Triage of Inpatient Echocardiogram

Cardiology

September 2025

Triage of Inpatient Echocardiogram Flowchart

Referral from ward

Does echo affect acute management plan?

No → Outpatient

Yes

Is patient haemodynamically unstable?

Yes

Category 1 - within 1 hour of referral

- Suspected pericardial effusion with signs of tamponade. Concern regarding cardiac tamponade following coronary intervention or permanent/temporary pace-maker insertion or lead extraction
- Chest pain with haemodynamic instability. Suspected acute aortic dissection (echo should not delay CT)
- Clinical suspicion of endocarditis with evidence of acute cardiac failure, valve decompensation, or root abscess
- Cardiogenic shock as judged by an appropriately senior clinician. Return of circulation following cardiac arrest
- Suspected acute pulmonary embolism in an unstable patient to guide thrombolysis decision

Indication for emergency transthoracic echocardiography - focused echocardiography can be performed using hand-held device.

Where a clinician of sufficient seniority suspects:

- acute circulatory failure due to life-threatening hypovolemia;
- acute systolic or diastolic heart failure;
- acute right heart failure due to pulmonary embolus; or
- cardiac tamponade

Common reasons for declined echocardiogram requests

- Insufficient clinical details provided
- Echocardiogram unlikely to alter clinical management
- Normal NT-proBNP if clinical question is heart failure
- Recent echocardiogram (<12 months) with the same referral indication
- Clear source of sepsis and septicaemia other than infective endocarditis
- Confirmed pulmonary embolism
- Routine pre-operative echocardiogram

No → Is time-sensitive diagnosis needed?

Category 2 - within 24 hours of referral

- New diagnosis of heart failure with no previous recent echocardiogram (<12 months). Perform within 24 hours if haemodynamically unstable or decompensated) *Appendix -suspected heart failure (page 8)
- Acute myocardial infarction with suspected complications
- Pulmonary embolism if cardiovascular compromise persists following initial therapy
- Acute pulmonary oedema with no recent echocardiogram
- Pre-invasive coronary angiogram or permanent pacemaker (as recommended by GIRFT) insertion accepted by the cardiology team
- Pre-operative non-cardiac surgery with undiagnosed cardiac condition which will alter anaesthetic approach (new symptoms/ signs of suspected cardiac condition, ECG, troponin, NT-proBNP)
- Detection of high-risk complication of infective endocarditis where the patient is haemodynamically unstable.

Category 3 - within 5 days of referral

- New diagnosis of heart failure with no previous recent echocardiogram (<12 months). Perform within 5 days if haemodynamically stable and no evidence of decompensation *Appendix - suspected heart failure (page 8)
- Syncope with systolic murmur or arrhythmia (Aim within 24 hours if murmur is new or documented malignant arrhythmia)
- Stable acute coronary syndrome
- Suspected infective endocarditis (as triaged based on Dukes criteria)

Click for information on suspected heart failure (page 8)

N-terminal pro-B-type natriuretic peptide (NT-proBNP)

Pathology - April 2025

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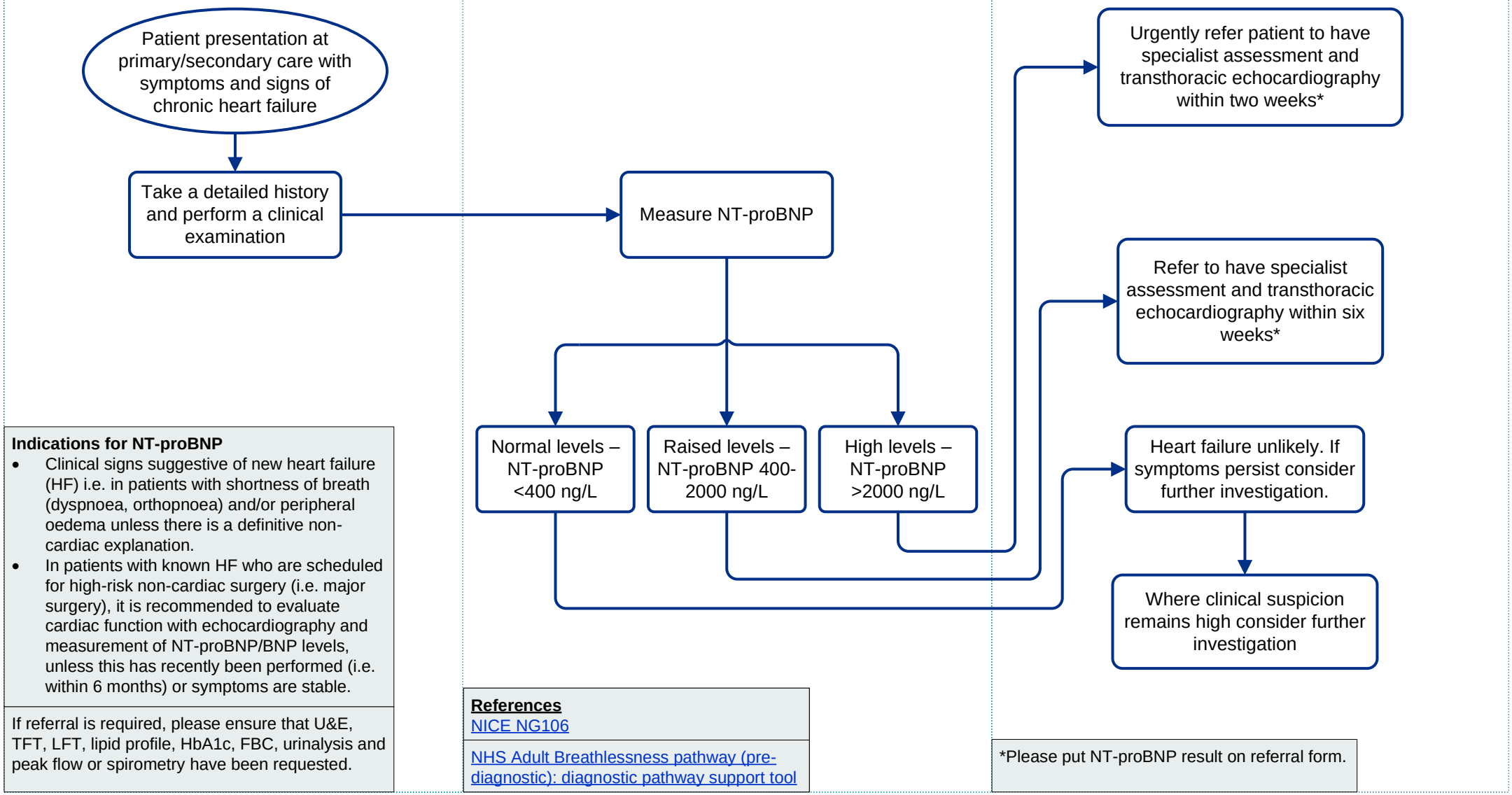
See notes for further information



Indications for NT-proBNP

- Clinical signs suggestive of new heart failure (HF) i.e. in patients with shortness of breath (dyspnoea, orthopnoea) and/or peripheral oedema unless there is a definitive non-cardiac explanation.
- In patients with known HF who are scheduled for high-risk non-cardiac surgery (i.e. major surgery), it is recommended to evaluate cardiac function with echocardiography and measurement of NT-proBNP/BNP levels, unless this has recently been performed (i.e. within 6 months) or symptoms are stable.

If referral is required, please ensure that U&E, TFT, LFT, lipid profile, HbA1c, FBC, urinalysis and peak flow or spirometry have been requested.

References

NICE NG106

NHS Adult Breathlessness pathway (pre-diagnostic): diagnostic pathway support tool

*Please put NT-proBNP result on referral form.

NT-proBNP in the investigation of Chronic Heart Failure

The use of the N-terminal pro B-type natriuretic peptide (NT-proBNP) measurements to act as an initial test for the investigation of chronic heart failure in primary care, prior to referral for echocardiography, has been recommended by NICE (1). The superior stability of NT-proBNP makes this the peptide of choice, and should be offered by all pathology laboratories to Primary Care.

To reduce unwarranted variation in the Laboratory support to diagnosing Chronic Heart Failure, GIRFT has worked closely with NHSE to ensure that all NHSE Pathology Laboratories use the NICE NG106 Guidance and follow GIRFT recommendations on:

1. Harmonising to the NT-proBNP test

2. Harmonising the testing pathway and decision limits (see figure 1).

3. Harmonising on units of measurement

4. Harmonising the turnaround time

In 2024 NHSE published "*Enhancing GP direct access to diagnostic tests for patients with suspected chronic obstructive pulmonary disease, asthma, or heart failure" (2).* The NHSE document embedded the NICE and GIRFT guidelines into routine NHSE practice, and recommended that Pathology Laboratories follow the NICE/GIRFT guidance.

In order to assess compliance with these guidelines, GIRFT undertook an Audit in late 2024 which showed that 96% of English Laboratories provide a Natriuretic peptide service for GPs and 95% of these provide NT-proBNP. This represents a significant response to reducing unwarranted variation in the Pathology service for Heart Failure. Reasons given for not providing the service include no funding by ICB (pathology DA Contract issues).

Pathway

Patient examination for suspected Chronic Heart Failure

- Take a careful and detailed history, perform a clinical examination and request NT-proBNP to guide the physician on the next part of the pathway. If the patient presents with breathlessness, the NHSE published *Adult breathlessness pathway (pre-diagnostic): diagnostic pathway support tool should be used* (3).
- Laboratories must use the units "ng/L" to report NT-proBNP.
- Laboratories should have a maximum turnaround time of 48 hours from receipt of the request.

Results

- **NT-proBNP >2000 ng/L (High levels):**
  - Because very high levels of NT-proBNP carry a poor prognosis, refer people with suspected heart failure and an NT-proBNP level above 2,000 ng/L urgently, to have specialist assessment and transthoracic echocardiography within 2 weeks (*Please put NT-proBNP result on referral form*).
- **NT-proBNP 400-2000 ng/L (Raised levels):**
  - Refer people with suspected heart failure and an NT-proBNP level between 400 and 2,000 ng/L to have specialist assessment and transthoracic echocardiography within 6 weeks. (*Please put NT-proBNP result on referral form)*.
- **NT-proBNP <400 ng/L (Normal levels):**
  - NT-proBNP <400 ng/L in an untreated patient makes a diagnosis of heart failure less likely.
  - If clinical suspicion remains high consider further investigation.

If referral is required, please ensure that U&E, TFT, LFT, lipid profile, HbA1c, FBC, urinalysis and peak flow or spirometry have been requested.

Be aware that:

- It should be noted that NT-proBNP can be elevated in conditions other than heart failure and that certain drugs can reduce levels (1). Thus in the interpretation of NT-proBNP NICE cut-off levels should be used initially, but drug therapy, age, other conditions and clinical suspicion should be taken into account.
- The level of serum natriuretic peptide does not differentiate between heart failure with reduced ejection fraction and heart failure with preserved ejection fraction.
- Obesity, African or African-Caribbean family background, or treatment with diuretics, angiotensin converting enzyme (ACE) inhibitors, beta-blockers, angiotensin II receptor blockers (ARBs) or mineralocorticoid receptor antagonists (MRAs) can reduce levels of serum natriuretic peptides.
- High levels of serum natriuretic peptides can have causes other than heart failure (for example, age over 70 years, left ventricular hypertrophy, ischaemia, tachycardia, right ventricular overload, hypoxaemia [including pulmonary embolism], renal dysfunction [eGFR less than 60 mL/minute/1.73 m2], sepsis, chronic obstructive pulmonary disease, diabetes, or cirrhosis of the liver).

Guidance

1. NICE Guideline NG106: Chronic heart failure in adults: diagnosis and management 2018
2. NHS England: Enhancing GP direct access to diagnostic tests for patients with suspected chronic obstructive pulmonary disease, asthma, or heart failure
3. NHS England: Adult breathlessness pathway (pre-diagnostic): diagnostic pathway support tool

Diagnostic pathway for patient presenting with chronic persistent breathlessness

(>8 weeks duration)

- **Breathlessness is frequently multi-factorial without a single specific diagnosis.**
- **Anxiety, depression, low physical activity and deconditioning are commonly associated with breathlessness.**

Clinical assessment

History and physical examination including:

- Smoking history and body mass index.

Initial investigations according to clinical judgement:

- FBC/TFTs/biochemistry
- ECG
- NT-proBNP
- Chest x-ray
- Spirometry ± reversibility with bronchodilators
- Fractional exhaled nitric oxide (FeNO)
- Patient health questionnaire (PHQ4)
- MRC breathlessness scale
- GP physical activity questionnaire (GPPAQ).

If diagnosis clear, undertake **confirmatory investigations** as appropriate and management of the condition:

- **Reassess** after appropriate timescale.

Diagnosis unclear

Discuss and implement further investigative plan at unexplained breathlessness MDM* utilising community diagnostic centres.

- Pulmonary function tests
- CT thorax
- Echocardiogram
- Ambulatory ECG monitoring.

Identify and confirm suspected diagnoses.

Undertake appropriate management.

Diagnosis remains unclear

Refer to respiratory physician or cardiologist for further investigations:

- Including cardiopulmonary exercise test.

Management

Breathlessness self-management, structured exercise rehabilitation, physiotherapy for breathing control exercises, occupational therapy, psychological support.

Management

Breathlessness self-management, smoking cessation, healthy lifestyle support including maintaining activity and weight management.

For acute severe breathlessness or red flags consider urgent specialist assessment.

Clinical judgement to be used at all times

RED FLAGS INCLUDE:

- Symptoms and signs including chest pain, haemoptysis, cyanosis, unable to speak in sentences, confusion, agitation, unilateral leg swelling, inspiratory and expiratory stridor
- Increased risk of VTE
- Rapidly progressing symptoms
- New low resting SpO2 or reduction during minimal exercise
- Unexplained reduction in SpO2 and elevated respiratory rate.

*MDM - see glossary for more details.