British Society of Echocardiography

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# Clinical indications and triage of echocardiography

## Out-patient requests (excluding the follow-up of established valve disease)

## Introduction

This poster is part of a series of three outlining best practice in the triage of echocardiography requests. The two other posters cover the 'Heart valve disease' and 'Emergency inpatient and critical care' requests for echocardiography.

**The importance of triage**

- Accurate triage is an effective tool to release resources to patients who need it.
- The process of triage may differ between departments according to workflows and skill sets.
- Appropriate clinical time should be devoted to triage. This is of even greater importance under high demand/reduced capacity settings: experience suggests that clinical focus on triage releases both time and capacity for scanning.
- Together with separate advice on valve disease, this guidance is intended to reflect the common transthoracic echo (TTE) out-patient workload of an echocardiography department; it does not cover triage of more specialist echo services (e.g. cardio-oncology or adult congenital heart disease).

**How this document works**

Recommendations focus on the clinical information received from the referrer together with, where relevant, the predicted rate of progression of previously established pathology. Where incomplete clinical information has been provided by the referrer it is advised that the request is returned to allow for further clarification.

Under each section recommendations for TTE are categorised as being:

- ■ ***'Not indicated'*** where transthoracic echo is unlikely to routinely provide useful information
- ▶ ***'Indicated'*** where routine TTE is deemed appropriate - within 6 weeks
- ▶ ***'Urgent'*** where TTE should be prioritised

**Implementing triage within departments:**

This document is provided as a guide and a focus for discussion amongst local teams, not as a protocol. Timeframes for both the ***'indicated'*** and ***'urgent'*** categories will vary between departments based on the availability of personnel and resources. In the event of a shift in resources after initial triage, re-triage may be required.

Cardiologist support for triage is important for clinical decison-making that falls outside of these posters.

# OUTPATIENTS

## HEART MURMUR

■
- Unchanged murmur in an asymptomatic individual with a previous normal echo

▶
- Murmur in presence of cardiac or respiratory symptoms
- Murmur in an asymptomatic individual who has clinical features or other investigation suggesting structural heart disease

▶
- Murmur in the presence of class 3 or 4 heart failure symptoms or syncope

## SUSPECTED HEART FAILURE

If **clinical signs of heart failure (HF)** (e.g. peripheral oedema, bilateral pleural effusions) **and symptoms** consistent with HF, **perform NT-proBNP testing.**

- >400ng/l refer for HF specialist assessment (with echocardiography) as per NICE guidelines.[1]
- <400ng/l HF is unlikely (seek advice/guidance from specialist HF team prior to accepting)

**GP direct access or outpatient echocardiography alone (without HF specialist assessment) is not recommended in suspected chronic heart failure.**

■
- Clinical signs & symptoms of HF but NT-proBNP <400ng/l
- Patients in atrial fibrillation with an uncontrolled ventricular rate (unless class III or IV HF symptoms where urgent HF referral indicated)
- Routine repeat assessment in clinically stable patients in whom no change in management is contemplated

▶
- Clinical signs & symptoms of HF with elevated NT-proBNP ≥ 400ng/l
- Unexplained shortness of breath with abnormal ECG and/or radiographic signs of HF and elevated NT-proBNP (>400ng/l)
- Suspected inherited cardiomyopathy based on abnormal examination, ECG, or family history in first degree relative
- Assessment of neuromuscular diseases associated with cardiac manifestations (e.g. muscular dystrophies, Friedreich's ataxia, or mitochondrial myopathies)

▶
- Clinical signs & symptoms of HF with elevated NT-proBNP (≥ 2000ng/l)
- Class III or IV heart failure symptoms (with urgent referral/review to HF team)

**Ref: 1.** NICE guidelines (NG106) 2018. Chronic heart failure in adults: diagnosis and management

## HYPERTENSION AND SUSPECTED LEFT VENTRICULAR HYPERTROPHY

■
- Routine assessment of any patient with essential hypertension
- Asymptomatic patients with an established genetic or infiltrative cause of left ventricular hypertrophy where there is no change in clinical status and where an echo has been performed within the last 12 months
- Repeat assessment of left ventricular function in asymptomatic patients
- Repeat assessment for left ventricular mass regression (if clinical concern is present regarding hypertrophic cardiomyopathy then repeat assessment with CMR is preferable)

▶
- Suspected left ventricular dysfunction
- Elevated blood pressure with concerns for end organ damage
- Patients with a suspected or established genetic or infiltrative cause of left ventricular hypertrophy (with support from appropriate specialist teams where relevant)
- Assessment of a first degree relative of an established case of HCM or other relevant inherited cardiac condition

▶
- Accelerated hypertension (>180/120mmHg) with breathlessness or other clinical concerns of acute left ventricular dysfunction. Discussion with hospital team recommended for inpatient admission

## SUSPECTED CARDIAC MASS / POSSIBLE CARDIAC CAUSE OF SYSTEMIC CIRCULATION EMBOLISM

■
- Patients with terminal illness whose management would not be affected by identification of any echocardiographic abnormalities
- Patients in whom echocardiography will not affect the decision to commence anticoagulation

▶
- Embolic peripheral or neurological events suggesting an intracardiac mass:
  - Acute interruption of blood flow to a major peripheral or visceral artery
  - Unexplained stroke or transient ischaemic attack without evidence of prior cerebrovascular disease or without significant risk factors for other cause (consider saline contrast echocardiography by TTE or TOE)
  - The importance of a patent foramen ovale if found when performing a bubble-contrast study may depend on the patient's age and may therefore only be appropriate in those under 55
- Cross-sectional imaging or clinical findings suggesting an intracardiac mass (if possible left atrial appendage thrombus then TOE preferable)
- Periodic repeat assessment following removal of a cardiac mass or tumour (usually annual review will suffice after an initial post-op scan)
- Known primary malignancies where echocardiographic surveillance for cardiac involvement forms part of the normal staging process (e.g. renal cell carcinoma)

▶
- Embolic event in the presence of clinical or ECG suspicion of significant left ventricular impairment (e.g. anterior Q waves on 12 lead ECG or clinical examination findings suggestive of left ventricular systolic dysfunction)

## PULMONARY DISEASE

■
- Repeat assessment to evaluate the probability of pulmonary hypertension (PH) in those with a low probability of PH and no risk factors for pulmonary arterial hypertension or CTEPH.
- In those with intermediate or high echo probability of PH due to lung disease or left heart disease where echocardiography is unlikely to alter management. For follow up of TR see valve poster.

▶
- Lung disease combined with a clinical suspicion of right ventricular failure (e.g. peripheral oedema, raised jugular venous pressure)
- Following pulmonary embolism when clinical concern for right ventricular impairment and / or presence of developing pulmonary hypertension
- Patients with unexplained persistent or positional oxygen desaturation (consider bubble-contrast echocardiography to evaluate for a right to left shunt)

## ATRIAL FIBRILLATION

■
- Previous echocardiogram and no change in cardovascular status
- Echocardiography unlikely to alter management e.g. frailty

▶
- No previous echocardiogram where echo findings are likely to alter management (e.g. suspicion of structural heart disease or to guide antiarrhythmic medication choice)

**Ref: 1.** NICE Atrial Fibrillation Dec 2023

## PALPITATIONS AND PRE-SYNCOPE/SYNCOPE

■
- Vasovagal syncope with clear precipitant and normal ECG / cardiac examination
- TTE not essential (recommend medical history and clinical examination by experienced clinician prior to referral where possible):
  - Palpitations without ECG proof of arrhythmia or clinical suspicion of structural heart disease
  - Low burden or isolated ventricular ectopy in the absence of a clinical suspicion of structural heart disease

▶
- Assessment of patients who have an arrhythmia associated with structural heart disease (e.g. ventricular tachycardia, SVT, AF)
- Ventricular ectopy: Individualised approach to echocardiography. Ventricular ectopy increases with age. A ventricular ectopic burden of >10% is widely accepted as being abnormal. Echocardiography following clinical discussion is reasonable in those with a lower ventricular ectopy burden where there is a suspicion of structural heart disease
- Routine assessment of ventricular function to assist with the calculation of risk of sudden cardiac death post-myocardial infarction or following a documented ventricular arrhythmia
- Evaluation of left ventricular function prior to initiating certain anti-arrhythmic medications (e.g. flecainide)

▶
- Syncope in a patient with clinically suspected structural heart disease
- Exertional syncope or haemodynamically significant arrhythmia

## SUSPECTED PERICARDIAL DISEASE

■
- Repeat assessment of a small pericardial effusion without clinical change
- Follow-up studies in patients where management would not be affected by identification of any echocardiographic abnormalities

▶
- Clinically suspected pericardial effusion or pericardial constriction
- Periodic repeat assessment of a moderate or large pericardial effusion
- Repeat assessment of small pericardial effusion with a change in clinical status

▶
- Clinical suspicion of cardiac tamponade (especially if predisposing factors are present, e.g. known malignancy, suspected myo-pericarditis, recent cardiac surgery). Discussion with hospital team recommended for inpatient admission

## PRE OPERATIVE ECHOCARDIOGRAPHY FOR ELECTIVE AND SEMI-URGENT NON-CARDIAC SURGERY

■
- Request based purely on risk of surgery
- Referral based on age or frailty only
- Where a patient is under active echo follow-up (i.e. progressive valve disease or known LV dysfunction): repeat echo assessment prior to next planned echo review with no intervening change in clinical cardiac status
- Known arrhythmia (e.g. atrial fibrillation) without signs of congestive cardiac failure or murmur

▶
- Poor functional status associated with SOB / oedema and elevated NT-proBNP, before high-risk non-cardiac surgery
- Abnormal ECG (for example):
  - LBBB, LVH with strain (anterolateral ST depression +/- T wave inversion) or pathological Q waves are predictive of LVSD.
  - If there has been no change in 12-lead ECG since last echo, a clinically relevant change in LV function is unlikely.
- Clinical suspicion of structural heart disease in proven arrhythmia (e.g. atrial fibrillation) that would alter anaesthetic approach and no previous echo
- New murmur:
  - In presence of cardiac or respiratory symptoms
  - Asymptomatic individual in whom clinical features or other investigation suggest severe structural heart disease

## ESTABLISHED CHF & CARDIOMYOPATHY

■
- Patients with terminal illness whose management would not be affected by identification of any change in echo appearance
- Routine repeat assessment in clinically stable patients in whom no change in management or following procedures is contemplated

▶
- Repeat assessment where the result may change management or following procedures to improve cardiac function (e.g. guideline-directed medical therapy, device therapy, cardioversion, or coronary revascularisation)
- Repeat assessment where there has been a change in clinical status

▶
- New onset class III or IV heart failure symptoms (with urgent referral/review by HF team)

## AORTOPATHY [1,2]

■
- Patients frailty or terminal illness whose management would not be affected by identification of any change in echocardiographic appearance

▶
- Assessment of suspected or proven genetic disorders in which aortic pathology may be a feature, (e.g. Marfan Syndrome)
- For periodic assessment of aortic aneurysm or aortic root dilatation this should be reviewed by the clinician with regards to surveillance period or whether cross sectional imaging is needed in preference. If aortic root clearly seen and no concern for ascending aorta dilatation: annual echo default initially.
- Dilated aortic root:
  - If aortic root size increase by > 3mm validate by CT / MRI
  - If stable aortic root size and <45mm, it is reasonable to adjust surveillance period up to 24 months depending on clinical risk
- Bicuspid aortic valve and normal aortic root size: 3 yearly interval

▶
- Clinical suspicion of an acute aortic event (should not replace or delay cross-sectional imaging if more clinically appropriate). Discussion with hospital team recommended for inpatient admission

**Ref: 1.** 2022 ACC/AHA Guideline for the diagnosis and management of aortic disease
**2.** Multimodality imaging in thoracic aortic diseases – consensus statement from EACVI / ESC 2023