Blood Pressure Guide

Summary of Various International Recommendations

IMPORTANT: This information is for educational purposes only.
This material is not a substitute for professional medical advice, diagnosis or treatment.

Guide: Monitor Blood Pressure at Home

Evolution strives to minimise the burden of cardiovascular, pulmonary and neurokinetic diseases. Hypertension, or high blood pressure (BP), remains a major health concern globally. When uncontrolled, it can lead to heart attack, stroke, heart failure, vision problems, kidney disease and other diseases impacted by blood vessel pressure. Current estimates indicate that approximately 45-50% of adults in the U.S. have hypertension, with prevalence increasing with age (Benjamin et al., 2019). Notably, approximately 20% of young adults aged 18-39 are affected by elevated BP, highlighting the need to monitor even early onset trends (Frey et al., 2019).

Dementia cases are on the rise. Uncontrolled hypertension is a significant risk factor for cognitive decline and dementia over time. Research demonstrates that individuals with poorly managed BP are at a significantly higher risk of developing Alzheimer's disease and other forms of dementia, emphasising the importance of BP control for cognitive health (Iadecola et al., 2016). Since elevated BP often presents with no symptoms—a condition known as "the silent killer"—regular monitoring is crucial for early detection and management.

Blood pressure readings can vary due to numerous factors, including stress, activity level, and measurement techniques. Single-occasion measurements, even in clinical settings, may not accurately reflect an individual's true BP levels. Yet, detection of your range of BP readings can be an early identifiable sign of a health emergency to protect your major organs. Therefore, taking the time to engage in a few weeks of home blood pressure monitoring can provide a reliable assessment of blood pressure trends. This approach, combined with other recommended practices, enhances the accuracy of BP monitoring and supports better health outcomes as normal and safe trends are achieved (Whelton et al., 2017).

This guide will help you:

1. Understand your results and recommended actions based on these results
2. Accurately measure your blood pressure
3. Take safe and reasonable steps to monitor your healthy blood pressure in the long term

Preparing to Measure

Variables that affect pressure readings (non-exhaustive list):

- hydration levels at the time of measurement
- general physical health at the time of measurement
- temperature and humidity of the place of measurement
- overall state of the person who is measuring the blood pressure
- blood sugar dysregulation and insulin resistance
- the size of the blood pressure cuff used
- recent or distant food or sustenance intake
- recent salt and electrolyte intake
- prescribed medications
- diet and over-the-counter supplementation
- present mental state, stress and/ or anxiety level/s (acute and chronic)
- recent exertion levels
- smoking up to 30 mins prior
- caffeine and nicotine
- bladder distension, empty bladder
- familiarity and perception of person taking pressure
- familiarity or lack thereof with the environment; where measurement is taken

Tools Needed:

Choose the Best Blood Pressure Monitor

There are two main types of blood pressure monitors:

1. **Manual Monitors (*Sphygmomanometers*)** – A stethoscope and some skills are required. They are not recommended for home use unless you are trained.
2. ***Automatic Digital Monitors* (Recommended)** – These are easier to source and use and are usually more accurate for home monitoring. An **upper-arm monitor** is preferred to wrist monitors, which are currently proven to give less consistent readings and can be especially unreliable when incorrectly positioned.

Cuff Bladder Size: Measure the arm circumference at the midpoint of the upper arm, which is the best way to determine the appropriate cuff size.

A cuff that's too large may cause falsely low readings, and one that's too small may cause falsely high readings. For accurate readings, choose a cuff that **fits snugly.**

Using the **incorrect cuff size** can lead to inaccurate blood pressure measurements. Accurate BP measurement is crucial, especially in clinical settings, as misdiagnosis of **hypertension** or **hypotension** due to improper cuff size can lead to incorrect treatment plans.

The **AHA's 2017 Blood Pressure Measurement Guidelines** recommend:

- The **width** of the cuff bladder should be approximately **40% of the arm circumference**

Both the European Society of Hypertension (ESH) and the AHA 2017 statements conclude that the **length** should be about **80% of the arm circumference** to ensure proper measurement.

Standardised Measurement Method:

Reminder: This guide advocates for using **digital automatic monitors**, particularly upper-arm devices, as the standard for home blood pressure measurement. This recommendation is widely supported by international guidelines.

1. **Rest for at least 5 minutes before measurement**. (10-15 minutes)
2. **Position your body**: Sit comfortably in a chair with your back supported and feet flat on the floor. Keep your arm at heart level, either resting on a table or your lap.
3. **Ensure the cuff is the correct size for your arm.**
4. **Apply the cuff correctly**:
   a. The cuff should be placed at **heart level**, and the **lower edge** should be approximately **1 inch above** the **elbow crease**.
   b. Make sure the cuff fits snugly but not too tightly. The cuff should be centred over the *brachial artery* on the inside of your arm.
5. **Turn on the monitor**: Press the start button on your digital monitor.
6. **Wait for the cuff to inflate and deflate**: The cuff will inflate to a certain pressure and then gradually deflate. During this process, the monitor will record your blood pressure.

7. **Repeat readings** (2-3 measurements, 1-2 minutes apart).
8. **Stay still, avoid talking, and avoid moving or crossing your legs during measurement.**
9. **Avoid measuring immediately after physical activity.**
10. **Timing:**
    a. **Measure at least twice per day**
    b. **First Measure: In the morning at the same time each day,** ideally in the morning before you eat or take any medications.
    c. **Second/ Third Measures: Randomly Chosen Time**

Record and Track Your Readings

Two (2) weeks of consecutive daily tracked BP measurements can adequately assess norms. Tracking trends over time by keeping a log of your blood pressure readings and sharing this information with your healthcare provider/s can help you to best manage BP optimally.

1. Use a notebook
2. Record the date & time
3. Record systolic and diastolic values
4. Record heart rate
5. Add notes (e.g., feeling stressed, after shopping)
6. Carry notes with you
7. Take a picture of your notes with your phone

NOTE:

- Some monitors have apps or memory functions
- Organising a telehealth visit where you are monitored while doing this could be helpful.

Myths about Blood Pressure

Myth 1: Blood pressure remains the same all day.
False: Blood pressure (BP) fluctuates throughout the day as part of normal physiological processes. These variations are influenced by factors such as physical activity, stress, sleep-wake cycles, dietary intake, and autonomic nervous system activity, including vagus nerve tone (Muntner et al., 2019). Recognizing these fluctuations is important for accurate BP assessment and management.

Myth 2: Blood pressure medications are the only option for reducing BP.
False: While antihypertensive medications are often necessary, especially in cases of stage 2 hypertension or when lifestyle modifications are insufficient, natural habits and lifestyle changes can effectively lower BP over time. Techniques such as dietary modifications, physical activity, stress reduction, and weight management are foundational and often recommended as first-line interventions (Whelton et al., 2018).

Myth 3: There is nothing natural proven to reduce blood pressure.

False: Several natural and lifestyle-based interventions have demonstrated efficacy in reducing BP. For example, anxiety and stress can temporarily elevate BP by approximately 10 mm Hg (Myers et al., 2017). Techniques such as deep breathing exercises and physical activity have well-established evidence supporting their role in lowering BP (Norton et al., 2010). Additionally, certain nutrients and supplements—including omega-3 fatty acids, magnesium, hibiscus tea, coenzyme Q10, and garlic—have been shown to positively influence BP levels with a clinical level of significance (Abed et al., 2018; Siu et al., 2017).

Table 1: Internationally Recommended Actions Based on BP Readings

Blood Pressure Category	Blood Pressure Range	Recommended Action
Normal	< 120/80 mm Hg	No immediate action needed.
Elevated	120-129/80 mm Hg	Recheck in a few weeks or consult a healthcare provider.
Hypertension Stage 1	130-139/80-89 mm Hg	Lifestyle changes and consider medication; consult your healthcare provider.
Hypertension Stage 2	140 or higher/90 or higher mm Hg	Seek medical attention for possible treatment, including medication.
Hypertensive Crisis	> 180/120 mm Hg	Seek immediate medical attention.

Table 1: Blood pressure readings and guideline recommendations for action.

When to seek medical advice (non-exhaustive checklist)

Immediate medical attention is warranted in the following cases:

Consistently high blood pressure readings indicating hypertension stage 1 (130-139 mm Hg systolic or 80-89 mm Hg diastolic) or stage 2 (≥140/90 mm Hg), especially if readings are elevated over multiple measurements (Whelton et al., 2017).

Sudden and persistent increases in BP without an apparent cause, which may signal a hypertensive crisis requiring urgent care (James et al., 2014).

Presence of symptoms suggestive of hypertensive emergencies or cardiovascular events, including (yet not limited to):

- Severe headache
- Dizziness or loss of balance
- Chest pain or angina
- Nausea or vomiting
- Palpitations or irregular heartbeat
- Sudden onset of arm weakness or numbness
- Indigestion symptoms
- Jaw pain
- Shortness of breath or difficulty breathing
- Visual disturbances (e.g., blurred vision)
- Severe or worsening headache unresponsive to usual remedies
- Sudden visual changes, such as loss of vision or double vision
- Unusual fatigue or confusion, which may indicate a hypertensive crisis affecting brain function

F.A.S.T. for Stroke Recognition:

In cases of suspected stroke, use the easy-to-remember F.A.S.T. acronym to identify symptoms requiring immediate emergency response:

- **Face**: Facial drooping or numbness
- **Arms**: Weakness or numbness in one arm
- **Speech**: Difficulty speaking or understanding speech
- **Time**: Call emergency services immediately if any of these signs are present (American Stroke Association, 2019).

Note: Prompt medical evaluation can prevent progression to life-threatening complications such as stroke, heart attack, or organ damage. Regular blood pressure monitoring and early intervention are essential components of hypertension management (Whelton et al., 2017).

To summarise, the monitoring methods described are consistent with globally recommended practices and can help you to accurately track pressure levels. In particular, the use of automatic upper-arm monitors, with the most appropriate cuff size considerations, and the record-keeping of multiple BP measurements over at least two weeks appears to capture baseline BP readings with a high degree of accuracy. This method demonstrably rules out the need for sole reliance on BP measures in emergencies or any other one-off measurement. Any stress-inducing environment can temporarily increase BP. The methods described are evidence-based approaches for clarifying your blood pressure trends in the comfort of your home environment. Record home BP in alliance with your GP, healthcare professional, family member, or caregiver to align with the best practices and keep your blood pressure at safe levels. Finally, if you already have a prescription, the methods described can advise about the titration of the “right amount” of medicine. Accurate home BP trends in the context of the individual’s presentation, history, and other variables can ensure that your medications are best adjusted for your current needs.

Table 2: Evidence Base of Natural Substances Proven to Positively Influence BP

Nutrient Source	Mechanism of Action	Effect on BP	Reference
Omega-3 Fatty Acids (EPA & DHA) 	-Enhance endothelial function -Reduce vascular resistance -Anti-inflammatory -↑ Nitric oxide	↓Systolic & diastolic BP	Abed, M. A., et al. (2018). Effect of omega-3 fatty acids on blood pressure: A systematic review and meta-analysis. J Clin Hypertens, 20(4), 556–567.
Magnesium (see research summary for further details)	-Natural calcium channel blocker -↑ Nitric oxide -Relaxes vascular smooth muscle	↓Systolic & diastolic BP	Siu, A., et al. (2017). Magnesium and blood pressure: A clinical review. Am J Hypertens, 30(4), 359–366.
Hibiscus Tea 	-Acts as a natural ACE inhibitor -Diuretic effect -Rich in polyphenols and anthocyanins	↓Systolic & diastolic BP	Abed, M. A., et al. (2018). Herbal remedies and hypertension: A review of clinical studies. J Herbal Med, 13, 33–40.
Coenzyme Q10	-Improves mitochondrial efficiency -Reduces oxidative stress -Enhances endothelial function	↓BP in hypertensives	Siu, A., et al. (2017). Nutraceuticals and blood pressure: Clinical effectiveness and mechanisms. Clin Nutr, 36(3), 671–681.
Garlic (Allicin) 	-Inhibits ACE -↑ Nitric oxide production - Vasodilatory effects	↓Systolic BP by ~8–10 mm Hg	Abed, M. A., et al. (2018). Garlic and cardiovascular health: A meta-analysis of randomized clinical trials. Phytomedicine, 34, 94–101.

Table 2: Nutrient Impacts on Blood pressure with evidence

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This guide is based on an analysis of cross-continental hypertension guidelines. Should there be any interest in helping to improve the contents, Please contact us directly. [admin@bpralliance.com]

Sandro Fubler MSc. CR, BSc. (Hons) RPT: May 2025