

Validating the Clinical Impact of Proper Positioning on BP Measurement



Midmark is committed to helping bring increased standardization and accuracy to blood pressure (BP) measurement. Through our [Better BP Initiative](#), we have been offering education to healthcare providers on the importance of consistent BP capture, as well as the clinical and monetary impact of inaccurate BP.

As part of this initiative, Midmark funded the CORRECT BP study. The study was designed to affirm the guidelines for in-clinic BP measurement that the American Heart Association (AHA) published in 2017. It specifically looked at the impact proper positioning can have on BP readings.

Midmark was not directly involved with decisions related to the study design, data collection, analysis or interpretation of the data. The study was conducted by an independent clinical research organization in conjunction with a major public university to ensure that all “Good Clinical Practice Guidelines” were followed.

The authors of the study had full autonomy to design and administer the protocol they conceived to ensure all data was unbiased, factual and illustrative of actual clinical outcomes.

[A peer-reviewed report of the study was published in eClinical Medicine, part of The Lancet Discovery Science.](#)

CORRECT BP Study Overview

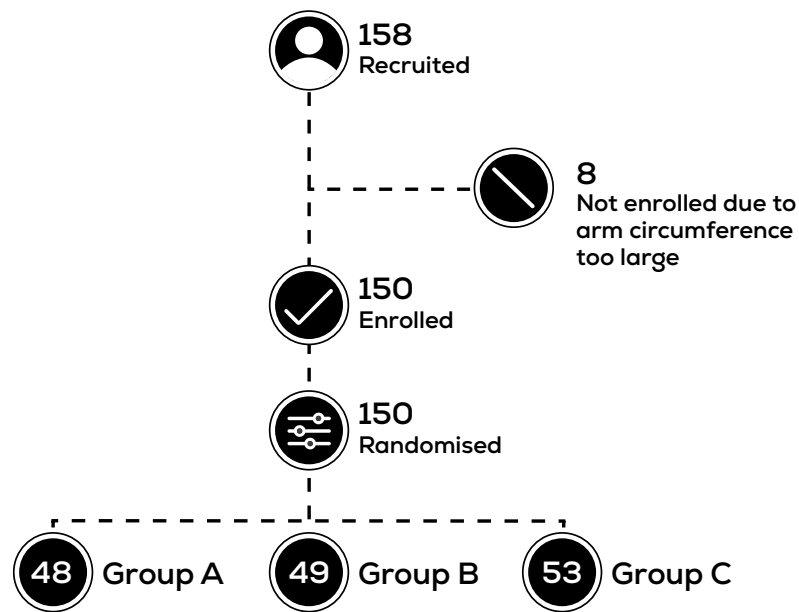
The primary objective of the CORRECT BP study was to compare BP readings taken while adhering to AHA guidelines to those typical of routine clinical care. It was specifically designed to determine the effect of poor positioning that occurs when BP is taken with the patient sitting on a typical clinical exam room table, where the feet are not flat on the floor, the back is not supported and the arm is not supported with the BP cuff at heart level.

The study focused on “resting BP” rather than “random BP” because the vast majority of clinical studies on the efficacy of BP management to goal targets have been done using resting BP as the foundation of management. Virtually, all recommendations made on best practice for BP management, including those derived from the Systolic Blood Pressure Intervention Trial (SPRINT) study, are based on diagnosing and managing patients using best-case acquired resting BP.

While random BP, such as home readings, does inform clinicians of variability and does help in management, basing therapeutic decisions on them can be risky because of the extreme variability of random readings.

In fact, the **US Preventive Services Task Force (USPSTF)** recommends that the initial screening and primary diagnosis of hypertension should be performed with office blood pressure measurement (OBPM). Ambulatory blood pressure monitoring (ABPM) and home blood pressure monitoring (HBPM) with validated and accurate devices should be used outside of a clinical setting to confirm a diagnosis of hypertension before starting treatment.





The CORRECT BP study was a three-group randomized clinical study with a cross-over design. Group A had three BP readings taken while seated on a fixed-height exam table followed by three readings taken in a position-adjustable exam chair. Group B had three BP readings taken in the chair followed by three readings taken on the table. The order in which the two types of readings were taken was randomized.

Group C had three BP readings taken in the exam chair followed by another three readings taken in the chair and was included for the purpose of obtaining an independent estimate of the order effect.

The study authors and designers chose to use the **Midmark 626 Barrier-Free® Examination Chair** to ensure proper participant positioning following AHA recommendations. It is the only exam chair of its kind designed to promote proper patient positioning for a more accurate BP measurement. Its low chair height allowed participants to place their feet flat on the floor, and powered movement of the back section helped ensure the participant's back was supported. The chair's **Patient Support Rails+** were used to support the arm with the BP cuff at heart level.



Proper Positioning is Critical



The CORRECT BP study validated that proper positioning has a clinically significant impact on BP readings. The results of the study demonstrated that following the AHA protocol (regarding positioning) for obtaining BP readings is critical for accurate BP measurement, and failure to do so can impact the validity of a diagnosis of hypertension, which is essential to establishing appropriate treatment and mitigating the complications and risks caused by many chronic conditions.

The study found that AHA and SPRINT recommended positioning resulted in substantially lower BP values when compared to improper positioning. BP readings taken on a fixed-height exam table where the proper AHA protocol could not be achieved were significantly higher than readings taken using the proper technique with the patient seated in an exam chair with adjustable positioning options.

Pooled systolic/diastolic BP readings taken on the exam table with incorrect positioning were significantly higher by 7.0/4.5 mmHg (both $p < 0.0001$) than those taken in the exam chair.

The Clinical Significance of the Results

If improperly acquired higher BP readings are used, it could result in misclassifying a patient as having hypertension when they do not. Accurate BP measurement can help reduce instances where a patient might be overmedicated, which can increase the risk of side effects.

Additionally, it is becoming increasingly important to accurately detect small differences in BP readings to effectively manage patients with hypertension and other metabolic disorders, such as diabetes, renal disease and cardiovascular conditions. Careful BP management, including identifying and adjusting to small shifts over time, is essential to management of metabolic disorders.

The observed benefit of proper positioning in the CORRECT BP study is sufficient to change the classification of BP disorders for millions of patients from hypertensive to normotensive. In fact, the study results support **estimates that as many as 30 million or more Americans may be incorrectly classified as having hypertension.**

It is important to stress that the study is not a criticism of healthcare providers' current measurement processes. It is a reminder that even with something as seemingly simple and routine as BP measurement, there is the risk of human errors and inaccuracies occurring when proper protocols are not followed. This study demonstrated that the effects of these errors are substantial and can directly impact clinical decision-making.

Providers should think about how they might **redesign their system's approaches** with respect to patient care to find ways to implement proper positioning and other recommendations into their BP acquisition process in a way that is still efficient without negatively impacting patients or workflow.

For patients, the study is a reminder of why they should pay attention to BP measurements and understand why accurate BP measurement is important. It also illustrates the importance of patients understanding the proper process to take an accurate BP measurement and taking steps to own their BP measurement process.

For more information on the Midmark Better BP initiative and how healthcare providers can help ensure accurate, consistent BP capture, visit **midmark.com/betterbp**.



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