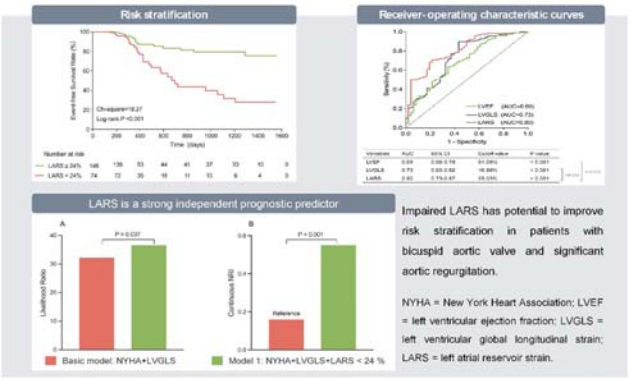
square (from 32.19 to 36.56, P = 0.037) and reclassification (continuous net reclassification index (NRI) = 0.55, P < 0.001) of the prediction model. **Conclusion:** In patients with BAV and significant AR, the impairment of LARS is a strong independent prognostic predictor and confers incremental prognostic utility over clinical and other echocardiographic parameters. These findings suggest that LARS could be considered in risk stratification for such populations.



P3-30

Relative Pressure by Vector Flow Mapping as a Non-Invasive Marker of Pulmonary Capillary Wedge Pressure

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Background: Interventricular pressure gradient is a reflection of cardiac performance and particularly diastolic left ventricular (LV) function. Vector flow mapping (VFM) translates flow velocity vectors into pressures using the Navier-Stokes equation, allowing calculation of the relative pressure (RP) between the LV apex and base. The relationships between these flow dynamics and left-sided filling pressures are not well understood. We aimed to evaluate the association of diastolic RP with pulmonary capillary wedge pressure (PCWP) as a surrogate marker for LV filling pressures. **Methods:** We prospectively enrolled patients undergoing right heart catheterization (RHC) for a range of clinical indications. Patients with severe mitral stenosis or atrial fibrillation were excluded. Within 24 hours of the RHC, each patient underwent echocardiography with VFM to obtain LV 3-chamber view of flow velocity vectors frames. Images were analyzed in VFM software (DAS-RS1, Fujifilm). LV apex to base pressure difference (ΔP in mmHg) during peak diastole was measured and averaged over 2-4 cardiac cycles. Patients were categorized based on their PCWP obtained during RHC: normal (≤12 mmHg) and high (>12 mmHg). **Results:** A total of 35 patients (age 69.7±12.9 years, 63% males) were included in the analysis. The mean peak diastolic RP was significantly higher among patients in high PCWP group (2.9±1.9, n=18) vs normal PCWP group (1.6±0.7, n=17) (p=0.01). Receiver operating curve analysis showed that higher RP values significantly correlated with high PCWP risk [AUC=0.70 (95% CI, 0.52-0.88)]. The optimal cutoff for high PCWP prediction was a RP of >2.2, with 82% specificity and 61% sensitivity. Logistic regression indicated a 2.3-fold increase (OR=2.27, 95% CI 1.22-5.61, p=0.03) in the odds of having high PCWP per unit rise in peak diastolic RP. **Conclusion:** Diastolic relative pressure as measured by vector flow mapping correlates with PCWP and may provide additional non-invasive data for identifying patients with high PCWP.

Figure: (A) The predictive value of peak diastolic relative pressure for PCWP>12mmHg
(B) Peak diastolic relative pressure in patients with normal vs high PCWP
PCWP= pulmonary capillary wedge pressure

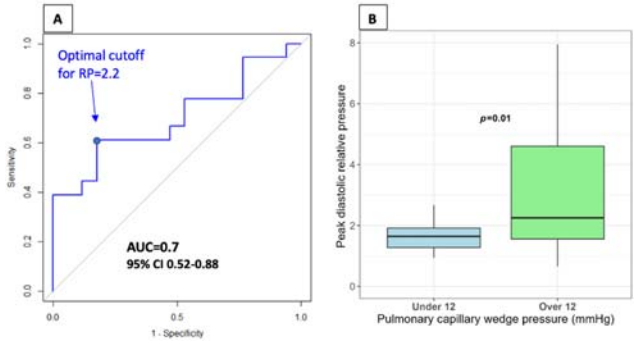
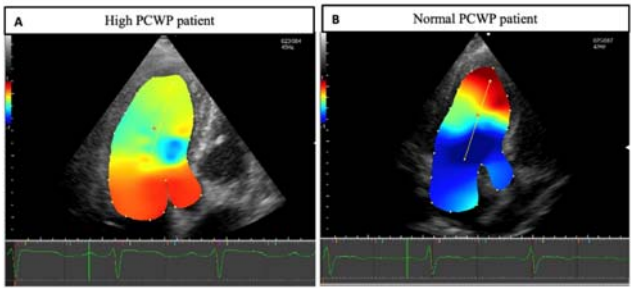


Figure: Relative pressure imaging with vector flow mapping in patient with high (A) vs normal (B) PCWP
PCWP= pulmonary capillary wedge pressure



P3-31

AI-Based Detection of Heart Failure with Preserved Ejection Fraction

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Background: Heart failure with preserved ejection fraction (HFpEF) is a highly prevalent disease, affecting more than 3 million patients in the US and over 30 million patients worldwide. In this study, we aimed to validate in a real-world population a novel artificial intelligence (AI) software that uses a single 4 chamber apical TTE view to identify patients with HFpEF. **Methods:** All clinical echocardiograms performed during a seven day period (n=692) were evaluated using the EchoGo Heart Failure software (Ultromics Ltd). Output from the software included screening diagnosis (positive or negative for heart failure) and binary classification of EF (i.e. normal >= 50% or abnormal < 50%). Clinical diagnoses were confirmed by manual chart review. HF2PEF scores were tabulated based on clinical risk factors identified in the chart and cardiologists' interpretation of the echocardiograms. **Results:** 143 patients screened as positive for heart failure. Among these, 26 patients were identified as having an abnormal EF. Of the remaining patients, 56 patients were confirmed to either have a clinical diagnosis of HFpEF (41 cases) or had evidence of heart failure with improved EF (15 cases). Among the remaining 61 patients who screened positive but lacked a clinical diagnosis of heart failure, several factors emerged that potentially affected cardiac mechanics or indicated underlying structural heart diseases. The remaining 28 patients did not have evidence of prior structural heart disease or clinical diagnosis of HFpEF. Nevertheless, 26 of these patients had findings consistent with at least grade 1 diastolic dysfunction, with 11 patients presenting grade 2 diastolic dysfunction based on cardiologists' review of their echocardiograms. Additionally, 17 out of these 28 patients exhibited a high probability (> 50%) of HFpEF based on HF2PEF scores. **Conclusions:** This comprehensive analysis, derived from a single-center clinical validation study, underscores the capability of AI software to identify patients with potential HFpEF. It demonstrates comparable accuracy to established diagnostic tools in recognizing patients necessitating further evaluation. The study emphasizes the need for additional testing to clarify diagnoses, especially in cases where certain parameters impact the precision of existing tools.

Clinical diagnoses in patients identified as positive screens for heart failure.

Diagnosis	No. of Patients (%)
Abnormal EF	26 (18.2%)
Clinical HFpEF	41 (28.7)
Clinical HF with improved EF	15 (10.5%)
Prior structural heart disease	29 (20.3%)
Aortic valve disease (at least moderate stenosis or regurgitation, or post TAVR/SAVR)	20
Mitral valve disease (at least moderate stenosis or regurgitation, or post TEER, surgical repair, or replacement)	13
Tricuspid valve disease (at least moderate stenosis or regurgitation, or post TEER, surgical repair, or replacement)	2
Right sided heart failure	3
Post heart transplant or PFO closure	4 (2.8%)
Potential new diagnoses of HFpEF	28 (19.6%)