R, Brunstrom M, Burnier M, et al. 2024 European Society of Hypertension clinical practice guidelines for the management of arterial hypertension. Eur J Intern Med. 2024;126:1-15. DOI: 10.1016/j.ejim.2024.05.033.

PHARMACOLOGICAL TREATMENT OPTIONS

The WHO guidelines on treatment of hypertension in adults[1,2] recommend the use of either thiazide and thiazide-like diuretics, angiotensin converting enzyme inhibitors (ACEIs), angiotensin II receptor blockers (ARBs), or long-acting calcium channel blockers (CCBs) for the initial management of hypertension. Treatment should be monitored to ensure target blood pressure is attained. Where blood pressure is not adequately attained, combination therapy can be considered.[1]

With many novel therapies expected in the next few years, pharmacists should be aware of these future options to help manage hard-to-control hypertension when current treatments are insufficient.

The therapeutic categories that can be used to manage hypertension are outlined on the following pages.

1. Al-Makki A, DiPette D, Whelton PK, et al. Hypertension pharmacological treatment in adults: A World Health Organization guideline executive summary. Hypertension. 2022 Jan;79(1):293-301. DOI: 10.1161/HYPERTENSIONAHA.121.18192
2. .World Health Organization (WHO). Guideline for the pharmacological treatment of hypertension in adults. Geneva: WHO; 2021. Available at: https://iris.who.int/bitstream/handle/10665/344424/9789240033986-eng.pdf.

PHARMACOLOGICAL TREATMENT OPTIONS

Understanding the mechanisms of action, common side effects, and contraindications of antihypertensive medicine classes is essential for pharmacists to provide patient-specific counselling and optimise therapeutic outcomes.[1]

THERAPEUTIC CATEGORY	MECHANISM OF ACTION	EXAMPLES OF MEDICINES IN THIS CATEGORY	EXAMPLES OF COMMON SIDE EFFECTS	POTENTIAL MEDICATION INTERACTIONS	NOTES ON PATIENT COUNSELLING
Angiotensin-converting enzyme inhibitors (ACEIs)	Exert a haemodynamic effect by inhibiting the renin-angiotensin system, modulating sympathetic nervous system activity and increasing prostaglandin synthesis, causing vasodilation and natriuresis.	• Captopril • Cilazapril • Enalapril • Fosinopril • Lisinopril • Perindopril • Quinapril • Ramipril • Zofenopril	• Chronic cough • Metallic taste • Hyperkalaemia • Syncope • Hypotension	• ARBs. • Increased risk of hyperkalaemia in those on potassium supplements and potassium-sparing diuretics.	• Do not use when patient has medical history of angioedema with ACEIs. • First-dose hypotension—first dose preferably taken at bedtime. • Renal function and electrolytes should be checked before starting ACEIs (or increasing the dose) and monitored during treatment (more frequently if side effects mentioned are present). • Contraindicated in pregnant women, patients with bilateral renal artery stenosis, and acquired or congenital solitary kidney and stenosis.

1. International Pharmaceutical Federation (FIP). Cardiovascular diseases: A handbook for pharmacists. The Hague: FIP, 2022. Available at: https://www.fip.org/file/5251.

PHARMACOLOGICAL TREATMENT OPTIONS

THERAPEUTIC CATEGORY	MECHANISM OF ACTION	EXAMPLES OF MEDICINES IN THIS CATEGORY	EXAMPLES OF COMMON SIDE EFFECTS	POTENTIAL MEDICATION INTERACTIONS	NOTES ON PATIENT COUNSELLING
Angiotensin II receptor blockers (ARBs)	Block angiotensin receptor, inhibiting the effects of angiotensin II.	• Candesartan • Eprosartan • Irbesartan • losartan • Olmesartan • Telmisartan • Valsartan	• Dizziness • Light-headedness • Vomiting • Diarrhoea • Hyperkalaemia • Angioedema	• ACEIs. • Increased risk of hyperkalaemia in those on potassium supplements.	Contraindicated in: • pregnant women • patients with bilateral renal artery stenosis • solitary kidney
Beta blockers	Competitively antagonise endogenous catecholamines by blocking their binding to receptor sites.	• Cardioselective (beta-1): acebutolol, atenolol, bisoprolol, esmolol, metoprolol, nebivolol. • Non-cardioselective (beta-1 and beta- 2): carvedilol (beta-1 and alfa-1), labetalol, pindolol, propranolol, sotalol, timolol.	• Dizziness • Cold extremities • Difficulty sleeping • Nightmares • Fatigue • Impotence	• Nebivolol induces nitric oxide-induced vasodilatation.	• Monitor lung function. • Avoid in patients with reactive airways disease.

1. International Pharmaceutical Federation (FIP). Cardiovascular diseases: A handbook for pharmacists. The Hague: FIP, 2022. Available at: https://www.fip.org/file/5251.

PHARMACOLOGICAL TREATMENT OPTIONS

Calcium channel blockers should be carefully considered based on individual patient response and potential side effects.[1]

THERAPEUTIC CATEGORY	MECHANISM OF ACTION	EXAMPLES OF MEDICINES IN THIS CATEGORY	EXAMPLES OF COMMON SIDE EFFECTS	POTENTIAL MEDICATION INTERACTIONS	NOTES ON PATIENT COUNSELLING
Calcium channel blockers	Selectively inhibit calcium influx through cellular membranes, thus reducing the rate and conduction of cardiac muscle.	Dihydropyridines: • Amlodipine • Barnidipine • Felodipine • Lacidipine • Lercarnidipine • Nicardipine • Nifedipine • Nimodipine • Nitrendipine Non-dihydropyridines: • Diltiazem • Verapamil	• Headache • Constipation • Rash • Nausea • Flushing • Oedema • Drowsiness • Hypotension	• Combination of non-dihydropyridines CCB and beta blockers can increase risk of bradycardia and heart block. • Interactions with diltiazem and verapamil (CYP3A4 major substrate and moderate inhibitor).	Potential dose-related pedal oedema, which is more common in women than men.

1. International Pharmaceutical Federation (FIP). Cardiovascular diseases: A handbook for pharmacists. The Hague: FIP, 2022. Available at: https://www.fip.org/file/5251.

PHARMACOLOGICAL TREATMENT OPTIONS

Calcium channel blockers should be carefully considered based on individual patient response and potential side effects.[1]

THERAPEUTIC CATEGORY	MECHANISM OF ACTION	EXAMPLES OF MEDICINES IN THIS CATEGORY	EXAMPLES OF COMMON SIDE EFFECTS	NOTES ON PATIENT COUNSELLING
Thiazide or thiazide-like diuretics	Increase urine flow by inhibiting the sodium/chloride cotransporter located in the distal convoluted tubule.	• Chlorthalidone • Hydrochlorothiazide • Indapamide metolazone	Dose-related side effects include: • Blurred vision • Dizziness • Light-headedness • Loss of appetite • Headache and weakness • Stomach upset • Electrolyte disturbances • Variations in plasma parameters: glucose, uric acid, lipids.	• Monitor renal function. Monitor for hyponatraemia, hypokalaemia, and uric acid and calcium levels. • Thiazides and related diuretics should not be used to treat gestational hypertension. • Use with caution in patients with medical history of acute gout unless receiving uric acid therapy.

1. International Pharmaceutical Federation (FIP). Cardiovascular diseases: A handbook for pharmacists. The Hague: FIP, 2022. Available at: https://www.fip.org/file/5251.

PHARMACOLOGICAL TREATMENT OPTIONS

THERAPEUTIC CATEGORY	MECHANISM OF ACTION	EXAMPLES OF MEDICINES IN THIS CATEGORY	EXAMPLES OF COMMON SIDE EFFECTS	POTENTIAL MEDICATION INTERACTIONS	NOTES ON PATIENT COUNSELLING
Aldosterone antagonists	Block the effects of aldosterone, causing excretion of sodium by the kidneys and other glands, encouraging water loss and a subsequent decrease in blood pressure and reduction in fluid around the heart.	• Eplerenone • Spironolactone	• Dizziness • Upset stomach • Dry mouth • Muscle spasms • Swelling and tenderness of breast • Skin rash.	Increased risk of hyperkalaemia in those using potassium supplements or using drugs that increase potassium levels, e.g., ACEIs and ARBs	Patients may be required to limit salt intake.

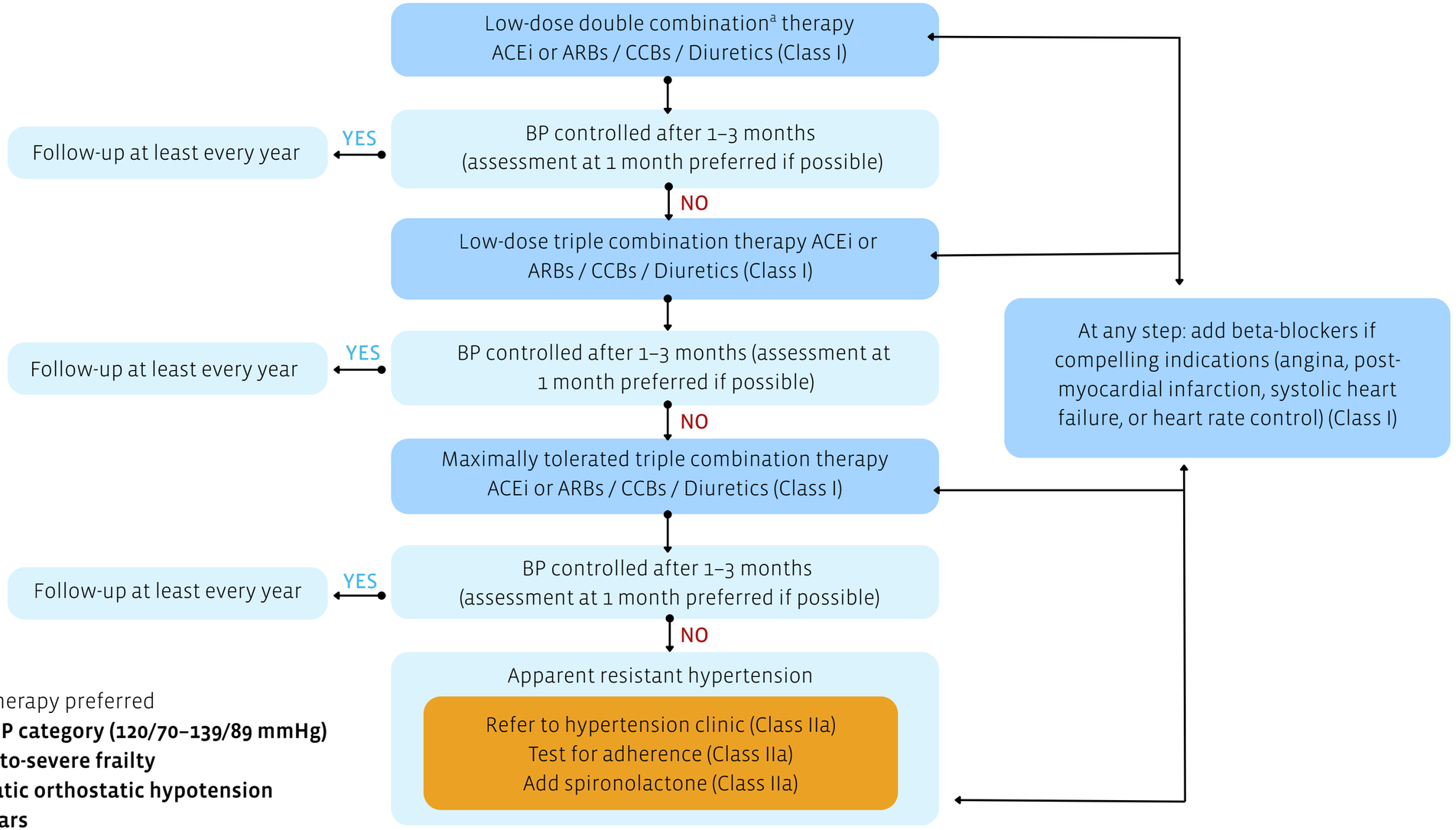
1. International Pharmaceutical Federation (FIP). Cardiovascular diseases: A handbook for pharmacists. The Hague: FIP, 2022. Available at: https://www.fip.org/file/5251.

PHARMACOLOGICAL TREATMENT OPTIONS

THERAPEUTIC CATEGORY	MECHANISM OF ACTION	EXAMPLES OF MEDICINES IN THIS CATEGORY	EXAMPLES OF COMMON SIDE EFFECTS	POTENTIAL MEDICATION INTERACTIONS	NOTES ON PATIENT COUNSELLING
Loop diuretics	Inhibition of the sodium / potassium / chloride co-transporter (symporter) located in the thick ascending limb of the loop of Henle.	• Furosemide • Torasemide	• Dizziness • Headache • Gastrointestinal upset • Hyponatraemia • Hypokalaemia • Ototoxicity • Dehydration	• Interact with amphotericin B, digoxin, ACEIs, antidiabetic medicines, antifungal agents, dobutamine, and sotalol due to diuretic-associated hypokalaemia • Interact pharmacodynamically with medicines like cephalosporins, ceritinib, levothyroxine, pixantrone, probenecid, lithium, nonsteroidal anti-inflammatory drugs, sulfonylureas and herbal medicines.	• Monitor for hyponatraemia, hypokalaemia and uric acid, and calcium levels. • Use with caution in patients with medical history of acute gout unless they are receiving uric acid therapy. • Due to the risk of ototoxicity, loop diuretics should be avoided in patients already taking medicines that can damage hearing, e.g., cisplatin, carboplatin, gentamicin and aspirin.

1. International Pharmaceutical Federation (FIP). Cardiovascular diseases: A handbook for pharmacists. The Hague: FIP, 2022. Available at: https://www.fip.org/file/5251.

EXAMPLE OF ALGORITHM FOR PHARMACOLOGICAL TREATMENT



[a]Initial monotherapy preferred

- **Elevated BP category (120/70–139/89 mmHg)**
- **Moderate-to-severe frailty**
- **Symptomatic orthostatic hypotension**
- **Age ≥85 years**

ACEi: angiotensin-converting enzyme inhibitor, ARB: angiotensin receptor blocker; BP: blood pressure; CCB: calcium channel blocker.

Adapted from: 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Available at: https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines/Elevated-Blood-Pressure-and-Hypertension

PHARMACOLOGICAL TREATMENT OPTIONS

CLASSES OF RECOMMENDATIONS	DEFINITION	WORDING TO USE
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended or is indicated.
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
Class IIa	Weight of evidence/opinion is in favour of usefulness/efficacy.	Should be considered.
Class IIb	Usefulness/efficacy is less well established by evidence/opinion.	May be considered.
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended.

Adapted from: 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Available at: https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines/Elevated-Blood-Pressure-and-Hypertension

MEDICATION OPTIMISATION



- **Pharmacological treatment overview**
  - The aim of pharmacological treatment is to reduce cardiovascular risk by lowering blood pressure, regardless of baseline levels.
  - Greater reductions in blood pressure are associated with greater risk reduction, particularly in adults up to 85 years of age.

- **First-line treatments include**
  - ACE inhibitors
  - ARBs
  - Calcium channel blockers
  - Diuretics

- **Specific considerations**
  - Beta-blockers are useful in specific cases like angina, heart failure, or post-myocardial infarction (MI), but they are less effective for stroke prevention and may cause more side effects.
  - Combining beta-blockers with diuretics may raise diabetes risk, and beta-blockers should generally be avoided in isolated systolic hypertension or arterial stiffness.

- **Second-line treatments**
  - If standard treatments fail to control blood pressure, spironolactone may be added for resistant hypertension. While it shows benefit in heart failure, its cardiovascular effects in general hypertension are less clear.
  - Other medicines (such as alpha-blockers, hydralazine, or centrally acting agents) have limited supporting evidence and higher side effect risks, so they should be used with caution and only when necessary.
  - Minoxidil is reserved as a last option due to side effects.

- **Treatment strategies:**
  - Hypertension often requires more than one medication.
  - Low-dose combinations from different classes are more effective and may cause fewer side effects than increasing the dose of a single medicine.
  - Single-pill combinations are preferred, but individual responses vary; treatment should be personalised.
  - Polypills combining blood pressure, lipid, and antiplatelet therapies may improve cardiovascular outcomes, but access remains limited in many settings.

Pharmacists support patients in optimising therapy by monitoring blood pressure, identifying side effects, and promoting adherence, ultimately contributing to better cardiovascular outcomes.

1. McEvoy JW, McCarthy CP, Bruno RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024;45(38):3912–4011. DOI: https://doi.org/10.1093/eurheartj/ehae178.

ACT NOW

PROMOTING ADHERENCE TO ANTIHYPERTENSIVE TREATMENT

Uncontrolled blood pressure in patients who have been diagnosed and prescribed treatment is often due to medication non-adherence. Pharmacists play a key role in promoting adherence by discussing reasons for missed doses in a non-judgemental way and suggesting practical strategies, such as:

- **Using phone alarms or reminders.**
- **Placing visual cues, such as notes on the refrigerator or bathroom mirror.**
- **Using pill organisers or blister packs.**
- **Linking medication-taking to an established routine, such as brushing teeth or having breakfast.**
- **Asking friends or family members to provide reminders.**
- **Using a medication tracker, calendar, or diary.**

Encourage patients to write a list of the perceived benefits and drawbacks of their antihypertensive medication regimen, and discuss these together so that problems can be solved collaboratively.

OPTIMISING THERAPY

- Conduct regular medication reviews to ensure patients are on the most appropriate therapy for them.
- Provide counselling to support adherence and address barriers, helping patients achieve optimal blood pressure control.
- In some jurisdictions, pharmacies may receive reimbursement for providing such services.

Host Hypertension Awareness Days in your pharmacy, aligning with key dates such as World Hypertension Day (17th May) and World Heart Day (29th September), to raise public awareness about the importance of blood pressure control.

7. EDUCATIONAL GUIDE KEY LEARNINGS

KEY LEARNINGS

- Uncontrolled hypertension is a silent condition that increases the risk of heart disease, stroke, kidney damage, and other serious complications.[1]
- Although genetic predisposition to hypertension is non-modifiable and carries a lifelong risk of cardiovascular disease, hypertension itself is largely preventable and modifiable through key environmental and lifestyle factors.[2]
- Many factors can increase the risk of developing high blood pressure. Knowing the risk factors can help identify how likely a person is to develop it. Modifiable risk factors can be managed with healthy habits.[3]
- Pharmacists are well placed to support patients through education, monitoring, and referral, playing a key role in blood pressure control.[4]
- You and your pharmacy team can make a meaningful impact by helping patients access appropriate hypertension care, improve treatment adherence, and reduce long-term health risks.

1. World Health Organization (WHO). Global report on hypertension: the race against a silent killer. Geneva: WHO, 2023. Available at: https://www.who.int/publications/i/item/9789240081062.
2. Carey RM, Muntner P, Bosworth HB, Whelton PK. Prevention and control of hypertension: JACC Health Promotion Series. J Am Coll Cardiol. 2018 Sep 11;72(11):1278–1293. doi: 10.1016/j.jacc.2018.07.008.
3. American Heart Association (AHA). Know your risk factors for high blood pressure [Internet]. 2024. [accessed: 17 Aug 2025]. Available at: https://www.heart.org/en/health-topics/high-blood-pressure/know-your-risk-factors-for-high-blood-pressure.
4. International Pharmaceutical Federation (FIP). Beating NCDs in the community: the contribution of pharmacists [Internet]. The Hague: FIP; 2019. [accessed: 17 Aug 2025]. Available at: https://www.fip.org/file/4694.

10. GLOSSARY OF COMMON TERMS

GLOSSARY

Ambulatory blood pressure measurement (ABPM): ABPM is an out-of-office BP measurement that uses a fully automated device, usually for a 24-hour period.[1]

Antihypertensive medications: are widely used to reduce high blood pressure, also known as hypertension. The medications are grouped into different classes. Each class helps lower blood pressure in different ways.[2]

Blood pressure (BP): Blood pressure is the amount of force the blood uses to get through the arteries.[3]

Cardiovascular diseases (CVDs): A group of disorders of the heart and blood vessels. Examples include coronary heart disease, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis and pulmonary embolism.[4]

Cardiovascular risk: Cardiovascular risk refers to the probability of suffering a cardiovascular event in the future. The European Society of Cardiology (ESC) strongly recommends the use of risk prediction models in order to enhance healthcare and CVD prevention.[5,6]

Chronic diseases: Conditions that last 1 year or more and require ongoing medical attention or limit activities of daily living or both. Chronic diseases are caused by a combination of genetic, physiological, environmental, and behavioural factors. They are also known as noncommunicable diseases (NCDs).[7,8]

Chronic kidney disease: Abnormalities of kidney structure or function, including markers of kidney damage and a reduced glomerular filtration rate (GFR), that have been present for at least 3 months and with implications for health.[9]

1. McEvoy JW, McCarthy CP, Bruno RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024;45(38):3912–4011. DOI: https://doi.org/10.1093/eurheartj/ehae178.
2. American Heart Association. Types of blood pressure medications [Internet]. 2024 [accessed: 12 August 2025]. Available at: https://www.heart.org/en/health-topics/high-blood-pressure/changes-you-can-make-to-manage-high-blood-pressure/types-of-blood-pressure-medications.
3. Cleveland Clinic. Blood pressure [Internet]. 6 February 2025 [accessed: 12 August 2025]. Available at: https://my.clevelandclinic.org/health/diagnostics/17649-blood-pressure.
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GLOSSARY

DASH: DASH (Dietary Approaches to Stop Hypertension) is a flexible and balanced eating plan that helps create a heart-healthy eating style for life. It was named “Best Heart-Healthy Diet” and “Best Diet for High Blood Pressure” by U.S. News & World Report in 2025. The DASH eating plan requires no special foods and instead provides daily and weekly nutritional goals.[1]

Diabetes: A disease that causes hyperglycaemia (also known as high blood glucose or high blood sugar), which occurs when the pancreas does not produce enough of the hormone insulin or when the body cannot effectively use the insulin it produces.[2]

Diastolic blood pressure: Diastolic blood pressure measures the pressure of the blood pushing against the artery walls while the heart muscle rests between beats.[3]

Heart failure: A type of CVD that occurs when the heart cannot pump enough blood to the body’s vital organs. Although the heart works, it does not work as well as it should. This can cause fluid to pool in the body, which manifests as swelling (oedema) in the lower legs and ankles, and shortness of breath as fluid collects in the lungs.[4] For more information about how pharmacists can support patients with heart failure visit the FIP website.

Home BP monitoring (HBPM): Home blood pressure monitoring (HBPM) is a self-monitoring tool that can be incorporated into the care for patients with hypertension and is recommended by major guidelines.[5]

Hypertension: Also called high or raised blood pressure, hypertension is a condition in which the blood vessels have persistently raised pressure.[6] High blood pressure can lead to other serious problems such as heart attack and stroke. It can affect all age groups: children, young adults, adults and older adults.[7]

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GLOSSARY

Iatrogenesis: Iatrogenesis or iatrogenic effect, (“originating from a physician”) is avoidable harm ensuing from medical treatment or advice to patients.[1]

Lifestyle changes: Modifications in daily habits and nonpharmacological approaches included in a comprehensive hypertension treatment plan, aiming to address modifiable risk factors such as unhealthy diet, physical inactivity, tobacco and alcohol use, and excess weight. These include reducing salt intake, eating more fruit and vegetables, regular physical activity, avoiding tobacco, reducing alcohol consumption, limiting foods high in saturated fats, and eliminating or reducing trans fats in the diet.[2]

Masked hypertension: For daytime measurements, the definition of masked hypertension in untreated individuals is an in-office BP of <140/90 mm Hg and an out of-office BP of ≥135/85 mm Hg. Conventional measurement of blood pressure (BP) in individual patient care has limitations, such as giving normal readings when, in fact, the patient is hypertensive (masked hypertension). Although masked phenomena are acknowledged as a consequence of the methodology of BP measurement, the condition nevertheless has serious consequences for the diagnosis and management of hypertension.[3]

Medication management: Patient-centred care to optimise safe, effective, and appropriate medication therapy. It involves several services aimed to improve clinical outcomes, such as completing medication reviews and health assessments, monitoring treatment plans, providing education, promoting self-management, and monitoring efficacy and safety of therapy.[4]

Obstructive sleep apnoea (OSA): A sleep disorder characterised by repeated episodes of complete (apnea) or partial (hypopnea) collapse of the upper airway, causing oxygen desaturation or sleep arousal.[5]

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GLOSSARY

Primary aldosteronism (PA): A common cause of secondary hypertension caused by excessive and inappropriate secretion of the hormone aldosterone from one or both adrenal glands.[1]

Renal parenchymal disease: A condition that damages functional parts of the kidneys. The most common causes are diabetes and high blood pressure. Later stage symptoms include changes in urine or urination habits, fatigue or swelling around the hands or feet.[2]

Sustained hypertension: SH, which includes sustained uncontrolled hypertension in patients receiving antihypertensive treatment, is characterised by elevated clinic BP (systolic ≥ 140 mmHg and/or diastolic ≥ 90 mmHg) and home BP (systolic ≥ 135 mmHg and/or diastolic ≥ 85 mmHg). Controlled BP, which includes true uncontrolled hypertension in treated patients, is characterised by lower clinic BP (systolic < 140 mmHg and diastolic < 90 mmHg) and home BP (systolic < 135 mmHg and diastolic < 85 mmHg).[3]

Systolic blood pressure: Systolic blood pressure measures the pressure of the blood pushing against the artery walls when the heart beats.[4]

White coat effect: Named for the white coats traditionally worn by doctors, white-coat hypertension refers to blood pressure that is high only when measured in a health care setting. These blood pressure spikes are presumed to be triggered by anxiety and stress.[5]

Uncontrolled hypertension: is defined as systolic blood pressure (SBP) ≥ 130 mmHg and/or diastolic blood pressure (DBP) ≥ 80 mmHg, persistently, in individuals receiving antihypertensive therapy.

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