

# EVALUATION OF DYNAMIC MONITORS FOR THE PREDICTION OF VOLUME RESPONSIVENESS IN PATIENTS WITH AND WITHOUT DIASTOLIC DYSFUNCTION

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## Background

- Intra-operative optimization of cardiac function can decrease incidence of complications
- Current gold standards to guide optimization are Pulse Pressure Variation (PPV) and Stroke Volume Variation (SVV)
- Left ventricular dysfunction is known to predict adverse cardiovascular outcomes (MACE), in-hospital mortality and extra fluid support
- Does left ventricular dysfunction alter the threshold for dynamic monitors and their ability to predict volume responsiveness?

## Methods

- IRB approval collected with written consent
- Data collected from UC Davis Medical Center at the end of each case
- TTE was used to assess DD grading prior anesthesia induction
- Ventilation 8ml/kg (IBW), PEEP 5cm H<sub>2</sub>O
- IV fluids were administered at a basal infusion rate of 1ml/kg (ABW)/hr
- As hemodynamic parameters necessitated, crystalloid or colloid was infused
- Response to each fluid bolus was recorded by the FloTrac/EV-1000 monitor
- Data was analyzed as a 3 minute average with a 2 minute delay pre and post bolus
- Comparisons were made between patients with and without DD
- ROC analysis using PRISM, Youden's index (YI) and plot using Microsoft Excel 2019

## Raw Data Sample

Time	CO L/min	SV mL/b	SVV %	SYS mmHg	DIA mmHg	MAP mmHg
10:30:31 am	6.3	91	8	157	59	82
10:31:31 am	6.4	93	8	158	61	84
10:32:31 am	6.5	96	8	159	60	84
10:33:31 am	6.5	97	7	158	60	83
10:34:31 am	6.5	94	7	147	57	79
10:35:31 am	6.4	92	7	144	57	78
10:36:31 am	6.3	88	7	134	54	74
10:37:31 am	6.2	89	8	126	52	71
10:38:31 am	6	85	8	123	52	70
10:39:31 am	5.8	83	8	122	52	70
10:40:31 am	5.7	80	8	130	55	75

## Sample Calculations

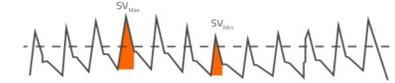
Time	CO L/min	SV mL/b	SVV %	SYS mmHg	DIA mmHg	MAP mmHg
10:35:02 am	Crystalloid 200 mL					
Pre	=AVERAGE(6.5+6.4+6.3)	93	8	158	60	83
Post	=AVERAGE(6+5.8+5.7)	83	8	125	53	72

At this time, more data is needed to accurately characterize the **SVV** threshold in patients with left ventricular *diastolic dysfunction* that would predict fluid responsiveness.



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SVV - Stroke Volume Variation

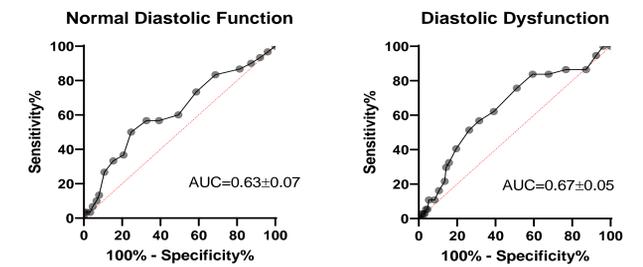


PPV - Pulse Pressure Variation



## Results

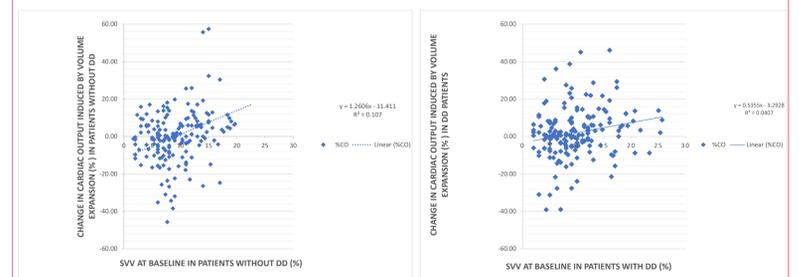
- To date, 68 patients were recruited for the study
- Mean age of 69 ± 10.3 years and BMI of 26 ± 4.6
- Patients without DD: SVV threshold of 11.5 at YI of 0.2533
- Patients with DD: SVV threshold of 10.5 at YI of 0.2518



## Discussion

- Current sample size is too small for conclusions
- Further data collection and analysis is needed to fully characterize the relationship
- General anesthesia might alter the diastolic dysfunction grading

## Additional (non-essential) results



## References

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3. Swaminathan, M., Nicora, A., Phillips-Bute, B. G., Aeschlimann, N., Milano, C. A., Mackensen, G. B., ... Mathew, J. P. (2011). Utility of a Simple Algorithm to Grade Diastolic Dysfunction and Predict Outcome After Coronary Artery Bypass Graft Surgery. *The Annals of Thoracic Surgery*, 91(6), 1844-1850.

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