

UHDB Guidelines for the use/interpretation of Echocardiography

Reference no:CG-CARDIO/2023/014

- Based on work from Consultant Cardiologists at Nottingham University Hospitals and expanded by the Consultant Cardiologists at Derby & Burton Teaching Hospitals.

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.	If the patient is symptomatic to any degree, consider referral to cardiology. If Moderate or severe aortic regurgitation or the aortic root is dilated suggest referral to cardiology. If the patient is not suitable for intervention, serial assessments are not required. Trace/Mild; with normal valve and root does not usually require echo surveillance Mild/Moderate, rescan 3 - 5 yrs Moderate: 1- 2 yrs Severe every 6 – 12 months-unless otherwise indicated
Aortic Stenosis	Severity of aortic stenosis is normally assessed by measuring the peak velocity, > 4 m/s suggests severe aortic stenosis, 3.0 - 3.9m/s moderate, < 2.9 m/s mild. Gradients may underestimate the degree of stenosis in patients with reduced LV function, in which case other measurements (eg ZVA, planimetry) may be used to	If patient is symptomatic with severe AS (SOB, chest pain, dizziness or syncope) this requires urgent cardiology referral. Findings of moderate or severe aortic stenosis including asymptomatic patients 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

	estimate the valve area and severity of stenosis.	does not require rescans or referral – discuss with cardiology if unsure. Rescan 1 yr. after initial diagnosis, if stable:- Mild rescan 3 – 5 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 normally 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	Suggest referral to cardiology unless previously known and investigated

	infarction. May contain thrombus	
Left Ventricular hypertrophy/Relative wall thickening	<p>Can be due to hypertension or aortic valve disease. If no obvious cause present then it may be due to hypertrophic cardiomyopathy or infiltration (amyloid, fabry)</p> <p>Relative wall thickness/Mass looks at the LV wall thickness compared to LV size and relative to BSA</p>	<p>If the patient is hypertensive, moderate- severe hypertrophy requires a review of therapy, if there is no obvious cause for hypertrophy, or reports indicates 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> <p>Concentric remodelling – a precursor to LVH, ensure good BP control.</p> <p>Eccentric LVH (normal or reduced wall thickening with a dilated LV) needs cardiology review</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 LVEF < 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 or the patients symptoms change significantly.</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>Symptomatic 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)	<p>If moderate or severe mitral regurgitation is present suggest referral to cardiology. If heart failure and mild mitral regurgitation optimise heart failure therapy.</p> <p>If the mitral valve appears normal mild MR does not usually require review unless associated with mitral valve prolapse then review 3 – 5 yrs.</p> <p>If the patient is not suitable for intervention, serial assessments are not required.</p> <p>Moderate MR rescan 1-2 yrs (more frequently if underlying cause is ischemia)</p> <p>Severe MR refer to cardiology and rescan as advised by cardiology (usually 6 – 12 months) unless not a candidate for mitral surgery</p>
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 used to assess severity.	<p>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</p> <p>Mild rescan 3 – 5 yrs.</p> <p>Moderate rescan 1 – 2 yrs.</p> <p>Severe 6-12 months</p> <p>Sinus Rhythm/AF may give conflicting Doppler data, discuss with cardiology if results do not match clinical picture.</p>
Mitral valve prolapse (MVP)	Now less commonly reported than previously. In true MVP severity of MR can be difficult to assess	<p>Commonly seen as billowing of the valve body which results in only mild regurgitation, if any MR.</p> <p>True prolapse, where the tip of the valve leaflets prolapses atrially, and is associated with moderate or severe MR.</p> <p>Patients with MR classified as moderate or severe and mitral prolapse should be referred.</p>

		Any degree of MVP in young patient refer to cardiology.
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 < 80 yrs. of age rescan 5 yrs.
Thrombus	Usually seen in the left ventricle/left & right 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 mild 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 mmHg) is common, is often associated with systemic HT and, particularly in the elderly, generally does not require further assessment. Severe TR requires further review
Tricuspid/Pulmonary stenosis	Rare findings, pulmonary stenosis usually associated with a congenital abnormality	Mild pulmonary stenosis, if congenital cause normally remains unchanged in adult life but rescan 3 – 5 yrs. if indicated Moderate or severe tricuspid or pulmonary stenosis should be referred to cardiology

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 4 – 6 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 4-6 weeks at surgical centre. Then rescan 1 yr. if > 65yrs discharge if stable, if < 65 yrs. rescan a 2 nd 1 yr. interval, then discharge if stable.
Biological Valve replacements	TAVI	A baseline study should have been performed at the surgical centre 4 – 6 weeks post implant. (< 60 yrs.) No scan required for the first 5 years if no change in clinical assessment. 1 – 2 yrs. thereafter. For > 60 yrs. scan 10 yrs. post implant/or change in clinical assessment and then surveillance scans 1 – 2 yrs. Post implant echo 4- 6 weeks, then annual surveillance, if stable increase to 2 yearly. >80 years old after 1 st yearly ECHO from valve clinic can be discharged.
Congenital cardiac abnormalities	Wide range of abnormalities and possible surgical outcomes	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

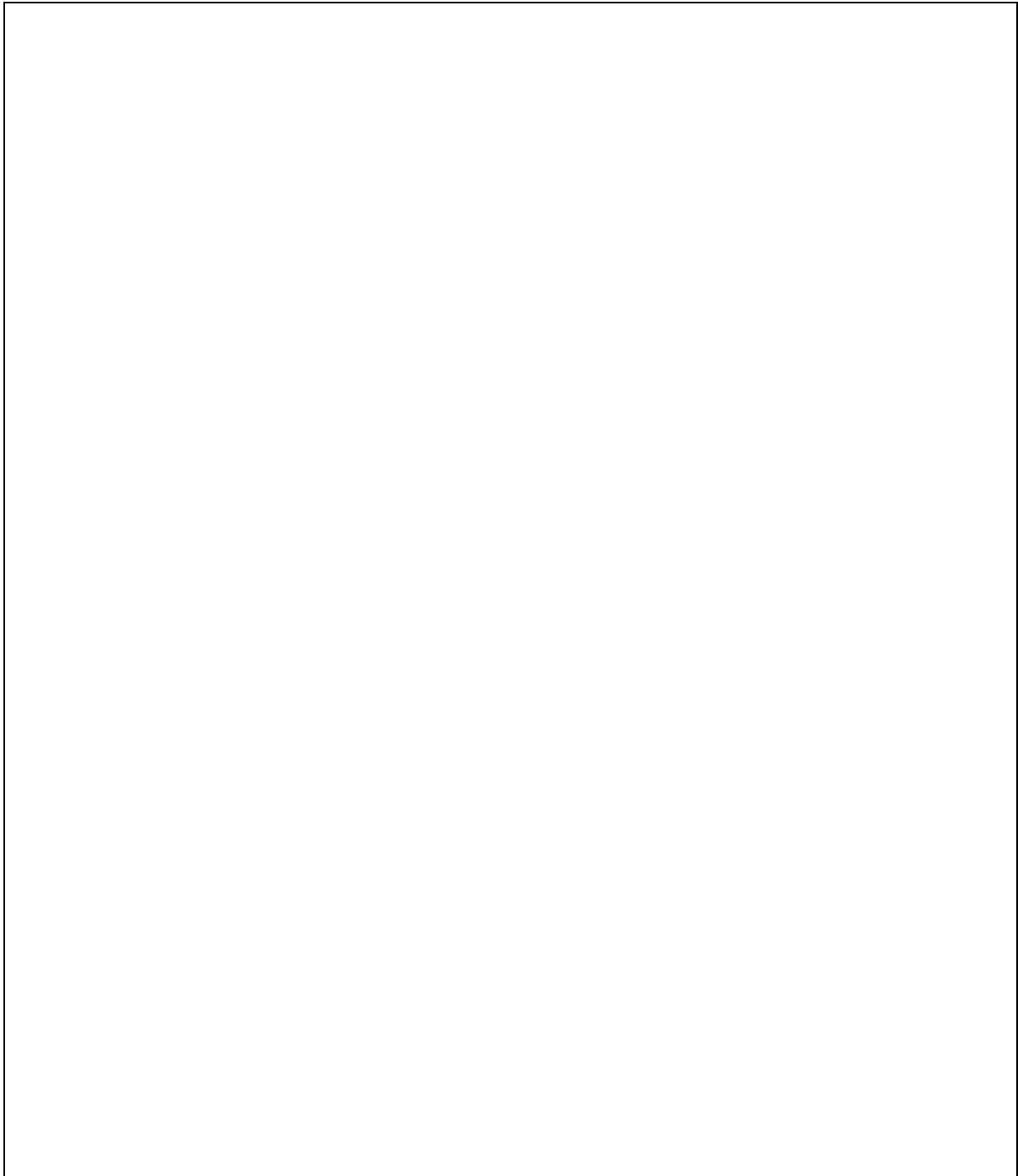
	Bicuspid valve	<p>should be discussed with the grown up/Adult congenital heart clinic.</p> <p>Bicuspid valves with no AS, no aortic root dilatation and no more than mild AR 3 –5 yearly scan.</p> <p>Bicuspid valve with thickening and mild AS rescan at one year and 2 yearly thereafter if no changes noted on the repeat scan . Bicuspid valves with moderate or severe AS require cardiology review.</p>
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		<p>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.</p> <p>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</p> <p>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.</p>

Pulmonary Hypertension	<p>4 main causes</p> <p>Pulmonary arterial hypertension (rare)</p> <p>Pulmonary hypertension caused by left heart disease (most common)</p> <p>Pulmonary hypertension caused by lung conditions</p> <p>Pulmonary hypertension due to PE</p>	<p>Pulmonary hypertension is now graded as a probability in order to prevent underestimation when right atrial pressure is high. Various calculations and measurements are needed to be able to grade accurately.</p> <p>To assess pulmonary hypertension post PE usually scan 3/12 post PE</p> <p>Low probability of pulmonary hypertension, no follow up required.</p> <p>Intermediate and high probability of pulmonary hypertension unless as an obvious result of an abnormality already under treatment where the patient is already symptomatic then the patient should have cardiology or respiratory review dependant on other clinical findings.</p>
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Documentation Controls:

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Notes

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