

Guidelines for Measuring Blood Pressure At Rest and Before Exercise

Background:

Measuring your blood pressure at home will help to show your doctor how well your medication is working and is a good way for you to manage your own health.

After reviewing this document you will know;

1. What type of blood pressure monitor to purchase and where to purchase it
2. How to measure your blood pressure at home and what the numbers mean
3. Know if you need to monitor you blood pressure before aerobic exercise and what a safe blood pressure should be to ensure safe exercise

Blood pressure can be affected by many factors some of which include:

- Time of day
- Medications
- Stress and emotions
- Activity
- Sleep
- Hydrations status

Therefore, you should measure your blood pressure under the same conditions every time.

What do the Numbers Mean?

Your monitor will display a number such as 120/80. The top number “120” represents your systolic blood pressure which is the highest pressure in your artery (blood vessel) when you heart is pumping blood to your body. The bottom number “80” represents your diastolic blood pressure which is the lowest pressure in your artery when your heart is at rest.

What should my Blood Pressure be?

In general, if you do not have diabetes, or any kidney problems, your blood pressure should be as close to 120/80 mmHg as possible. It is acceptable for systolic blood pressure to range between 110 mmHg to 130 mmHg. Show your healthcare worker your readings, especially if they are higher than 140/90 mmHg. Keep in mind that one single high reading doesn't mean you have high blood pressure. If you have very low readings with symptoms of dizziness – speak to your doctor.

It is important if you are going to be monitoring your blood pressure at home that you have a conversation with your doctor or other member of your medical team who is familiar with your medical history to find out what your blood pressure should be*

How to Measure your Blood Pressure at Home

Once you have purchased your blood pressure monitor if possible, bring it with you to your next rehab session or to your family doctor and someone will show you how to use it correctly.

1. If your doctor or therapist has told you that there is a difference in the blood pressure measure between arms, then measure on the arm that resulted in the highest measurement.
2. Measure on the same arm each time.
3. Before measuring your blood pressure, have at least 5 minutes rest, and at least 30 minutes without smoking or caffeine intake
4. You should be seated, your back supported, and your arm resting on the table at heart level.
5. Place the cuff on your arm as per the instructions from the manufacturer of your BP monitor
6. You should be relaxed, not moving or talking, legs uncrossed.
7. Measure your blood pressure twice at each sitting with at least 2 minutes between measures. The second measure is usually the most accurate.

A video on how to properly measure blood pressure can be found at:

<https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/multimedia/how-to-measure-blood-pressure/vid-20084749>

How often Should I Measure my Blood Pressure?



- If you are measuring your blood pressure to monitor new treatment, ask your doctor or therapist how often and when you should measure your blood pressure.
- If your blood pressure is controlled and you are monitoring it long term – 1 to 2 times per week is reasonable.
- Do not measure your blood pressure too much or it may cause anxiety and will in turn result in higher blood pressure readings

Remember to record your results on a tracking sheet like the one we have provided below

Purchasing a Blood Pressure Monitor

When choosing your blood pressure monitor it is important to choose one that has been tested to determine if it is accurate.

Hypertension Canada publishes a list of recommended BP devices on their website with rankings.

 <p>Recommended by Recommandé par Hypertension Canada Gold Or</p>	<p>Those with a <u>Gold rating</u> meet the highest and most current international standards</p>
 <p>Recommended by Recommandé par Hypertension Canada Silver Argent</p>	<p>Those with a <u>Silver rating</u> meet the highest international standards available prior to their most recent updates</p>
<p>*Both gold and silver ranked devices are considered accurate by Hypertension Canada</p>	

We have provided a list of 5 devices and options for purchase below. For the full list of recommended devices visit <https://hypertension.ca/bpdevices>

What Type of Device Should I Buy?

These are common types of monitors we recommend for home use:

<p>Digital Automatic Monitors</p>	<p>We recommend digital automatic monitors for home use. They are widely available and well suited for the majority of people.</p>
<p>Digital Semi-Automatic Monitors</p>	<p>Some semi-automatic monitors are available but require you to inflate the cuff by squeezing a bulb, which may be difficult for people with weak hand grip.</p>

Tips for Buying the Right Monitor for You!

- Ask a pharmacist to help you determine the appropriate cuff size; it should cover about 80% of your upper arm (elbow to your shoulder)
- Avoid finger and wrist monitors as they may not be as accurate as arm monitors
- Some monitors allow you to store your blood pressure readings to play back to your doctor
- If you have been told that you have a heart arrhythmia (such as atrial fibrillation, or a lot of irregular heart beats) the blood pressure monitor may not be accurate. If you have intermittent irregular heart beats, ask for a monitor with special software that detects these heart rhythms so that you will know when you are getting accurate readings.

Product Name	Price	Validated (Accurate)	Cuff Size	Bluetooth & Phone App	Irregular Heartbeat Monitor	BP History Stored for # of Users	Power Supply
Omron BP-745 	\$84.99 (Costco) \$219.99 (Best Buy) \$199.99 (Wal-Mart)		22.86 - 43.18 cm	Yes	Yes	2	Battery & Plug in
LifeSource Ultraconnect 	\$129.99 (Life Source) \$139.99 (Best Buy)		22.0 - 42.0 cm	Yes	Yes	5	Battery (Rechargeable)
Rexall Premium Plus Automatic Blood Pressure Monitor	\$99.00 (Rexall) *In Store Only*		22.0 - 42.0 cm	No	No	2	Battery

								
<p>BIOS Diagnostic Precision Series 10.0</p> 	<p>\$89.99 (Costco)</p> <p>\$129.99 (BIOS Medical)</p>		<p>22 - 42 cm</p>	<p>No</p>	<p>Yes (AFIB)</p>	<p>2</p>	<p>Battery & Plug in</p>	
<p>Omron Bronze Upper Arm</p> 	<p>\$65.37 (Amazon)</p>		<p>22 - 42 cm</p>	<p>No</p>	<p>Yes</p>	<p>1</p>	<p>Battery</p>	

All machines have built in memory to store blood pressure readings

Do I Need to Measure My Blood Pressure (BP) Before Aerobic Exercise?

If you have a resting BP that is borderline high or low or that is sometimes high or low, you may be asked to measure your BP immediately before your exercise session to determine if exercising is safe for you. The acceptable and safe BP will depend on your medical history. Consult with your health care professional regarding the need to measure your BP after exercise. ***Note:** If your resting BP is low, hydrate with water and repeat the BP measurement after 5-10 minutes. The sense of thirst can be lost after a stroke and dehydration can result in temporarily low BP. Consult with your health care professional before exercising that day.

When is it safe to Exercise based on my Resting Blood Pressure Reading and other Health Condition(s)?

The chart below should be used in consultation with your primary care physician or other health care professional.

Resting BP and Health Condition	When is it Safe to Start Exercise?	Comments
Resting Blood Pressure, upper limits	The Systolic BP (top number) should be 170 mmHg or lower and/or the Diastolic BP (lower number) should be 110 mmHg or lower	Depending on the circumstances, lighter exercise may be safe for people not satisfying this criterion. However, it is not safe to exercise if systolic BP is greater than 200 mmHg and/or a diastolic BP greater than 110 mmHg (see your doctor).
Resting Blood Pressure, lower limits	Do not exercise if Systolic BP is less than 90 mmHg and/or if Diastolic BP is less than 50 mmHg	The brain has less protection against sudden episodes of low BP than high BP following stroke. ¹⁻⁴ If BP is low and/or with dizziness, light-headedness, and fainting then <u>investigation</u> and possible medication adjustment is required before exercise initiation (see your doctor).
Resting Blood Pressure (Diabetes), lower limits	Do not exercise if Systolic BP is less than 100 mmHg and/or if Diastolic BP is less than 60 mmHg	The brain's ability to protect itself from low BP can be impaired in people with diabetes. ⁵⁻⁷
Resting Blood Pressure (Diabetes), upper limits	The Systolic BP should be 160 mmHg or lower and/or the Diastolic BP should be 100 mmHg or lower	Depending on the circumstances, lighter exercise may be safe for people not satisfying this criterion.
Resting Blood Pressure (retinopathy, aortic aneurysm, kidney disease, ventricular aneurysm)	As close to less than 120/80 mmHg as possible	Depending on the circumstances, lighter exercise may be safe for patients not satisfying this criterion (see your doctor or health care professional).

References

1. Schmidt B, Czosnyka M, Klingelhöfer J. Asymmetry of cerebral autoregulation does not correspond to asymmetry of cerebrovascular pressure reactivity. *Perspectives in Medicine*. 2012;1(1-12):285-289.
2. Schmidt B, Klingelhöfer J, Perkes I, Czosnyka M. Cerebral autoregulatory response depends on the direction of change in perfusion pressure. *J Neurotraum*. 2009;26(5):651-656.
3. Aaslid R, Blaha M, Sviri G, Douville CM, Newell DW. Asymmetric dynamic cerebral autoregulatory response to cyclic stimuli. *Stroke*. 2007;38(5):1465-1469.
4. Tzeng Y-C, Willie CK, Atkinson G, Lucas SJ, Wong A, Ainslie PN. Cerebrovascular regulation during transient hypotension and hypertension in humans. *Hypertension*. 2010;56(2):268-273.
5. Mankovsky B, Piolot R, Mankovsky O, Ziegler D. Impairment of cerebral autoregulation in diabetic patients with cardiovascular autonomic neuropathy and orthostatic hypotension. *Diabetic Med* 2003;20(2):119-126.
6. Kim Y-S, Immink RV, Stok WJ, Karemaker JM, Secher NH, Van Lieshout JJ. Dynamic cerebral autoregulatory capacity is affected early in Type 2 diabetes. *Clin Sci (Colch)*. 2008;115(8):255-262.
7. Kim Y-S, Davis SC, Truijen J, Stok WJ, Secher NH, Van Lieshout JJ. Intensive blood pressure control affects cerebral blood flow in type 2 diabetes mellitus patients. *Hypertension*. 2011;57(4):738-745.