

Auscultation and Oscillometry Result in Different Blood Pressure Readings When Using Visual Display on an iOS Operated Device

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ABSTRACT

The Withing's blood pressure (BP) monitor is supported by iOS software and it can be used on devices including the iPhone®, iPad®, or iPod®. The device and downloadable application permit users to record, track, graph, and export BP data with ease. Unlike many other devices using oscillometry, the pressure during the process of deflation is displayed on the screen of the iOS device being utilized in tandem with the Withing's monitor. Currently, there is a dearth of evidence regarding whether the pressure displayed on the iOS device is accurate when assessed by auscultation. **PURPOSE:** The purpose of the investigation was to use auscultation to verify, according to the visual display, the approximate systolic and diastolic BP and compare those values with the oscillometric readings. **METHODS:** Seventeen female and thirteen male subjects (20.4 ± 0.9 yrs.) volunteered for the study. After a resting phase, BP was taken simultaneously on the left arm with use of the Withing's monitor and by auscultation with the diaphragm placed immediately inferior to the cuff. Two experienced professionals auscultated the BP with use of a dual-headed stethoscope. The averaged readings were compared with the BP determined by the Withing's monitor. **RESULTS:** According to the Withing's monitor, the average oscillometric BP was 120.17/67.80 mmHg. Technicians, using the visually-displayed pressure, determined the auscultated BP to be 113.52/67.73 mmHg. The diastolic pressures were strongly correlated ($r > 0.825$, $p < 0.01$) and the mean difference was negligible (0.07 mmHg, $p = 0.955$). The systolic pressures, although strongly correlated ($r > 0.922$, $p < 0.01$), were significantly different (mean difference 6.65 mmHg, $p < 0.01$). **CONCLUSIONS:** There appears to be a discrepancy in the determination of BP when comparing systolic BP readings between oscillometry and auscultation. The visual display of pressure on the iOS device may not be accurate. While the technique may rarely be employed, use of auscultation with the visually-displayed pressure does not seem appropriate. These findings do not necessarily indicate a lack of validity with the Withing's device. It is possible that the visual display may be intended more for user-effect.