



# At Home Blood Pressure Monitoring

Target audience:  
Staff Working in BC's Kidney Care Clinics

April 2021



# Learning Objectives

1. Understand At Home Blood Pressure (BP) Monitoring
2. Interpret a BP reading
3. Purchase a BP device
4. Select the correct cuff size
5. Identify BP devices for special needs
6. Education for patients
7. Classify frequency of BP measurements
8. Setting an Individualized BP Target for patients

# Blood Pressure



- Blood pressure measures how hard blood pushes against the arteries when moving through the body
- The force of the blood flow allows for nutrients and oxygen to be delivered to organs and tissues

# Home Blood Pressure Monitoring



- High BP is one of the major risk factors of kidney disease and the second leading cause of end-stage kidney disease (ESKD) in North America
  - In the United States, 26% of newly diagnosed ESKD patients had a primary diagnosis of hypertension
- Home BP monitoring predicts health outcomes better than office BP measurements
- Home BP monitoring helps with early recognition of changes

# Understand a Blood Pressure Reading

## Systolic Blood Pressure

The first or top number identifies how much pressure blood is exerting against the artery walls when the heart beats

## Diastolic Blood Pressure

The second or bottom number identifies how much pressure blood is exerting against your artery walls when the heart is at rest.



## Importance of at Home BP Monitoring

- An at home BP reading is more accurate than a reading taken at a doctor's office or clinic. Some people experience high blood pressure when seeing a health care provider (“white coat syndrome”)
- Routine monitoring is a more useful way to follow trends in blood pressure

## Benefits of at Home BP Monitoring

- Identifying changes in blood pressure over a period of time
- Tracking response to changes in treatment plan

# Blood Pressure Device (1 of 2)

- Devices can be purchased from most pharmacies and stores that sell health care equipment
- A device does not have to be expensive to be good
- Choose a device that says “Recommended by Hypertension Canada” both the gold and silver logos are accepted



# Blood Pressure Device (2 of 2)

- Choose a device that measures blood pressure in the upper arm
- If a person has special needs or needs financial assistance, discuss options available
- Sharing of a blood pressure machine with other members of a household is okay
  - Cuffs can be shared but should be cleaned with a disinfectant wipe between uses
  - It is important that each individual tracks their own blood pressure



# Selecting Cuff Size (1 of 2)

Using a blood pressure cuff that is too small can create inaccurate results and can elevate a blood pressure reading by 2-10 mmHg

## Measure the patient's arm circumference

- Multiply by 40% to get the right width of the bladder cuff
- Multiply by 80% to get the right length of the bladder cuff

For larger arms that are wider near the shoulder than the elbow, consider a cone-shaped. Standard cylindrical cuffs can produce inaccurate measurements.



The **ideal bladder cuff length** is  $\geq 80$  percent of the patient's arm circumference.  
The **ideal cuff bladder width** is  $\geq 40$  percent of the patient's arm circumference.



**Cone shaped cuff** for larger arms that are wider around the shoulder than the elbow

# Selecting Cuff Size (2 of 2)

Arm Circumference		Recommended Cuff Size (width x length in cm)
cm	in	
22 - 26	8.7 - 10.2	12 x 22 ( <b>small adult</b> )*
27 - 34	10.6 - 13.4	16 x 30 ( <b>adult</b> )*
35 - 44	13.8 - 17.3	16 x 36 ( <b>large adult</b> )*
45 - 52	17.7 - 20.5	16 x 42 ( <b>extra-large adult</b> )

Table 1.2

# Devices for Special Needs

## Visual impairments

- Suggest a device with easily identifiable buttons and a large/bright visual display.

## Hearing impairments

- Suggest a device with the ability to speak the results.

## Limited hand strength/dexterity:

- Suggest a device with a pre-formed cuff for easy placement on the upper arm.

## Irregular heart rhythms

- Automated BP monitors may not work properly with irregular heart rhythms.
- Use a demo model to ensure an accurate reading.
- If unable to find a suitable device, discuss options with the nephrologist/nurse practitioner.

# Patient Education

**Review “Taking Your Blood Pressure at Home”**  
[www.bcrenal.ca](http://www.bcrenal.ca) → Health Info → Chronic Kidney Disease → Resources for Kidney Patients



**Provide teaching on how to take a sitting BP**

# Patient Education (1 of 3)

## Instruct patient on which arm to use for measuring their BP at home.

- Adults with no vascular access planned or in place. Check BP on both arms. Use non-dominant arm unless difference between arms is  $>10$  mm Hg. If  $>10$  mm Hg, use arm with higher BP.
- Adults with vascular access in place: Use arm without the access.
- Children: Use right arm.
- Demonstrate how to take a sitting BP. Use the teach-back-method and ask the client to demonstrate how to take their BP

# Patient Education (2 of 3)

**If the nephrologist requests a standing BP, demonstrate and provide additional instructions:**

After measuring the sitting BP → Measure BP after standing 1 and 3 minutes and record both values

**Contact the kidney care team if:**

- Drop in systolic BP of >20 mmHg
- Drop in diastolic BP of >10 mmHg
- Lightheaded or dizziness with standing



# Taking a Blood Pressure Reading (3 of 3)



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## When Planning to Take A Blood Pressure Reading:

- Wait at least one hour after drinking coffee, smoking and exercise, as these can increase BP.

## Rest quietly for 5 minutes before starting

- Some people do relaxation exercises beforehand

## Take two blood pressure readings that are one minute apart

- ✓ Sitting position
- ✓ Back supported

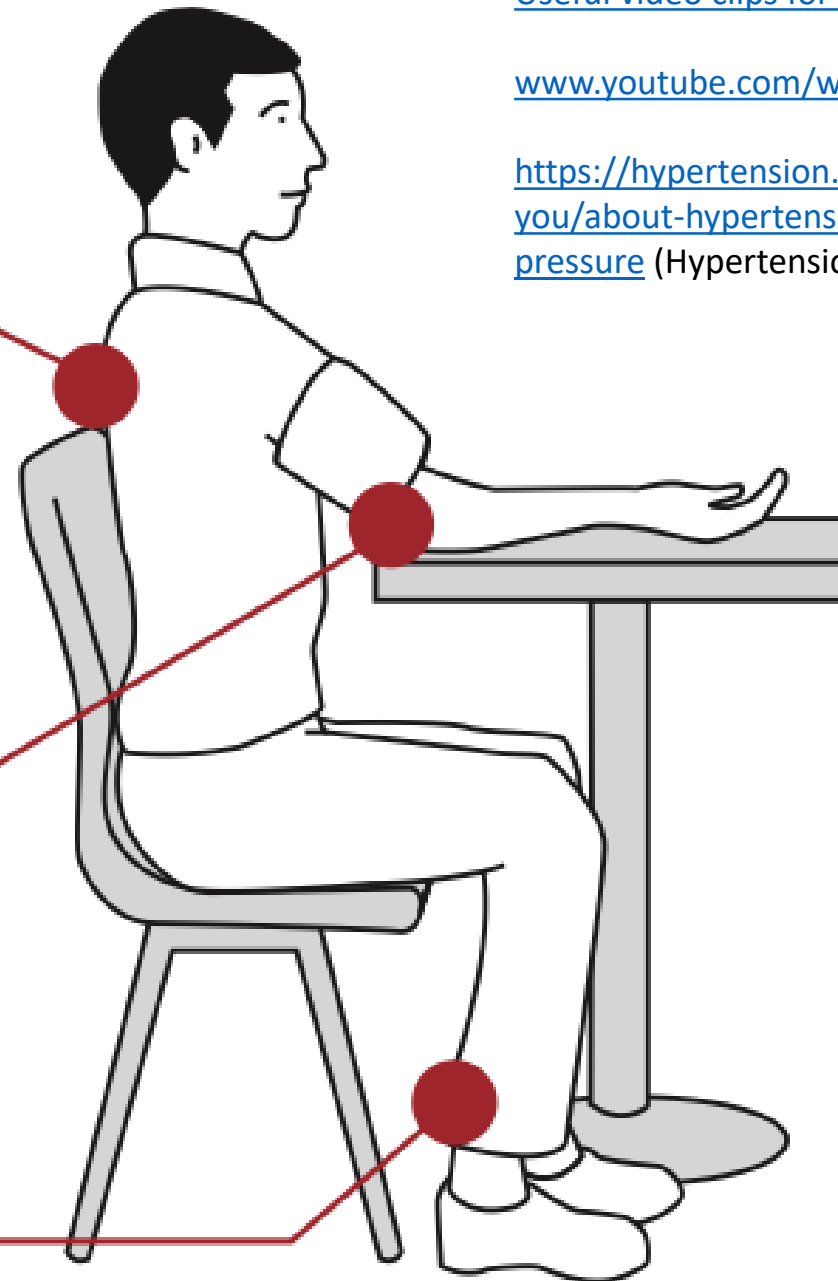
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- ✓ Arm bare and supported
- ✓ Use a cuff size appropriate for your arm
- ✓ Middle of the cuff at heart level
- ✓ Lower edge of cuff 3 cm above elbow crease

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- ✓ Do not talk or move before or during the measurement
- ✓ Legs uncrossed
- ✓ Feet flat on the floor

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[Useful video clips for patients](#)

[www.youtube.com/watch?v=0tGyRJxbYpQ](http://www.youtube.com/watch?v=0tGyRJxbYpQ) (4.5 min)

<https://hypertension.ca/hypertension-and-you/about-hypertension/what-is-high-blood-pressure> (Hypertension Canada, 10 min)



# Recording BP Readings



## Manual Tracking:

- Track using a printed calendar or BP log to all medical appointments



## Automatic Tracking:

- Many BP devices store a week's worth of reading but, if the battery dies, results will be lost
- Patients can manually record results on a printed calendar or BP log OR download to an app
- If electronic version, ask for an e-mail of the file
- Review what to do in the event of illness

**Blood pressure devices require checking before first use, at least once per year, and if it is dropped or damaged**



# Assessing a BP Device (1 of 3)

- Have the client sit down with arm at heart level
- Take three blood pressure measurements less than 30 seconds apart.
  
- **Reading 1:** Client takes BP on own device. Check the technique and cuff size. Do not record this reading
- **Reading 2:** Client takes BP on own device. Record reading
- **Reading 3:** Take a BP reading with clinics device. Record reading.
  - The comparison is satisfactory if the difference between readings two and three is less than 5 mm Hg

# Assessing a BP Device (2 of 3)

If the difference is 5 mm Hg or more, take 2 more readings on the same arm

**Reading 4:** Client takes BP on own device

**Reading 5:** Take the patients BP with clinic device



**Acceptable:** 5 – 10 mm Hg (note the difference)



**Not Acceptable:** More than 10 mm Hg. Suggest patient take device for servicing or purchase a new one.

# Assessing a BP Device (3 of 3)

**Table 1: Sample BP Readings and Suggested Actions**

Patient	Reading	Home Device	Clinic Device	Conclusion	Action
Mr B	1	145/90			Discard reading
	2	140/85			
	3		140/90	Acceptable	
Mrs J	1	135/80			Discard reading
	2	140/85			
	3		135/80	Not acceptable	
	4	135/75			
	5		125/80	Acceptable but note the difference in the patient record	
Ms Z	1	125/80			Discard reading
	2	130/85			
	3		150/90	Not acceptable	
	4	125/80			
	5		145/90	Not acceptable	Suggest patient take BP device for servicing (warranty may apply) or purchase a new one

Table 1.2

# Frequency of Measurements

Monitoring	Frequency	Situation	Instructions to Patient	KCC Instructions
<p><b>More frequent</b></p> <p>(may be requested by any member of the KCC team)</p>	<p>Morning &amp; evening, every day</p> <p>2 readings per session, one minute apart</p> <p>Continue for 7 days (total of 28 measurements)</p>	<ul style="list-style-type: none"> <li>• When starting home BP monitoring</li> <li>• Before each KCC appt</li> <li>• After changes in treatment</li> <li>• After hospitalization, illness or other change in clinical status</li> </ul>	<p>If consistently out-of-target range, contact the KCC at end of seven days</p>	<p>Average the results, excluding the readings from the first day</p> <p>Assess usual BP range &amp; note whether BP readings differ by time of day</p> <p>If continuously out-of-range refer to next slide</p>
<p><b>Standard</b></p>	<p>Twice a week, same time of day unless otherwise directed</p> <p>2 readings per session, one minute apart</p>	<p>All other times</p>	<p>If consistently out-of-target range, contact the KCC</p>	<p>Average the 2 readings taken per session</p> <p>Assess usual BP range</p> <p>If continuously out-of-range refer to next slide</p>

# Out-of-Range BP Readings

Situation	Urgency	Patient Instructions
BP is higher or lower than target AND patient is experiencing chest pain, SOB or sudden onset back pain, numbness/weakness, light headedness/dizziness, change in vision, difficulty speaking	Urgent	Contact nephrologist/NP for guidance; if not available, call 911
BP is above 180/110 (top of bottom number), even if patient is not experiencing symptoms	Urgent	Contact nephrologist/NP for guidance; if not available, call 911
BP is more than 10 mm Hg above or below target over several readings & days	Not Urgent	Do not wait for your next appt. Contact your KCC or primary care provider
BP is less than 10 mm Hg above or below target over several readings & days	Not Urgent	Bring this up at your next appt with your KCC or primary care providers

Table 1.4

# Setting and Individualized BP Target for Patients

**Discuss each patient's individual target for blood pressure with their Nephrologist or Nurse Practitioner.**

**blood pressure is out of range (low or high)?**

- Different people have different blood pressure targets depending on their health conditions and other factors. Your exact target should be discussed with your care team.

My blood pressure target is: \_\_\_\_\_

Table 1.4



# Reminders



- To take all medications as prescribed even if blood pressure decreases.
- A healthy diet is key to maintaining healthy blood pressure.
- Home BP monitoring is **NOT** a substitute for clinic visits.
- Dehydration can affect blood pressure.
  - Advise which medications should be temporarily discontinued if this occurs.

# References

BC Renal Kidney Care Clinic Committee. (2020, December 30). *BC Kidney Care Guideline: Supporting Home Blood Pressure Monitoring*. BC Renal, Provincial Health Authority. <http://www.bcrenal.ca>

Georgia Department of Health. (2019, July 10). *High Blood Pressure Control*. Georgia Coastal Health District. <https://www.gachd.org/programs-services/health-promotion-disease-prevention/high-blood-pressure-control>

Heart and Stroke Foundation of Canada. (n.d). *High blood pressure*. Heart and Stroke Foundation of Canada. <https://www.heartandstroke.ca/heart-disease/risk-and-prevention/condition-risk-factors/high-blood-pressure>

Hypertension Canada. (2016). *Home BP Measurement*. Hypertension Canada. <https://guidelines.hypertension.ca/patient-resources>

Pinterest. (n.d). *Flat Calendar Icon: Desain pamphlet, Desain flat, Desain web*. Pinterest. [https://www.pinterest.ie/pin/322570392054365656/?amp\\_client\\_id=CLIENT\\_ID%28%29&mweb\\_unauth\\_id=%7B%7D](https://www.pinterest.ie/pin/322570392054365656/?amp_client_id=CLIENT_ID%28%29&mweb_unauth_id=%7B%7D)

Shutter Shock. (n.d). *email icon gray images*. Shutterstock. <https://www.shutterstock.com/search/email+icon+gray>

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