

Cardiomyopathy echocardiogram acquisition protocol

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Purpose

The purpose of this protocol is to standardize transthoracic echocardiography in:

- patients diagnosed with a cardiomyopathy
- patients who are suspected of having a cardiomyopathy
- asymptomatic carriers of a mutation that may lead to a cardiomyopathy
- family members undergoing family screening for a cardiomyopathy

Abbreviations

AV	Aortic valve
CW	Continuous wave Doppler
FR	Frame rate
LA	Left atrium
LV	Left ventricle
LVOT	Left ventricular outflow tract
MV	Mitral valve
PV	Pulmonary valve
PW	Pulsed wave Doppler
RA	Right atrium
RV	Right ventricle
RVOT	Right ventricular outflow tract
TDI	Tissue Doppler imaging
TV	Tricuspid valve

Acquisition

Echocardiograms should preferably be acquired with a GE machine for standardization of strain analysis. Height and weight of the patient should be registered. All echocardiograms should go along with appropriate ECG recording. At least 3 cardiac cycles should be acquired per view. For patients with atrial fibrillation, at least 5 cardiac cycles should be acquired per view. Doppler recordings should be acquired during end-expiration.

Views and measurements

Standard views

The standard views should be acquired in all patients. Additional views that are required for specific cardiomyopathies are shown on page 4. In case of valvular pathology, additional views should be acquired as recommended by corresponding guidelines.

Parasternal long-axis view	2D/M-Mode Color Doppler MV/AV
Parasternal short-axis view	
Apical level	2D
Mid-papillary level	2D (FR >55/sec)
MV level	2D Color Doppler MV
AV level	2D Color Doppler AV Color Doppler PV PW RVOT Color Doppler TV CW TV
Apical 4-chamber view	2D LV/LA 2D LV focused view (FR >55/sec), figure 1A* Color Doppler MV PW MV inflow TDI PW medial annulus TDI PW lateral annulus
Apical 5-chamber view	2D LV/LA Color Doppler AV PW LVOT CW AV
RV-focused apical 4 chamber	2D RV/RA 2D RV focused view (FR >55/sec) M-mode tricuspid annulus TDI PW tricuspid annulus Color Doppler TV CW TV
Apical 2-chamber view	2D LV/LA 2D LV focused view (FR >55/s), figure 1B* Color Doppler MV
Apical 3-chamber view	2D LV/LA 2D LV focused view (FR >55/s), figure 1C* Color Doppler MV/AV
Apical 3D view	LV focused (FR >20)
Subcostal 4-chamber view	2D
Subcostal vena cava inferior	2D/M-mode (with sniff)

Additional views

Hypertrophic cardiomyopathy

Apical 5-chamber view or 3-chamber view	(Doppler) PW/CW LVOT and mid-LV after Valsalva manoeuvre or exercise
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Non-compaction cardiomyopathy

Parasternal short-axis view	(2D) Focused short-axis views for measurement of LV compacted/non-compacted ratio
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Restrictive cardiomyopathy

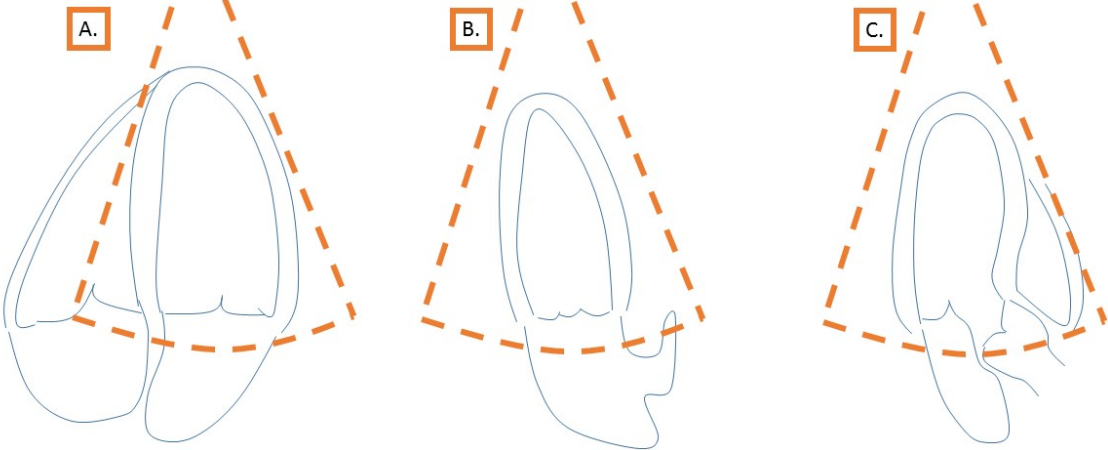
Apical 4-chamber view	(Doppler) PW of MV/TV inflow during in- and expiration (with respiration curve)
Subcostal vena cava inferior	(Doppler) PW of hepatic vein flow during in- and expiration (with respiration curve)

Right ventricular cardiomyopathy

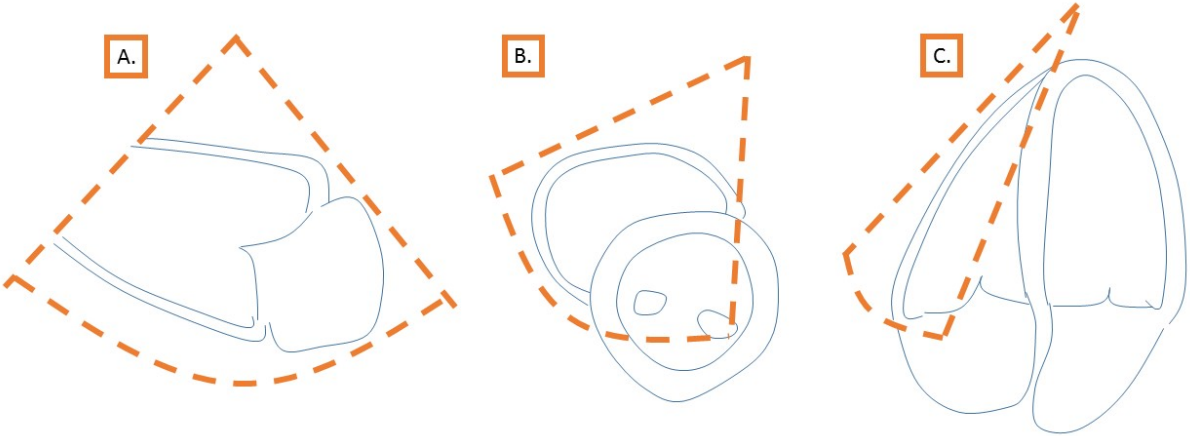
Parasternal long-axis view and parasternal short-axis view (AV level)	(2D) Focused on RVOT for measurement RVOT diameters
Parasternal RV-inflow, *figure 2A	(2D) Two separate acquisitions for assessment inferior/anterior RV wall (adjust focus position accordingly)
Parasternal short-axis view, *figure 2B	(2D) Focused on RV for assessment wall motion abnormalities (adjust focus position accordingly)
RV-focused apical 4 chamber, *figure 2C	(2D) Narrow-angled view of RV free wall during end-expiration for strain analysis (FR >80/s)
Subcostal 4-chamber view	(2D) Focused on RV

Figures

*Figure 1: LV-focused views



*Figure 2: RV-specific views



Literature references

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