Title

Hypotension Prediction Index: Correlations between Invasive and Non-invasive Pressure Inputs

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Hypotension Prediction Index:
Correlations between Invasive and Non-invasive Pressure Inputs

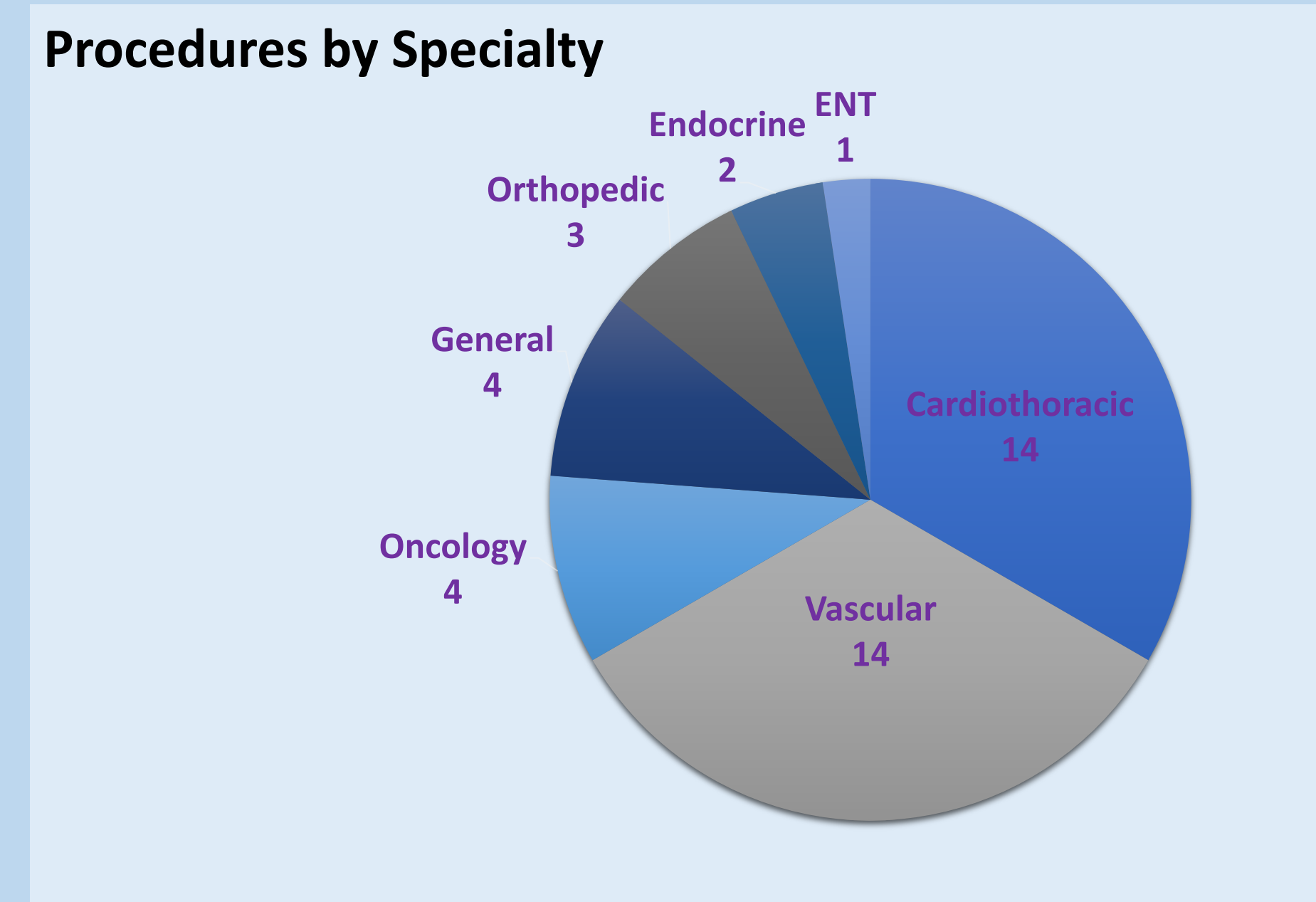### Kamron Sarhadi, BS, Jorge Avila, MD, Neal Fleming, MD, PhD

Background

- Continuous BP monitoring is essential to intraoperative care, as hypotensive events can significantly increase the risk of AKI, MI, and mortality post-op[1,2] .
- The Hypotension Prediction Index (HPI) is a novel algorithm derived from machine learning that gives anesthesiologists the ability to predictive hypotensive events.
- The HPI derived from intra-arterial catheter monitoring has been shown to predict hypotensive events with sensitivity and specificity >80%[3] .
- However, the utility and accuracy of the HPI when derived from non-invasive monitoring techniques, such the ClearSight finger cuff, have yet to be examined.
- This study seeks to compare the intra-arterial catheter-derived HPI vs the ClearSight finger cuff-derived HPI, to see if it is viable tool for anesthesiologists to use when non-invasive monitoring is not indicated.

Methods

- Obtained IRB approval for research on human subjects.
- Recorded patients' hemodynamics concurrently with both invasive (intra-arterial) and non-invasive (ClearSight) monitoring.
- Each monitoring system was connected to a Hemosphere monitor with the HPI software.
- Data collected from the ClearSight system was compared to corresponding intra-arterial waveform data using Bland-Altman and Pearson correlation analysis.
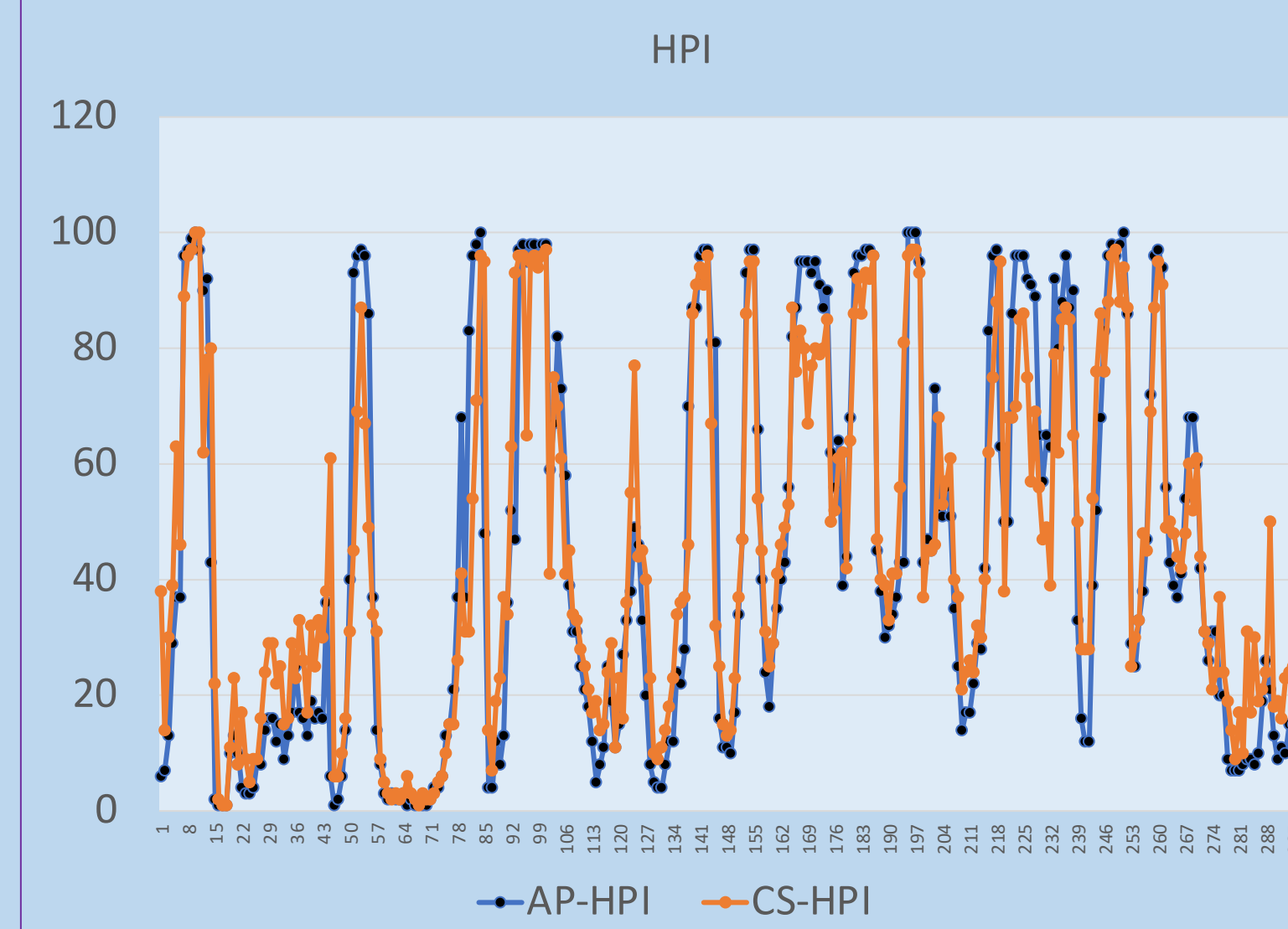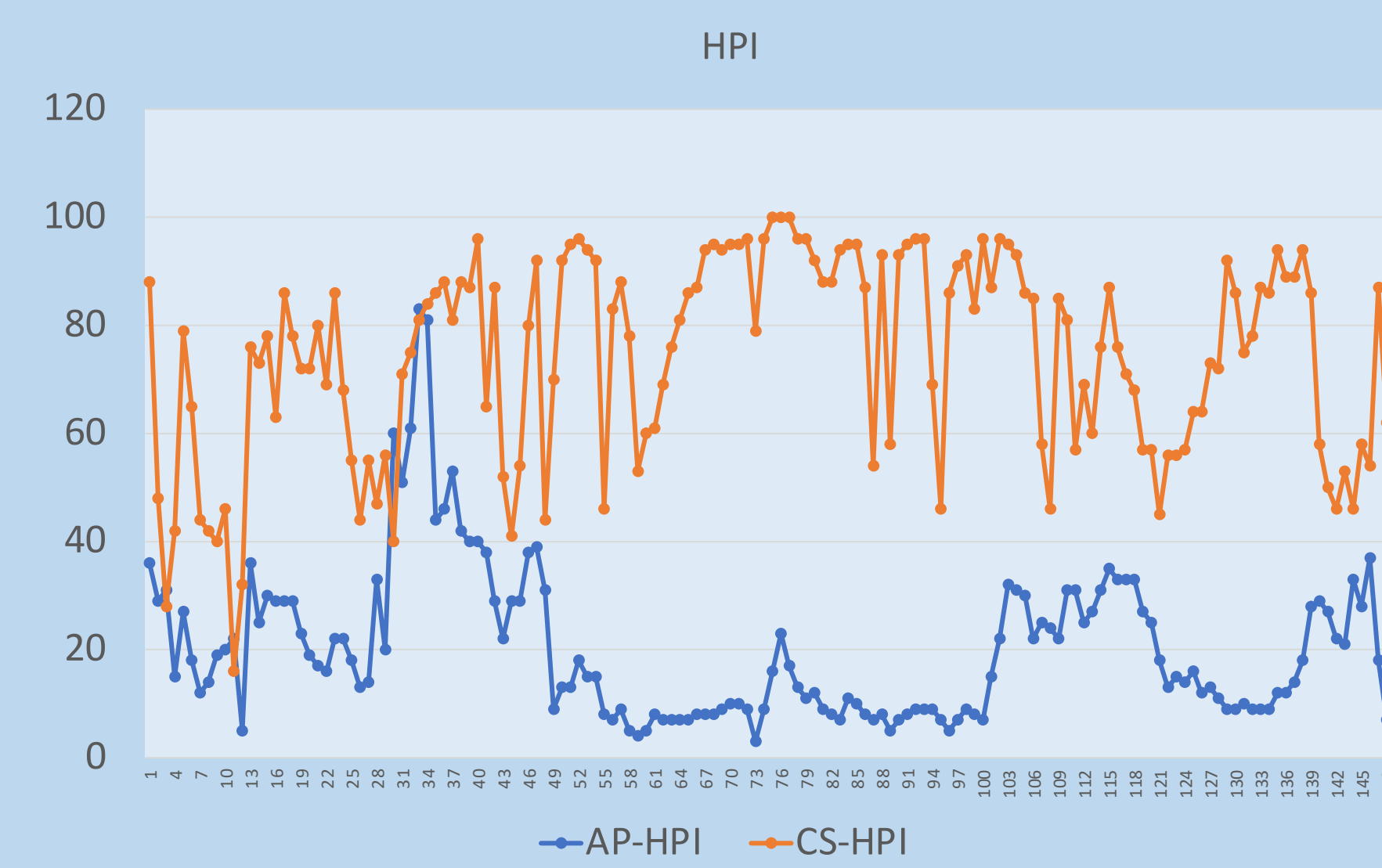
Results

Procedures by Specialty

Pie chart: Cardiothoracic 14, Vascular 14, Oncology 4, General 4, Orthopedic 3, Endocrine 2, ENT 1

Demographics

# OF PATIENTS	AGE	HEIGHT	WEIGHT	SEX
42	66.7 $\pm$ 17.2	170.9 $\pm$ 10.7	87 $\pm$ 22.5	59.5% M, 40.5% F

The Good

The Bad

The Ugly
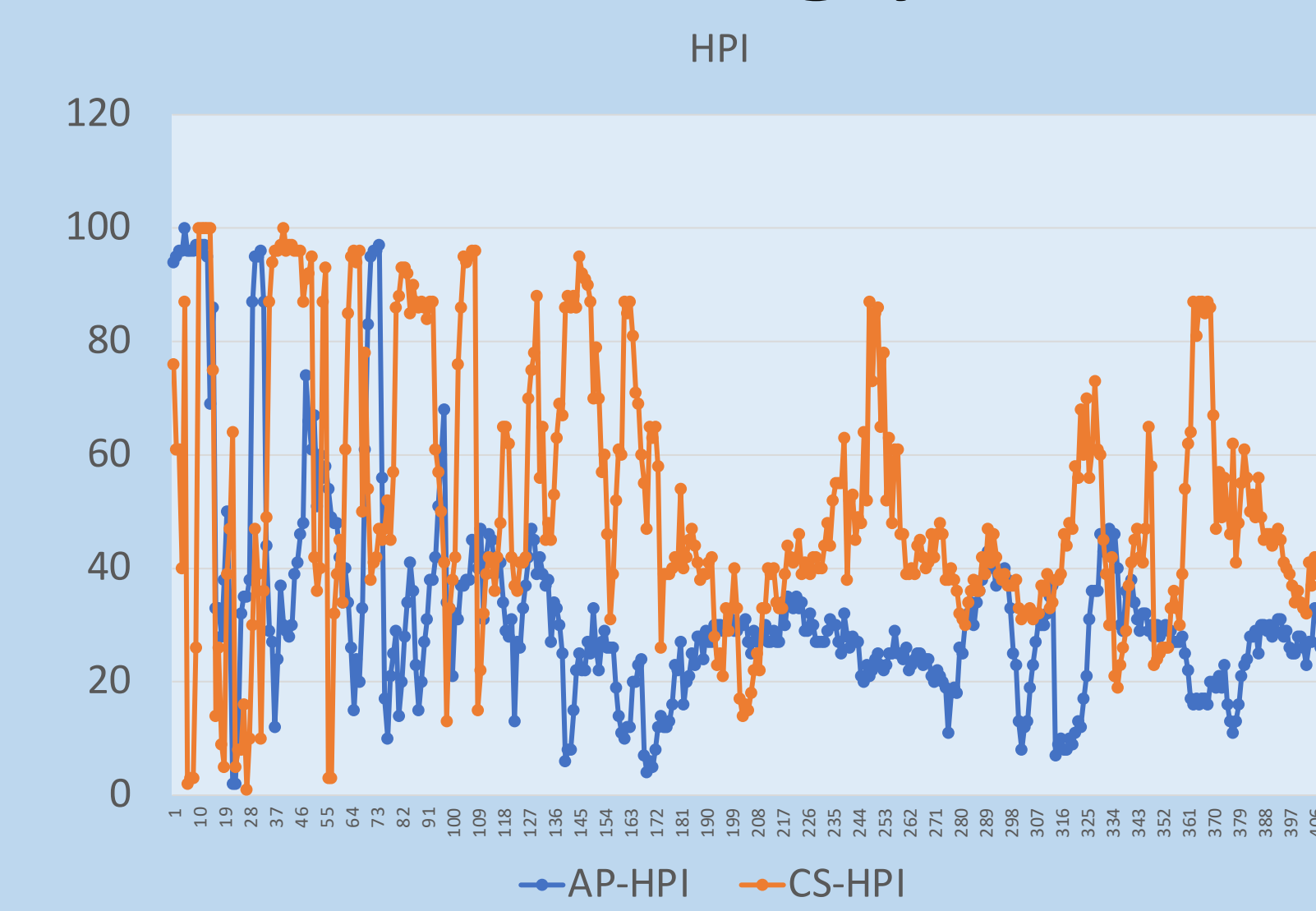
Correlation
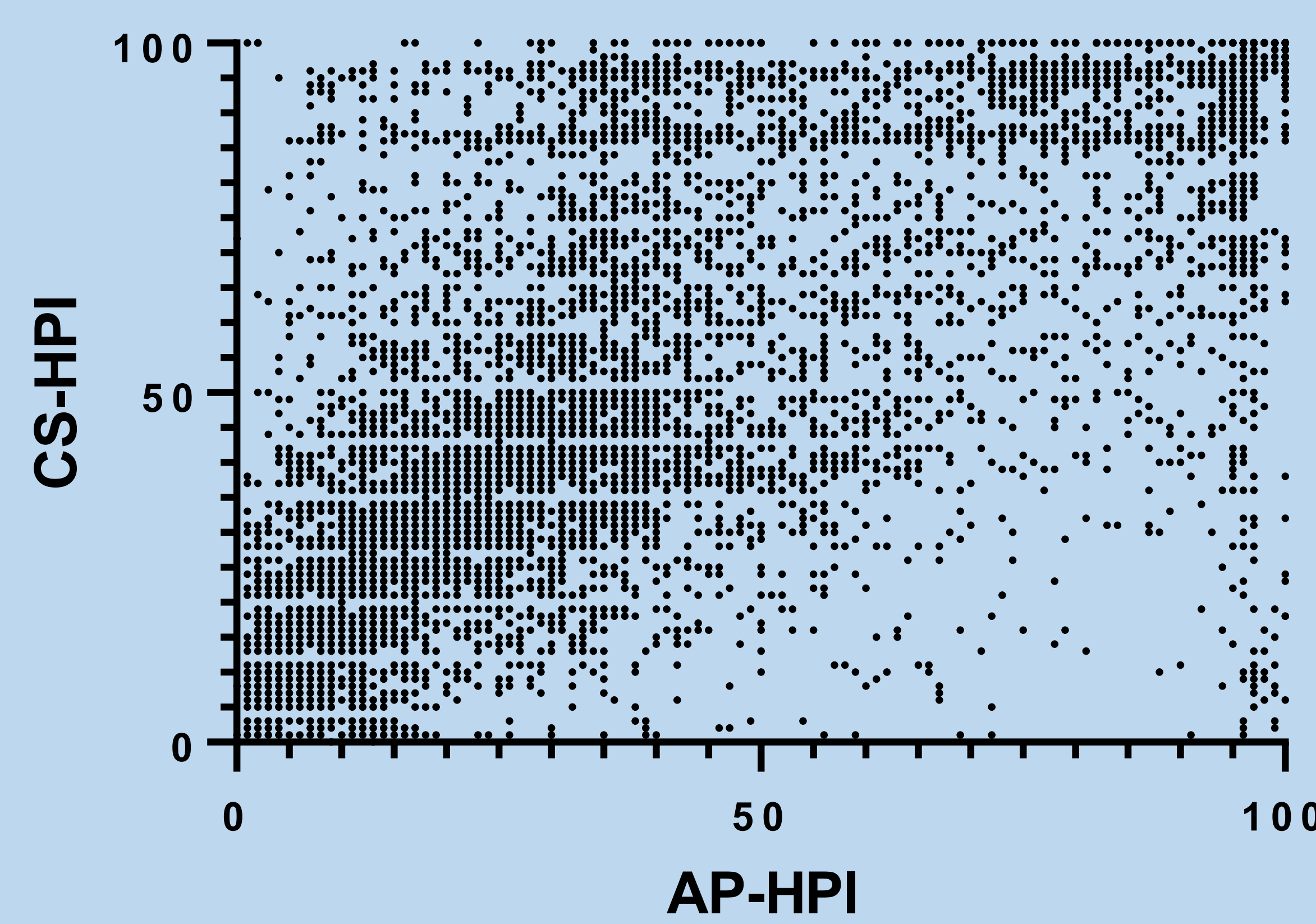
r	0.7128
95% CI	0.7019 to 0.7235
r^2	0.5081

Bland-Altman Analysis

+1.96 SD 35.858686
Mean -10.5
-1.96 SD -56.89923
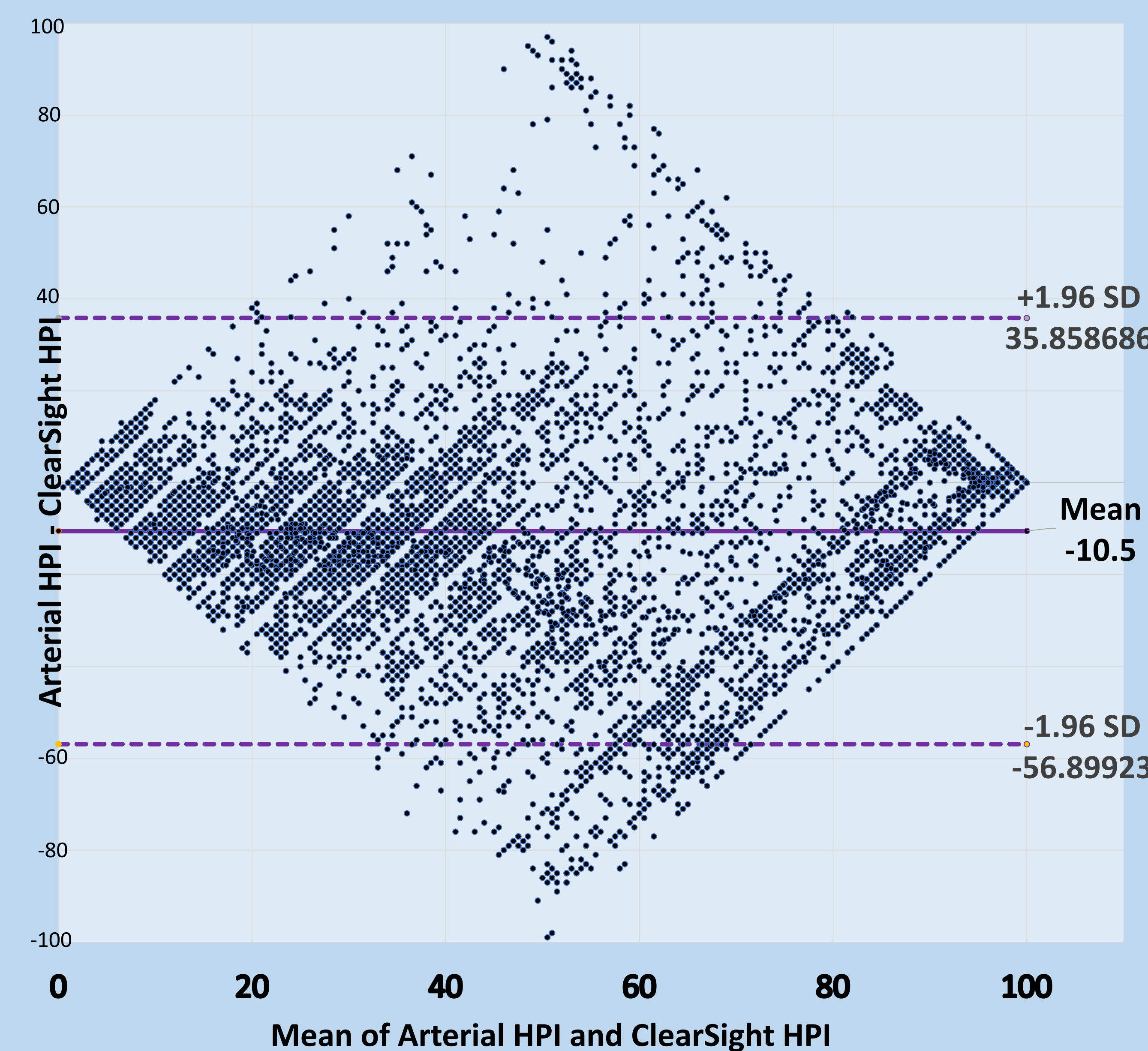
Discussion

- Bias of -10.5
- 95% LOA $\pm$46.4
- Differences between ClearSight vs. Intra-arterial HPI becomes less pronounced at the extremes and more pronounced at values between 35-80.
- Reasonably good Pearson Correlation between 2 HPIs.

Next Steps

- Analysis of concordance.
- Repeat correlation and B-A analysis with 5-min interval data to buffer for lag and response time.

References

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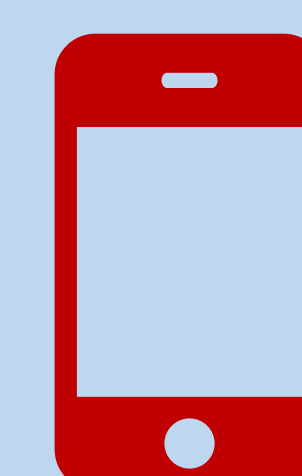
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