

Supplement 1. Learning objectives in the course model developed and adapted from Greim et al. and Weimer et al.

Topic	Learning objectives: upon completing this course, the participant will be able to:
Basic anatomy and physiology	<ul style="list-style-type: none">✓ Describe anatomic relationships in the chest✓ Show the exact position of the heart and the positional relationship of the chambers to each other✓ Explain the physiology of blood flow and valve mechanics during systole and diastole✓ Explain the physiology of blood flow and valve mechanics during systole and diastole✓ Explain the movement of the diaphragm during inhalation and exhalation
Physical principles, choice of transducer, and instrument settings	<ul style="list-style-type: none">✓ Explain the physical principles of image acquisition and ultrasound diagnosis✓ Explain the differences between the various transducers and justify the choice of transducer✓ Explain how penetration depth, image resolution, and frequency relate to each other
Patient positioning and transducer movement	<ul style="list-style-type: none">✓ Carry out positioning variations and explain how positioning improves the ultrasound conditions✓ Understand and implement defined movement sequences (tilting, angulating, rotating, shifting, swiveling) in relation to image morphology
Examination	<ul style="list-style-type: none">✓ Adjust the defined standard sections and explain the plane✓ List relevant questions that can be answered by setting the respective plane✓ Describe the possible transducer movements and adjustable settings available to optimize the planes

Pathologies

- ✓ Identify the most common pathologies in in the standard sections: Hyper- and hypovolemia, dilated cardiomyopathy, right heart strain, pericardial effusion/tamponade, mitral valve insufficiency, aortic valve stenosis, left heart hypertrophy, myxoma, thrombus, infarction, pulmonary hypertension, reduced left ventricular pump function, pleural effusion
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