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Welcome to our blood pressure competency training!

Our goal is to strengthen your techniques for blood pressure measurement and to review the blood pressure thresholds and treatment options. This workbook includes helpful reference materials regarding blood pressure competency.

MPRO

MPRO is an independent nonprofit organization committed to improving the quality of health care across Michigan.

MPRO provides consultative services and medical review in Michigan and 10 other states including Informal Dispute Resolution, Independent Informal Dispute Resolution, Medicaid Fee-for-service utilization review and independent external reviews of claim denials. MPRO’s utilization review services consist of retrospective audits of claims for medical necessity of services and validation of codes billed. Additionally, MPRO provides prior authorization that is individualized to meet the needs of the insurer.

MPRO also offers a variety of health information technology (HIT) services, including assistance with meaningful use, patient engagement, Physician Quality Reporting System (PQRS), value-based modifier, health information exchanges, electronic health record (EHR) selection and adoption and security risk assessments.

MPRO serves in collaboration with Stratis Health of Minnesota and MetaStar of Wisconsin as Lake Superior Quality Innovation Network (QIN) for the Centers for Medicare & Medicaid Services (CMS). Under this contract MPRO works to improve health care for Medicare beneficiaries in Michigan by working with a broad range of providers, communities and partners.
Background

Accurate Blood Pressure (BP)
What Impacts a Patient’s Blood Pressure
Strategies for Proper BP Measurement
Testing Competency
Accurate Blood Pressure (BP)

- Inaccurate BP has the potential for great harm.
- A missed elevated BP or misclassified BP can cause delayed or denied treatment.
- A misclassified BP where the patient’s true BP is actually lower, can cause unnecessary treatment for hypertension (HTN).

What Impacts a Patient’s Blood Pressure

Patient factors (we can’t always control)

- “White Coat Syndrome”
- Nervousness, stress, anger, illness, pain, long waiting time
- Demographics: age, sex, race and ethnicity
- Lifestyle: diet, exercise, substance use (smoking, alcohol use, etc.)

Measurement factors (we can control)

- Air in the BP cuff before measuring
- Correct BP cuff size
  - Too large -&gt; underestimates BP
  - Too small -&gt; overestimates BP
- Unevenly wrapped cuff
- Deflating cuff too quickly
- Not inflating the cuff high enough
- Auscultatory gap (when pulse disappears then reappears while deflating the cuff)
- Looking at the gauge at an angle

Strategies for Proper BP Measurement

- Well developed policies and procedures, organization wide, that addresses accurate blood pressure monitoring.
- Train and evaluate direct care staff on accurate BP measurement and recording.

Testing Competency

- Continually monitor for competency and support your staff.
- Annual reassessment – Staff competency must be reassessed at least annually in order to maintain accurate BP measurement.
- External auditors can/should make friendly surprise visits and act as guest subjects.
Equipment

Sphygmomanometer
Blood Pressure Cuff
Stethoscope
Blood Pressure Monitor Calibration
Sphygmomanometer

- Defective sphygmomanometer leads to inaccuracy.
- Most organizations have changed from Mercury to aneroid or digital.
- Regardless of the type used, all must be calibrated according to the manufacturers recommendations.

Blood Pressure Cuff

- Standardization in selection process of cuff for BP measure – measuring tape.
- Standardization in purchase of cuff types.

Stethoscope

- BP measurement relies on accurate transmission of Korotkoff sounds and that can vary from stethoscope to stethoscope.
- Use of various stethoscope amongst staff can account for poor acoustical performance and effect the accuracy of BP measurement.
- Use of either bell or diaphragm?

Notes:

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Proper Technique

Steps to Take Blood Pressure
Acceptable Bladder Dimension
Tips From the AMA
Steps to Take Blood Pressure

Step 1: Choose the Right Equipment

What you will need:

- A quality stethoscope.
- An appropriately sized blood pressure cuff.
- A blood pressure measurement instrument such as an aneroid or mercury column sphygmomanometer or an automated device with a manual inflate mode.

Step 2: Ensure Use of the Proper BP Cuff Size

- Most measurement errors occur by not taking the time to choose the proper cuff size.
- Wrap the cuff around the patient's arm and use the INDEX line to determine if the patient's arm circumference falls within the RANGE area.
- Otherwise, choose the appropriate smaller or larger cuff.

Step 3: Prepare the Patient

- Allow the patient 5 minutes to relax before the first reading.

Step 4: Place the BP Cuff on the Patient's Arm

- Palpate/locate the brachial artery and position the BP cuff so that the ARTERY marker points to the brachial artery.
- Wrap the BP cuff snugly around the arm.

Step 5: Position the Stethoscope

On the same arm that you placed the BP cuff, palpate the antecubital fossa (crease of the arm) to locate the strongest pulse and place the bell of the diaphragm over the brachial artery at this location.

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Step 6: Determine Maximum Inflation Level

- Option 1: Inflate cuff as you listen to the brachial pulse.
  1. As the BP cuff inflates enough to block blood flow, you should stop hearing pulse sounds through the stethoscope.
  2. The gauge should read 20-30mmHg above the individual’s normal BP reading.

- Option 2: Inflate cuff as you palpate the radial pulse.
  1. As the BP cuff inflates enough to block blood flow, you should stop feeling pulse.
  2. Then go 20-30mmHg above that number when you inflate the cuff again for the reading.

Step 7: Slowly Deflate the BP Cuff

- Begin deflation.
- The AHA recommends that pressure should fall at 2-3 mmHg per second, anything faster may likely result in an inaccurate measurement.

Step 8 – Listen for the Systolic Reading

- The first occurrence of pulse sounds heard as blood begins to flow through the artery is the patient's systolic pressure.
- This may resemble a tapping noise at first.

Step 9: Listen for the Diastolic Reading

- Continue to listen as the BP cuff pressure drops and the sounds fade.
- Note the gauge reading when the rhythmic sounds stop.
- This will be the diastolic reading.

Step 10: Double Check for Accuracy

- The AHA recommends taking a reading with both arms and averaging the readings.
- To check the pressure again for accuracy, wait about five minutes between readings.
- Typically, blood pressure is higher in the mornings and lower in the evenings.
- If the blood pressure reading is a concern or masked or white coat hypertension is suspected, a 24 hour blood pressure study may be required to assess the patient's overall blood pressure profile.
## Acceptable Bladder Dimension for Arms of Different Sizes

<table>
<thead>
<tr>
<th>Cuff</th>
<th>Bladder Width (cm)</th>
<th>Bladder Length (cm)</th>
<th>Arm Circumference Range at Midpoint (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>3</td>
<td>6</td>
<td>&lt;6</td>
</tr>
<tr>
<td>Infant</td>
<td>5</td>
<td>15</td>
<td>6-15</td>
</tr>
<tr>
<td>Child</td>
<td>8</td>
<td>21</td>
<td>16-21</td>
</tr>
<tr>
<td>Small Adult</td>
<td>10</td>
<td>24</td>
<td>22-26</td>
</tr>
<tr>
<td>Adult</td>
<td>13</td>
<td>30</td>
<td>27-34</td>
</tr>
<tr>
<td>Large Adult</td>
<td>16</td>
<td>38</td>
<td>35-44</td>
</tr>
<tr>
<td>Adult Thigh</td>
<td>20</td>
<td>42</td>
<td>45-52</td>
</tr>
</tbody>
</table>

## Tips From the AMA

7 Simple Tips to Get an Accurate Blood Pressure Reading

- **Put Cuff on Bare Arm**
  - Cuff over clothing adds 10-15 mm Hg

- **Don’t Have a Conversation**
  - Talking adds 10-15 mm Hg

- **Empty Bladder First**
  - Full bladder adds 10-15 mm Hg

- **Support Arm at Heart Level**
  - Unsupported arm adds 10 mm Hg

- **Support Back Uncrossed**
  - Unsupported back adds 5-10 mm Hg

- **Keep Legs Uncrossed**
  - Crossed legs add 2-4 mm Hg

- **Support Feet**
  - Unsupported feet add 5-10 mm Hg

Diagnosis/Treatment

Blood Pressure Level Thresholds/Diagnosis
Target Blood Pressure
Lifestyle Changes
Utilizing EHR
Referral to Hypertension Specialist
Teaching Self-Monitoring Strategies
Blood Pressure Level Thresholds/Diagnosis

Blood Pressure Level Thresholds

<table>
<thead>
<tr>
<th>Normal</th>
<th>Systolic &lt; 120 mmHg</th>
<th>Diastolic &lt; 80 mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated</td>
<td>Systolic 120 – 129 mmHg</td>
<td>Diastolic &lt;80 mmHg</td>
</tr>
<tr>
<td>Stage I Hypertension</td>
<td>Systolic 130 – 139 mmHg</td>
<td>Diastolic 80 – 89 mmHg</td>
</tr>
<tr>
<td>Stage II Hypertension</td>
<td>Systolic &gt; 140 mmHg</td>
<td>Diastolic &gt; 90 mmHg</td>
</tr>
</tbody>
</table>

Diagnosis

- Examine patient medical history looking for multiple previous elevated measures.
- Confirm diagnosis of hypertension at a second visit 1-4 weeks after the first visit.
- If BP is extremely high (systolic > 180 mmHg) or the patient is unlikely to attend follow-up visits, treatment can be started after only one set of measurements.

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Lifestyle Changes

Diet high in:
- Fruits, vegetables, and other fiber
- Protein
- Minerals

Diet low in:
- Sodium
- Total and saturated fat
- Cholesterol

Physical activity (adults 18-64 years)
- 2 hours and 30 mins/week of moderate aerobic activity
- OR 1 hour and 15 mins/week of vigorous aerobic activity

Substance use
- Smoking cessation
- Limiting alcohol consumption

Power of Lifestyle Changes

<table>
<thead>
<tr>
<th>Lifestyle Modifications¹ (LM)</th>
<th>Recommendation</th>
<th>Approximate SBP** Reduction (Range)***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight reduction</td>
<td>Maintain normal body weight (body mass index 18.5–24.9 kg/m²)</td>
<td>5–20 mm Hg/10 kg</td>
</tr>
<tr>
<td>Adopt DASH†† eating plan</td>
<td>Consume a diet rich in fruits, vegetables, and lowfat dairy products with a reduced content of saturated and total fat</td>
<td>8–14 mm Hg</td>
</tr>
<tr>
<td>Dietary sodium reduction</td>
<td>Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride)</td>
<td>2–8 mm Hg</td>
</tr>
<tr>
<td>Physical activity</td>
<td>Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week which may be broken into shorter time intervals such as 10 minutes each of moderate or vigorous effort)</td>
<td>4–9 mm Hg</td>
</tr>
<tr>
<td>Moderation of alcohol consumption</td>
<td>Limit consumption to no more than 2 drinks (e.g. 24 oz. beer, 10 oz. wine, or 3 oz. 80-proof whiskey) per day in most men, and to no more than 1 drink per day in women and lighter weight persons</td>
<td>2–4 mm Hg</td>
</tr>
</tbody>
</table>

"SBP – systolic blood pressure
†† The effects of implementing these modifications are dose and time dependent, and could be greater for some individuals
†††DASH – Dietary Approaches to Stop Hypertension

Utilizing EHR

- Hypertension clinical decision support (CDS) alerts.
  - Based on patient BP being entered into the system, alerts will be generated to the provider to implement hypertension protocol.
- Set up monthly recall reports.
  - Follow up with patients diagnosed with hypertension without a visit in past 3-6 months.
- Send messaging to patients.
  - Self-monitoring, answer questions, schedule follow up visits.
- Track NQF-0018 (Controlling High Blood Pressure) in Measures Portal monthly.

Referral to Hypertension Specialist

- If after a period of visits, the patient is not meeting target blood pressure, have EHR alert provider to refer the patient to a specialist.

Teaching Self-Monitoring

- Engage patients in taking their own blood pressure daily using self monitoring devices.
- Have patient record blood pressure levels; encourage them to write levels down or record them in EHR patient portal.

Strategies

Making Hypertension Control a Practice Priority

- Designate a HTN champion in the practice.
- Train and evaluate direct care staff on accurate BP measurement.
- BP checks without appointments/copays.
- Develop flow chart for how hypertension patients will be tracked and managed.
- Establish a program to support home BP monitoring.
- Identify and promote medication adherence.
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