

## Referring for echocardiography:

when not to test

### INTRODUCTION

The COVID-19 pandemic has prompted a reassessment of the traditional pathways and processes involved in the delivery of health care. This is especially true for diagnostic services, which have been profoundly affected during the pandemic as a result of an increase in demand and the reduction in workforce availability that followed staff illness, isolation, and redeployment. This has led to a dramatic increase in the number of patients waiting for key investigations; this is a problem felt acutely by echocardiography services across the UK. The effects of the pandemic have also exacerbated pre-existing tensions for echocardiography services, where an increasing incidence of cardiovascular pathology has not been matched by the number of sonographers trained to perform the scans.<sup>1</sup> This presents clinicians and healthcare providers with the potential for significant risk as large numbers of patients wait for a test with no meaningful framework available to easily determine which of them are in greatest need.

### DECIDING WHEN ECHOCARDIOGRAPHY IS OF BENEFIT

These concerns prompted the British Society of Echocardiography (BSE) along with NHS England to produce expert consensus guidance on when echocardiography is indicated and in which clinical situations it is unlikely to add benefit to a patient's clinical journey.<sup>2</sup> These recommendations were developed by expert review of the available literature for indications for an echocardiogram in specific clinical scenarios. This evidence base was applied pragmatically to develop consensus on when an echocardiogram is likely or unlikely to be of benefit to patients.

It was felt by the guideline development committee that it is often more helpful for non-specialist clinicians to understand when a particular test is not needed, and this is often not covered in usual guidelines

and recommendation documents. As many requests for echocardiography originate from primary care, specific guidance to support primary care clinicians in situations where balanced clinical reasoning favours avoiding further investigation has now been published (Figure 1). However, it is important to acknowledge that this guidance is not intended to replace individual clinical judgement.

An overreaching principle of medicine is that the result of any investigation should have a significant impact on a patient's management. It is often more challenging to decide when an echocardiogram is not needed, and this decision can be especially difficult to reach in a patient with a life-limiting condition. In this situation, the inevitable deterioration in symptoms may often provoke the clinician to look for a cause, but it must be clear that identification of this will meaningfully affect subsequent patient care. Careful discussion of the reasons for inaction is necessary but often it can be comforting for patients that another test is not needed.

### Heart failure

Assessment for possible heart failure is an extremely common reason to request an echocardiogram, especially if cardiomegaly is reported on a chest X-ray. However, in the absence of a significant cardiac history, and with a normal physical examination and 12-lead electrocardiogram (ECG), then the presence of simple cardiomegaly (without pulmonary congestion or other findings suggestive of cardiac disease) on a chest X-ray does not warrant an echocardiogram as the likely yield of identifying significant cardiac pathology is low.<sup>3</sup>

### Hypertension

Hypertension in a young patient (that is, aged <40 years) can prompt a search for a secondary cause and an echocardiogram is an important part of the work-up to look for an underlying cardiovascular

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**Submitted:** 6 April 2021; **Editor's response:** 27 April 2021; **final acceptance:** 6 May 2021.

©British Journal of General Practice 2021; **71:** 333–334.

**DOI:** <https://doi.org/10.3399/bjgp21X716441>

**Introduction**

Transthoracic echocardiography is an essential test in the evaluation of patients with suspected structural and functional cardiac conditions. When used appropriately it facilitates rapid diagnosis and timely intervention for patients. The BSE have previously issued detailed guidance, aimed at hospital and specialist referrers, regarding the indications for, and optimal timing of, outpatient, inpatient, and critical care transthoracic echocardiography. These indications can be accessed in full here [bsecho.org/PCTriage](https://www.bsecho.org/PCTriage). However, we also recognise that very often the most useful information in primary care is to know

the clinical conditions in which transthoracic echocardiography is not routinely indicated at the time of initial clinical contact. These conditions are grouped by symptom or clinical finding below for rapid reference by General Practitioners for use in primary care settings. This guidance is not intended to override clinical judgment in individual cases and has chiefly been created to support situations where clinical judgement favours avoiding further investigation. This document can also aid the general practitioner in challenging unnecessary echo requests from secondary care.

CONDITIONS IN WHICH AN ECHOCARDIOGRAM IS UNLIKELY TO AFFECT PATIENT MANAGEMENT	
<p><b>HEART MURMUR</b></p> <ul style="list-style-type: none"> <li>Assessment of an innocent (i.e. physiological/flow) murmur. An innocent murmur has previously been defined as: a systolic murmur of short duration; grade 1 or 2 intensity at the left sternal border; a systolic ejection pattern; a normal S2; no other abnormal sounds or murmurs; no evidence of ventricular hypertrophy or dilation; no thrills; and the absence of an increase in intensity with the Valsalva manoeuvre. Such murmurs are especially common in high-output states such as pregnancy.</li> <li>Unchanged murmur in an asymptomatic individual with a previous normal echo</li> </ul>	<p><b>SUSPECTED PERICARDIAL DISEASE</b></p> <ul style="list-style-type: none"> <li>Repeat assessment of a small pericardial effusion without clinical change</li> </ul>
<p><b>SUSPECTED HEART FAILURE</b></p> <ul style="list-style-type: none"> <li>Assessment of patients with peripheral oedema and no other symptoms to suggest cardiac disease with a normal ECG and BNP or NT-pro-BNP levels.</li> </ul>	<p><b>PRE-OPERATIVE ECHOCARDIOGRAPHY FOR ELECTIVE AND SEMI URGENT NON-CARDIAC SURGERY</b></p> <ul style="list-style-type: none"> <li>Routine pre-operative echocardiography</li> <li>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</li> </ul>
<p><b>HYPERTENSION AND SUSPECTED LEFT VENTRICULAR HYPERTROPHY</b></p> <ul style="list-style-type: none"> <li>Routine assessment of essential hypertension with normal ECG and examination over the age of 40</li> </ul>	<p><b>ESTABLISHED CARDIOMYOPATHY</b></p> <ul style="list-style-type: none"> <li>Routine repeat assessment in clinically stable patients in whom no change in management is contemplated</li> </ul>
<p><b>SUSPECTED CARDIAC MASS/POSSIBLE CARDIAC CAUSE OF SYSTEMIC-CIRCULATION EMBOLISM</b></p> <ul style="list-style-type: none"> <li>Patients in whom echo will not affect the decision to commence anticoagulation: for example, patients in atrial fibrillation with cerebrovascular event and no suspicion of structural heart disease</li> </ul>	<p><b>INHERITED CARDIAC DISEASES</b></p> <ul style="list-style-type: none"> <li>Where there is a family history of a cardiomyopathy a screening echo should only be undertaken in first-degree relatives (i.e. children, siblings and parents of the proband case) unless specialist guidance suggests otherwise.</li> <li>Echo outside of the guidance for frequency of repeat echos with a family history of cardiomyopathy</li> </ul>
<p><b>PULMONARY DISEASE</b></p> <ul style="list-style-type: none"> <li>Lung disease with no clinical suspicion of cardiac involvement or pulmonary hypertension</li> </ul>	<p><b>GENERAL CONSIDERATIONS</b></p> <ul style="list-style-type: none"> <li>Repeat echocardiogram in the absence of a change of patient symptoms or signs</li> <li>In patients with terminal or significantly life-limiting diseases in which an echo would not alter management</li> <li>In patients with significant frailty in which an echo would not alter management</li> </ul>
<p><b>PALPITATIONS AND PRE-SYNCOPE/SYNCOPE</b></p> <ul style="list-style-type: none"> <li>Palpitations without ECG proof of arrhythmia or clinical suspicion of structural heart disease on examination</li> <li>Classic neuro-cardiogenic (vaso-vagal) syncope</li> </ul>	

Figure 1. British Society of Echocardiography primary care triage poster. © Copyright British Society of Echocardiography. Reproduced with permission.

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aetiology (for example, coarctation of the aorta) and end organ damage.<sup>4</sup> However, an echocardiogram is not indicated routinely to evaluate patients with hypertension, particularly when a normal 12-lead ECG and physical examination is present. Inherited cardiac diseases can present in a wide age range and echocardiogram surveillance is mandated in patients who are primary-degree relatives of an affected individual. These patients should be under regular echocardiogram follow-up guided by a specialist clinic. However, unless symptoms change, an echocardiogram outside the international guidance is not indicated.<sup>5</sup>

**CONCLUSION**

Echocardiography is an incredibly versatile diagnostic tool and when used appropriately is vital in the prompt diagnosis and management in patients presenting with potential cardiac disease. However, its timely utility is predicated on the most

appropriate use of this imaging modality. In general practice often the most challenging decision is whether or not to refer or test. This guidance produced by the BSE is hoped to prompt reflection on the necessity of testing by the clinician, and support rational and evidence-based referral to echocardiography services.

**Provenance**

Freely submitted; externally peer reviewed.

**Competing interests**

The authors have declared no competing interests.

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