Competency Training: For Correct Blood Pressure Measurement

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Objectives

- Review techniques required for accurate measurement
- Strengthen techniques in staff
- Discuss how best to accomplish staff training.
Accurate Blood Pressure

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt; 120</td>
<td>and &lt; 80</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120-139</td>
<td>or 80-89</td>
</tr>
<tr>
<td><strong>High Blood Pressure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 1 Hypertension</td>
<td>140–159</td>
<td>or 90–99</td>
</tr>
<tr>
<td>Stage 2 Hypertension</td>
<td></td>
<td>or</td>
</tr>
</tbody>
</table>
Strategies to educate staff on proper BP measurement

Well developed policies and procedures, organization wide, that addresses accurate blood pressure monitoring.
Weakness in Blood Pressure Technique

- Errors in measures can occur due to a variety of factors.
- Each of these factors are relational, interdependent and will ultimately affect the performance of the technique and the actual measurement.
- Most of the factors can be addressed as part of the training process.
Weakness in Blood Pressure Technique Cont’d

- Most fallible factor is the Observer.
- Observer accuracy is taken for granted.
- Assumption that all staff have the same level of knowledge and skill sets regarding BP measurement
- This creates the lack of continuity from observer to observer regarding BP measurement practice.
Solution

Only the development of protocols and competencies, diligent training and organizational adherence to policies will address this issue and standardize practice.
Sphygmomanometer

- Defective sphygmomanometer, leads to inaccuracy.
- Most organizations have changed from Mercury to aneroid or digital Sphygmomanometers.
- Regardless of the type used; all must be calibrated according to the manufacturers recommendations.
Review techniques to properly measure Blood Pressure

- Trained observer-The goal for BP measurement autonomy!
- Only an observer who is aware of the factors that lead to false readings should measure blood pressure.
BP Cuff

- Standardization in selection process of cuff for BP measure – measuring tape
- Standardization in purchase of cuff types
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>
BP measurement relies on accurate transmission of Korotkoff sounds and that can vary from stethoscope to stethoscope. The 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?
Limb Selection

- Organizational standard to have initial visit dual BP readings.
- Right/left arm preference.
- Placement of stethoscope
- Height of arm
- Placement of cuff
**Patient Position**

- Standardize the position for BP measurement.
- If a pt. is not in a chair, their BP should not be done!
- Waiting time before blood pressure measurement; practice standard?
Patient Preparation

- Cold exposure -11/8 mmHg
- Full bladder/bowel ↑ 27/22 mmHg
- Physical activity ↓ 5-11/4-8 mmHg
- Smoking - ↑ 10/8 mmHg
- Stimulants - ↑ 8-10/7-8 mmHg (alcohol, smoking, caffeine)
- Talking - ↑ 17/13 mmHg
Observer

- Prejudice
- Digit preference
- Observer haste
- Interruption; causing approximation
- Which Korotkoff sound?
**Example**

<table>
<thead>
<tr>
<th>Pre-determined BP values</th>
<th>Staff BP values</th>
</tr>
</thead>
<tbody>
<tr>
<td>100/70</td>
<td>98/70</td>
</tr>
<tr>
<td>112/72</td>
<td>110/70</td>
</tr>
<tr>
<td>124/84</td>
<td>120/88</td>
</tr>
<tr>
<td>136/86</td>
<td>130/88</td>
</tr>
<tr>
<td>98/58</td>
<td>98/60</td>
</tr>
</tbody>
</table>
Performing Staff Training and Competency

Not just teaching and training, but developing and educating.

- Theory instruction
- Tutorial session
- Return demonstrations with live subjects
Testing Competency

- The competency checklist
- The competency should reinforce the technical skill.
- Incorporate theoretical knowledge.
Strengthen Techniques

- 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.
Questions?
Suggestions?
References

- www.abdn.ac.uk/medical/bhs/index
References

Summary Report “National High Blood Pressure Education Program/National Heart, Lung, and Blood Institute and American Heart Association working meeting on Blood Pressure Measurement. NIH Bethesda Maryland April 19, 2002