Exploring Accuracy and Precision of Noninvasive and Intra-Arterial Blood Pressure Measurement in Neurocritical Care Patients
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Purpose
- The purpose of this study is to describe the accuracy and precision of noninvasive and intra-arterial blood pressure measurements in neurocritical care patients.

Background/Problem
- Inconsistencies with blood pressure (BP) readings due to inter-observer variability, equipment, the skills and competency of the clinician, and other physiological factors can lead to inappropriate clinical decision making.
- Despite the use of BP monitoring across patient populations, research on the accuracy and precision of BP remains limited.
- A university hospital conducted a study that explored the consistency of patients’ BP readings from different locations.
- This sub-study further explored BP accuracy and precision, utilizing existing data.

Methodology
- This is a planned secondary analysis from a prospective, non-randomized observational study.
- A search for sources of literature that defined what an accurate BP is and which location to take the BP on was conducted.
- A 12x12 Pearson Correlation Matrix was created through the CORR procedure to display precision of BP measurements from the CATNIP data.

Accuracy
- refers to how close something is to its true value.

Precision
- refers to how approximate values are to one another.

Results
- The diastolic BPs and the mean arterial pressures (MAPs) for each have a stronger correlation with each other.
- Pearson correlation coefficients for systolic BP ranged from -0.0245 to 0.8823; diastolic BP ranged from -0.0226 to 0.8402 and MAP ranged from -0.0749 to 0.9486.
- For the diastolic blood pressures in the correlation matrix, the arterial diastolic BP and the left wrist (LW) systolic BP have the weakest correlation.
- There is no agreed upon best practice for BP site selection.

Discussion
- BP can be taken in either arm or either wrist, and no one site can be recommended given the statistically significantly different Pearson Correlation Coefficients.
- There is very limited precision between arterial line and non-invasive blood pressure (NIBP) measurements.

Recommendations for Future Research
- The parent study was conducted in a single center. A recommendation for further research would be to incorporate this study with multiple centers.
- Another recommendation would be to look into multiple populations and not only neurocritical care patients.

References
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