British Society of Echocardiography

Clinical Indications and Triage of Echocardiography

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

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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.

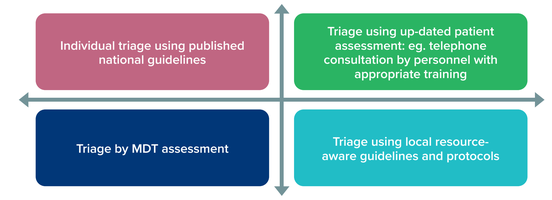
Under each section recommendations for TTE are categorised as being:

- ■ ***'Not indicated'*** where transthoracic echo is unlikely to routinely provide useful information
- ▶ ***'Indicated'*** where routine TTE is deemed appropriate
- ▶ ***'Urgent'*** where TTE should be prioritised (if relevant)

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.

Augmenting triage

The adjacent diagram outlines several different mechanisms of re-triage that can be undertaken. Any or multiple triage processes can be used according to local expertise and skill sets to maximise the accuracy of resource allocation.



OUTPATIENTS

HEART MURMUR

■
- Assessment of an innocent (i.e. physiological/flow) murmur diagnosed by a competent clinician
- Unchanged murmur in an asymptomatic individual with a previous normal echo

▶
- Murmur in the presence of cardiac or respiratory symptoms
- Murmur in an asymptomatic individual in whom clinical features or other investigation suggest structural heart disease

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

SUSPECTED HEART FAILURE

■
- Minor radiographic cardiomegaly in the absence of symptoms or signs of heart failure
- Assessment of patients with peripheral oedema but normal jugular venous pressure and no evidence of cardiac disease (e.g. asymptomatic individual with a normal 12 lead ECG)
- Patients in atrial fibrillation with an uncontrolled ventricular rate (unless class 3 or 4 heart failure symptoms)

▶
- Clinical or radiographic signs of heart failure (e.g. peripheral oedema, bilateral pleural effusions)
- Unexplained shortness of breath in the absence of clinical signs of heart failure if the ECG and/or chest X-ray is abnormal
- Persistent hypotension of unknown cause
- Suspected 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)

▶
- Class 3 or 4 heart failure symptoms
- Raised BNP (i.e. >2,000ng/l [1]) or previous history of myocardial infarction
- Clinical suspicion of pericardial effusion

[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
- Routine assessment of 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
- Evaluation of clinically suspected aortic coarctation (e.g. hypertension in the young)
- 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)

▶
- Accelerated hypertension with breathlessness or other clinical concerns of acute left ventricular dysfunction

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 (e.g. patients in atrial fibrillation with cerebrovascular event and no suspicion of structural heart disease)

▶
- 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 in the absence of a meaningful tricuspid regurgitation jet or other echo markers of pulmonary hypertension on echo within the last 12 months. If there is clinical concern regarding pulmonary hypertension then advice from a pulmonary hypertension specialist service is recommended.
- Lung disease with no clinical suspicion of cardiac involvement or pulmonary hypertension

▶
- 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
- Evaluation for suspected or established pulmonary hypertension
- Evaluation of response to treatment of pulmonary arterial hypertension and pulmonary embolism
- To distinguish cardiac from non-cardiac causes of dyspnoea when the results of clinical and other diagnostic testing are ambiguous
- Patients with unexplained persistent or positional oxygen desaturation (consider bubble-contrast echocardiography to evaluate for a right to left shunt)

BEFORE CARDIOVERSION IN PATIENTS WITH ATRIAL FIBRILLATION

■
- Patients requiring emergency cardioversion
- Patients on long-term anti-coagulation at a therapeutic level with no clinical suspicion of structural heart disease
- Patients on long-term anti-coagulation at a therapeutic level with established structural heart disease but no recent clinical change

▶
- To guide decision-making regarding DC cardioversion in a patient with no recent echo study (i.e. within the last 12 months) or in a patient with a recent echo study and a change in clinical cardiovascular status since it was performed
- Patients requiring cardioversion with atrial fibrillation of greater than 48 hours duration and not adequately anticoagulated (TOE required)
- Repeat assessment of documented left atrial appendage thrombus (TOE required)
- Repeat assessment following an embolic event at previous cardioversion (TOE required)
- Patients with atrial fibrillation of less than 48 hours duration together with a clinical suspicion of structural heart disease and not adequately anticoagulated (TOE required)

PALPITATIONS AND PRE-SYNCOPE/SYNCOPE

■
- Palpitations without ECG proof of arrhythmia or clinical suspicion of structural heart disease on examination by an experienced clinician
- Low burden or isolated ventricular ectopy in the absence of a clinical suspicion of structural heart disease
- Classic neuro-cardiogenic syncope

▶
- Clinical suspicion of structural heart disease in proven arrhythmia (e.g. atrial fibrillation or ventricular ectopy at greater than 10% frequency or ventricular ectopy occurring on exertion)
- 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 a high-risk occupation (e.g. pilot, bus driver)
- Assessment of patients without clinical suspicion of structural heart disease who have an arrhythmia commonly associated with structural heart disease (e.g. ventricular tachycardia)

▶
- Syncope in a patient with clinically suspected structural heart disease
- Exertional syncope

SUSPECTED PERICARDIAL DISEASE

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

▶
- Clinically suspected pericarditis, 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)

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

■
- Routine pre-operative echocardiography
- Where a patient is under active echo follow-up (i.e. valve disease): repeat echo assessment prior to next planned echo appointment with no intervening change in clinical status

▶
- Documented clinical evidence of ischaemic heart disease with a significantly reduced functional capacity (i.e. less than 4 metabolic equivalents (METS) workload achieved on exercise testing)
- Unexplained shortness of breath in the absence of clinical signs of heart failure if the ECG and/or chest X-ray are abnormal
- Murmur in the presence of cardiac or respiratory symptoms
- Murmur in an asymptomatic individual in whom clinical features or other investigation suggest severe structural heart disease

ESTABLISHED 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 is contemplated

▶
- Repeat assessment in documented cardiomyopathy where the result may change management or following procedures that may improve ventricular function (e.g. cardioversion or coronary revascularisation)
- Repeat assessment in documented cardiomyopathy where there has been a change in clinical status

▶
- New onset class 3 or 4 heart failure symptoms

AORTOPATHY

■
- Patients with 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)
- Diagnosis and periodic assessment of aortic aneurysm, dilatation of the aorta and previous surgical repair of the aorta (an annual default interval between scans but this timeline may be superseded following multi-disciplinary team review). Due to the limited ability of TTE to visualise the thoracic aorta the appropriate concomitant use of cross-sectional imaging is recommended.

▶
- Clinical suspicion of an acute aortic event (should not replace or delay cross-sectional imaging if more clinically appropriate)