Heart & Valves

Patient screening tool for functional tricuspid regurgitation

Please consider screening your heart failure patients for tricuspid regurgitation.

Patient information

Patient name _____ DOB _____

Phone number _____ Email _____

LV EF % _____ NTpro-BNP _____

DOB = date of birth; LV EF % = left ventricular ejection fraction; NTpro-BNP = N-Terminal Pro-B-Type Natriuretic Peptide

Tricuspid regurgitation grading parameters (transthoracic echo)

Please see Figure 1 for reference on grading the tricuspid valve in tricuspid regurgitation.

Vena contracta (Biplane) _____ EROA (PISA) _____

3D VCA or quantitative EROA _____

EROA = effective regurgitant orifice area; PISA = proximal isovelocity surface area; VCA = vena contracta area

Please consider if the patient meets the following criteria*,[2]:

- ☐ Has severe, massive or torrential tricuspid regurgitation by **at least one of the measures** above on transthoracic echo evaluation
- ☐ On optimal medical therapy based on heart failure phenotype (please see Figure 2)
- ☐ NYHA II-IV with continued signs and symptoms of heart failure. Potential symptoms to consider include:
  - ○ Recent heart failure hospitalization, acute healthcare facility/emergency department visits, or urgent unscheduled outpatient visits for intravenous diuresis or intensification of oral diuretics for HF
  - ○ Dyspnea
  - ○ Reduced exercise tolerance or increased time to recover after exercise
  - ○ Fatigue impacting quality of life
  - ○ Lower extremity edema
  - ○ Orthopnea, paroxysmal nocturnal dyspnea or bendopnea
  - ○ Hepatomegaly, splenomegaly or ascites
  - ○ Other criteria noted in Figure 3

If the above criteria are met, this patient **may be considered for a referral to a heart team** for further assessment regarding whether a transcatheter valve intervention may be beneficial.*

For patients with moderate tricuspid regurgitation, please consider periodic re-evaluation of the tricuspid valve.

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Figure 1
Grading of Tricuspid Regurgitation

Grade of TR	VC (Biplane)	EROA (PISA)	3D VCA or quantitative EROA[a]
Mild	<3 mm	<20 mm^2	-
Moderate	3–6.9 mm	20–39 mm^2	-
Severe	7–13 mm	40–59 mm^2	75–94 mm^2
Massive	14–20 mm	60–79 mm^2	95–114 mm^2
Torrential	≥21 mm	≥80 mm^2	≥115 mm^2

Severe

Adapted from Hahn *et al.* 2017[1].

[a]3D VCA and quantitative Doppler EROA cut-offs may be larger than PISA EROA.

VC = vena contracta; EROA = effective regurgitant orifice area; 3D VCA = three-dimensional vena contracta area; PISA = proximal isovelocity surface area

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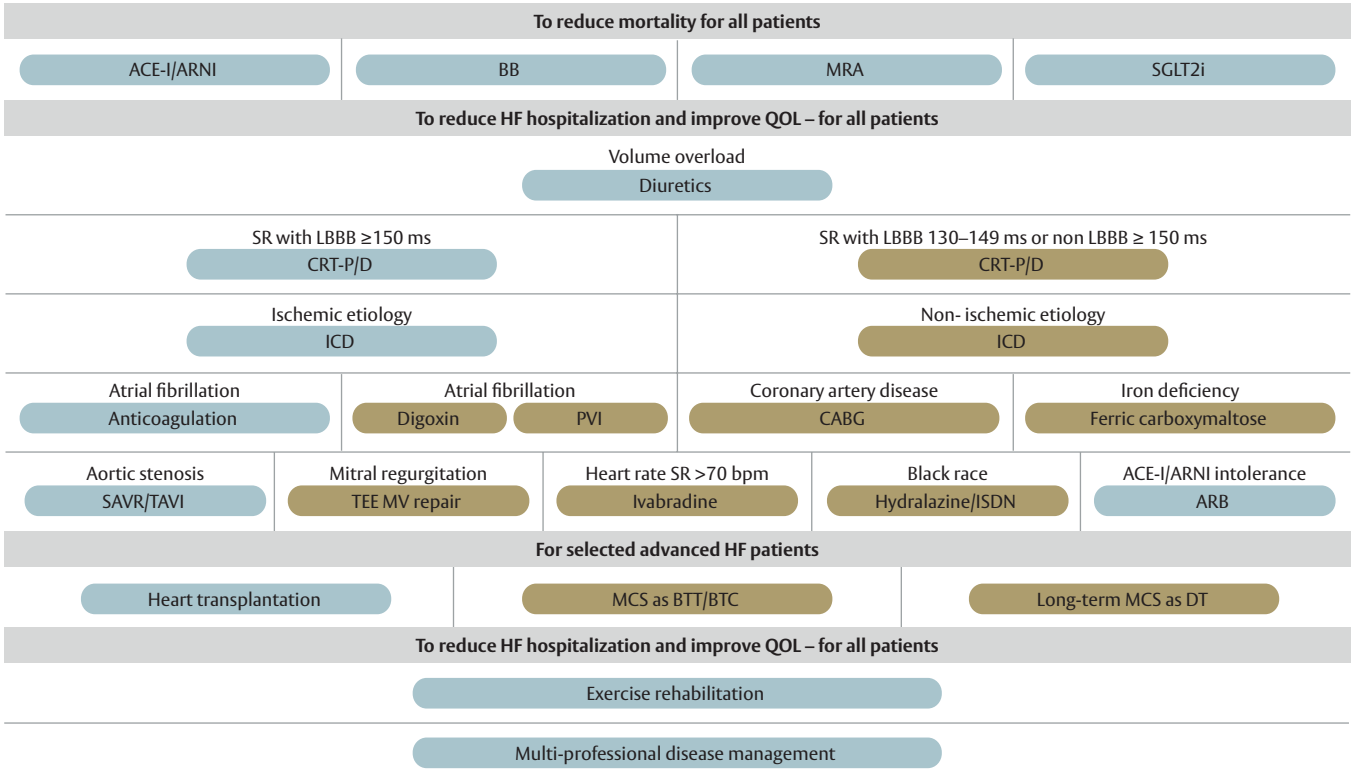
Let's turn the page.

Figure 2

Strategic phenotypic overview of the management of HFrEF from the ESC HF guidelines.

2022 American Heart Association (AHA)/American College of Cardiology (ACC)/Heart Failure Society of America (HFSA) HF guidelines are similar.[2]



Medical management for heart failure with mildly reduced ejection fraction (HFmrEF) and heart failure with preserved ejection fraction (HFpEF) is far more limited and shown below. The 2021 ESC HF guidelines with a 2023 Focused Update and 2022 AHA/ACC/HFSA HF guidelines recommendations are similar with the expection of the addition of sodium glucose co-transporter 2 (SGLT2) inhibitors in the AHA/ACC/HFSA guidelines.[2,3,4]

HFmrEF

- Diuretics [Class I]
- Angiotensin-converting enzyme inhibitor (ACE-I)/angiotensin receptor blocker (ARB)/ angiotensin receptor-neprilysin inhibitor (ARNI) [Class IIb]
- Beta blockers [Class IIb]
- Mineralocorticoid receptor antagonists (MRA) [Class IIb]
- SGLT2 inhibitors [Class Ia]

HFpEF

- Diuretics [Class I]
- SGLT2 inhibitors [Class Ia]

Colour code for classes of recommendation:
Blue for Class of recommendation I;
Yellow for Class of recommendation IIa.

Adapted from McDonagh *et al.* 2021[2] and McDonagh *et al.* 2023[4]

ACE-I = angiotensin-converting enzyme inhibitor;
ARB = angiotensin receptor blocker;
ARNI = angiotensin receptor-neprilysin inhibitor;
BB = betablocker;
b.p.m. = beats per minute;
BTC = bridge to candidacy;
BTT = bridge to transplantation;
CABG = coronary artery bypass graft;
CRT-D = cardiac resynchronization therapy with defibrillator;
CRT-P = cardiac resynchronization therapy pacemaker;
DT = destination therapy;
HF = heart failure;
HFrEF = heart failure with reduced ejection fraction;
ICD = implantable cardioverter-defibrillator;
ISDN = isosorbide dinitrate;
LBBB = left bundle branch block;
MCS = mechanical circulatory support;
MRA =mineralocorticoid receptor antagonist;
MV = mitral valve;
PVI = pulmonary vein isolation;
QOL = quality of life;
SAVR = surgical aortic valve replacement;
SGLT2i = sodiumglucose co-transporter 2 inhibitor;
SR = sinus rhythm;
TAVI = transcatheter aortic valve replacement;
TEE = transcatheter edge to edge.

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Let's turn the page.

Figure 3

Symptoms and signs of heart failure[2]

Symptoms	Signs	
Typical	**More specific**	
Breathlessness Orthopnoea Paroxysmal nocturnal dyspnea Reduced exercise tolerance Fatigue, tiredness, increased time to recover after exercise Ankle swelling	Elevated jugular venous pressure Hepatojugular reflux Third heart sound (gallop rhythm) Laterally displaced apical impulse	
Less typical	**Less specific**	
Nocturnal cough Wheezing Bloated feeling Loss of appetite Confusion (especially in the elderly) Depression Palpitations Dizziness Syncope Bendopnea[a]	Weight gain (>2 kg/week) Weight loss (in advanced HF) Tissue wasting (cachexia) Cardiac murmur Peripheral oedema (ankle, sacral, scrotal) Pulmonary crepitations Pleural effusion Tachycardia	Irregular pulse Tachypnoea Hepatomegaly Ascites Cold extremities Oliguria Narrow pulse pressure

[a]*This symptom of advanced HF corresponds to shortness of breath when leaning forward*

HF = heart failure

*These criteria are based on ESC 2021 Guidelines and the 2023 Focused Update of the 2021 ESC Guidelines for heart failure so please consider if these are applicable to your local geography. This document is not meant to provide a clinical recommendation; all clinical decision making should be based on a discussion between patient and physician.

References

1. Hahn RT, Zamorano JL. The need for a new tricuspid regurgitation grading scheme. *Eur Heart J Cardiovasc Imaging.* 2017;18:1342–43.
2. McDonagh TA, Metra M, Adamo M, et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). With the special contribution of the Heart Failure Association (HFA) of the ESC. *Eur J Heart Fail.* 2022;24:4–131.
3. Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines [published correction appears in Circulation. 2022 May 3;145(18):e1033]. *Circulation.* 2022;145(18):e895–e1032.
4. McDonagh TA, Metra M, Adamo M, et al. 2023 Focused Update of the 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: Developed by the task force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). With the special contribution of the Heart Failure Association (HFA) of the ESC. *Eur Heart J.* 2023;44:3627-3639.

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