ESC Leitlinien Herzklappenerkrankungen

Was sind die Essentials für die klinische Praxis?

Univ.-Prof. Dr. med. W. Rottbauer

Universitäres Herzzentrum Ulm · Klinik für Innere Medizin II

Kardiologie · Angiologie · Pneumologie · Internistische Intensivmedizin ·

Sport- und Rehabilitationsmedizin

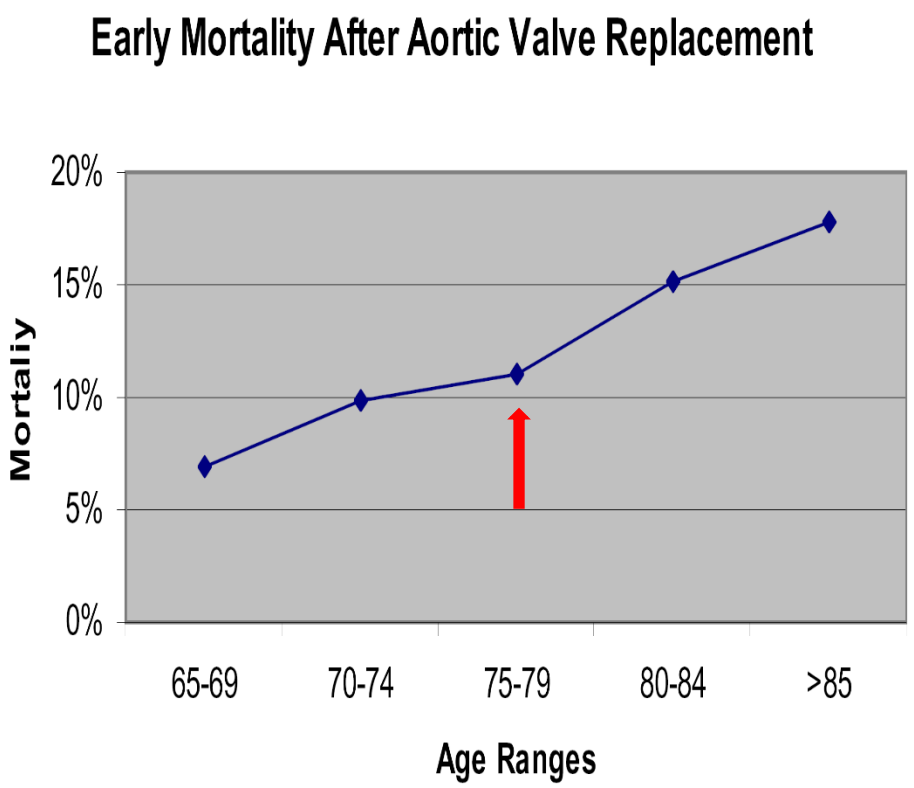
Universitätsklinikum Ulm

Herzklappenerkrankungen

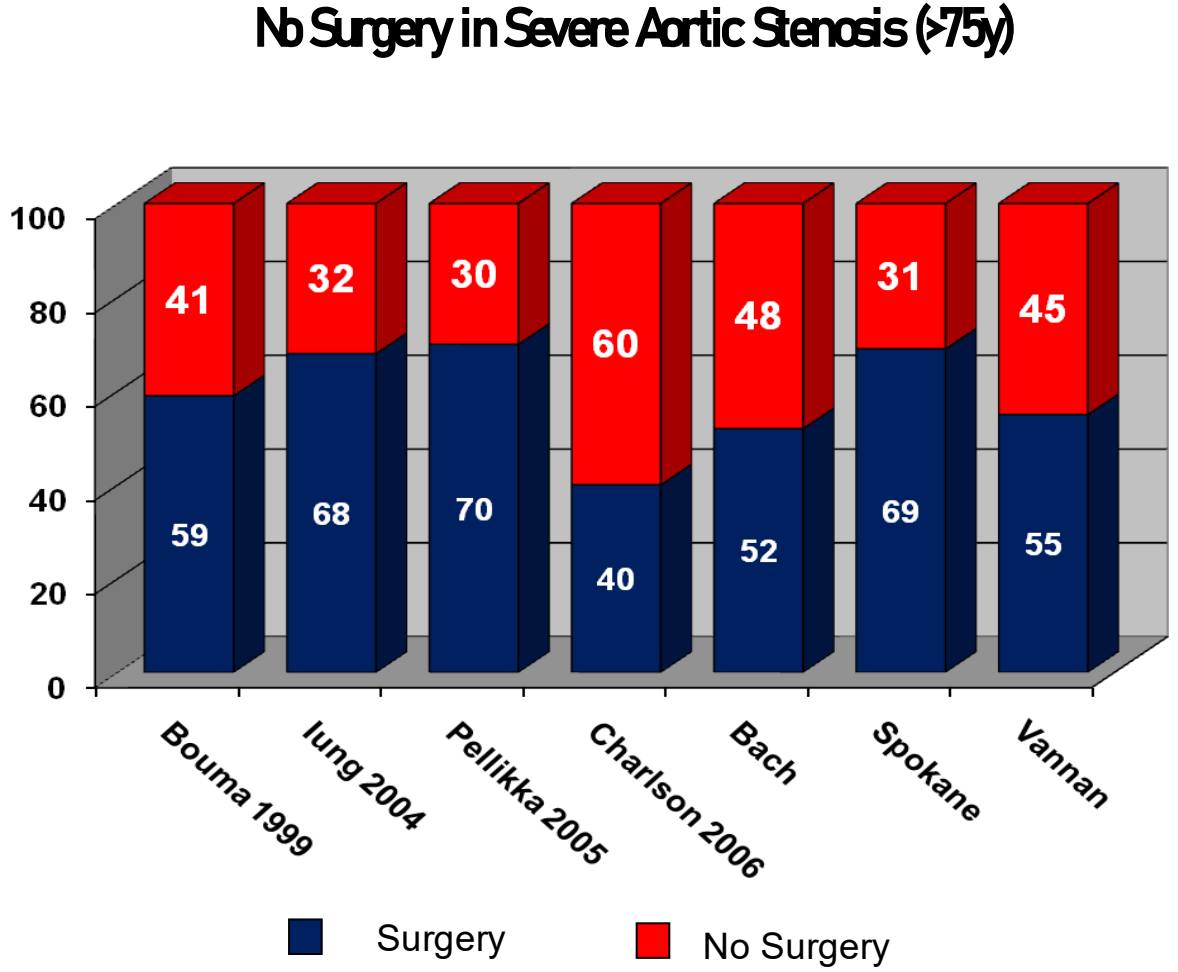
Therapie über lange Zeit eine Domaine der Herzchirurgie

Herzklappenerkrankungen

Herzchirurgische Therapie hat ihren Preis



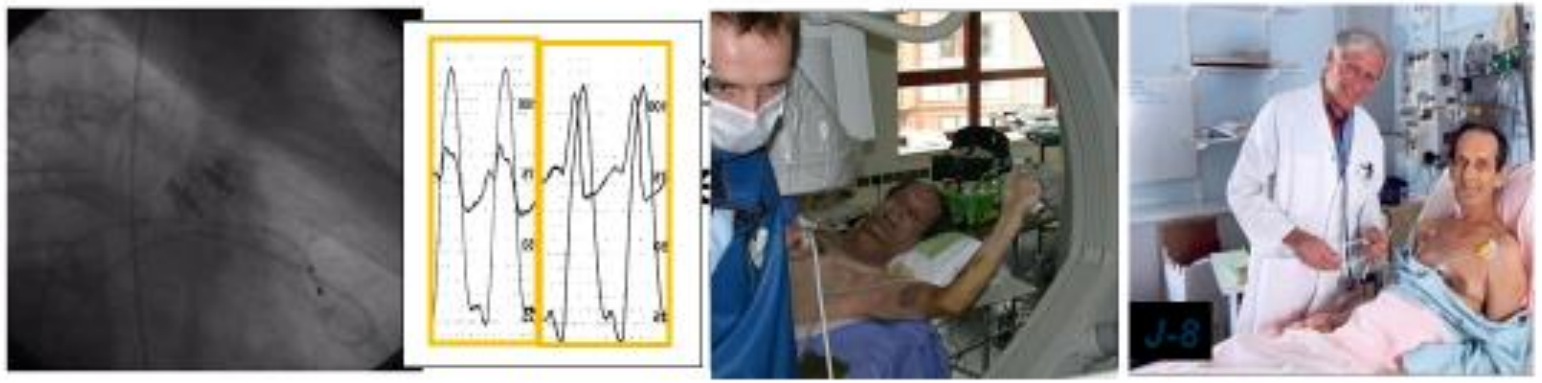
Burr et al.: Annals of Thor Surg, 1995, 60:264-269



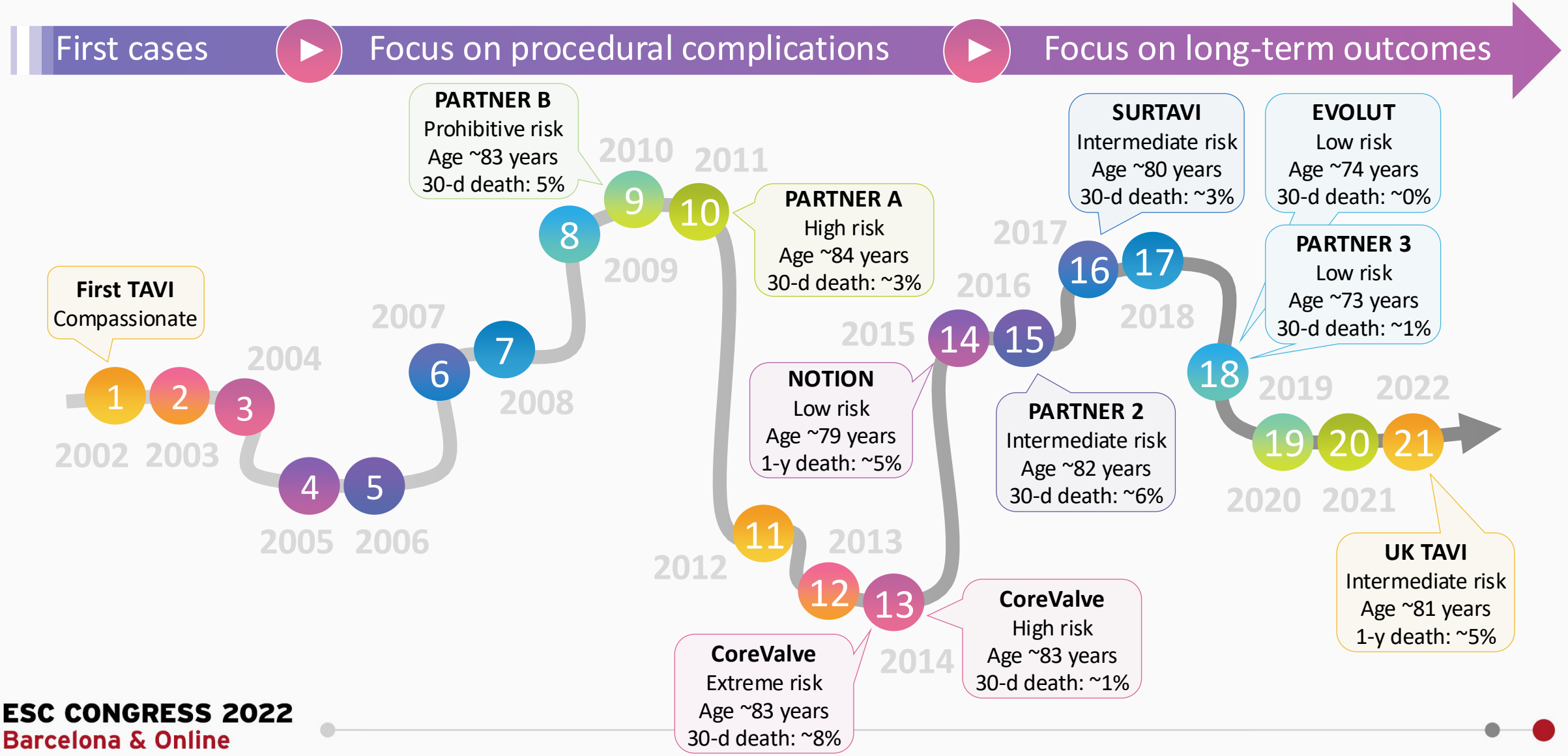
Interventionelle Therapie der Aortenstenose

…der große Durchbruch TAVI…

First implantation—from dream to reality



…TAVI Entwicklung…
wissenschaftliche Evidenz



ESC guidelines for the management of valvular heart disease

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ESC European Society of Cardiology
European Heart Journal (2025) **00**, 1–102
https://doi.org/10.1093/eurheartj/ehaf194

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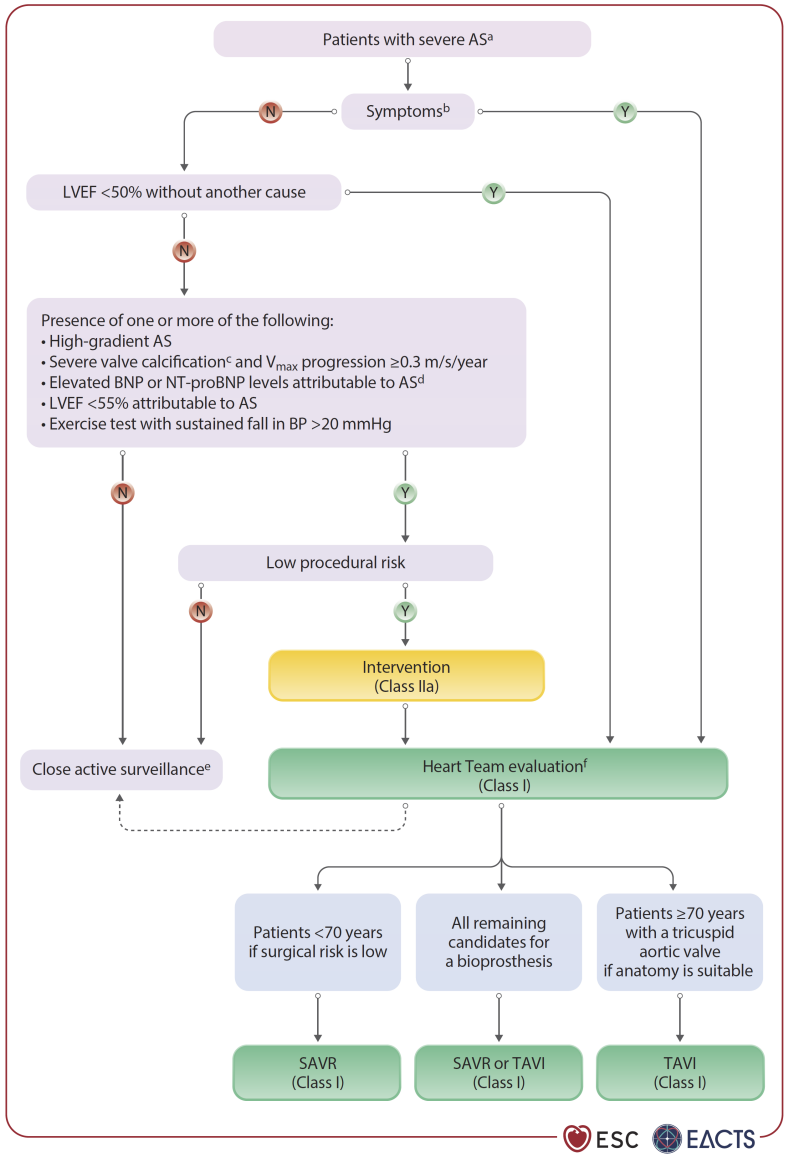
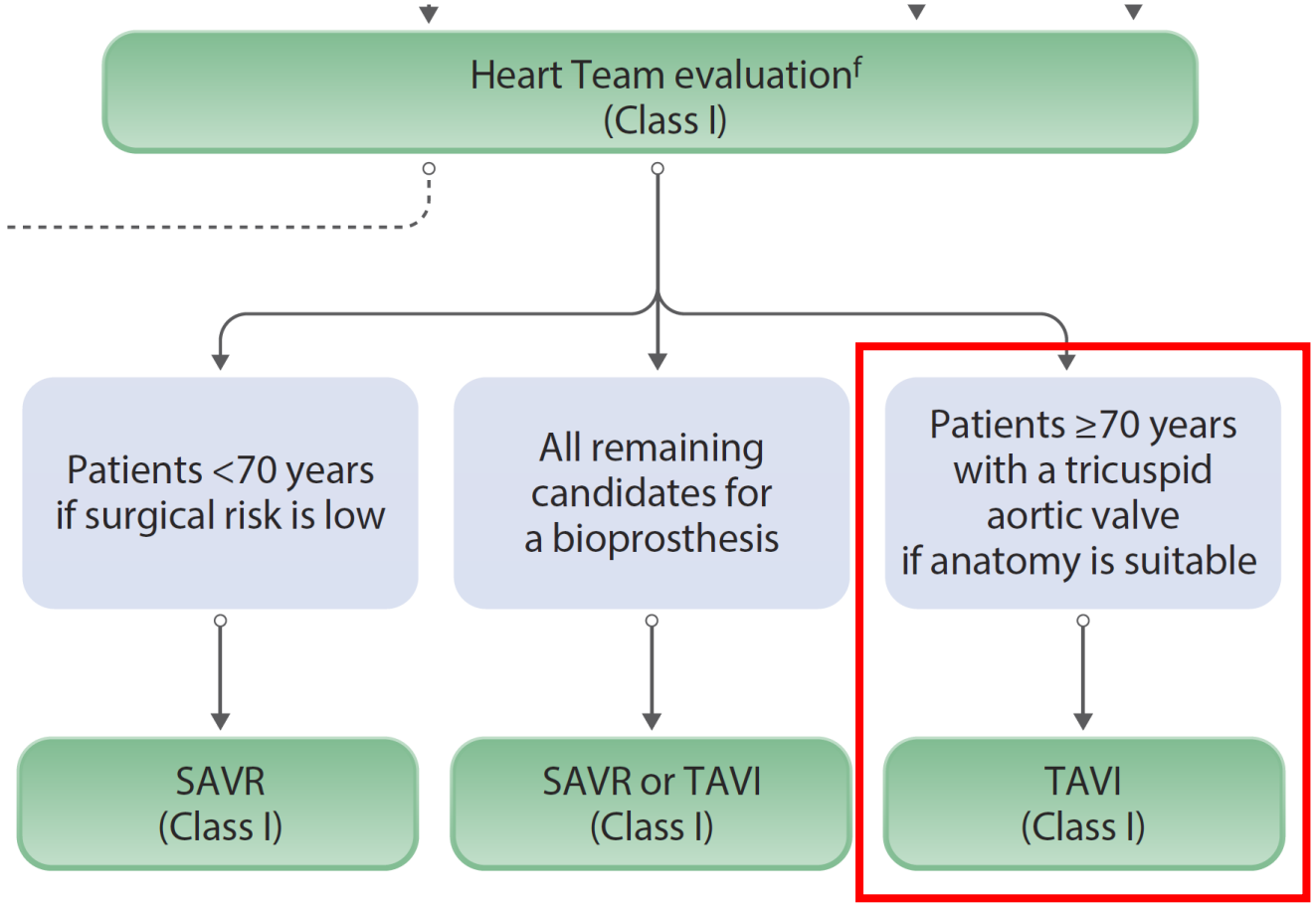
➡ **Aortenstenose**

ESC guidelines for the management of valvular heart disease

Hochgradige Aortenstenose > 70 LJ

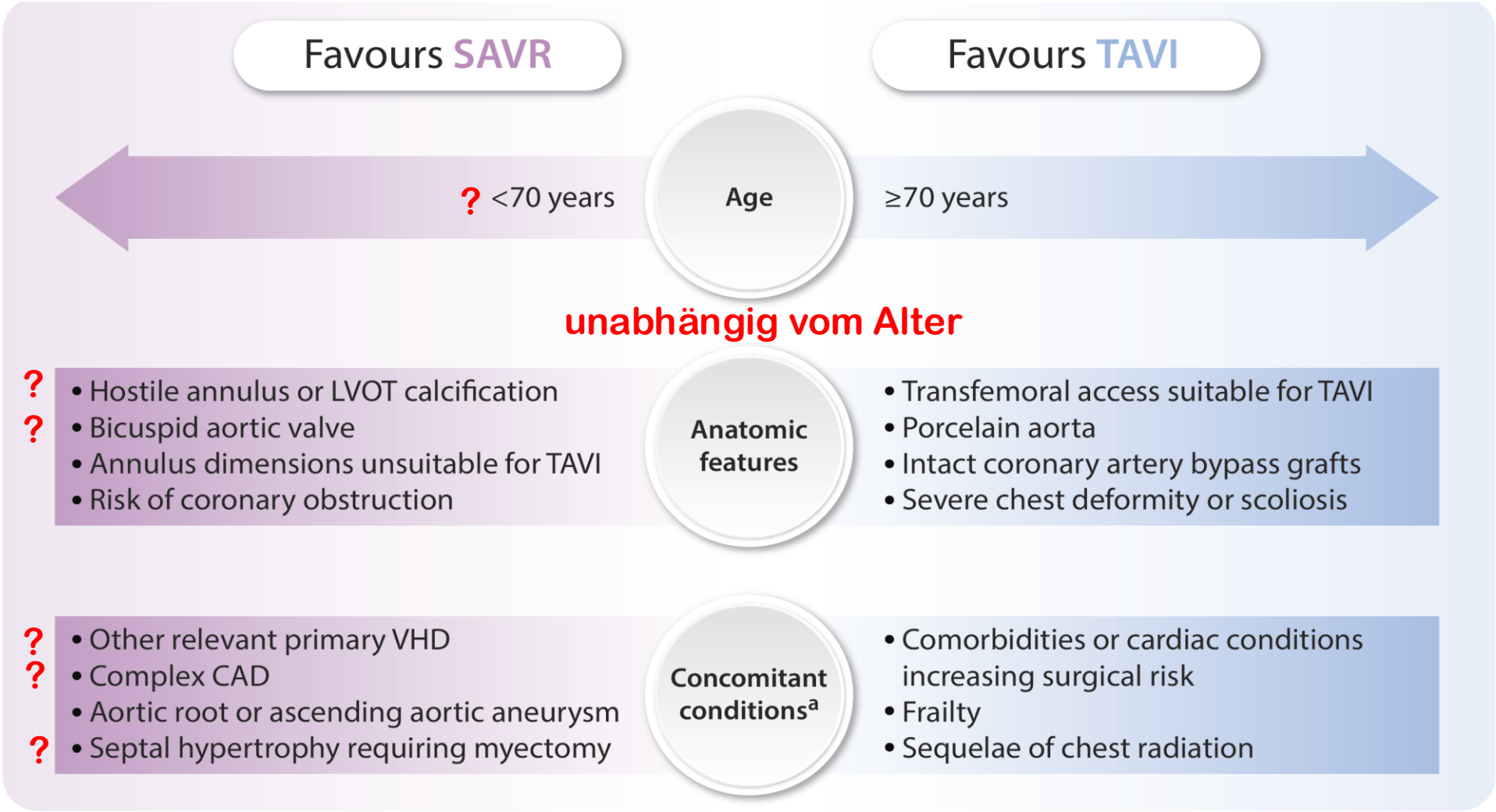


DEDICATE



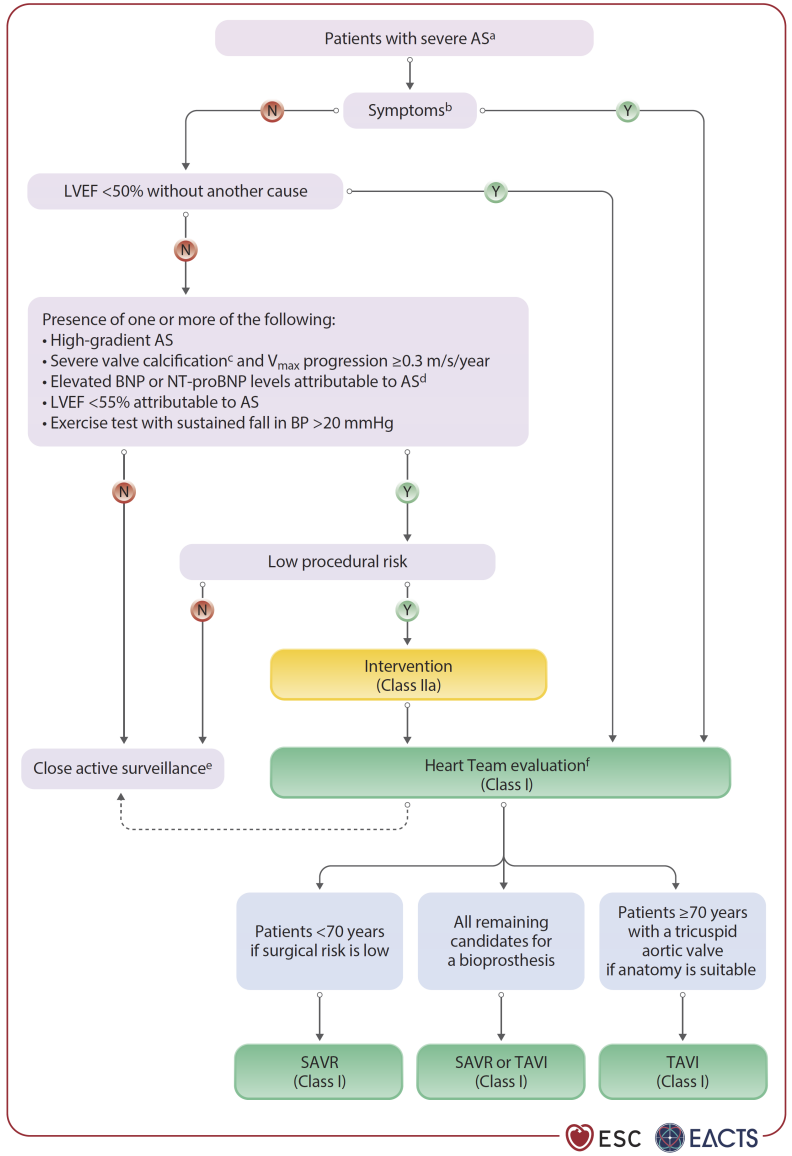
ESC guidelines for the management of valvular heart disease

Hochgradige Aortenstenose

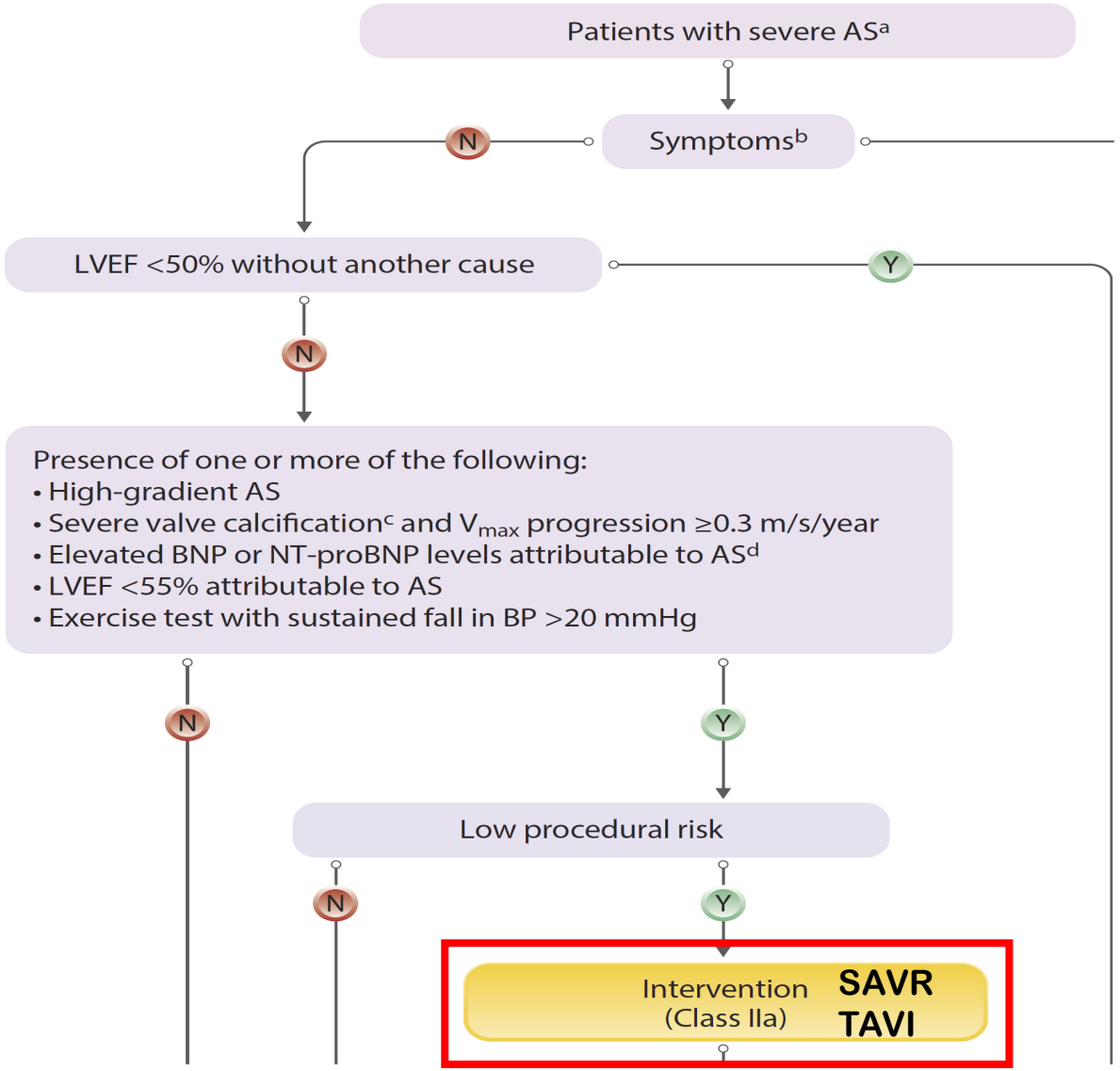


ESC guidelines for the management of valvular heart disease

asymptomatische hochgradige Aortenstenose (up to 40%)



AVATAR
EARLY-TAVR



Leitliniengerechte Therapie der Aortenstenose 2026

…take home message…

- die bessere Behandlungsmethode der Aortenstenose mit Bioprothese ist heute die TAVI, unabhängig vom operativen Risiko und Lebensalter

- auch die asymptomatische hochgradige Aortenstenose sollte heute mit TAVI behandelt werden

Zeitreise durch 20 Jahre TAVI

…niedrigere Kosten für TAVI als chirurgische Therapie…

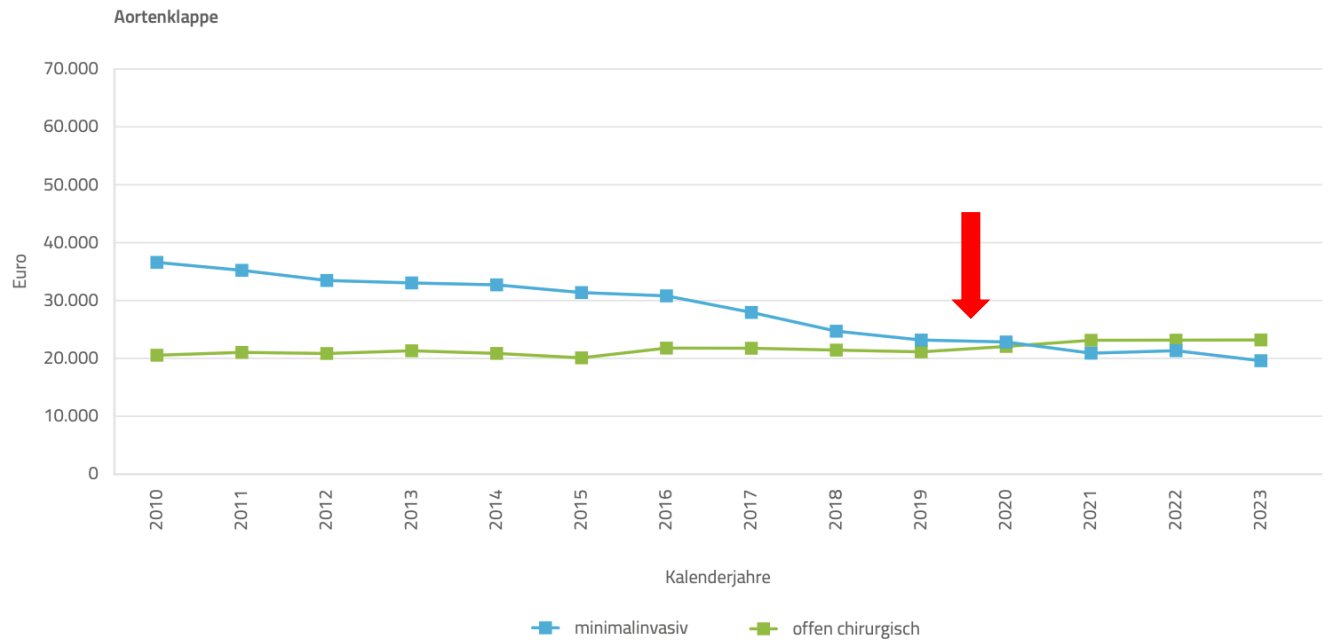
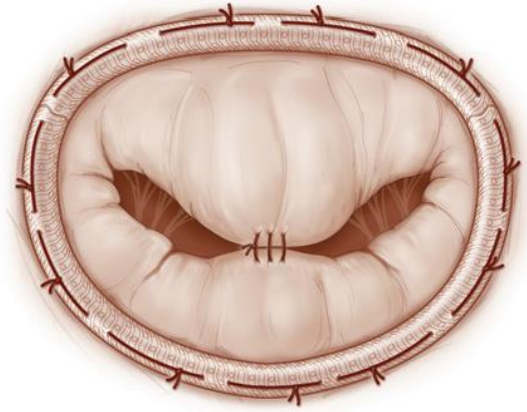


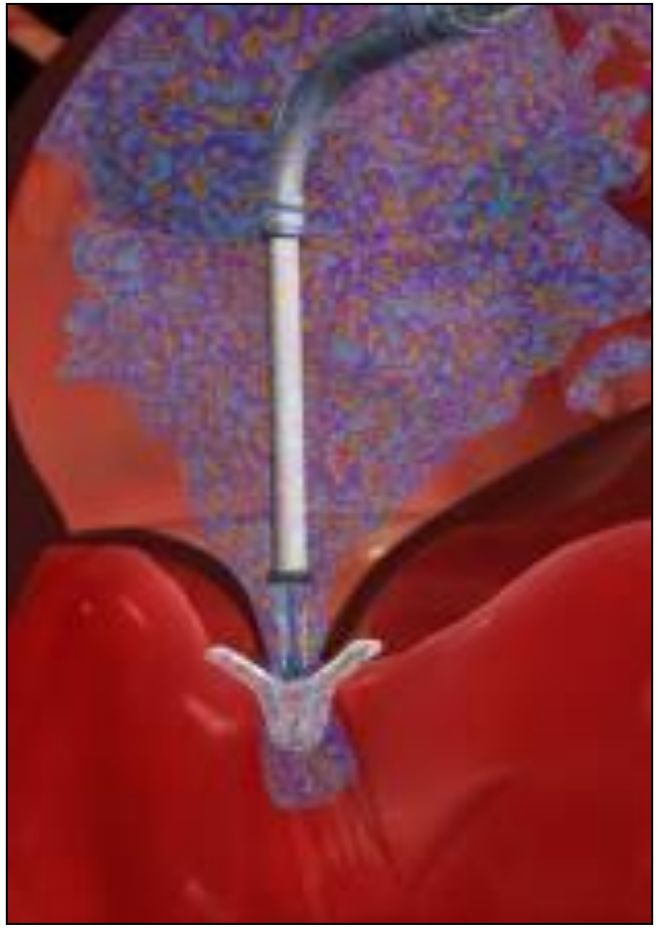
Abb. 1 inflationsbereinigte Kosten für den isolierten Aortenklappenersatz (TAVI vs offen chirurgisch) in Deutschland bei Versicherungsnehmern der BARMER Krankenversicherung in im Zeitraum der Jahre 2010 bis 2023.

Interventionelle Therapie der Mitralinsuffizienz

…edge to edge repair mittels MitraClip…

Alfieri Stich



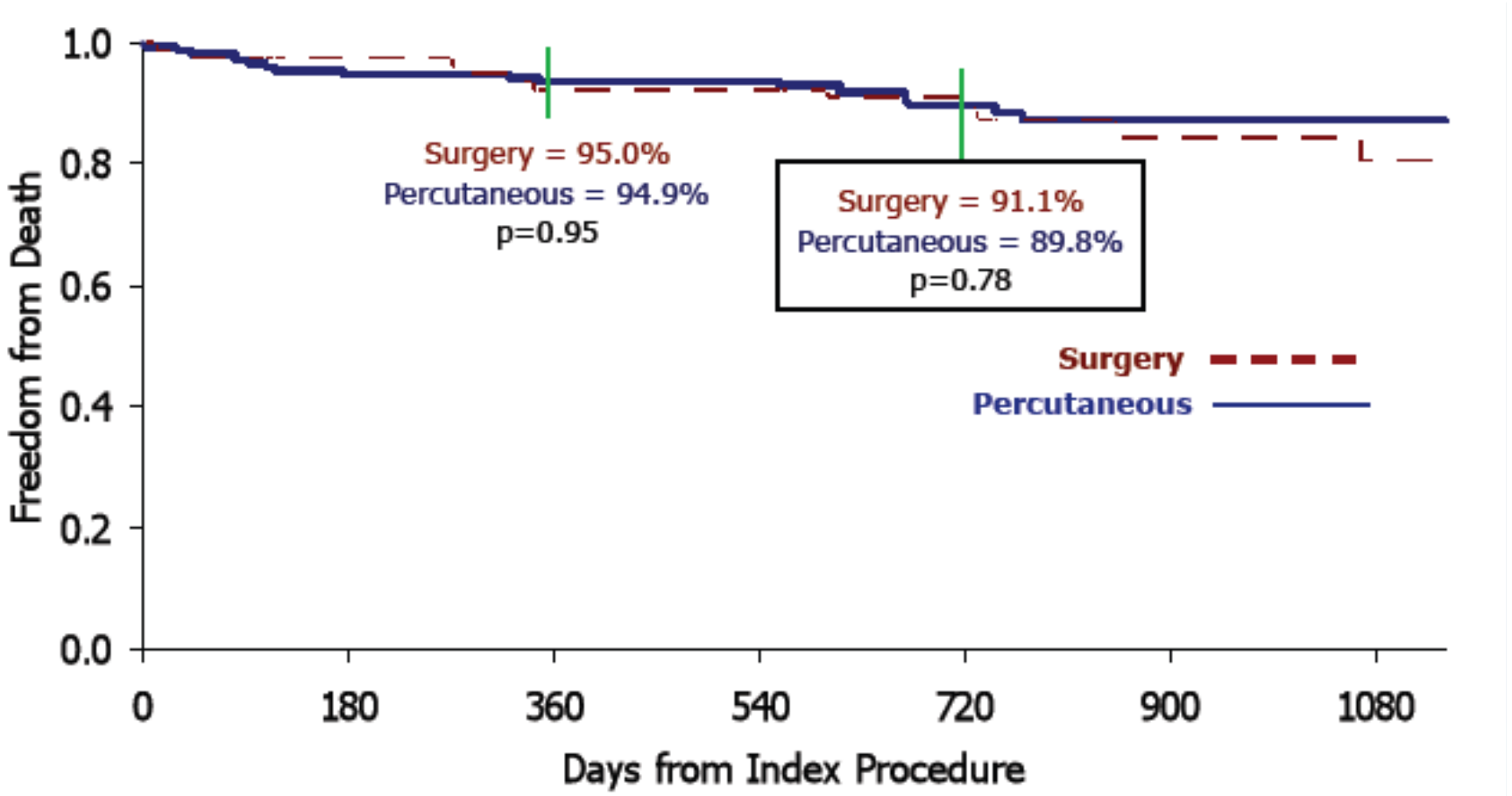


MitraClip® System

2003

Interventionelle Mitralklappen-Reparatur

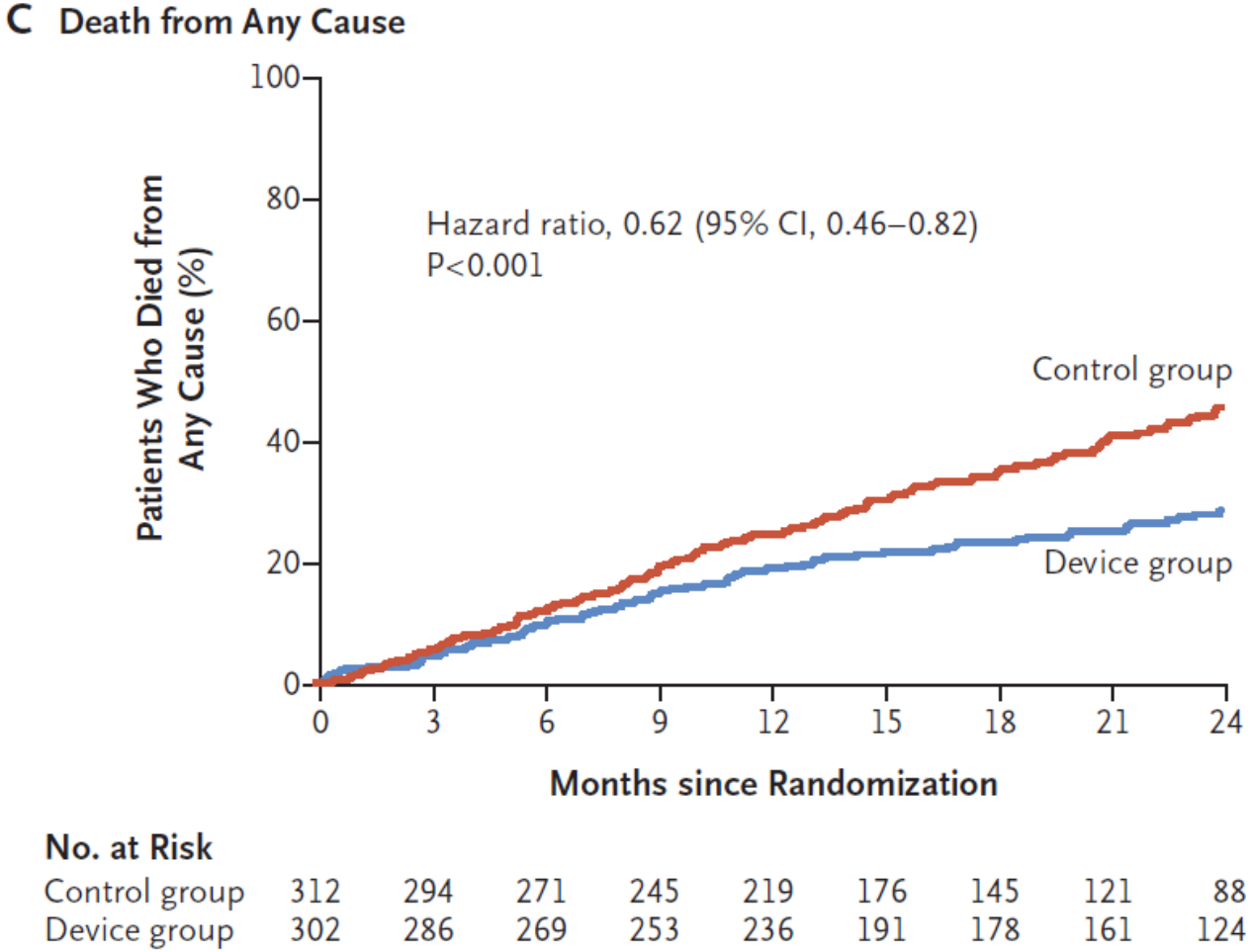
…EVEREST II: MitraClip versus OP bei DMR oder FMR…



Feldman T. et al., *NEJM* 2011

Interventionelle Mitralklappen-Reparatur

…COAPT: MitraClip versus GDMT bei FMR…

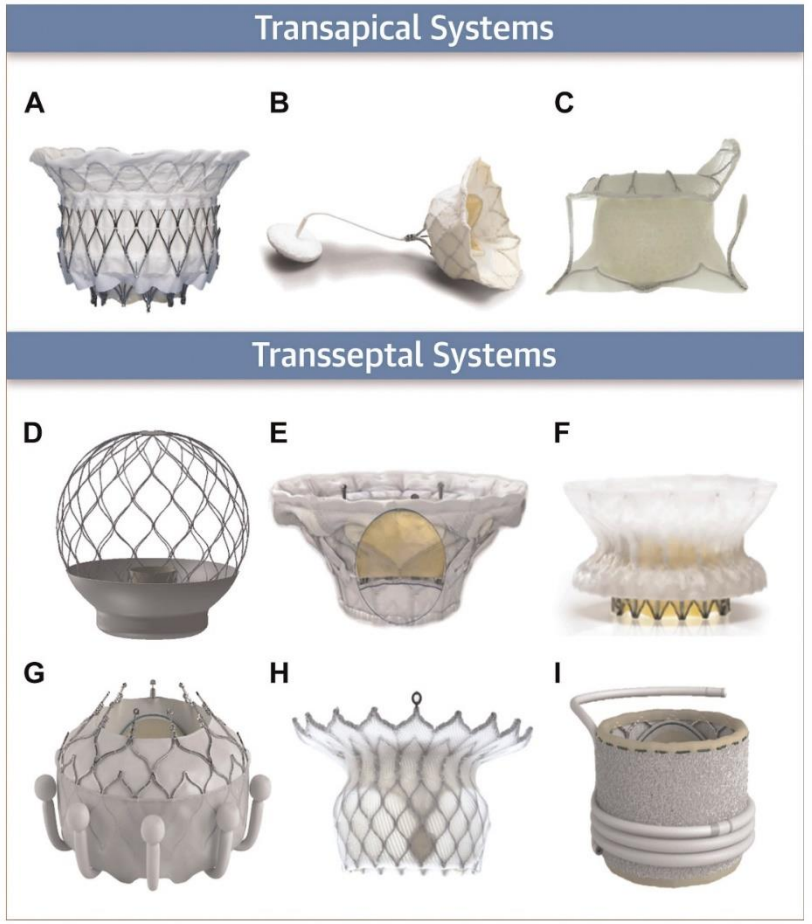


Stone GW et al, *NEJM 2018*

… Interventionelle Mitralklappen-Ersatz…

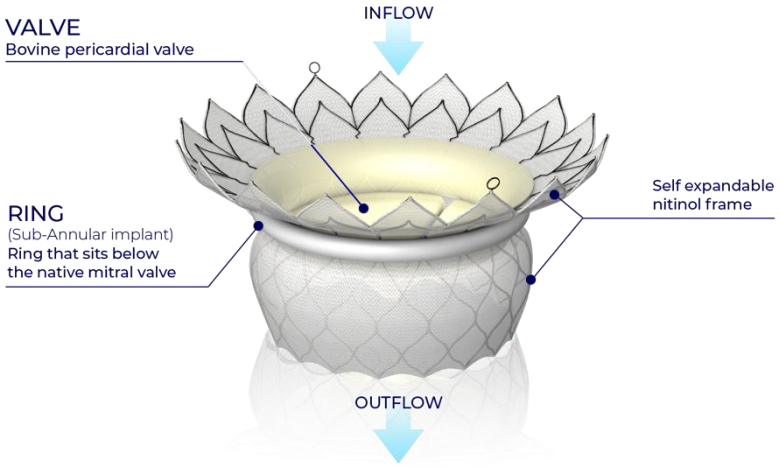
in inoperable patients with unfavourable TEER anatomy

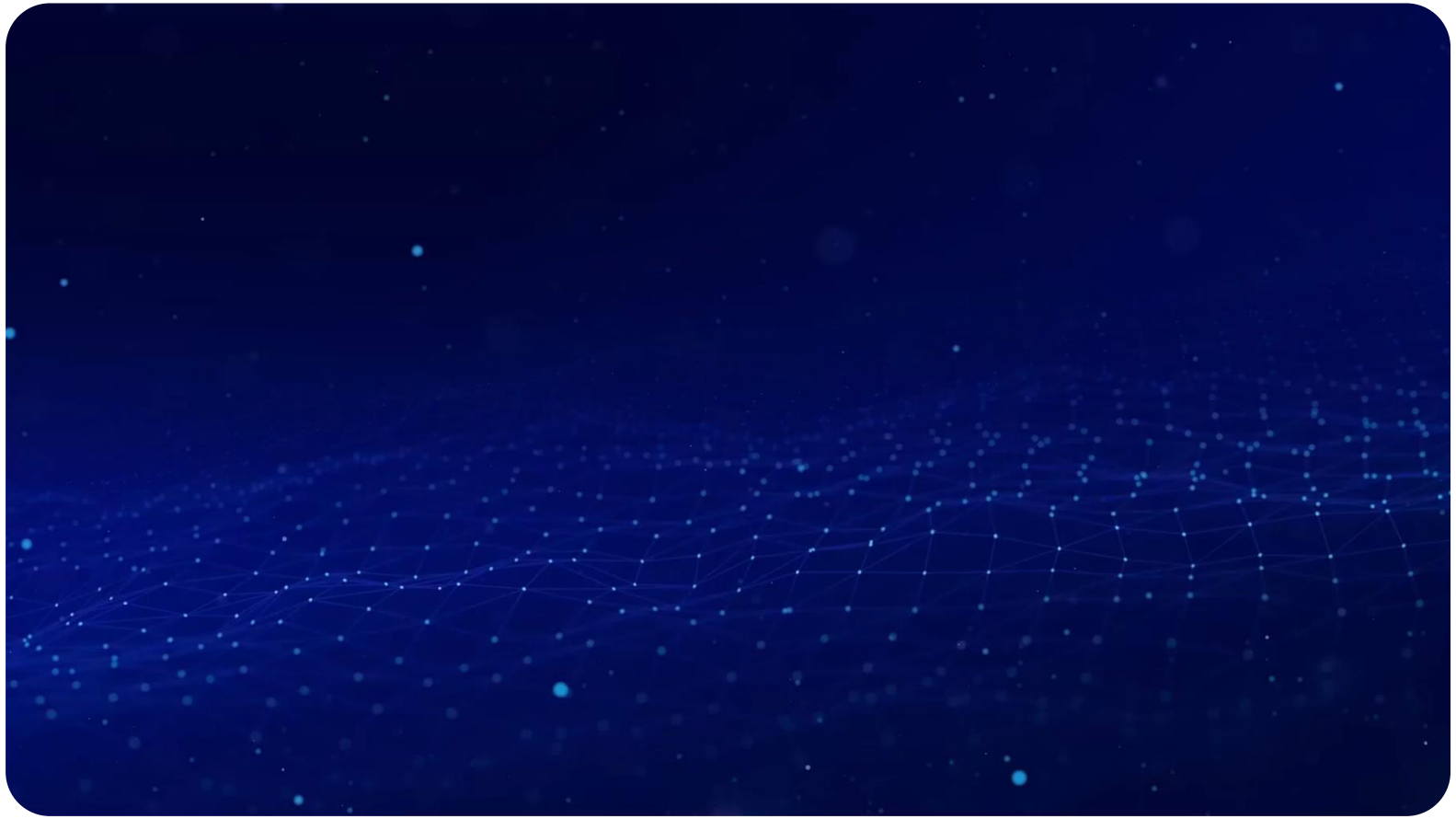
CENTRAL ILLUSTRATION: Transcatheter Mitral Valve Replacement Systems With Available Clinical Data



Hensey, M. et al. J Am Coll Cardiol Intv. 2021;14(5):489-500.

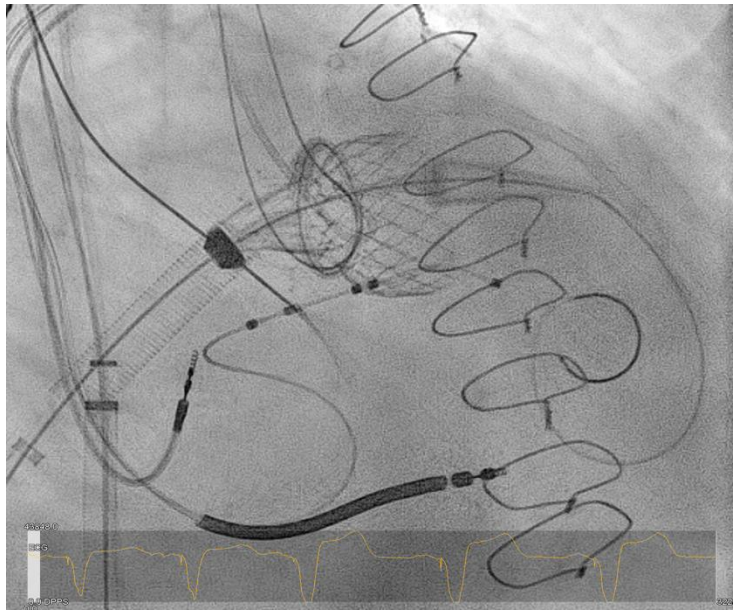
The HighLife TSMVR Procedure





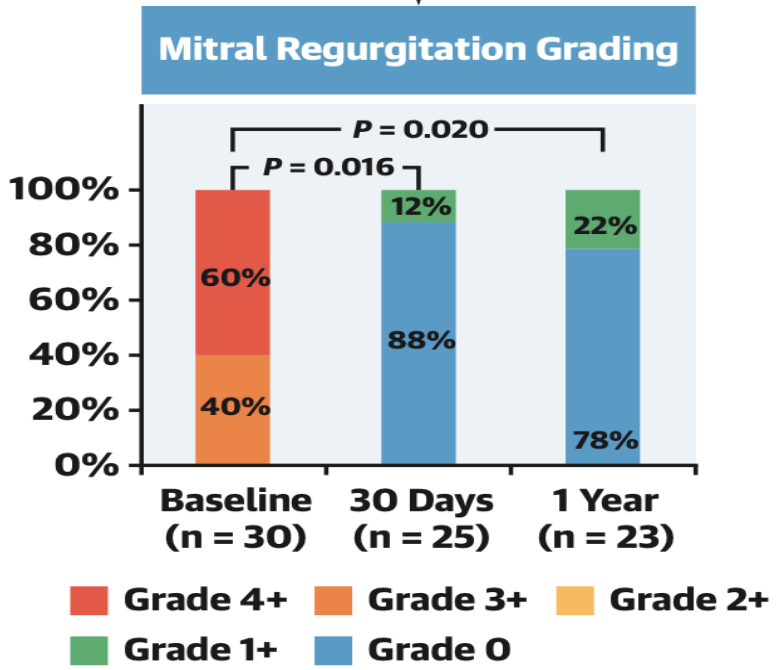
HighLife TSMVR Feasibility Study

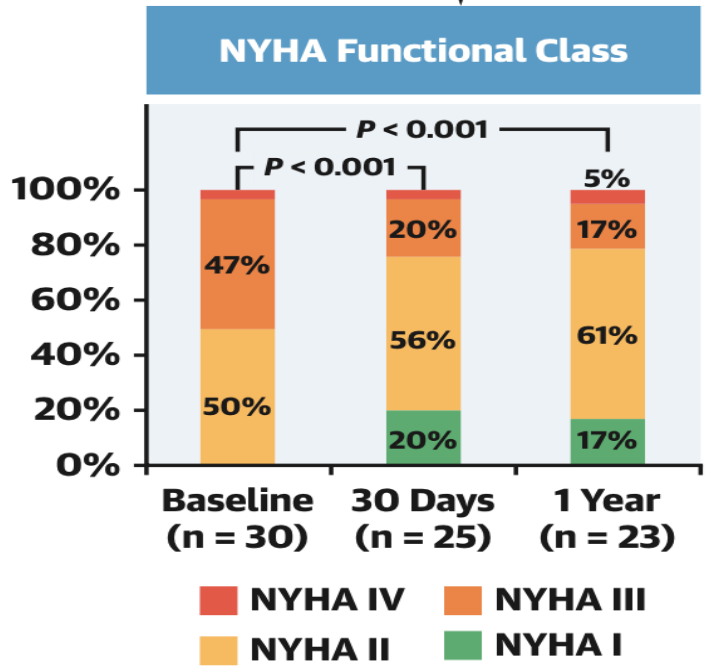
first 30 patients – 1-year echo and NYHA outcomes



1-Year Outcome

- Mean gradient of the HighLife valve 5.1 mm Hg
- No LVOT obstruction (mean gradient 2.0 mm Hg)
- No mitral valve reintervention

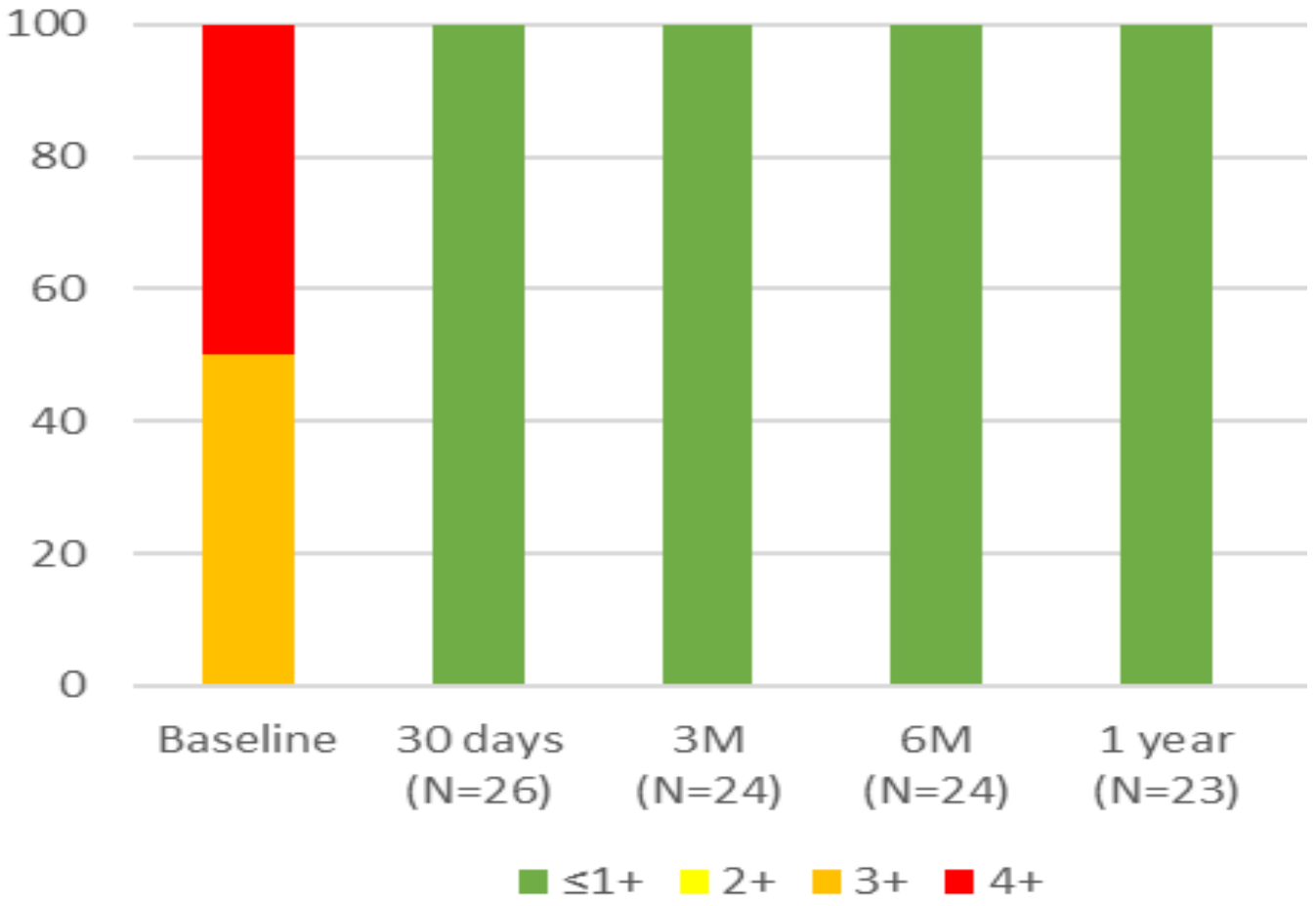




Schneider L-M et al. *JACC Intv.* 2023

HighLife TSMVR Feasibility Study

first 30 patients – 2-year echo outcomes



Keßler M et al., *TCT* 2024

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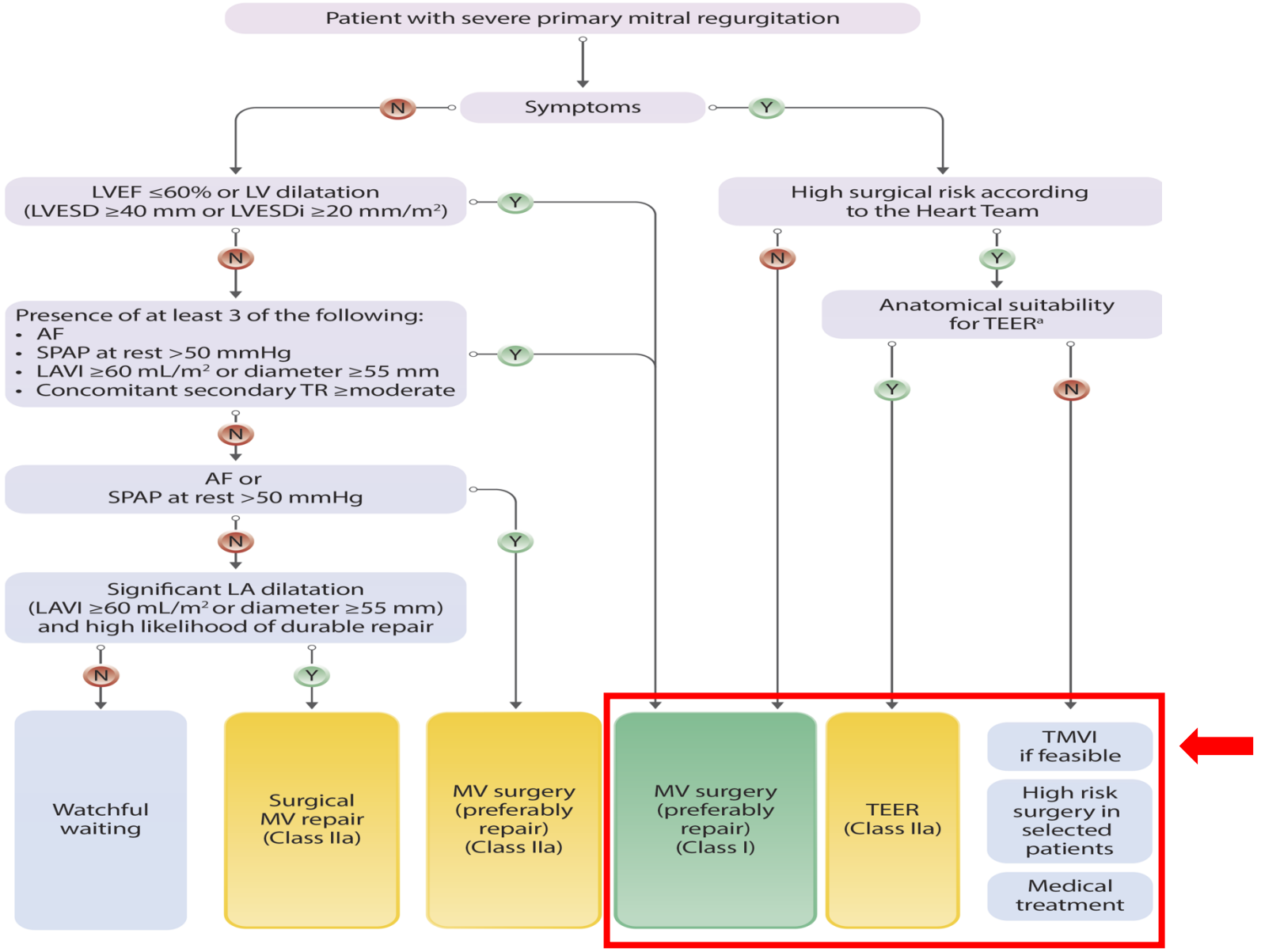
→ **Mitralinsuffizienz**

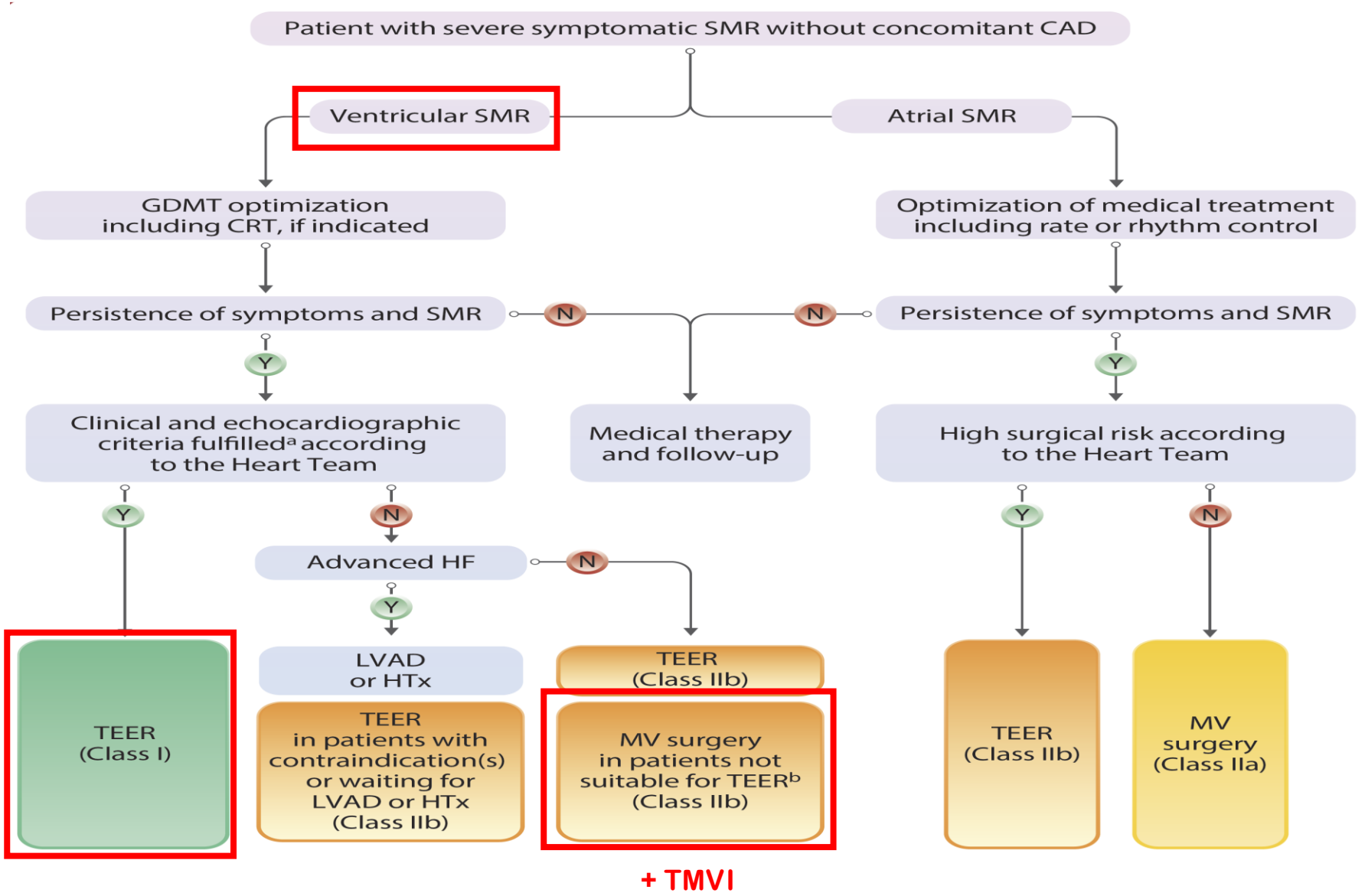
ESC guidelines for the management of valvular heart disease

Primäre/Degenerative Mitralinsuffizienz



ESC guidelines for the management of valvular heart disease

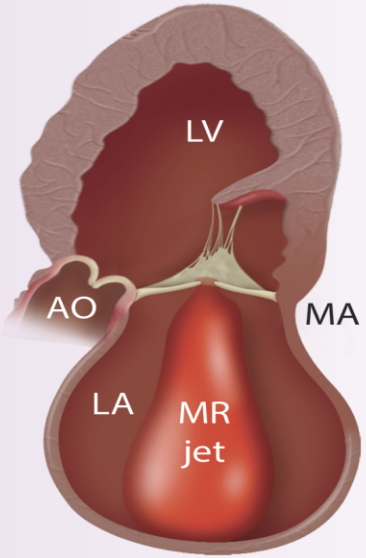
Sekundäre/Funktionelle Mitralinsuffizienz - ventrikulär

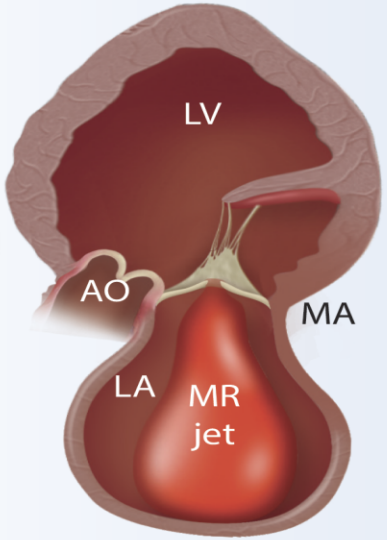


ESC guidelines for the management of valvular heart disease

Sekundäre Mitralinsuffizienz – atriale versus ventrikuläre MI

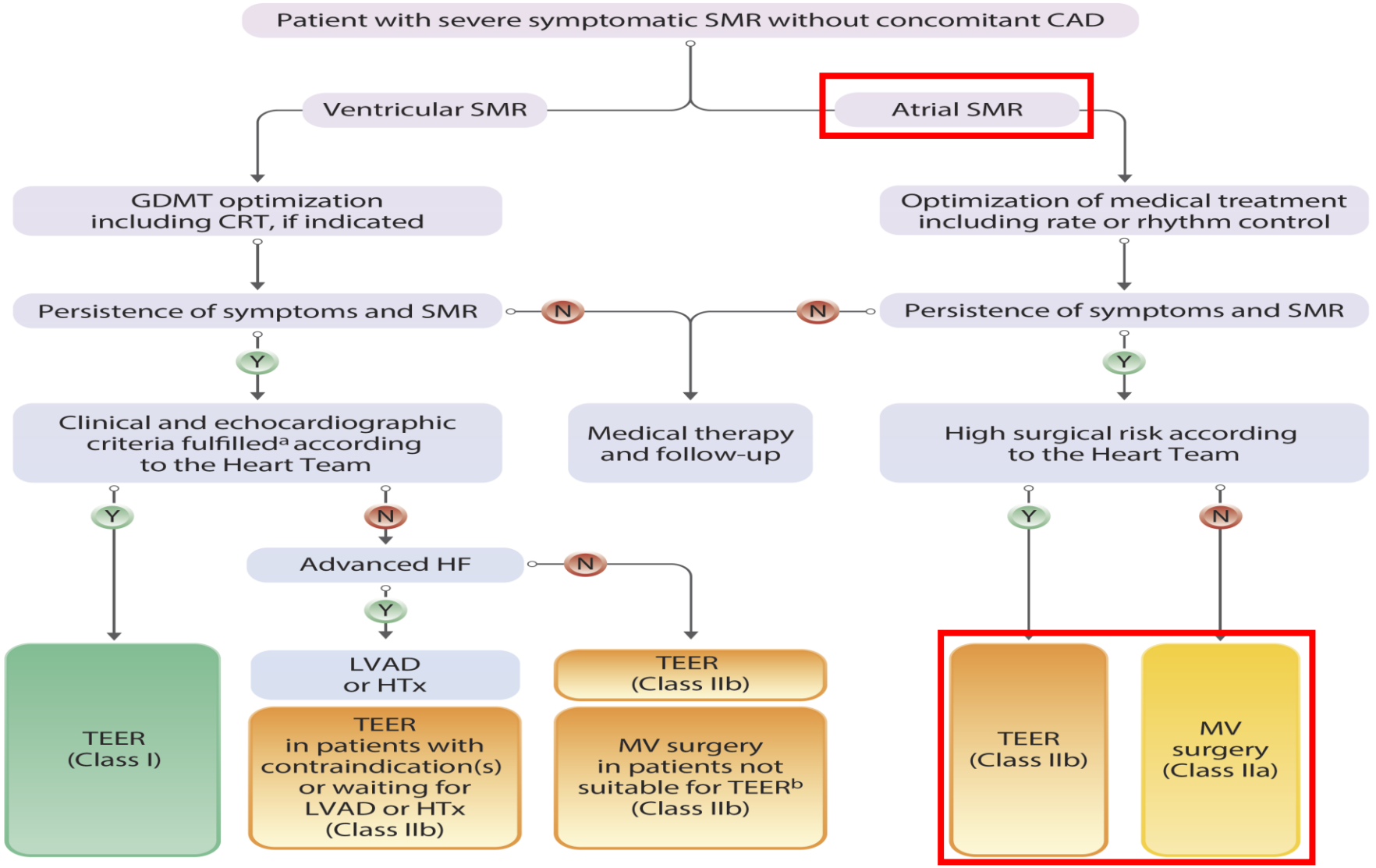
Key criteria	Atrial SMR	Ventricular SMR
	LVEF ≥50% without regional wall motion abnormalities	LVEF <50% with or without regional wall abnormalities
	No or mildly dilated LV cavity[a] without leaflet tethering	Restrictive leaflet motion with tethering
	Mitral annulus dilatation (AP >35 mm)	Normal leaflet morphology
	Enlarged LA (LAVI >34 mL/m^2)	Central or eccentric jet
Additional echocardiographic criteria[b]		
	Normal leaflet motion	Dilated LV
	Normal leaflet morphology	Dilated LA
	Usually central jet	Dilated MV annulus
Additional clinical criteria		
	Atrial fibrillation	Ischaemic heart disease
	HFpEF	Dilated cardiomyopathy





ESC guidelines for the management of valvular heart disease

Sekundäre Mitralinsuffizienz - atrial



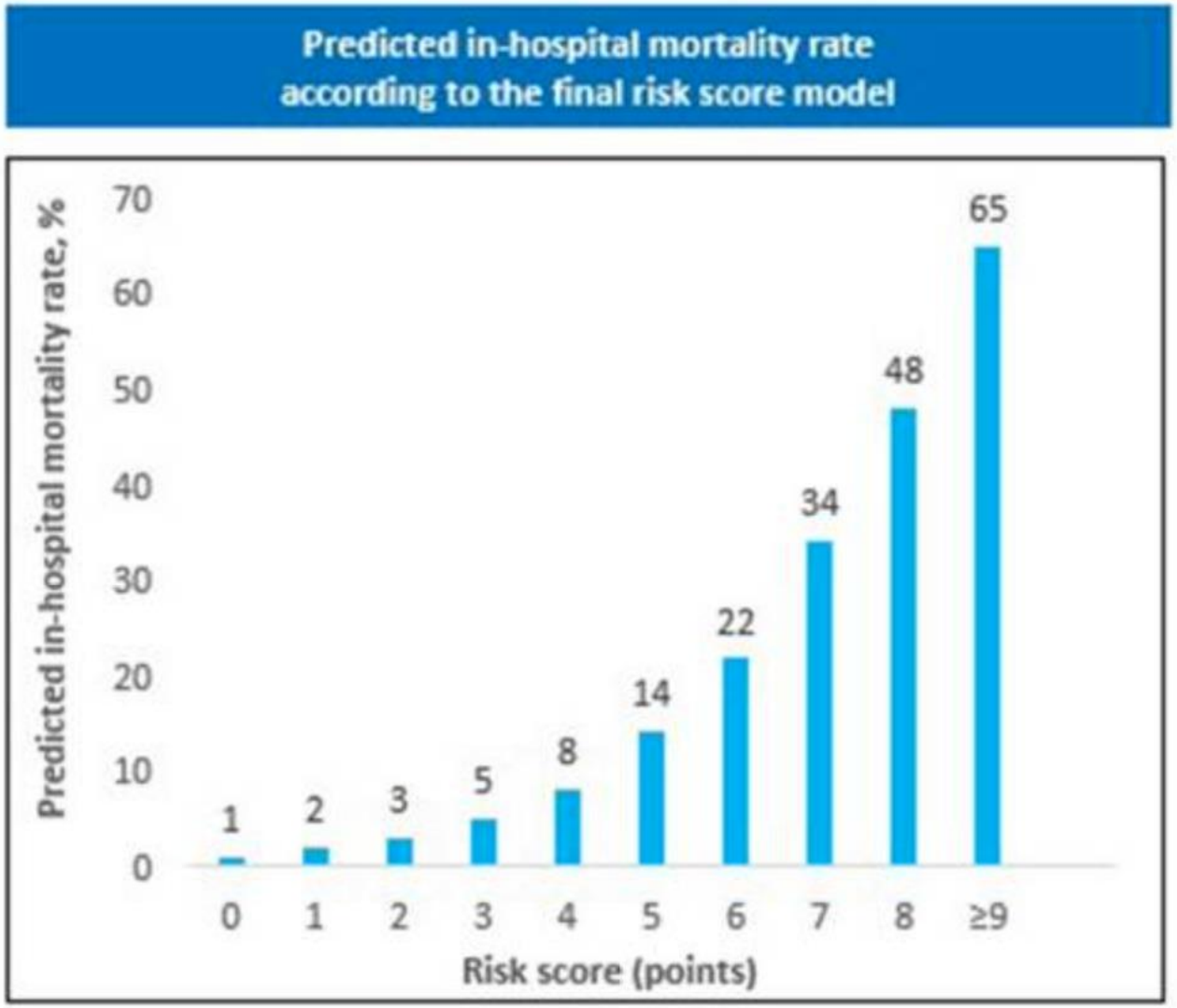
Leitliniengerechte Therapie der Mitralinsuffizienz 2026

…take home message…

- Es sollten die beiden Entitäten „strukturelle MI“ und „funktionelle MI“ zwingend getrennt betrachtet werden
- Bei funktioneller MI M-TEER, keine OP
- Bei struktureller MI bisher nur M-TEER bei hohem OP Risiko
- TMVI machbar, exzellente Ergebnisse, Stellenwert im Vergleich zu OP und TEER noch nicht klar

Interventionelle Therapie der Trikuspidalinsuffizienz

…die Operation ist mit einer sehr hohen Sterblichkeit assoziiert…



TRISCORE

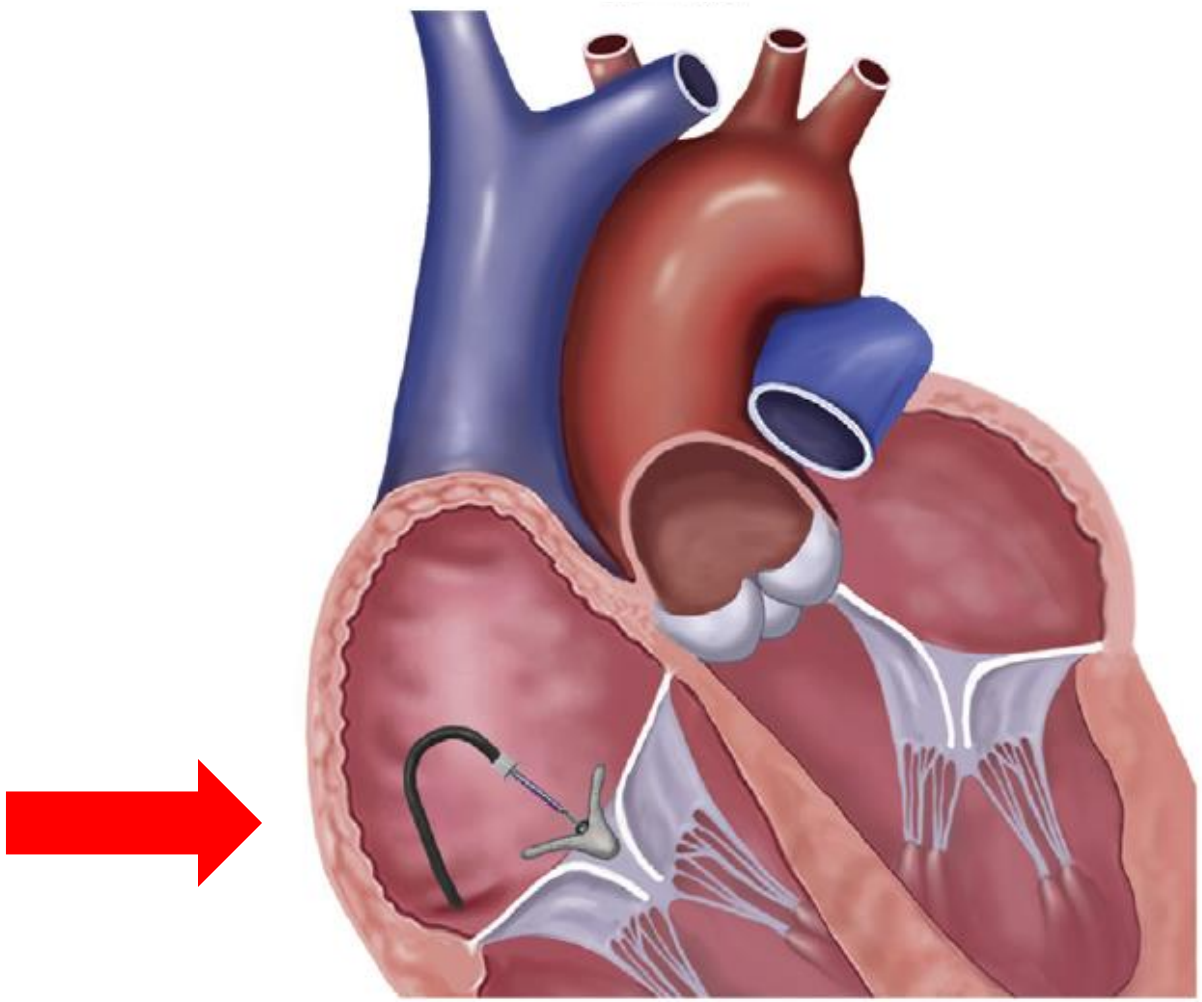
Risk factors and scoring system for in-hospital mortality after isolated tricuspid valve surgery

Risk factors (final model from multivariate analysis)	Scoring
Age ≥ 70 years	1
NYHA functional class III-IV	1
Right-sided heart failure signs	2
Daily dose of furosemide ≥ 125mg	2
Glomerular filtration rate < 30 ml/min	2
Elevated total bilirubin	2
Left ventricular ejection fraction < 60%	1
Moderate/severe right ventricular dysfunction	1
Total	12

Dreyfus J. et al, *Eur Heart J* 2023

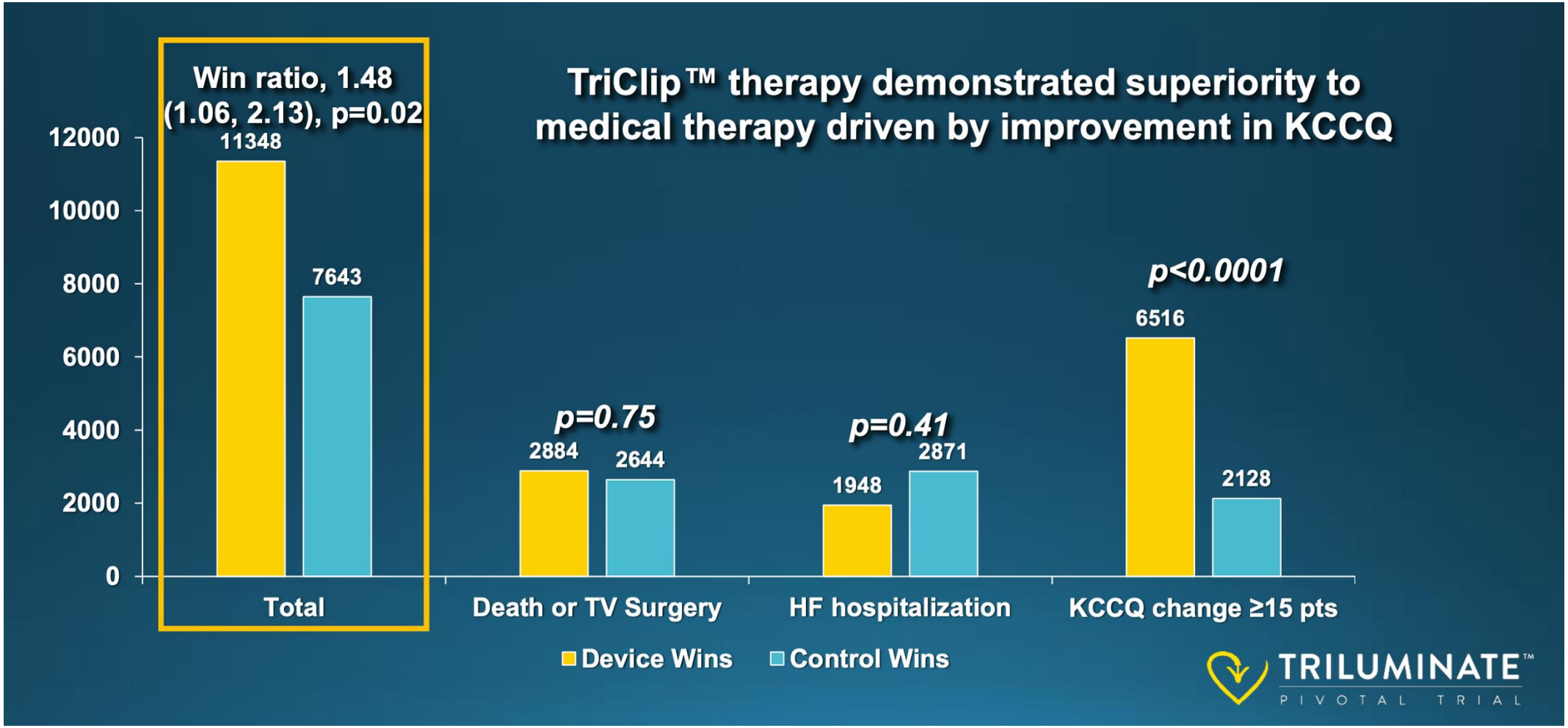
Interventionelle Therapie der Trikuspidalinsuffizienz

…edge to edge repair mittels TriClip…



Trikuspidalinsuffizienz

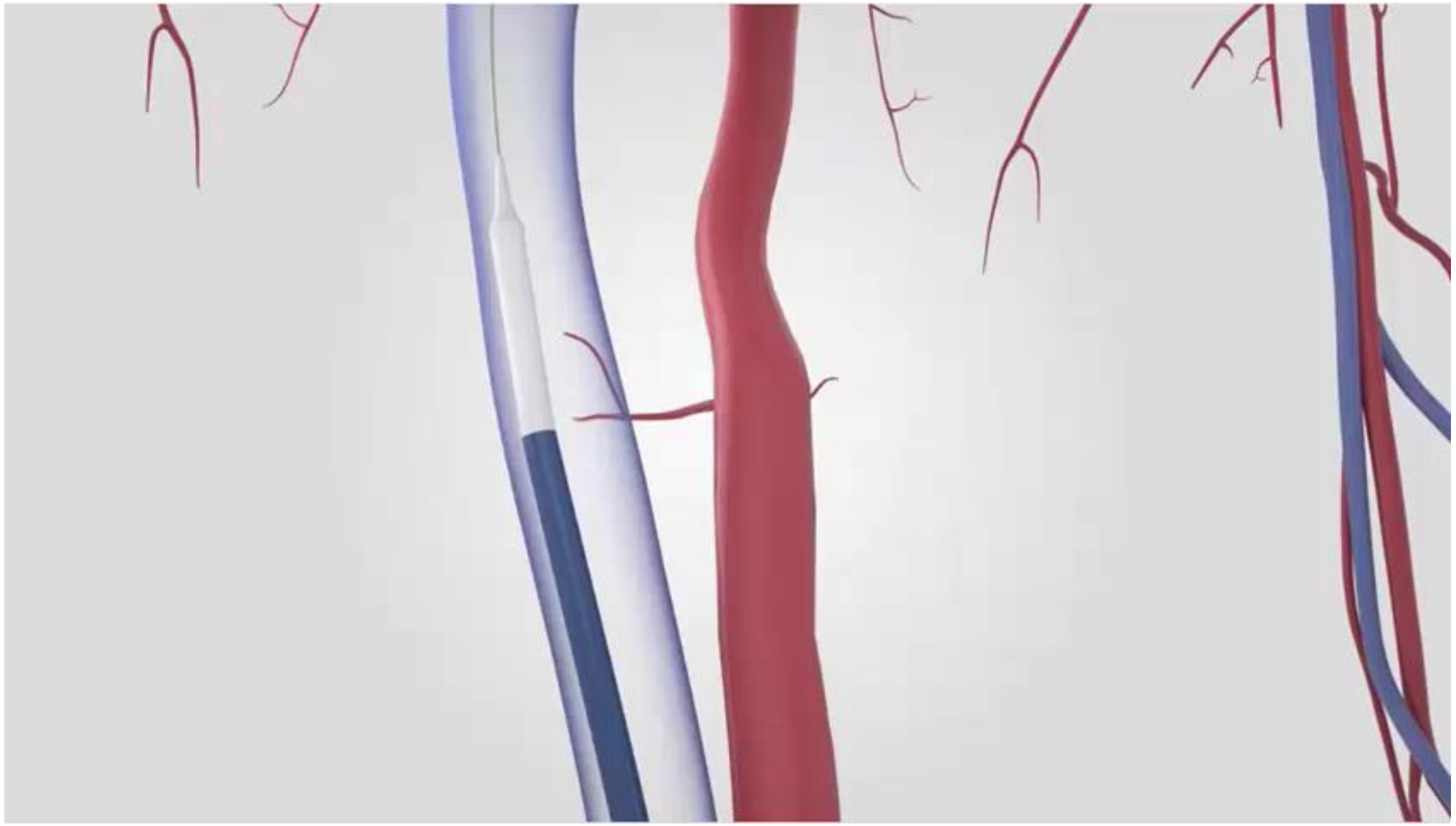
…TRILUMINATE pivotal trial – insgesamt klinischer Benefit, aber…



Soraija P. et al, *NEJM* 2023

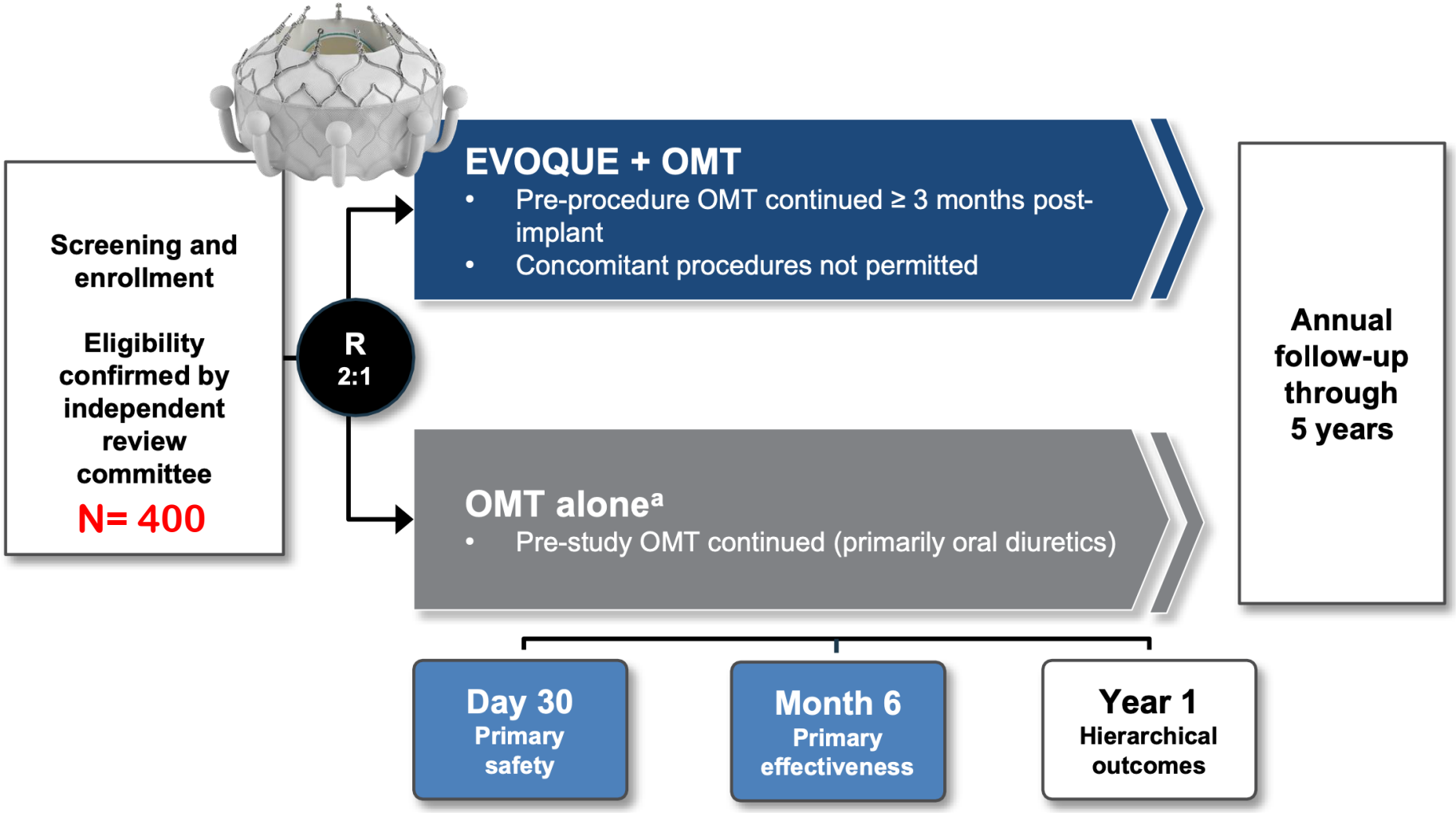
Interventionelle Behandlung von AV-Klappenerkrankungen

neue Möglichkeiten – Trikuspidalklappenersatz Evoque



Trikuspidalinsuffizienz

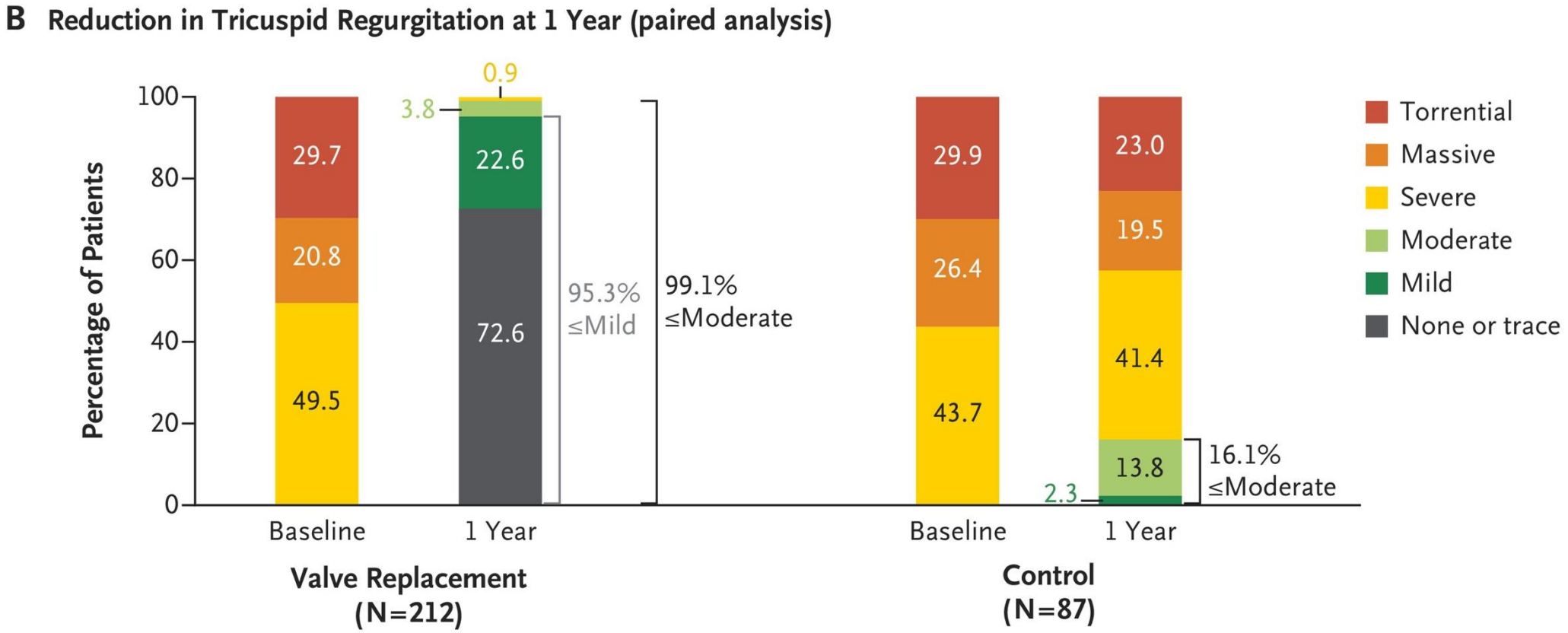
…EVOQUE Klappenersatz – TRISCEND II…



Kodali S. et al, *TCT* 2023

Trikuspidalinsuffizienz

…TRISCEND II – TR reduction at 12 months …



Kodali S. et al, *TCT* 2023

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→ **Trikuspidalinsuffizienz**

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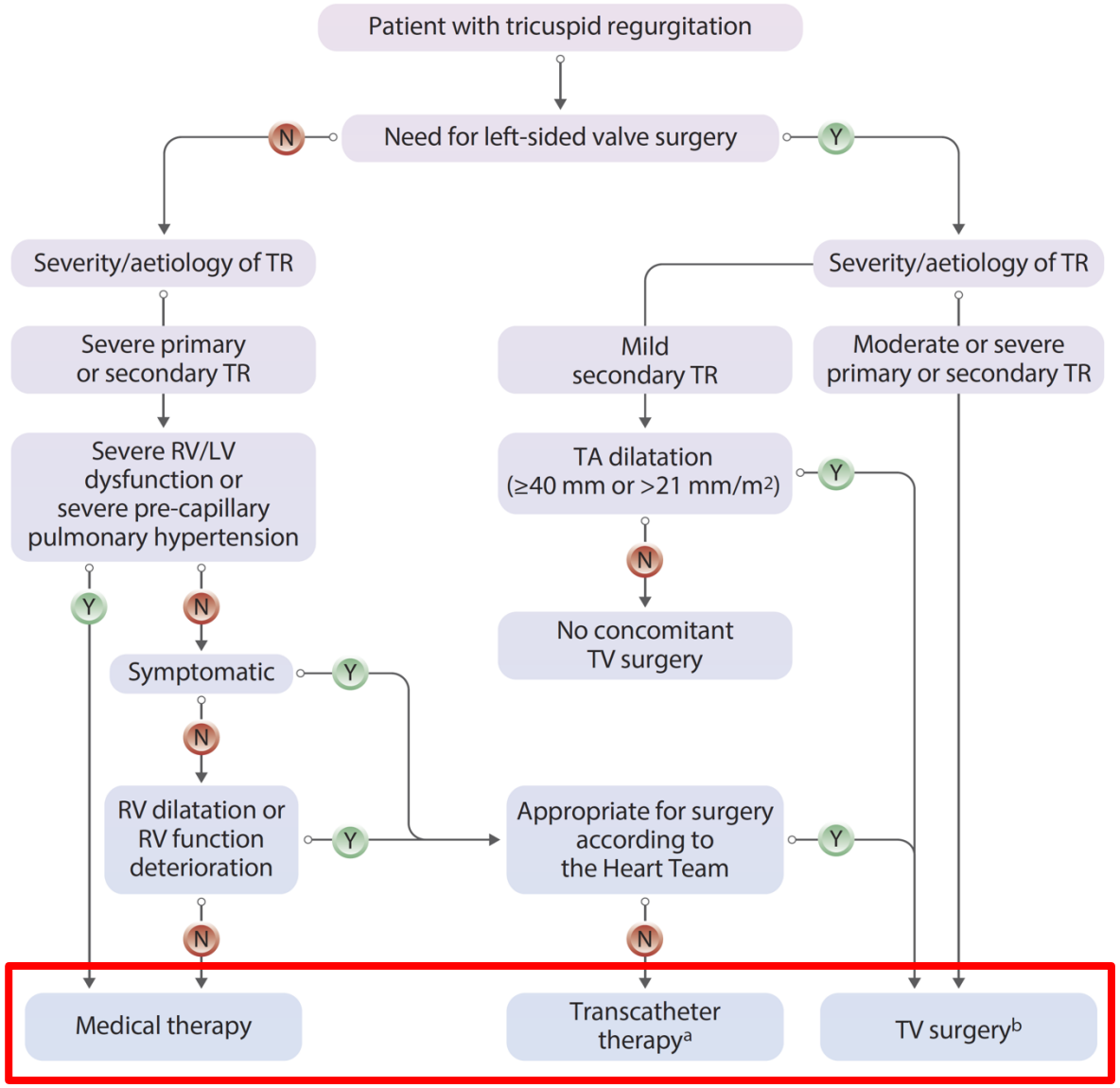
Trikuspidalinsuffizienz



Patients with severe tricuspid regurgitation without left-sided valvular heart disease requiring surgery		
TV surgery[c] is recommended in symptomatic patients with severe primary TR without severe RV dysfunction or severe PH.	I	C
TV surgery[c] should be considered in asymptomatic patients with severe primary TR who have RV dilatation/RV function deterioration, but without severe LV/RV dysfunction or severe PH.	IIa	C
TV surgery[c] should be considered in patients with severe secondary TR who are symptomatic or have RV dilatation/RV function deterioration, but without severe LV/RV dysfunction or PH.[685,720,745–747]	IIa	B
Transcatheter TV treatment should be considered to improve quality of life and RV remodelling in high-risk patients with symptomatic severe TR despite optimal medical therapy in the absence of severe RV dysfunction or pre-capillary PH.[713,733,735,738,748–751]	IIa	A

Leitliniengerechte Therapie der Trikuspidalinsuffizienz 2026

…take home message …

- TI Operation mit sehr hoher Sterblichkeit assoziiert
- Perkutane Verfahren zur Behandlung der TI wie TEER und auch Klappenersatz zeigen
  - Hohe Effektivität in Reduktion von TI und Symptomatik
  - Verbesserung funktioneller Parameter und Quality of Life
  - Sehr gutes Sicherheitsprofil

  aber
    - noch keine Prognoseverbesserung (Mortalität, Rehospitalisierung)

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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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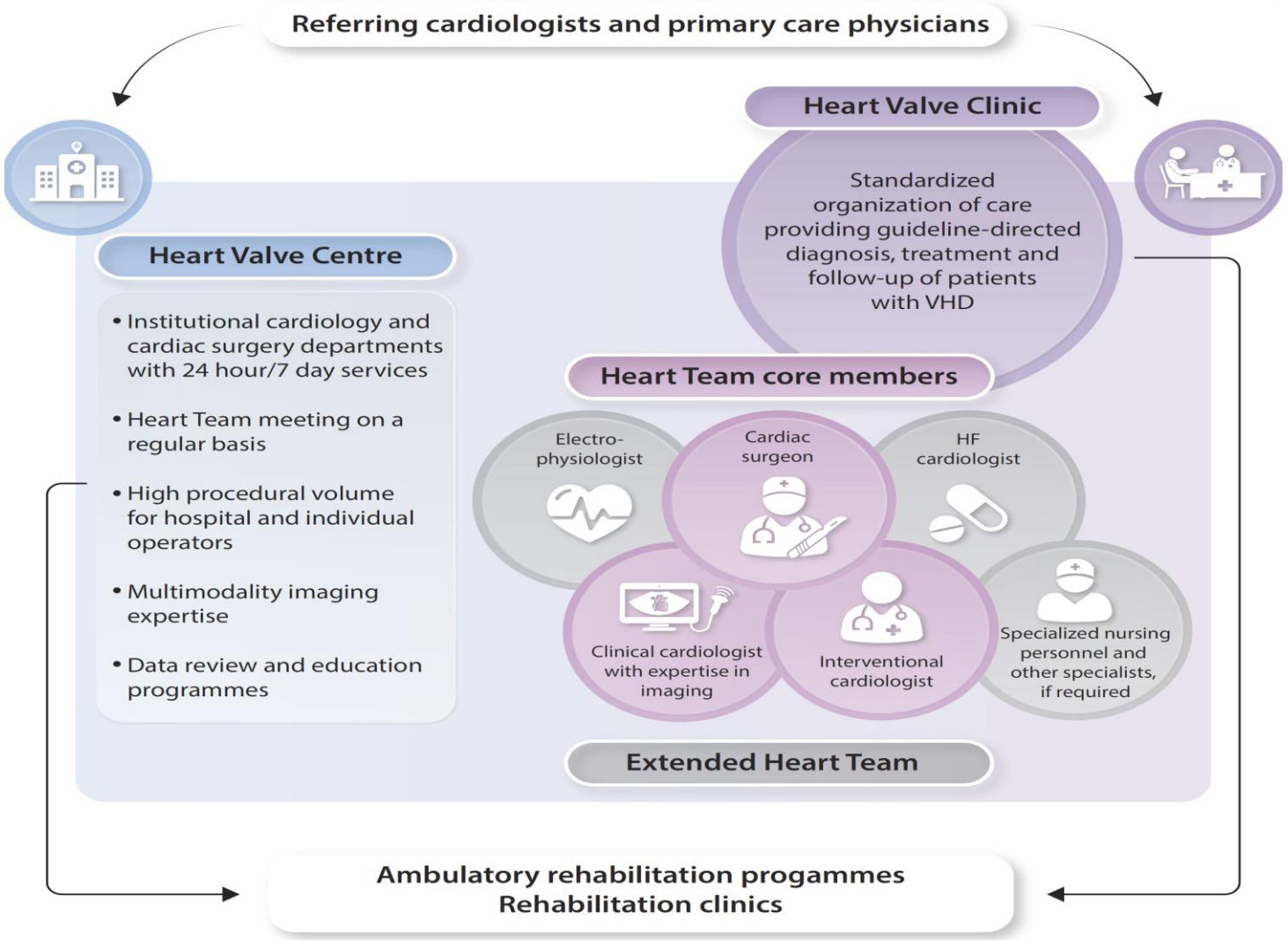
→ generelle Empfehlungen

ESC guidelines for the management of valvular heart disease

requirement 1 - heart valve network



3.1.2. Procedural volume and clinical outcomes

The correlation between high institutional (and individual operator) volume and best procedural outcomes is intuitive, yet complex. Nevertheless, there is evidence of such a relationship for many cardiovascular procedures including SAVR,[23,24] surgical MV repair,[25,26] mitral and tricuspid TEER,[27–30] and TAVI (particularly in centres with an associated high-volume SAVR programme).[31–33] Studies have shown that an annualized operator volume of approximately 25 surgical mitral valve procedures,[26] 50 TAVIs (~100 per centre),[33] a cumulative experience of ~50 M-TEER procedures per operator/centre,[27] and a site volume of more than 20 T-TEERs/year[30] are associated with improved technical and clinical outcomes. Higher institutional surgical volume is associated with lower complication rates,[34–36] improved management,[37] and better infrastructural support.[38,39]

National procedural activity varies widely between high-, middle-, and low-income countries,[40] and it is therefore difficult to provide recommendations concerning the precise number of institutional or operator procedures that is required for high-quality care, excellent facilities, and processes. Instead, a network approach that highlights the importance of centres performing a high volume of procedures (e.g. based upon quartiles in individual countries or regions) seems more suitable, with complex procedures concentrated in the centres with the highest volumes (*Table 6*).

Table 6 Complex procedures ideally performed in the most experienced Heart Valve Centres

Transcatheter interventions	Surgical interventions
• Transfemoral TAVI in patients with high-risk features: – Low coronary ostia – Difficult femoral anatomy – Bicuspid valve – Severe calcification protruding into the LVOT – Severe LV and/or RV impairment – Pure AV regurgitation – Multiple valve disease – Complex coronary artery disease – Severe extracardiac disease (e.g. renal failure, PH) • Non-transfemoral TAVI • Valve-in-valve (including TAV-in-TAV) • All leaflet modification procedures (BASILICA, LAMPOON etc.) • PVL closure procedures • Complex M-TEER[a] • Redo M-TEER procedures • Tricuspid or mitral valve-in-ring or valve-in-valve, valve-in-MAC • TMVI • All tricuspid procedures	• High-risk procedures (especially in patients with LV and/or RV impairment) • Redo procedures • Minimally invasive and robotic valve surgery • Complex MV repair – Barlow disease – Anterior or bileaflet prolapse – High risk of SAM – Severe MAC • AV repair • Ross procedure • Valve surgery combined with complex surgery of the aorta • Endocarditis surgery

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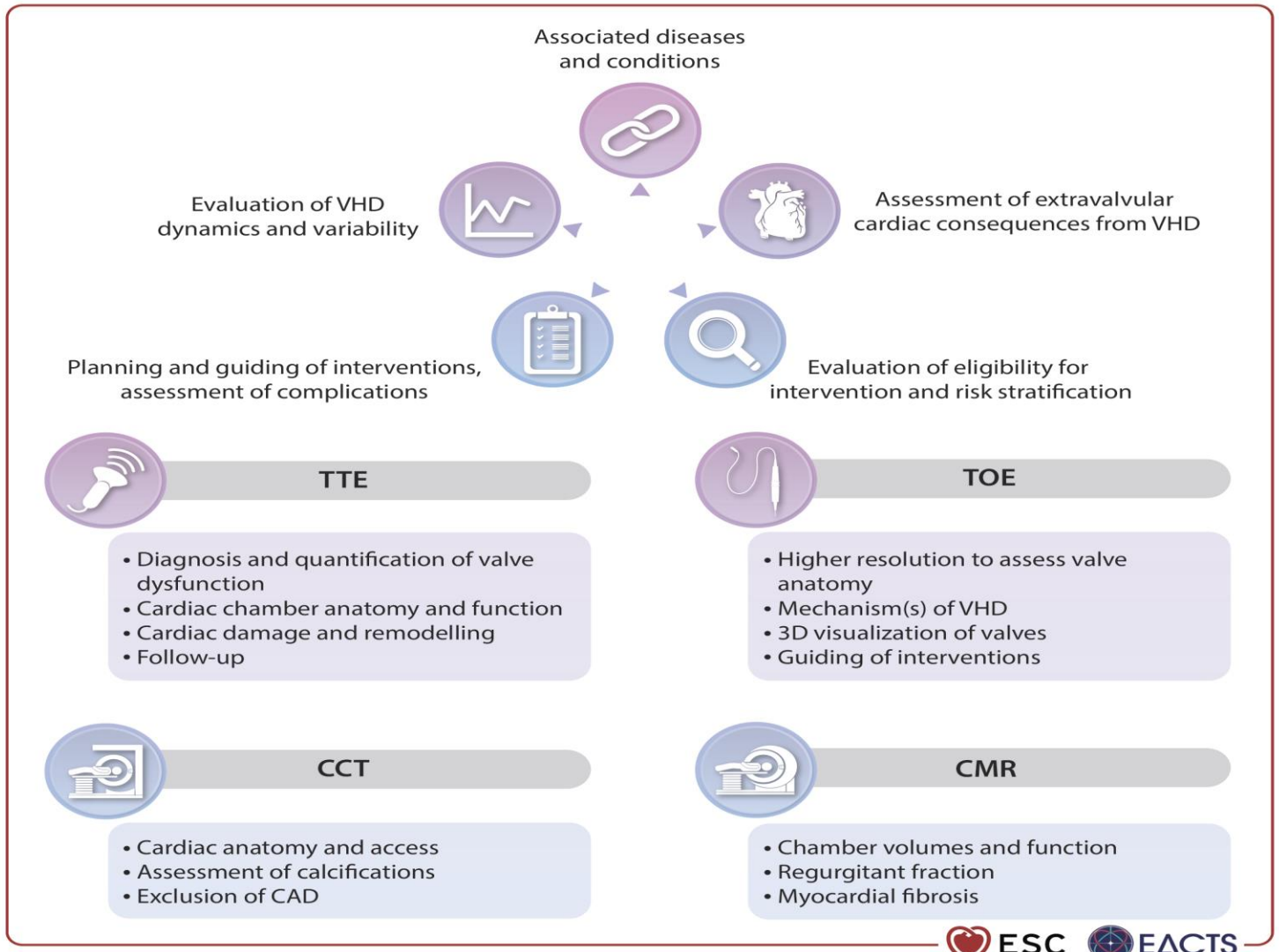
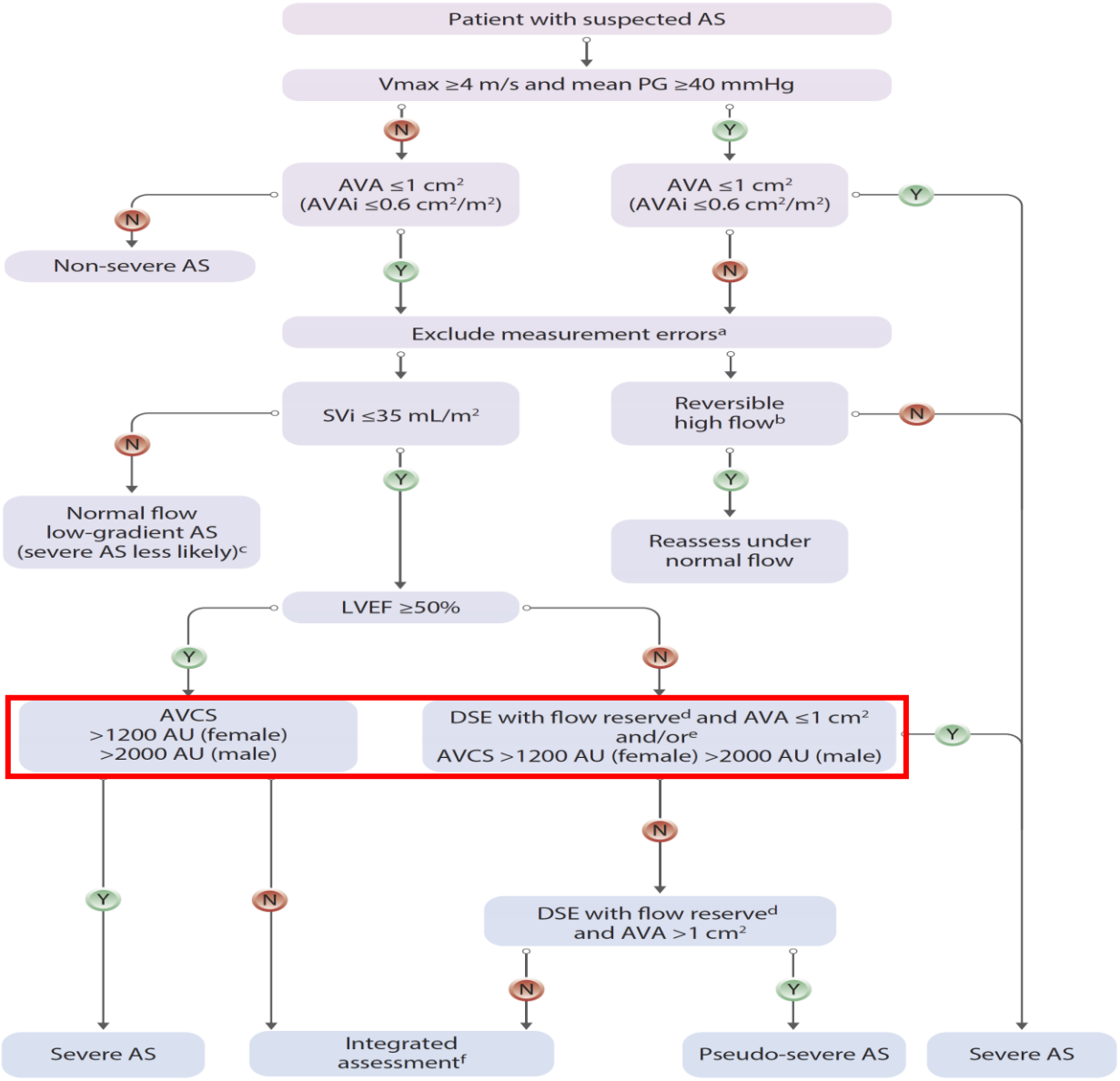
requirement 2 - integrative imaging assessment



Work-up low gradient AS



Recommendations	Class[a]	Level[b]
Diagnosis of coronary artery disease		
CCTA is recommended before valve intervention in patients with moderate or lower (≤50%) pre-test likelihood of obstructive CAD.[122–124]	I	B
Invasive coronary angiography is recommended before valve intervention in patients with high and very high (>50%) pre-test likelihood of obstructive CAD.	I	C
Invasive coronary angiography is recommended in the evaluation of CAD in patients with severe ventricular SMR.	I	C
Omission of invasive coronary angiography should be considered in TAVI candidates, if procedural planning CT angiography is of sufficient quality to rule out significant CAD.[125–129]	IIa	B

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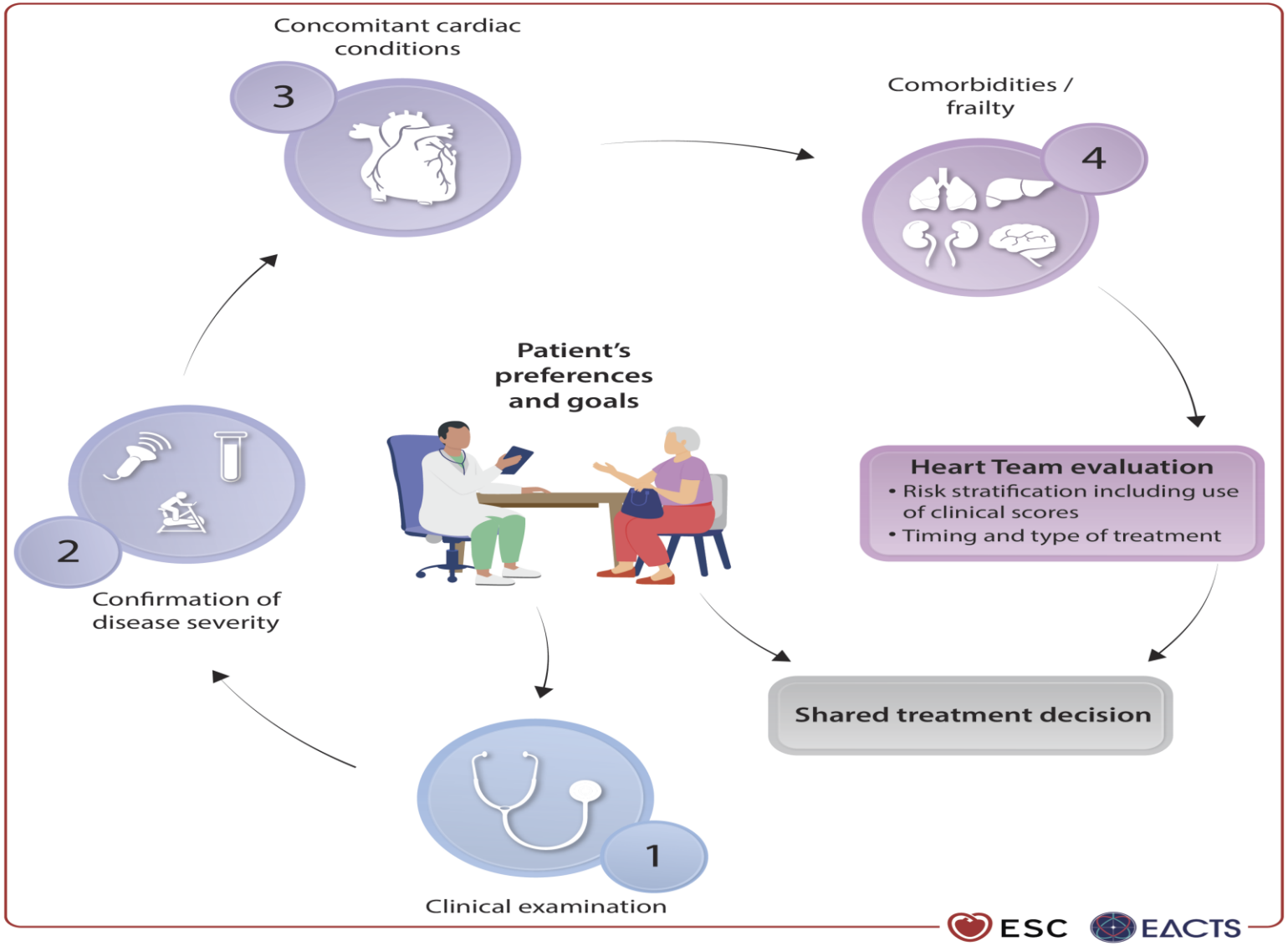
requirement 3 - patient-centred evaluation for treatment



ESC Leitlinien Klappenerkrankungen

Was sind die Essentials für die klinische Praxis?

Univ.-Prof. Dr. med. W. Rottbauer

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