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Essential Messages from ESC Guidelines

Clinical Practice
Guidelines Committee

Guidelines for the management of
Valvular Heart Disease



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Essential Messages

2025 ESC/EACTS Guidelines for the management of valvular heart disease

Developed by the task force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

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ESSENTIAL MESSAGES FROM THE 2025 ESC/EACTS GUIDELINES FOR THE MANAGEMENT OF VALVULAR HEART DISEASE

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Key messages

Heart Team and Heart Valve Centre

- An integrated regional Heart Valve Network incorporating outpatient Heart Valve Clinics and specialist Heart Valve Centres allows optimal patient care.
- Heart Valve Centres should fulfil institutional and local statutory requirements, and strive for high procedural volume and excellent clinical outcomes.
- Heart Team recommendations should be based upon these guideline recommendations, relevant updated evidence, key medical considerations, and patient preferences.
- Core members of the Heart Team include the primary clinical cardiologist, cardiologists with subspecialty expertise in VHD, specialists in advanced cardiovascular imaging and peri-procedural imaging guidance, and surgeons and interventional cardiologists with training and expertise in valve interventions.
- A network approach that distinguishes between higher- and lower-volume centres is appropriate, with more complex procedures focused in the most experienced (i.e. upper quartile) centres. Information on the network organization should be communicated to patients, as well as referring cardiologists and general practitioners.

Aortic regurgitation

- Assessment of AR severity with TTE remains challenging and current cut-offs for intervention are mostly based on 2D measurements, although 3D echocardiography and CMR allow more accurate evaluation of LV volumes and LVEF.
- Mechanisms of AR may be closely related to the aortic diameters that should be measured accurately at all levels of the aortic root (annulus, sinuses, and sinotubular junction).
- Indication for operation is based on symptoms, LV volumes, LVEF, and aortic diameters. Although valve replacement remains the standard treatment, AV repair (or AV sparing when associated with root aneurysm) is being increasingly used to avoid prosthesis-related complications, especially in experienced centres.
- Current transcatheter options for AR are limited and applicable only in patients who are ineligible for surgery.

Aortic stenosis

- Diagnosis of severe AS requires integrative evaluation of pressure gradients (the most robust measurements), AVA, flow conditions, the extent of valve calcification, and LV function.
- Selection of the most appropriate mode of intervention should take into account clinical characteristics (age and estimated life expectancy, concomitant conditions), access and valve anatomy (particularly the feasibility of transfemoral TAVI and calcification patterns), and surgical risk, as well as repeat procedure options and risks (lifetime management).

Mitral regurgitation

- The echocardiographic diagnostic workup of patients with MR includes multiparametric assessment of MR severity, evaluation of MV anatomy (often with 3D TOE), identification of the mechanism (PMR, ventricular SMR, or atrial SMR), and evaluation of cardiac damage.
- Surgical MV repair is the preferred method of treatment in severe PMR. Transcatheter edge-to-edge repair is recommended in patients who are inoperable or high risk according to the Heart Team.
- Surgical MV repair is the procedure of choice for asymptomatic patients with primary MR and signs of cardiac damage, including moderate or more TR.
- In patients with ventricular SMR, GDMT (including CRT if indicated) is the initial and essential treatment step. In symptomatic patients without CAD needing revascularization, M-TEER is recommended. In patients with concomitant complex CAD and those not suitable for TEER, mitral surgery may be considered.
- In patients with atrial SMR, MV surgery, AF ablation if indicated, and LAAO should be considered after optimization of medical therapy. Transcatheter edge-to-edge repair may be considered in patients at high surgical risk.

Mitral stenosis

- Most patients with severe rheumatic MS and favourable valve anatomy should undergo PMC, which is the standard of care. Surgery is recommended for symptomatic patients with contraindications, unfavourable anatomy and clinical characteristics for PMC.
- Decision-making in patients with unfavourable anatomy should take into account local PMC experience.
- In selected patients with clinically severe degenerative MS and MAC, transcatheter intervention or surgery may improve symptoms.

Tricuspid regurgitation

- Concomitant TV repair is the preferred method for patients with left-sided valve pathology and associated moderate or severe TR.
- The use of risk scores for the assessment of RV and secondary organ dysfunction should be strongly encouraged in patients with isolated severe TV disease.
- In isolated severe TR without severe RV dysfunction, surgery should be performed at an early stage in patients at low operative risk.
- In isolated severe TR patients at increased surgical risk, tricuspid TEER or transcatheter replacement should be considered to improve quality of life and RV remodelling, in the absence of severe RV dysfunction or pre-capillary PH.

Tricuspid stenosis

- TS is a very rare manifestation of acquired VHD in high-income countries.
- TS is mainly associated with rheumatic valve disease, carcinoid syndrome, or enzymatic disorders such as Fabry's or Whipple's disease.
- Treatment of symptomatic TS mainly involves surgical TV replacement.

Multiple and mixed valvular heart disease

- Transvalvular gradients and velocities reflect the combined burden of regurgitation and stenosis in mixed aortic and mitral disease.
- Treatment decisions should be based on the assessment of symptom and functional status, cardiac damage, anatomical suitability, and the risk-benefit ratio of intervention and lifetime management considerations.
- Patients with mixed moderate AS and AR have similar detrimental outcomes compared with those with severe isolated AS.
- In transcatheter procedures, which allow a sequential approach, downstream lesions should be treated first to prevent potential haemodynamic deterioration and allow improvement of upstream lesions due to changing loading conditions and reverse remodelling.

Antithrombotic treatment in patients with a mechanical heart valve

- International normalized ratio therapeutic range should be balanced to the type and anatomical site of MHV, as well to the thrombotic risk profile of the individual patient.
- Patient training, self-monitoring, and education can increase INR stability and TTR.
- Minor or minimally invasive NCS procedures do not require VKA interruption in patients with an MHV.
- In patients with an MHV undergoing elective major NCS, bridging may be omitted if the thromboembolic risk is low.

Non-cardiac surgery

- The risk of peri-operative cardiovascular complications related to surgery and to patient-specific factors should be evaluated and communicated to the patient and surgical team.
- In patients with symptomatic severe AS requiring urgent high-risk NCS, BAV or TAVI should be considered prior to surgery. In patients planned for elective NCS, AV intervention is recommended prior to NCS.

Pregnancy

- In women with VHD, decisions regarding management before and during pregnancy should be taken after discussion by the multidisciplinary Pregnancy Heart Team. Unplanned pregnancies should be discouraged.
- The following conditions should be corrected prior to considering pregnancy:
 - clinically severe MS (MVA <1.5 cm²), even when asymptomatic
 - severe symptomatic AS, or asymptomatic patients with impaired LV function or a pathological exercise test
 - heritable aortic disorders and high risk of aortic dissection.
- Vaginal delivery is the first choice for the majority of patients. Indications for Caesarean section include pre-term labour in patients on OAC, severe MS or AS, aggressive aortic pathology, acute intractable HF, and severe PH.
- Women with MHVs should be managed in expert centres.

Gaps in evidence

General aspects

- Patient-reported outcome measures are infrequently reported in VHD studies. Patient-reported outcome measure-oriented studies are required to improve quality of life and patient satisfaction.
- Methods to address underdiagnosis and undertreatment of VHD need to be identified and implemented.

Heart Team and Heart Valve Centre

- Structured research is required to investigate the relationship between procedural volume and clinical outcomes, in order to define minimum annual thresholds for individual operators and institutions undertaking surgical and transcatheter valve interventions.
- There is a pressing need to ensure higher dispersion and adoption of interventions for VHD, especially in middle- and low-income countries.

Conditions associated with valvular heart disease

CAD:

- The prognostic value of functional assessment of stable, moderate coronary stenosis in VHD patients remains to be determined.
- The optimal strategy (invasive vs non-invasive) for CAD assessment in specific VHD populations remains to be elucidated.
- The optimal timing of PCI in patients with CAD undergoing TAVI is yet to be determined.
- The benefit of complete coronary revascularization with CABG in patients with combined VHD and CAD requires further research.

AF:

- It is unclear which patients with chronic persistent AF and concomitant VHD are deemed to be suitable for rhythm control therapy.
- The protective effect against stroke of OAC with VKA or DOACs in patients after surgical or transcatheter LAAO remains to be determined.
- Cardiogenic shock and acute HF:
 - The optimal treatment strategy in VHD patients presenting with cardiogenic shock and acute HF is unknown.

Gaps in evidence

Aortic regurgitation

- Impact of early LV remodelling on prognosis in asymptomatic AR patients is unknown.
- Prognostic value of CMR-derived indices in asymptomatic patients needs to be determined.
- More data are required on long-term results of surgical AV repair for AR.
- More evidence is required on transcatheter treatment options for AR, in particular using dedicated devices.

Aortic stenosis

- Better understanding of the pathophysiology of AS is needed to propose innovative medical therapy.
- Further research is required on:
 - Refined prognostic markers to guide timing of intervention in asymptomatic patients.
 - The role of revascularization in patients with severe AS and asymptomatic concomitant CAD.
 - Further data on the long-term durability of transcatheter valves in comparison with surgical BHVs in younger patients.
 - The role of TAVI in patients with BAV AS and patients <70 years of age.
 - Results of intervention (valve or coronary) after TAVI or SAVR.
 - Determining the optimal lifetime management strategy for AS patients.

Gaps in evidence

Mitral regurgitation

- The association between primary MR and ventricular arrhythmias requires more investigation, including the impact of intervention on ventricular arrhythmias.
- More data are required on the role of TEER in patients with advanced HF.
- Long-term results of TEER need to be further assessed, including the clinical relevance of transmitral gradients after treatment of both primary and secondary MR.
- Results of ongoing trials comparing MV surgery with TEER in non-high risk primary MR patients are awaited.
- Data on the mid- and long-term clinical impacts of transcatheter MV replacement are required.
- More data on the clinical impacts of surgical and transcatheter treatment of atrial SMR are required.

Mitral stenosis

- The potential role of TMVI using dedicated devices in high-risk patients is to be determined, particularly those with severe MAC.

Tricuspid regurgitation

- The long-term risks and benefits of concomitant TV surgery in patients with less than moderate TR and annular dilatation undergoing left-sided valve surgery need to be determined.
- Further investigations are required on the outcomes of TV intervention in asymptomatic patients with severe TR and RV dysfunction or significant dilation.
- The importance of addressing concomitant AF in patients with TR needs to be investigated.
- More data are required on the indications, timing, and long-term outcomes of TV repair and replacement for TV disease.
- Better understanding is required of the respective role of surgery vs transcatheter TV therapy for TR treatment.

Tricuspid stenosis

- The role of transcatheter TV replacement remains unexplored in patients with TS. The most efficient way to achieve ventricular pacing in patients after TV replacement needs to be investigated.

Gaps in evidence

Multiple and mixed valvular heart disease

- Further evaluation of the impact on outcomes and indication for intervention, as well as timing and modalities of intervention, is required.

Prosthetic valves

- Further development of current prosthetic valve devices is required to address their main complications (e.g. improved tissue processing to reduce degeneration of bioprostheses or new mechanical valve designs to reduce risk of thrombosis).
- Antithrombotic drugs in MHV patients:
 - Whether UFH or LMWH should be preferred as bridging therapy after MHV implantation, as well as their timing and dosage, remains to be established.
 - For patients with MHV undergoing major NCS, the optimal post-operative management and bridging of VKA needs further investigation.
 - The role of pharmacogenomics for VKORC1, CYP2C9, and CYP4F2 in patients with highly variable INR, and low TTR or major vascular complications despite good adherence, should be further investigated.
 - More data on the risks and benefits of slow thrombolysis for valve thrombosis are required.

Pregnancy

- More data are required on optimal management of anticoagulation in pregnant women with MHVs. Prospective studies comparing different antithrombotic regimens are lacking.

Non-cardiac surgery

- Clinical utility of scales for peri-operative risk evaluation needs to be determined.

Sex-specific considerations

- The development of sex-adjusted surgical risk prediction tools is required.
- Additional data are needed to validate sex-specific cut-offs indicating interventions.
- Further research is needed to investigate sex-related differences in the prognosis and treatment of specific valve diseases, especially TR.

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