



ADVANCED ULTRASONOGRAPHY PRACTICAL COURSE



Daily programme

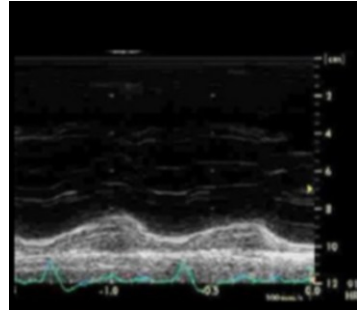
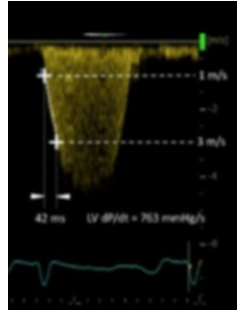
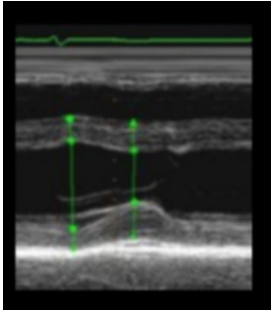
Time	Duration	STATIONS		
		1	2	3
08:30	00:15	Introduction		
		Cardiac output estimation	Left ventricular systolic function	Segmental kinetics (simulator)
08:45	00:40	A	B	C
09:25	00:40	C	A	B
10:05	00:15	Break		
10:20	00:40	B	C	A
		Right ventricular function	Pulmonary artery pressure estimation	Pathologies (simulator)
11:00	00:40	A	B	C
11:40	00:40	C	A	B
12:20	00:40	Lunch break		
13:00	00:40	B	C	A
		Left atrial pressure – diastolic function	Review / test	Clinical cases
13:40	00:40	A	B	C
14:20	00:40	C	A	B
15:00	00:15	Break		
15:15	00:40	B	C	A
15:55	00:20	Conclusion		
16:15				

Objectives

- Teach the settings that must be mastered for the test.
- Review normal values.
- Answer questions about the theoretical course.

Left ventricular systolic function

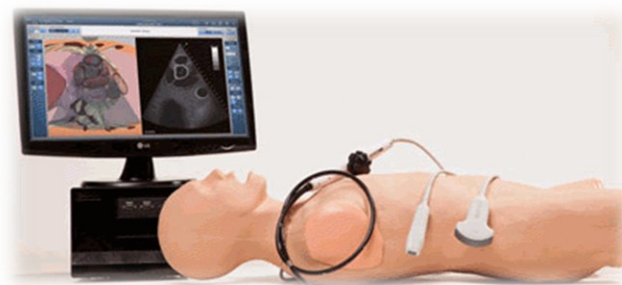
- Calculate LVEF using the Teichholz formula.
- Measure MAPSE.
- Measure EPSS.
- If mitral regurgitation is present, calculate dP/dT_{max} .



Segmental kinetics analysis

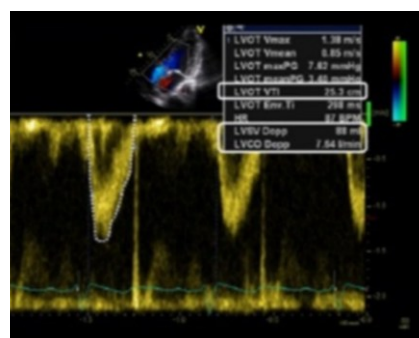
Interactive simulator cases:

- Acute anterior myocardial infarction
- Anterior myocardial infarction in a patient with COPD
- Lateral myocardial infarction in a patient with COPD
- Lateral myocardial infarction
- Inferior myocardial infarction
- Right ventricular myocardial infarction
- Inferior myocardial infarction with right ventricular involvement
- Coronary artery disease with wall motion abnormalities in all three coronary territories



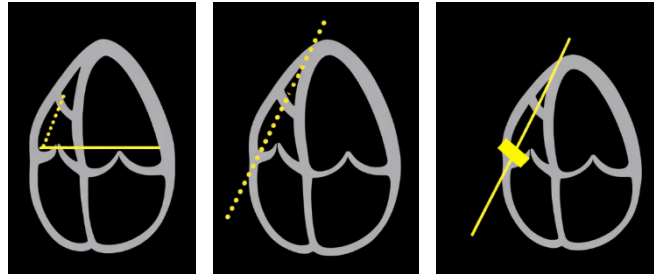
Cardiac output estimation

- Measure the LVOT diameter in the parasternal long-axis view.
- Obtain an optimal LVOT velocity-time integral recording in the apical five-chamber view.



Right ventricular function assessment

- Calculate the right-to-left ventricular ratio from the apical four-chamber and subcostal views.
- Measure the apical angle of the right ventricle.
- Measure TAPSE.
- Measure S' .
- Assess septal motion in the parasternal short-axis view at the papillary muscle level



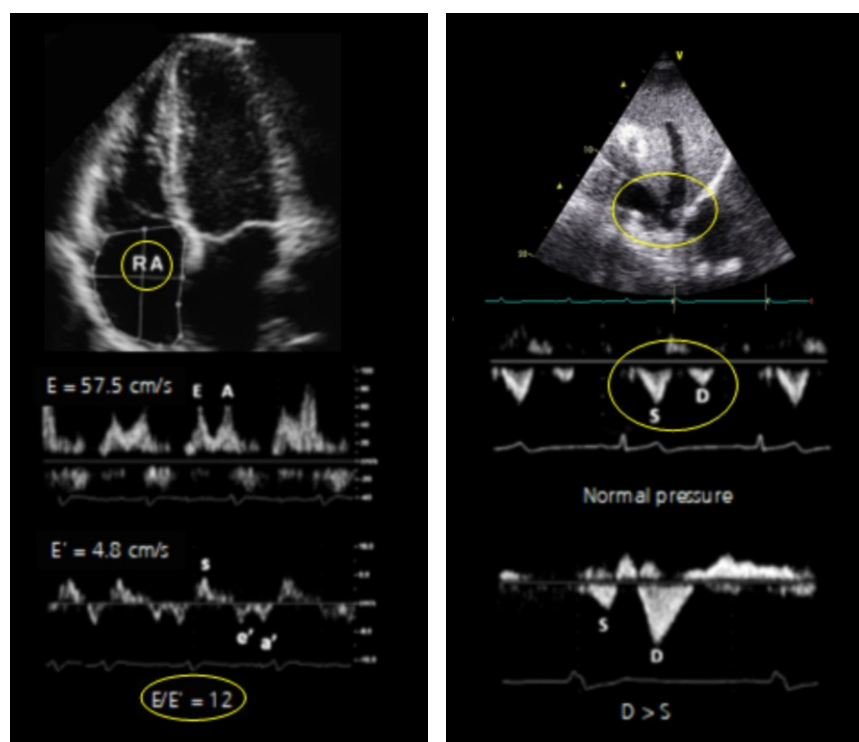
Pulmonary arterial pressure estimation

- Obtain the three views required to record tricuspid regurgitation jets and antegrade pulmonary flow.
- Use continuous-wave and pulsed-wave Doppler with appropriate settings.
- Correctly align the ultrasound beam and position the sample volume.



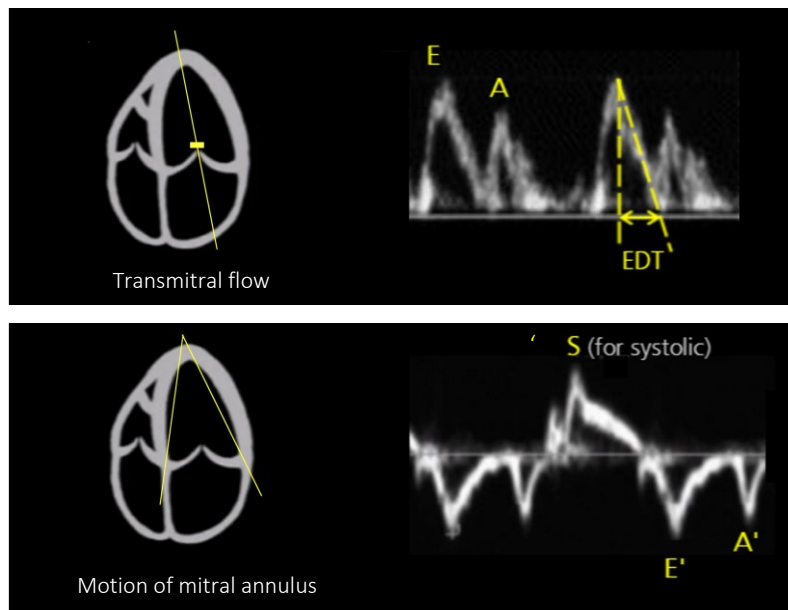
Right atrial pressure estimation

- Assess the IVC.
- Assess the left hepatic vein.
- Assess hepatic venous flow.
- Calculate tricuspid E/E' .
- Measure right atrial area.



Left atrial pressure estimation

- Assess transmitral inflow: E wave, A wave, and E-wave deceleration time.
- Assess mitral annular tissue Doppler: S', E', and A' velocities.



Interactive mixed cases using a simulator

- Severe biventricular systolic dysfunction
- Pulmonary hypertension
- Infective endocarditis of the aortic valve
- Aortic stenosis
- Thrombus in transit through a patent foramen ovale
- Type B aortic dissection
- Air embolism
- LVOT obstruction after aortic valve replacement
- Cardiac tamponade
- Acute right ventricular failure



Interactive cases integrating echocardiography into complex clinical scenarios:

- LV systolic dysfunction with shock of ischemic origin
- Pulmonary embolism with severe RV dysfunction and popliteal thrombosis
- Severe combined systolic and diastolic biventricular dysfunction with markedly reduced stroke volume and cardiac output in a chronic setting
- Large circumferential pericardial effusion with signs of tamponade, including early-to-mid diastolic right ventricular compression
- Grade III LV diastolic dysfunction
- Severe aortic stenosis
- Right ventricular infarction (differential diagnosis with massive pulmonary embolism)
- Flash pulmonary oedema caused by rupture of the mitral chordae
- Severe left ventricular dysfunction with a Takotsubo pattern and subaortic obstruction (gradient > 50 mmHg)
- Aortic endocarditis with aortic regurgitation