

## **Blood Pressure Cuff Selection: Does One Size Fit All?**

Maureen A. Walsh, Tyler A. Kuhn, Jessica A. McFadden, Taylor M. Weeter, Michael E. Holmstrup, Brock T. Jensen. Slippery Rock University, Slippery Rock, PA

Blood pressure (BP) is one of the most commonly measured vital signs. Historically, tremendous focus has been dedicated to increasing the reliability of BP measurement by standardizing protocols and reducing error to the smallest possible increment. Errors in BP measurement may result in misdiagnosis, cardiovascular complications during exercise, and improper prescription of antihypertensives. ‘Miscuffing’ is a common and significant source of error in BP measurement. The ‘80% rule’ (i.e. cuff  $\geq$ 80% of an individual’s arm circumference) is the gold standard method for BP cuff size selection as recommended by the American Heart Association. Interestingly, BP cuff manufacturers routinely print their own cuff size recommendation, based on an arm circumference range, on their products and this method often differs in the suggested cuff size from the ‘80% rule’. **PURPOSE:** The current study examined the occurrence of ‘miscuffing’ and the outcome of BP measurement using the ‘80% rule’ cuff selection method versus the manufacturer’s recommendations. **METHODS:** Forty-four individuals had their upper arm circumference measured, and appropriate cuff(s) selected using the two sizing methods. An automated oscillometric device was used to measure BP in duplicate with a 1-minute interval in between measurements, and 2-minute interval between cuffs if necessary. If different cuffs were selected, the order of measurement was randomized. A dependent t-test was used to ascertain potential BP measurement differences between sizing methods. **RESULTS:** ‘Miscuffing’ as the result of method discrepancies between the ‘80% rule’ and the manufacturer’s recommendation, occurred in over two-thirds (70%, n=31) of the sample. In these individuals, there was a significant difference in systolic BP between recommended cuffs (7.9 mmHg;  $p < 0.05$ ). Approximately 1 in 3 individuals, with two cuffs recommended (35%, n=11), had a smaller cuff suggested by the manufacturer, and were misclassified with a significantly elevated systolic BP (average increase 12.5 mmHg;  $p < 0.05$ ). **CONCLUSION:** BP cuff-selection methods are not universal and contribute to reliability concerns. ‘Miscuffing’ was a common observation when utilizing the manufacturer’s method for cuff selection and resulted in BP measurement error and misclassification.