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

(BC Renal Kidney Care Clinic Committee, 2020; Georgia Department of Health, 2019)
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

(BC Renal Kidney Care Clinic Committee, 2020; Georgia Department of Health, 2019)
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.

(BC Renal Kidney Care Clinic Committee, 2020; Georgia Department of Health, 2019)
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

(BC Renal Kidney Care Clinic Committee, 2020)
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

(BC Renal Kidney Care Clinic Committee, 2020)
• 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 ≥ 80 percent of the patient's arm circumference.
The ideal cuff bladder width is ≥ 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)

<table>
<thead>
<tr>
<th>Arm Circumference</th>
<th>Recommended Cuff Size (width x length in cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>cm</td>
<td>in</td>
</tr>
<tr>
<td>22 - 26</td>
<td>8.7 - 10.2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>45 - 52</td>
<td>17.7 - 20.5</td>
</tr>
</tbody>
</table>

Table 1.2

(BC Renal Kidney Care Clinic Committee, 2020)
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.

(BC Renal Kidney Care Clinic Committee, 2020)
Patient Education

Review “Taking Your Blood Pressure at Home”
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

(BC Renal Kidney Care Clinic Committee, 2020)
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

(BC Renal Kidney Care Clinic Committee, 2020; Georgia Department of Health, 2019)
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

(BC Renal Kidney Care Clinic Committee, 2020)
Useful video clips for patients

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)

(Hypertension Canada, 2020)
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

(BC Renal Kidney Care Clinic Committee, 2020; Pinterest, n.d; Shutter Shock, n.d)
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

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

(BC Renal Kidney Care Clinic Committee, 2020)
## Frequency of Measurements

<table>
<thead>
<tr>
<th>Monitoring</th>
<th>Frequency</th>
<th>Situation</th>
<th>Instructions to Patient</th>
<th>KCC Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>More frequent</td>
<td>Morning &amp; evening, every day</td>
<td>• When starting home BP monitoring • Before each KCC appt • After changes in treatment • After hospitalization, illness or other change in clinical status</td>
<td>If consistently out-of-target range, contact the KCC at end of seven days</td>
<td>Average the results, excluding the readings from the first day</td>
</tr>
<tr>
<td></td>
<td>2 readings per session, one minute apart</td>
<td></td>
<td></td>
<td>Assess usual BP range &amp; note whether BP readings differ by time of day</td>
</tr>
<tr>
<td></td>
<td>Continue for 7 days (total of 28 measurements)</td>
<td></td>
<td></td>
<td>If continuously out-of-range refer to next slide</td>
</tr>
<tr>
<td>Standard</td>
<td>Twice a week, same time of day unless otherwise directed</td>
<td>All other times</td>
<td>If consistently out-of-target range, contact the KCC</td>
<td>Average the 2 readings taken per session</td>
</tr>
<tr>
<td></td>
<td>2 readings per session, one minute apart</td>
<td></td>
<td></td>
<td>Assess usual BP range</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>If continuously out-of-range refer to next slide</td>
</tr>
</tbody>
</table>
# Out-of-Range BP Readings

<table>
<thead>
<tr>
<th>Situation</th>
<th>Urgency</th>
<th>Patient Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>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</td>
<td>Urgent</td>
<td>Contact nephrologist/NP for guidance; if not available, call 911</td>
</tr>
<tr>
<td>BP is above 180/110 (top of bottom number), even if patient is not experiencing symptoms</td>
<td>Urgent</td>
<td>Contact nephrologist/NP for guidance; if not available, call 911</td>
</tr>
<tr>
<td>BP is more than 10 mm Hg above or below target over several readings &amp; days</td>
<td>Not Urgent</td>
<td>Do not wait for your next appt. Contact your KCC or primary care provider</td>
</tr>
<tr>
<td>BP is less than 10 mm Hg above or below target over several readings &amp; days</td>
<td>Not Urgent</td>
<td>Bring this up at your next appt with your KCC or primary care providers</td>
</tr>
</tbody>
</table>

Table 1.4

(BC Renal Kidney Care Clinic Committee, 2020)
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

(BC Renal Kidney Care Clinic Committee, 2020)
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


Acknowledgements

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