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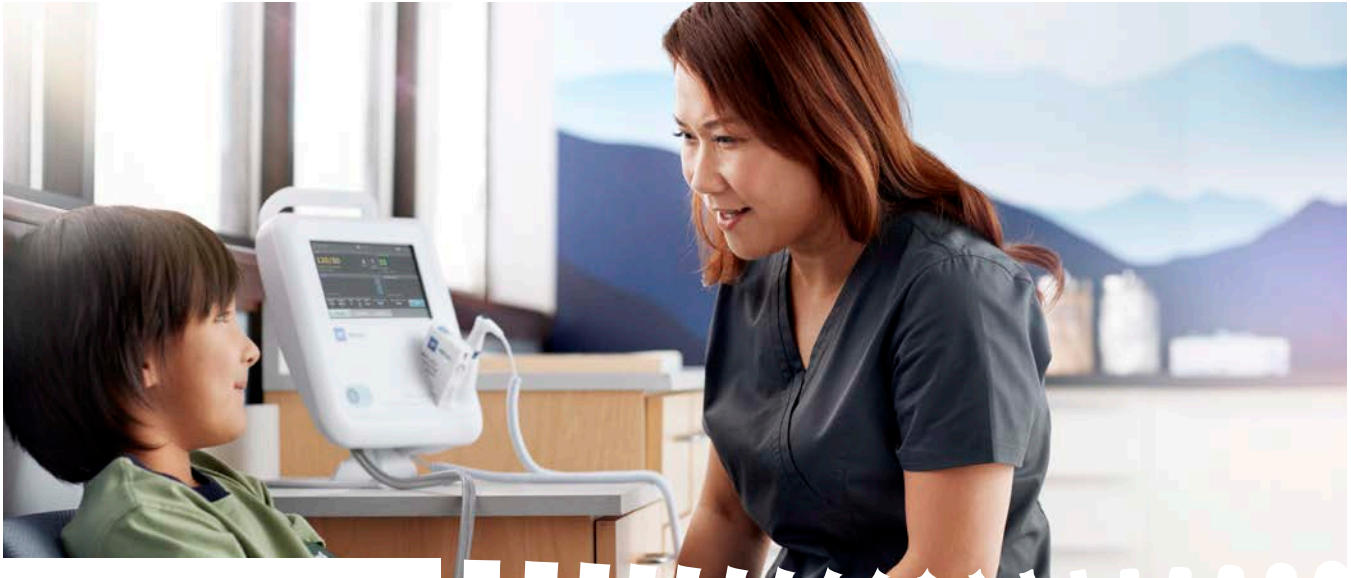
Exploring the Effect of Movement on Blood Pressure Readings with the Welch Allyn® SureBP® Algorithm



## INTRODUCTION

Acquiring an accurate blood pressure reading can be challenging, especially for pediatric and geriatric patients who may struggle to remain still throughout a reading. And while testing standards are in development for transport-induced motion on blood pressure readings,[1] no studies have focused on how to confidently measure blood pressure with movement-prone patients in an office setting...until now.

### UNDERSTANDING MOVEMENT'S IMPACT ON BLOOD PRESSURE READINGS

Patient-induced movement—both voluntary and accidental—can affect the acquisition and accuracy of blood pressure readings. That's why it's important to understand the impact of patient movements and explore solutions that can capture accurate blood pressure readings in the presence of motion.

### RESEARCH OBJECTIVE

Researchers at Hillrom studied the Welch Allyn SureBP Algorithm—a unique, inflation-based blood pressure algorithm—in a vital signs device[2,3] to determine if the algorithm could reliably provide precise and consistent blood pressure readings during patient-simulated movements.
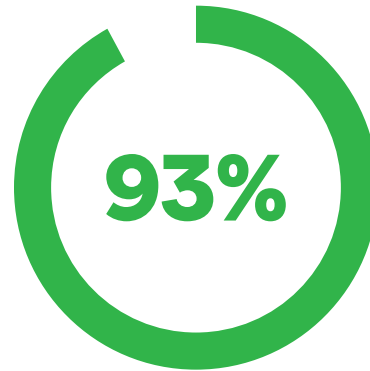
### STUDY PARAMETERS

Over a period of two months, 40 participants volunteered to take part in the study. Researchers collected data on readings taken while patients moved their arm, then compared those readings to blood pressure measurements taken without movement. Readings taken with patient-induced motion required study participants to simulate serial pronation and supination of the left arm every five seconds throughout the reading.[4]

## RESULTS

### CAN'T STOP THE BEAT: 93% SUCCESS RATE WHEN OBTAINING A READING ON THE FIRST ATTEMPT

The Hillrom™ vital signs device with SureBP generated a blood pressure value for 93% of patients (37 volunteers) on the first measurement attempt.[5] When a second attempt was performed, the device recorded a value in 100% of patients (the remaining three volunteers).[6] The automated vital signs device with the SureBP algorithm required little to no repeat readings because it was able to capture measurements despite patient-induced movement. Reducing the number of repeat readings can help improve patient experiences—with fewer measurements to retake, clinicians can focus their time on important patient interactions.
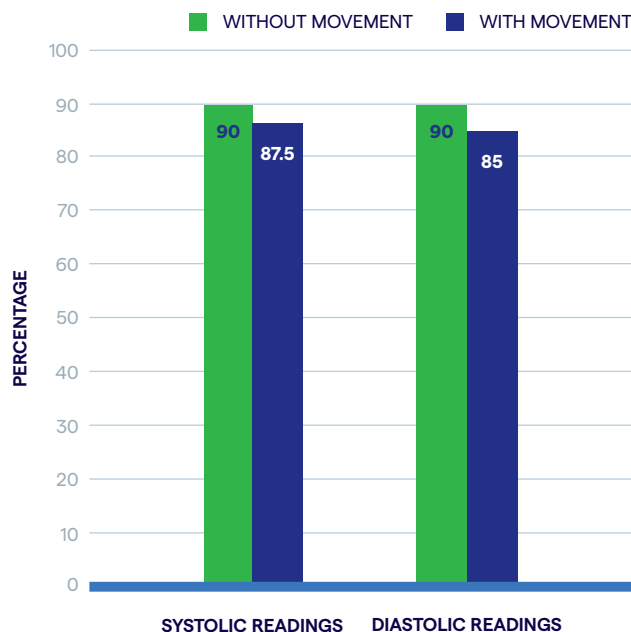
### PERFORMANCE UNDER PRESSURE: ACCURACY IN RELATION TO MOVEMENT

In addition to determining the percentage of successful blood pressure readings, researchers also analyzed the accuracy of those readings. During this study, the device's blood pressure algorithm demonstrated consistency between readings, even when movement was present, producing 85-87.5% of readings in a range of +/- 10 mmHg as compared to the manual device for the systolic and diastolic.[7, 8, 9]

**93%**

SINGLE READ SUCCESS RATE

**100%**

SECOND READ SUCCESS RATE

**WITHOUT MOVEMENT**   **WITH MOVEMENT**

| | SYSTOLIC READINGS | DIASTOLIC READINGS |
|---|---|---|
| Without Movement | 90 | 90 |
| With Movement | 87.5 | 85 |

PERCENTAGE

# CONCLUSION

An automatic vital signs device that can consistently provide accurate blood pressure readings can help capture results in your movement-prone patients. Any motion during measurement can cause repeat readings and data inaccuracies, which consume precious time and may affect clinical decision-making. Therefore, standardizing your practice with automated vital signs devices—specifically with an algorithm shown to withstand the challenges of patient movement—can help provide efficiencies and improve the quality of patient data.

Regardless of a patient's ability to remain still, you need to feel confident in the data you collect and the tools you use. That's why a robust, motion-tolerant vital signs solution is an important tool across care settings. Just because your patients move, does not mean they can't be measured.

Contact your Hillrom representative to learn more about vital signs solutions featuring the SureBP algorithm.

Introducing Hillrom's latest innovation: the Welch Allyn® Spot Vital Signs® 4400. This simple, easy-to-use solution offers an efficient way to capture, access and document vital signs so you can spend more time focused on your patients. It also includes the SureBP® algorithm for consistent, accurate blood pressure readings—even in the presence of patient movement.

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