

Echocardiogram - Interpretation - Full Clinical Guideline

Reference no.:CG-CARDIO/2018/014

All suggested management sections are looking at the echo abnormality in isolation with no change in patient symptoms – if any other parameters change in conjunction with the echo abnormality (ie dilated LV, Pulmonary hypertension) then the patients treatment pathway must reflect this and cardiology review should be considered.

Echo abnormality	Interpretation	Suggested management
Aortic Regurgitation	Mild aortic regurgitation is not uncommonly seen with hypertension or dilatation of the aortic root. Moderate AR is also quite common in the elderly but can be underestimated on echo. Severe aortic regurgitation requires further assessment. See also congenital cardiac abnormalities for Bicuspid aortic valve assessment.	If patient symptomatic to any degree, consider referral to cardiology. If severe aortic regurgitation is present suggest referral to cardiology. If the patient is not suitable for intervention, serial assessments are not required. If they are Mild rescan - 3 yrs Moderate - 2 yrs Severe every year unless otherwise indicated
Aortic Stenosis	Severity of aortic stenosis is normally assessed by measuring the peak aortic gradient, the mean gradient and assessment of calculated aortic valve area. Gradient may underestimate degree of stenosis in patients with reduced LV function in which case other measurements (eg ZVA, planimetry) may be used to estimate the valve area and severity of stenosis and therefore the reporting physiologist/sonographer will grade the stenosis taking into account all factors. See also congenital cardiac abnormalities for Bicuspid aortic valve assessment.	If patient is symptomatic with SOB, chest pain, dizziness or syncope suggest urgent cardiology referral. Asymptomatic patients with aortic stenosis should be considered for referral to cardiology for clinical/echocardiographic follow up. Aortic stenosis in a patient who would not be a candidate for valve intervention (TAVI or AVR) surgery does not require rescans or referral – discuss with cardiology if unsure. Rescan 1 yr after initial diagnosis, if stable:- Mild rescan 3 yrs Moderate rescan 1 – 2 yrs Severe 6 – 12 months (on cardiology advice)

Cardiac masses	Cardiac masses, including thrombus, vegetations and benign and malignant cardiac tumours	Any patient with suspected cardiac mass should be referred for cardiology assessment
Dilated aortic root	Usually associated with aortic valve disease or hypertension, if acute history of chest /back pain consider aortic dissection	Suggest referral to cardiology if significantly dilated (>4.5 cm). Look for features of Marfan syndrome or bicuspid AV. If acute dissection is suspected admit to ED. Ensure hypertension is optimally controlled. In patients > 65 yrs of age aortic root diameter of < 4 cm is not of significant concern and aortic diameters of this size over 65 years do not require follow up
Dilated left atrium	When associated with atrial fibrillation it indicates an increased risk for thrombo-embolism. Also associated with mitral disease, hypertension ischaemic heart disease and cardiomyopathy	Consider anticoagulation if AF. (refer to AF guidelines) Ensure optimal control of BP
Dilated right heart	Associated with pulmonary hypertension, left to right shunts and AVRC. Report will usually give an estimate of likelihood of pulmonary hypertension.	In the absence of significant lung disease, a dilated right heart with or without pulmonary hypertension requires cardiology referral for further investigation e.g. primary pulmonary hypertension, shunts, cardiomyopathy, heart failure. If pulmonary hypertension and chronic lung disease refer to a respiratory physician.
Left ventricular aneurysm	Usually the results of coronary artery disease with previous myocardial infarction. May contain thrombus	Suggest referral to cardiology unless previously known and investigated

Left Ventricular hypertrophy	Can be due to hypertension to aortic valve disease. If no obvious cause present then it may be due to hypertrophic cardiomyopathy or infiltration (amyloid, fabry)	<p>If the patient is hypertensive, moderate-severe hypertrophy requires a review of therapy, if there is no obvious cause for hypertrophy, or reports indicate hypertrophic cardiomyopathy, refer to cardiology for investigation. "mild concentric LVH" is common, particularly in the elderly and generally just requires BP control.</p> <p>A sub aortic bulge (sigmoid septum) is common in the elderly and may cause a murmur</p>
Left ventricular systolic impairment	This can be asymptomatic but is more commonly associated with signs and symptoms of heart failure	<p>Review local guidelines for heart failure management. Patients with severe (LVEF <35%) and moderate (LVEF 35-45%) left ventricular dysfunction (LVSD) generally should be reviewed by cardiology. Patients with known chronic severe LVSD do not require further echo's unless a new intervention is being considered.</p> <p>It should be remembered that estimations of LV function are highly operator dependant and small changes should not be over interpreted.</p>
Left ventricular diastolic dysfunction	This can be asymptomatic but is more commonly associated with signs and symptoms of heart failure	<p>Grade 1 diastolic dysfunction (reversed mitral E to A ratio) is essentially a normal variant in > 65 yrs of age and does not require any action or monitoring (beyond BP control)</p> <p>Grade 2 & 3 heart failure (even with normal systolic LV function) should be treated in line with the local heart failure policy.</p>

Mitral regurgitation	Commonly secondary to left ventricular enlargement (dilated annulus) or due to intrinsic mitral pathology (valve reported as abnormal)	If moderate or severe mitral regurgitation is present suggest referral to cardiology. If heart failure and mild mitral regurgitation optimise heart failure therapy. Mild MR does not usually require review. If the patient is not suitable for intervention, serial assessments are not required. Moderate MR rescan 1-2 yrs (more frequently if underlying cause is ischemia) Severe MR refer to cardiology and rescan as advised by cardiology (usually yearly) unless not a candidate for mitral surgery.
Mitral stenosis	Mainly due to rheumatic heart disease. Severity is assessed by Mitral valve area < 1.0 cm ² = severe, 1 – 1.5 cm ² moderate, < 1.5 cm ² = mild. Valve gradients are also assessed	Suggest referral to cardiology for further assessment if moderate/severe. If in AF have a high risk of thrombo-emboli and so warfarin should be prescribed in the absence of contra indications. If the patient is not suitable for intervention, serial assessments are not required Mild rescan 3 yrs Moderate rescan yearly Severe yearly
Mitral valve prolapse	Now less commonly reported than previously. In true MVP severity of MR can be difficult to assess	Commonly seen is billowing of the valve body which results in only mild regurgitation, if any MR. True prolapse, where the tip of the valve leaflets prolapses atrially, is associated with moderate or severe MR. Patients with MR classified as moderate or severe and mitral prolapse should be referred if candidates for surgery
Pericardial effusion	Initiate investigations to determine cause	If moderate/large pericardial effusion – suggest referral to cardiology, if evidence of tamponade suggest immediate admission. Trivial pericardial fluid especially localised around only the right atrium is unlikely to be of any clinical importance.
Slight valvular thickening	Commonly seen in the elderly particularly the aortic valve cusps	If no reported stenosis/regurgitation or signs and symptoms of heart failure, then no further action is required. If < 65 yrs of age rescan 5 yrs

Thrombus	Usually seen in the left ventricle/left atrium. Always significant. If reported as mobile, high risk of thromboembolism	Will usually indicate the need for anticoagulation, although adherent thrombus late after infarction may not need anticoagulation. Suggest referral to cardiology
Pulmonary/Tricuspid regurgitation	Common findings during echocardiography. Allow assessment of pulmonary artery pressure non-invasively using Doppler.	Mild pulmonary and/or tricuspid regurgitation associated with normal chamber sizes and normal pulmonary artery pressure is a normal finding and no action is required. If pulmonary artery pressure is raised, consider respiratory disease, left heart disease, or primary pulmonary hypertension, consider cardiac review. Mild PH (<40 mm HG) is common, is often associated with systemic HT and, particularly in the elderly, generally does not require further assessment. Severe TR requires further review
Vegetations on cardiac valve	Rare finding on normal valves usually a sign of infective endocarditis	Suggest urgent referral to cardiology. Patients can get chronic vegetations after treatment for SBE
Wall thinning of left ventricular segment	Usually due to chronic coronary artery disease/previous MI or with some cardiomyopathies.	If previously documented myocardial infarction in the affected region, then the finding is compatible with this conclusion
Mechanical valve replacements	MV Repair	A baseline study should have been performed at the surgical centre 6 – 12 weeks post implant, repeat echo only if change in clinical assessment or 5 yearly. Full details of valve make/size should be given on referral. A Baseline study should be performed at the surgical centre 6 – 12 weeks post surgery. Then rescan 1 yr, if > 65yrs no need to repeat if stable, if < 65 yrs rescan a 2 nd 1 yr interval then no need to repeat if stable.
Biological Valve replacements	TAVI	A baseline study should have been performed at the surgical centre 6 – 12 weeks post implant. No scan required for the first 5 years if no change in clinical assessment. 1 – 2 yrs. thereafter. Scan yearly

Congenital cardiac abnormalities	Wide range of abnormalities and possible surgical outcomes Bicuspid valve	Minor abnormalities where the patient was discharged (childhood murmurs) do not require follow up if no change in clinical assessment. All other patients treatment pathway should be discussed with the grown up congenital heart clinic. Assessment of stenosis/ regurgitation or root dilatation with bicuspid valves should be scanned at 50% intervals compared to calcific/rheumatic valves.
Atrial Septal Defect (ASD)/Patent Foramen Ovale (PFO)	Often difficult to visualise - abnormalities and flows associated with the intra atrial septum.	All patients with an atrial septal defect (usually associated with right heart dilation) should be referred to cardiology. An atrial septal aneurysm or incidental patent foramen ovale in the absence of relevant clinical history (TIA or stroke, peripheral embolism, diving) is not significant and can be found in up to 20% of people.
BNP Values		Pt with suspected heart failure and BNP level of 400 pg/ml (116 pmol/litre) or an NTproBNP level above 2000 pg/ml (236 pmol/litre) echo within 2 weeks unless known severe LV systolic dysfunction. BNP level between 100 and 400 pg/ml (29-116 pmol/litre) or an NTproBNP level between 400 and 2000 pg/ml (47 – 236 pmol/litre) echo within 6 weeks unless known severe LV systolic dysfunction Be aware that high levels can have causes other than heart failure, including left ventricular hypertrophy, ischaemia, tachycardia, right ventricular overload, hypoxia (including pulmonary embolism), GFR less than 6- ml/minute, sepsis, COPD, diabetes, age greater than 70 and liver cirrhosis.

Based on original work from Drs Walsh & Sosin Consultant Cardiologists at Nottingham University Hospitals and expanded by the Consultant Cardiologists Mc Cance, Baron and Kelly at Derby Teaching Hospitals.

Version 4. Data compiled by Anne Bebbington, Advanced Clinical Physiologist Derby Teaching Hospitals. March 2018. To be reviewed March 2021

Documentation Controls

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