

Supplementary table 1 | Common challenges in filling pressure assessment in the acute setting

Parameter	View and technique	Relevant value(s)	Notes
Isovolumic relaxation time	Transmitral filling (PW Doppler)	- Normal: IVRT 70 + 12 ms - Abnormal diastolic function: IVRT >110 ms - Restrictive physiology: IVRT <60 ms	- Independent of inotropic status - Not widely used (requires phonocardiogram for accurate measurement)
E/A ratio	Transmitral filling (PW Doppler)	- Normal: E/A ratio 0.75–1.40 - Abnormal diastolic function: E<A velocity - Restrictive physiology: E>A velocity	- Age-dependent and filling-dependent - Not possible to assess in AF or atrial flutter - Might change in presence of ischaemia/incoordination
E deceleration time	Transmitral filling (PW Doppler)	- Normal: E DT 160–240 ms - Abnormal diastolic function: E DT >240 ms - Restrictive physiology: E DT <160 ms	- Weak negative correlation with PCWP ($r = 0.54$) - Sensitivity 86%, specificity 59%
E/E'	Transmitral filling (PW Doppler) plus TDI	- Normal: <10 - Elevated LAP (septal or average): ≥ 15 - Elevated LAP (lateral): ≥ 12 - PPV: <8 (lateral) predicts PCWP <18 mmHg (sensitivity 83%, specificity 88%)	- If between 10 and 15, will need additional measures - More accurate in patients with reduced EF - Not validated in: MS, MAC, MVR, MR, AF, pacing - Does not necessarily correlate with presence of pulmonary oedema
Pulmonary vein S/D	PW Doppler	If S/D >0.65 in presence of normal E/A and EF, LAP unlikely to be elevated	Normal values vary with age
Pulmonary vein DT	PW Doppler	- Calculate LAP - PV-DT <160 ms correlates with PCWP >18 mmHg	- Sensitivity 97%, specificity 96% - Good correlation with PCWP ($r = -0.89$) - Confounding variables: HR, CO, age, LV compliance, LV afterload, LV relaxation, LAP, PPV
Colour M-mode propagation velocity	Colour M-mode across MV, measure from MV annulus to 4 cm into left ventricle, slope of first aliasing velocity	<50 cm/s might indicate diastolic disease - PPV: E/Vp <1.7 predicts PCWP <18 mmHg (sensitivity 80%, specificity 100%)	- Difficult to obtain high-quality images in TTE - Fairly low sensitivity
IVC diameter (cm) and collapse with sniff (%)	Subcostal M-mode or 2D echo	0–5 mmHg: ≤ 2.1 cm, >50% collapse 5–10 mmHg: ≤ 2.1 cm, >50% collapse >2.1 cm, >50% collapse +15 mmHg: >2.1 cm, >50% collapse	- Affected by pressures: intrathoracic, intrapericardial, intra-abdominal - Affected by right heart pathology - Changes in PPV

A, peak late transmitral filling velocity; AF, atrial fibrillation; CO, cardiac output; D, peak pulmonary vein diastolic wave; DT, deceleration time; E, early transmitral filling velocity; E', peak mitral annular velocity; echo, echocardiography; EF, ejection fraction; HR, heart rate; IVC, inferior vena cava; IVRT, isovolumic relaxation time; LAP, left atrial pressure; LV, left ventricular; MAC, mitral annular calcification; MR, mitral regurgitation; MS, mitral stenosis; MV, mitral valve; MVR, mitral valve replacement; PCWP, pulmonary capillary wedge pressure; PPV, positive pressure ventilation; PW, pulsed-wave; S, peak pulmonary vein systolic wave; TDI, tissue Doppler imaging; TTE, transthoracic echocardiography; Vp, peak aortic velocity.