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 _____

Tricuspid regurgitation grading parameters (transthoracic echo)

Please see the echo card for additional guidance on evaluating the tricuspid valve via transthoracic echo.

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*:

- ☐ 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.

Clear form

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Figure 1

Grading of tricuspid regurgitation[1]

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

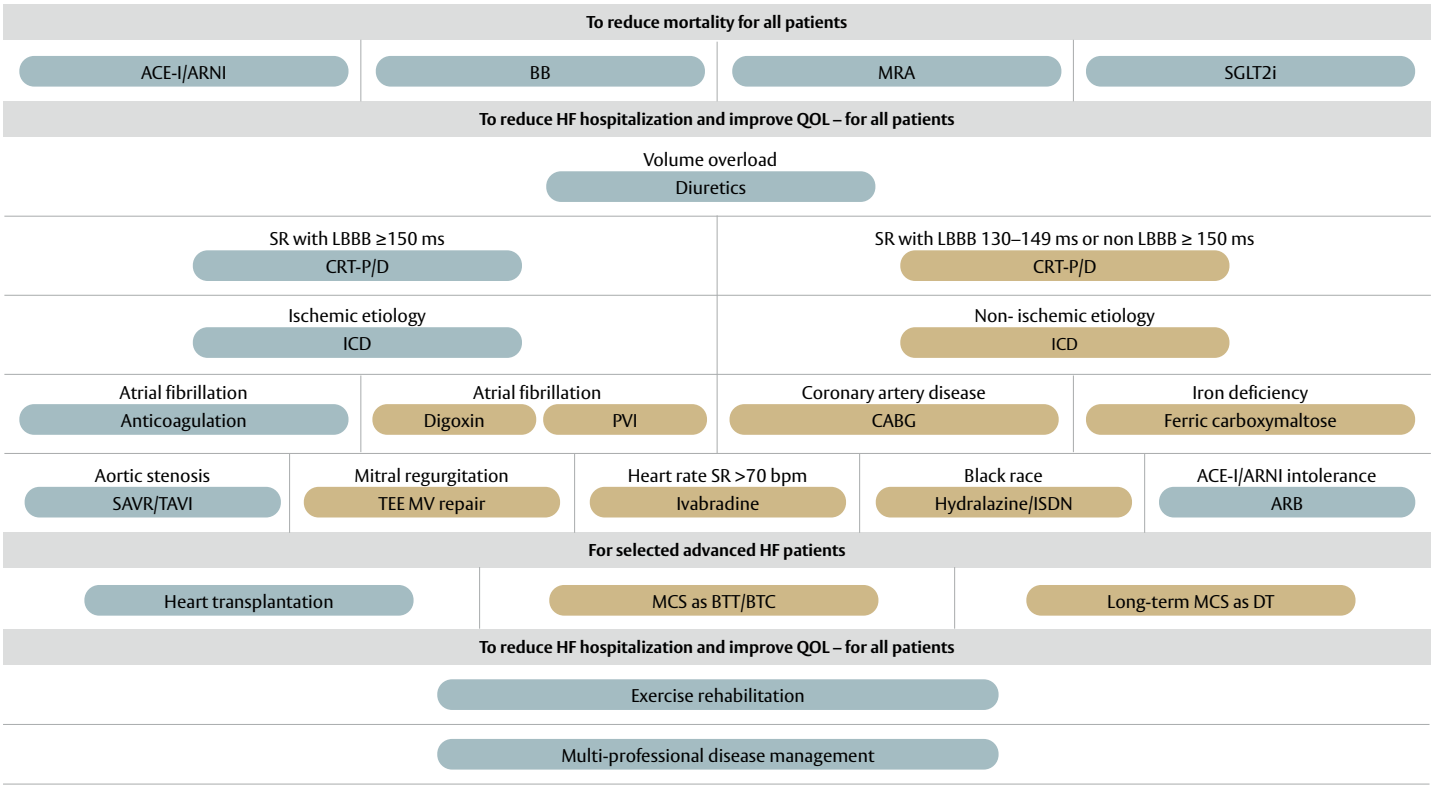
VC = vena contracta; EROA = effective regurgitant orifice area; 3D VCA = three-dimensional vena contracta area

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

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 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]

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 IIa, US only]

HFpEF

- Diuretics [Class I]
- SGLT2 inhibitors [Class IIa, US only]

ACE-I= angiotensin-converting enzyme inhibitor; ARB= angiotensin receptor blocker; ARNI= angiotensin receptor-neprilysin inhibitor; BB= beta-blocker; 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. 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]

Figure 3

Symptoms and signs of heart failure[2]

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

HF = heart failure
[a]This symptom of advanced HF corresponds to shortness of breath when leaning forward

*These criteria are based on ESC 2021 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.

This document was reviewed and approved by an author of the 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure, expert interventional cardiologists, and an independent panel of general cardiologists.

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