Accuracy of Forearm Blood Pressures in Post Anesthesia Patients with Large Upper Arm Circumference: Preliminary Data

Principle Investigator: Sheri Watson, BSN, RN, CPAN. Co-investigators: Marita E. Aguas, BSN, RN, MS, CCRN, CNL; Tracy Bienapfl, RN; Pat Colegrove, BSN, RN; Larissa Ellis, BSN, RN; Nancy Foisy, BSN, RN; Bonnie Jondahl, BS, RN; Mary Beth Yosses, MS, BSN, RN; Zoe Anastas, MPH, BSN, RN-BC

Portland Providence Medical Center, Portland, OR.

Introduction / Identification of the Problem: Forearm location for blood pressure (BP) cuffs is sometimes used in patients with large upper arm circumference rather than using a larger, appropriately-sized, upper arm cuff.

Purpose: To determine if forearm BP accurately reflects upper arm BP in patients with large upper arm circumference.

Methodology: Each subject served as their own control during BP measurement in two locations (forearm; upper arm). BP technique and cuff size were in accordance with national guidelines. Bias and precision for the forearm BPs were calculated according to the Bland-Altman method.

Results: Twenty-three post anesthesia patients participated in the study, with mean upper arm circumference of 41.8 ± 4.0 cm. Bias ± precision for forearm systolic and diastolic BP were 6.1 ± 10.4 mm Hg and 1.6 ± 7.4 mm Hg, respectively. Thirty percent of systolic and 17% of diastolic BPs in the forearm location were at least 10 mm Hg different from the upper arm BP.

Discussion: Results of this study support limited prior studies in critically ill patients on the accuracy of forearm versus upper arm BP measurements.

Conclusion: This study found clinically significant differences in forearm compared to upper arm systolic BP measurements.

Implications: The clinical practice of using the forearm for BP measurement in post anesthesia patients with large upper arm circumferences results in inaccurate systolic BP values.