

ECHOCARDIOGRAPHY IN HFpEF

ESC 2026 CLINICAL DIAGNOSIS · FROM REST TO EXERCISE PHYSIOLOGY

ESC 2026 [1] · ASE / BSE echo guidance [2,3] · Additional measures labelled by source

**NORMAL AT REST
DOES NOT EXCLUDE
HFpEF**

1 PHENOTYPE & CLINICAL CONTEXT

HFpEF CLINICAL DEFINITION [1]

LVEF $\geq 50\%$

No previous LVEF $<50\%$.
Review the EF trajectory.

Current or prior symptoms
and/or signs of heart failure

+

**Objective cardiac
abnormalities**

Structural and/or functional
evidence consistent with diastolic
dysfunction or raised filling
pressures.

Supported by natriuretic peptides.

ESC 2026 CLASSIFICATION

HFmrEF has been removed.
LVEF 41–49% is now within
HFrEF ($<50\%$).

Diastolic dysfunction $\neq$ HFpEF.

Without current or prior HF
symptoms/signs, cardiac
abnormalities may represent
stage B (pre-HF).

START WITH CLINICAL PROBABILITY

Consider age, obesity,
hypertension, AF, diabetes and
CKD. Assess alternative causes of
symptoms.

2 RESTING ECHO: ESC 2026 CRITERIA

SUPPORTING EVIDENCE AT REST [1]

 $E/e' > 9$

Raised filling pressure more likely.
 ≥ 15 : more specific,
less sensitive.

LA VOLUME INDEX

 $>34 \text{ mL/m}^2$ · sinus rhythm $>40 \text{ mL/m}^2$ · AF

LV GEOMETRY

LV mass index

 $\geq 95 \text{ g/m}^2$ women $\geq 115 \text{ g/m}^2$ menOR RWT >0.42

PULMONARY PRESSURE

sPAP $>35 \text{ mmHg}$ OR TR Vmax $>2.8 \text{ m/s}$

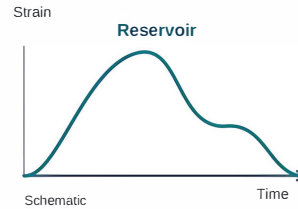
TR velocity measured at rest

**More abnormal parameters
increase HFpEF probability.**
No single value establishes the
diagnosis.

Complete TTE: assess LV/RV
function, valves and aetiology.
**Choose the diastolic algorithm
appropriate to rhythm and valve
disease.**

3 LEFT ATRIAL STRAIN

LOOK BEYOND ATRIAL SIZE



LA RESERVOIR STRAIN

 $\leq 18\%$

ASE 2025: supports elevated LA
pressure within its algorithm. [2]

Useful when conventional
measurements are missing or
discordant.

**A higher value does not
exclude HFpEF.** Sensitivity is
limited when EF is preserved. [2]

ACQUIRE & INTERPRET CAREFULLY

Use LA-focused views and
check tracking. Use dedicated
pathways for AF or significant
mitral disease. [2,3]

Source distinction: an ASE-derived
adjunct; not a criterion in ESC 2026
Table 10.

4 DIAGNOSTIC UNCERTAINTY

Exertional symptoms with normal
or indeterminate resting findings?



ESC 2026: select CPET, exercise
echo or invasive assessment to
resolve uncertainty. [1]

ASE 2025 EXERCISE CRITERIA [2]

Average $E/e' \geq 14$
(or septal $E/e' \geq 15$)
AND TR Vmax $\geq 3.2 \text{ m/s}$

BSE 2024 EXERCISE CRITERIA [3]

$E/e' > 14$ + TR Vmax $>2.8 \text{ m/s}$
suggest raised filling pressure.

Keep each framework's cut-offs
together. An isolated TR rise is
insufficient. [2,3]

IF DOUBT PERSISTS [1]

Selected patients: catheter
testing when the result may
change management.

PCWP ≥ 15 at rest
or ≥ 25 with exercise
or LVEDP ≥ 16 at rest

mmHg · Interpret in clinical context

5 ADVANCED MEASURES & LUNG ULTRASOUND

LUNG ULTRASOUND



B-lines add
evidence of
pulmonary
congestion. [1,2,4]

Useful for congestion assessment;
not specific to HFpEF.

LV GLS & RIGHT HEART

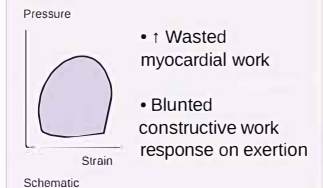
GLS may reveal systolic impairment
despite preserved EF. Assess RV
function and pulmonary pressure.
[1,2,5]

EMERGING MEASURES

MYOCARDIAL WORK (MyW)

Pilot study: 6 HFpEF patients. [7]

Stress-integrated pressure-strain
loops show that HFpEF patients
have:



- ↑ Wasted
myocardial work
- Blunted
constructive work
response on exertion

LA contractile strain rate (SRct)

Atrial shortening rate (s^{-1}). [6]

LA distensibility index (DI)

LASr / maximum LAVI. [6]

Research measures; further validation needed.

NATRIURETIC PEPTIDES · ESC 2026 OUTPATIENT PATHWAY [1]

NT-proBNP (pg/mL): $<50 \text{ y: } \geq 125$ | $50-74 \text{ y: } \geq 250$ | $\geq 75 \text{ y: } \geq 500$ or BNP $\geq 35 \text{ pg/mL}$

BNP BY RHYTHM · ESC 2021 HFpEF TABLE 9 [8]

Sinus rhythm >35 | AF $>105 \text{ pg/mL}$

Low values do not exclude HFpEF. Interpret with obesity, AF and kidney function.