Evaluation of RPVI as an Improved Non-Invasive Dynamic Monitor of Cardiac Function
## Presenter: Esha Lal

Background
- Fluid mismanagement can have clinical consequences ranging from shock to pulmonary edema
- Dynamic monitors of cardiac function such as pulse pressure variation (PPV) can predict fluid responsiveness but most are invasive
- Non-invasive dynamic cardiac monitors like PVI have less sensitivity and specificity for predicting fluid responsiveness and are most accurate under strict clinical conditions
- RPVI is a non-invasive parameter developed to correlate better with PPV

Methods
- IRB approval with written informed consent
- Data was collected from UC Davis Medical Center, Loma Linda University Medical Center and University of Florida at Jacksonville using automated acquisition software at three second intervals for offline calculations of PPV, PVI, and RPVI
- Linear Regression, Standard Bland Altman, 4-Quadrant, Polar Plot and ROC Analyses using Microsoft Excel 2019 and SigmaPlot 12.5
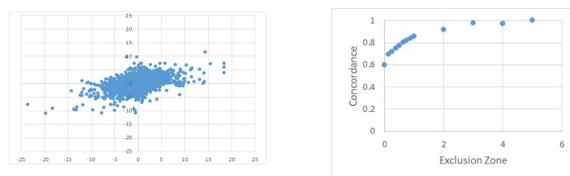
Results

RPVI correlation with PPV   Pearson's r=0.746
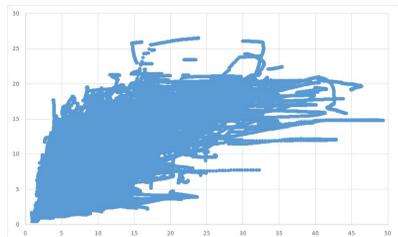
RPVI Bland-Altman analysis vs. PPV
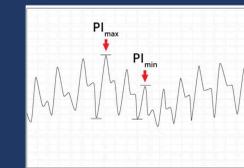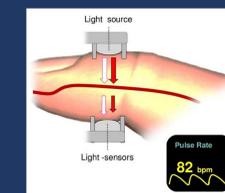Bias: -1.07   95% Limits: 6.24, -8.38
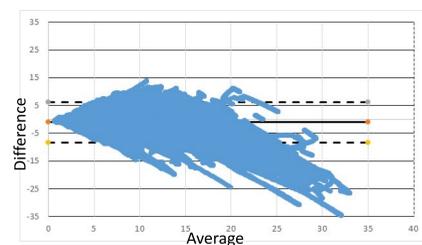
4 quadrant analysis RPVI vs. PPV
Concordance (±2% exclusion zone): 0.92

RPVI is a **non-invasive,** dynamic monitor of cardiac function that exhibits **excellent correlation** and **trending ability** when compared to the invasive **PPV.**


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Discussion
- RPVI is an improvement upon PVI with respect to correlation with PPV
- Differing sensitivities and specificities for RPVI when predicting PPV increases and decreases could indicate that the parameter may not be not equally predictive for positive and negative changes.
- A prospective study evaluating RPVI is underway to assess if RPVI is predictive of fluid responsiveness.

Additional (non-essential) results

RPVI predicts both increases and decreases in PPV (ROC analysis)
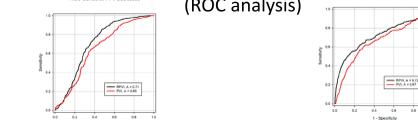
RPVI vs PVI (in pictures)
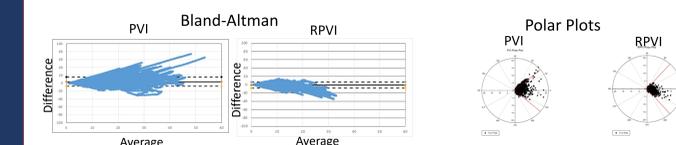
RPVI vs PVI (in numbers)

	RPVI	PVI
CORRELATION (*with PPV*)		
Pearson's r	0.746	0.573
BLAND_ALTMAN		
bias	-1.07	3.95
95% Limits of Agreement	6.24, -8.38	15.66, -7.76
4-QUADRANT ANALYSIS		
Concordance (2% exclusion zone)	0.92	0.78

References

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