CLINICAL QUESTION:
In emergency department patients, what non-invasive blood pressure (NIBP) measurement techniques provide acceptable measurements throughout the lifespan?

PROBLEM:
Blood pressure (BP) is a core vital sign used for patient diagnosis, management and treatment. Accurate blood pressure measurement is critical as inaccuracies may delay treatment of a serious condition and/or result in clinical decisions that under- or over-treat the patient’s medical condition. Invasive blood pressure measurement using arterial access is considered the “gold” standard to accurately and reliably determine the patient’s BP. The previous Clinical Practice Guideline (CPG): Non-Invasive Blood Pressure Measurement with Automated Devices (initially published in 2012), provided evidence for an acceptable correlation between auscultatory and automatic, or oscillometric, non-invasive blood pressure measurement. Therefore, this CPG will use upper arm non-invasive blood pressure as the standard reference by which other methods are evaluated. The primary focus of emergency departments is to provide initial patient management and stabilization. NIBP is a readily available method to ascertain BP, and therefore is the most common method of BP measurement in the emergency setting. Clinicians should be aware of the limitations and potential biases of various non-invasive BP measurement techniques in different patient populations and under different conditions to ensure the BP measurement technique used is appropriate and evidence-based. This CPG focuses on evidence-based practices regarding the use of noninvasive, oscillometric BP measurement for patients across the lifespan in the emergency care setting.
### Description of Decision Options/Interventions and the Level of Recommendation

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<thead>
<tr>
<th>Description of Decision Options/Interventions and the Level of Recommendation</th>
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<tr>
<td><strong>Interruption BP:</strong> Location of NIBP Measurement</td>
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<td>Use of the forearm for blood pressure measurement is acceptable when upper arm measurement is not possible. Forearm BP measurements will trend higher than upper arm measurements. (Keidan, et al., 2014; Leblanc et al., 2013; Schell et al., 2006; Schell et al., 2010; Taksande, et al., 2015; Watson, 2017)</td>
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<td>There is insufficient evidence to make a recommendation on the accuracy of lower extremity locations (thigh, calf, or ankle) for blood pressure measurement. (Keidan, et al., 2014; Lakhal, et al., 2012; Schell, et al., 2011)</td>
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<td><strong>Interruption NIBP:</strong> Cuff Size</td>
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<td><strong>Interruption NIBP:</strong> Effect of Clothing</td>
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<td><strong>Continuous NIBP (cNIBP)</strong></td>
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<td><strong>Obesity</strong></td>
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<td>Measuring BP of adults over 65 requires no special technique. (Anast et al., 2016; Guggiari et al., 2014; Irving et al., 2016; Lakhal et al., 2012; Liebl et al., 2004; Ma et al., 2008; Ozone et al., 2018; Pinar et al., 2010; Schell et al., 2010; Thien et al., 2015; Umana et al., 2006)</td>
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<td>Use of arm, ankle, or calf BP locations in children aged 1-15 years may not be as reliably accurate when compared to upper arm measurements and should be used only when upper arm is not available. (Keidan et al., 2014; Schell et al., 2011; Taksande et al., 2015)</td>
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<td>There is insufficient evidence to recommend for or against use of NIBP in the neonatal population. (O’Shea &amp; Dempsey, 2009)</td>
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**Access the full CPG at:** [https://www.ena.org/docs/default-source/resource-library/practice-resources/cpg/nibpmcpg.pdf](https://www.ena.org/docs/default-source/resource-library/practice-resources/cpg/nibpmcpg.pdf)

**ENA Clinical Practice Guidelines (CPGs)** are evidence-based documents that facilitate the application of current evidence into everyday emergency nursing practice. CPGs contain recommendations based on a systematic review and critical analysis of the literature about a clinical question. CPGs are created following the rigorous process described in ENA’s Requirements for the Development of Clinical Practice Guidelines. The purpose of CPGs is to positively impact patient care in emergency nursing by bridging the gap between practice and currently available evidence.