

Early diagnosis of heart failure

Although there is a range of symptoms and signs reported with heart failure, the combination of natriuretic peptide testing and echocardiography should help rule out or confirm the diagnosis^{1,2}.

Barriers to early diagnosis

DIAGNOSTIC PROCESS

- Symptoms of HF are often **non-specific** and clinical presentation can be complicated by **comorbidities**²
- Unexplained shortness of breath is the most common presentation, but neither specific nor sensitive for predicting HF²
- The non-specificity of the signs and symptoms of HF can make the process challenging²
- **Only 66%** of GPs reported feeling **confident** in their ability to **diagnose** LVSD³

DIAGNOSTIC TESTS

- In addition to clinical history and physical examination, electrocardiogram (ECG) is recommended as an initial assessment when HF is suspected
- The guidelines also recommend using **NT-proBNP combined with echocardiography** to diagnose HF^{1,2}
- **Less than 50% of GPs** reported feeling confident in their ability to interpret results of an ECG³
- Natriuretic peptides are **not extensively used**, with GPs expressing a need for access to natriuretic peptide tests³

Unexplained shortness of breath is a typical symptom of heart failure^{1,2}

SYMPTOMS AND SIGNS TYPICAL OF HEART FAILURE

Typical symptoms

- Breathlessness
- Orthopnoea
- Paroxysmal nocturnal dyspnoea
- Reduced exercise tolerance
- Fatigue, tiredness, increased time to recover after exercise
- Ankle swelling

More specific signs

- Elevated jugular venous pressure
- Hepatojugular reflux
- Third heart sound (gallop rhythm)
- Laterally displaced apical impulse

Early diagnosis is important to improve patient outcomes⁴

- Various diseases can lead to HF*, including coronary artery disease, cardiomyopathy, hypertension, congenital heart disease, pericardial disease, pulmonary hypertension, pulmonary arterial hypertension (PAH), diabetes, HIV, hyper-and hypo-thyroidism^{1,5}

1 in 20

Patients presenting in the primary care setting with chronic unexplained shortness of breath have heart failure as the cause⁶

Natriuretic peptide testing is a key tool in combination with echocardiography. However, it is important to follow guidance on NP testing²

Natriuretic peptides testing guidance

Key tools for rapid and accurate HF diagnosis

KEY GUIDANCE

- Always use NPs in conjunction with all other clinical information and never as a stand-alone test²
- NPs are reasonable surrogates for intracardiac volumes and filling pressures²
- NPs cannot identify the underlying cause of HF; if elevated then cardiac imaging must be used²
- If BNP or NT-proBNP levels are abnormal, further diagnostic tests are required²
- **Combined with echocardiography, BNP or NT-proBNP enable rapid and accurate diagnosis of HF and its phenotypes²**

RECOMMENDATIONS

- ESC Guideline for the diagnosis of acute and chronic heart failure states NPs can be used as an initial diagnostic test, especially in the non-acute setting, when echocardiography is not immediately available¹
- Class recommendation (strong evidence) for use of NPs in ambulatory patients with new onset unexplained shortness of breath⁷
 - Refer for echocardiography, based on the results¹
 - Other tests required only if diagnosis remains uncertain¹
- Available as point-of-care test or via local pathways central laboratories²

Natriuretic peptide testing is an integral part of assessment to rule out a heart failure diagnosis⁷.

Ruling out heart failure

- Diagnosis of new-onset HF at the community level can be difficult²
- Physical findings only have limited sensitivity (50-60%)²
- While an abnormal ECG increases the likelihood of a HF diagnosis, it is not reliable as a test to diagnose HF because of low specificity¹
- Biomarkers, and more specifically testing for natriuretic peptides (NP), are important components of the diagnosis of HF¹

Heart failure investigations include clinical findings, ECG and Chest X-ray findings and the results of natriuretic peptide testing².

Diagnosis and evaluation of heart failure phenotype can be confirmed from echocardiography².

If levels of NT-proBNP or BNP are normal,
then HF is unlikely¹

Taking account of factors that affect NP levels, the following test results can indicate whether acute heart failure is a likely or unlikely diagnosis.

Natriuretic peptide cut-off points⁸

TO EXCLUDE ACUTE HF

BNP

Cut-off value

< 30-50 pg/mL

Sensitivity

97%

Specificity

62%

PPV

71%

NPV

96%

NT-proBNP

Cut-off value

< 300 pg/mL

Sensitivity

99%

Specificity

68%

PPV

62%

NPV

99%

TO IDENTIFY ACUTE HF - SINGLE CUT-OFF POINT

BNP	NT-proBNP
Cut-off value < 100 pg/mL	Cut-off value < 900 pg/mL
Sensitivity 90%	Sensitivity 90%
Specificity 76%	Specificity 85%
PPV 79%	PPV 76%
NPV 89%	NPV 94%

TO IDENTIFY ACUTE HF - MULTIPLE CUT-POINT

BNP		
Cut-off value		
< 100 pg/mL To exclude HF	100-400 pg/mL "Grey zone"	> 400 pg/mL To rule in HF
Sensitivity		
90%	*	63%
Specificity		
73%	*	91%
PPV		
75%	*	86%
NPV		
90%	*	74%

NT-proBNP

Cut-off value

< 450 pg/mL

For age < 50 yr

< 900 pg/mL

For age 50-75 yr

< 1800 pg/mL

For age > 75 yr

Sensitivity

90%

Specificity

84%

PPV

88%

NPV

66%

References

BNP: a-type natriuretic peptide; CDR: clinical decision rules, ECG: electrocardiogram; GPs: general practitioners; HF: heart failure; LVH: left ventricular hypertrophy; LVSD: left ventricular systolic dysfunction; NPV: negative predictive value; NT-proBNP: N-terminal pro-B type natriuretic peptide; PAH: pulmonary arterial hypertension; PH: pulmonary hypertension; PPV: positive predictive value; yr: years.

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