

of the left atrium and identification of elevated filling pressures for the left ventricle [22]. Echocardiography plays a key role in predicting the development of NOAF, in choosing the treatment strategy (rhythm control vs. rate control), and in secondary prevention of recurrence after cardioversion [13, 20].

Left Atrial Dimensions

Anteroposterior Dimension of the Left Atrium (LA ESD) and Left Atrial Area (LAA)

- In parasternal long axis view (PLAX), the anteroposterior dimension of the LA (LA ESD) is measured at end-systole, using M-mode or 2D perpendicular to the long axis of the aortic root, from the posterior border of the aortic root to the posterior wall of the LA (Fig. 1). The normal value is approximately ≤ 40 mm. This is a one-dimensional parameter that may underestimate dilatation in cases of asymmetric LA remodelling [17].
- In the apical four-chamber view (A4C) at end-systole, planimetry of the LA area (LAA) is performed; normal value ≤ 20 cm². The tracing is drawn from the mitral valve annulus, encompassing the entire perimeter of the LA, whilst excluding the LA appendage and pulmonary vein orifices.

LA Volume: Biplanar Volume Measurement (LAV) and Indexed Value (LAVi)

- The most accurate method is biplanar calculation of LA volume (LAV) using the disc method in A4C and A2C views at endsystole (maximum LA volume). Both volumes are averaged (Fig. 2 and 3)

Fig. 1. PLAX view – LA ESD measurement

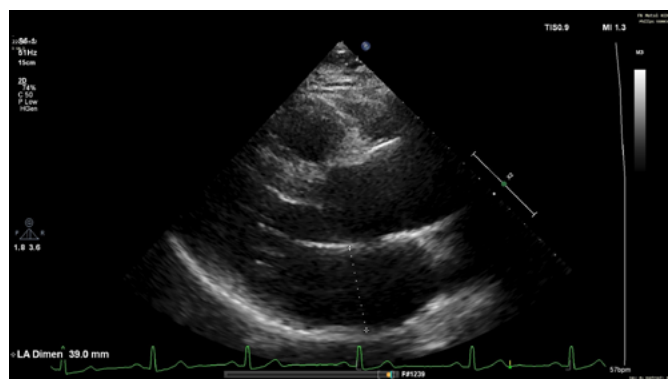
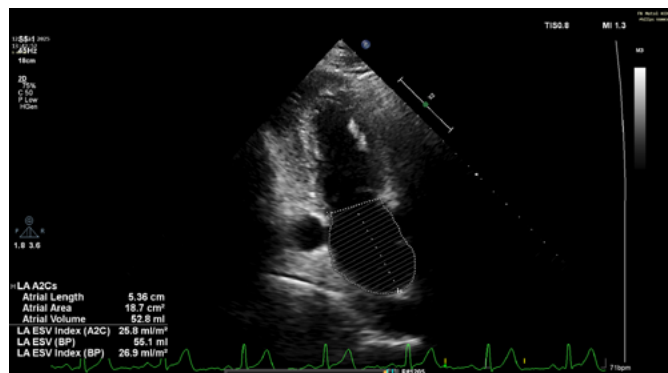


Fig. 3. A2C view – LAVi measurement



and indexed to body surface area (LAVi). LA dilatation is typically defined as LAVi ≥ 34 ml/m² [22].

Note: LAV/LAVi are preload-dependent and increase with chronically elevated LA pressure (LAP).

Left atrial function and left ventricular diastolic function

Transmitral Flow – PW Doppler (A4C, at the tips of the mitral valve leaflets)

- E wave = early LV filling; the absolute velocity is highly age- and preload-dependent; therefore, it has no single "physiological" value.
- E deceleration time (DT): approximately 160–220 ms.
- A wave = Atrial Contraction (only in sinus rhythm); the E/A ratio is also age- and preload-dependent.

Atrial Contraction – A-wave VTI (AVTI / velocity-time integral of A wave)

- The character of the A-wave reflects the strength of atrial contraction, LV elastance, and the volume of blood in the LA after early diastole.
- Note: AVTI can be used as a quantitative indicator of "atrial kick" in sinus rhythm (Fig. 4). The AVTI value 4–6 hours post-cardioversion reflects the return of atrial contraction and may be associated with the risk of NOAF recurrence.

Pulmonary Artery Pressure (PAP) and RV Load

- TR Vmax – maximum velocity of tricuspid regurgitation (TR) measured by continuous-wave Doppler. A TR Vmax value > 2.8 m/s sug-

Fig. 2. A4C view – LAVi measurement

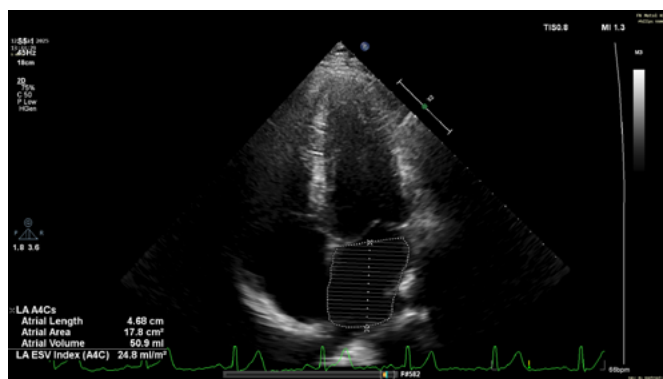


Fig. 4. A4C view – Transmitral PW Doppler with AVTI measurement

