Valve Vibes: Innovations in Structural Heart Care

Advancing Patient Care Through Technology, Trials, and Teamwork

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April 10, 2026

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Comprehensive Update: Structural Heart Transcatheter Therapies

Learning Objectives:

Describe the pathophysiology and clinical presentation of Structural Heart Diseases, focusing on Valve disease

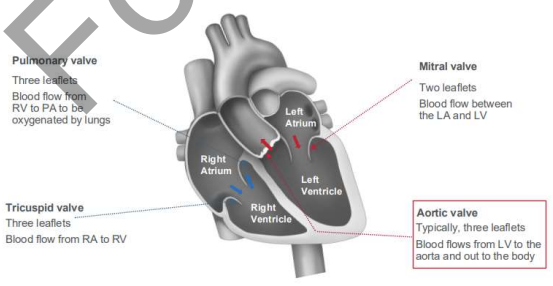
Explain the expanding indications, procedures, and ongoing management for Minimally Invasive Valve Therapies

Apply Evidence-Based Nursing Care to Optimize Outcomes in Patients Undergoing transcatheter structural heart procedures including shared decision-making principles

2

What is Structural Heart Disease?

Valves of the heart



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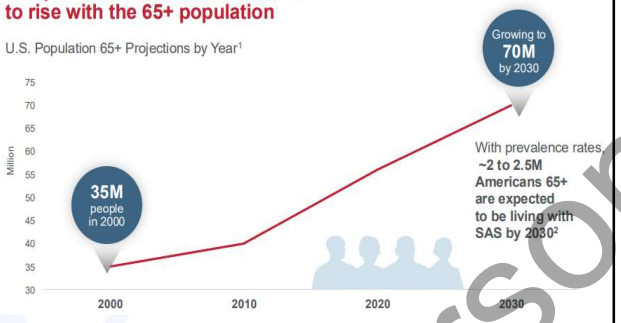
Excellence in Structural Heart Treatment: expanding indications, expanding impact

Valve	Therapy
Aortic	Transcatheter Aortic Valve Replacement (**TAVR**)
Mitral	Mitral Transcatheter Edge-to-Edge Repair (**mTEER**) Transcatheter Mitral Valve Replacement (**TMVR**)
Tricuspid	Tricuspid Transcatheter Edge-to-Edge Repair (**tTEER**) Transcatheter Tricuspid Valve Replacement (**TTVR**)
	Transcatheter Bicaval Valve Implantation (**TricValve**)

4

The prevalence of SAS continues to rise with the 65+ population

U.S. Population 65+ Projections by Year[1]



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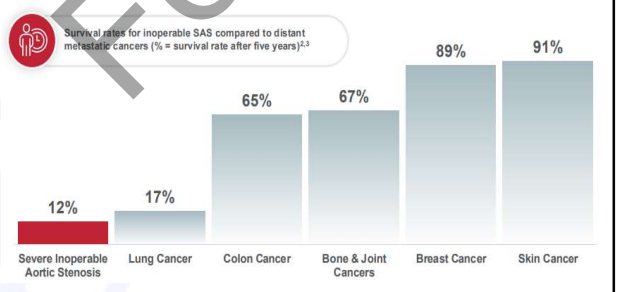
Untreated severe AS (SAS) has a worse survival rate than that of many metastatic cancers[1-3]

Survival rates for inoperable SAS compared to distant metastatic cancers (% = survival rate after five years)[2,3]



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TAVR procedural animation

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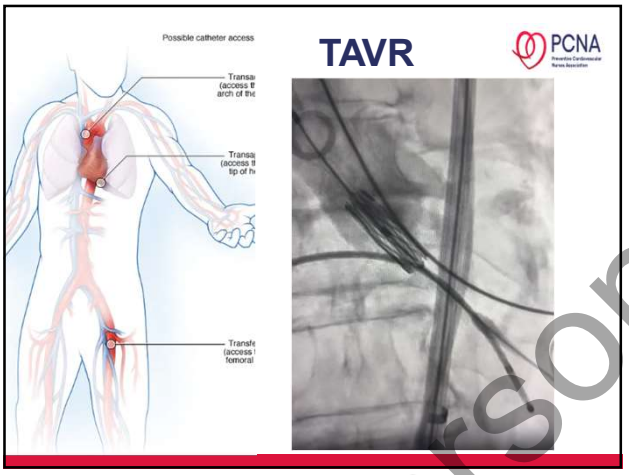

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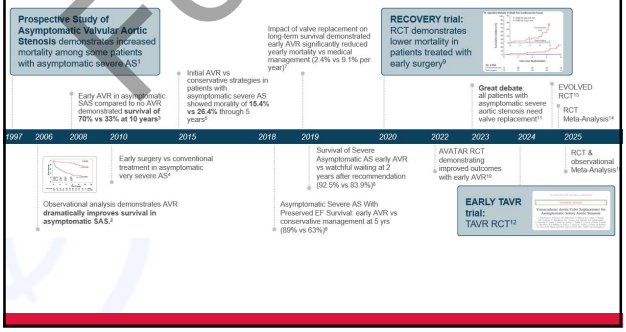
TAVR Expansion

20+ years of evidence investigating progression and treatment of asymptomatic severe aortic stenosis



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Team Effort

- Valve clinic coordinator
- Dedicated NP/PA
- Program manager
- Referral coordinator / Nurse navigator with a streamlined infrastructure in place for:
  - Referral coordination
  - Testing and appointment scheduling
  - Patient navigation
  - Patient tracking
  - NCDR/TVT quality assurance
- Research coordinator for clinical trials
- TVT Registry data collection/entry coordinator

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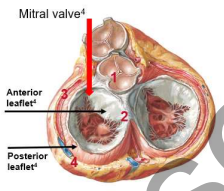
Mitral Innovations

TEER
TMVR
Emerging systems

Mitral Valve anatomy

- Atrioventricular valve
  - Separates the left atrium and left ventricle[1]
- Part of the high-pressure systemic circulation[2]
- Located obliquely, behind the aortic valve[1]
- Located near to 4 important anatomical structures[3]
  1. Aortic Valve[3]
  2. Bundle of HIS[3]
  3. Circumflex artery[3]
  4. Coronary sinus[3]



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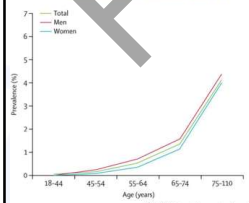
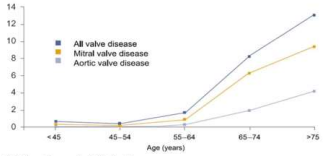
Mitral Valve Disease is the Most Common Valvular Disease[1]

The Prevalence of Mitral Regurgitation Significantly Increases with Age[2]

Prevalence of isolated moderate-to-severe MR (%)[2]



Prevalence of moderate-to-severe valve disease (%)[1]



PASCAL Precision system is only indicated for Primary/Degenerative MR in the US.

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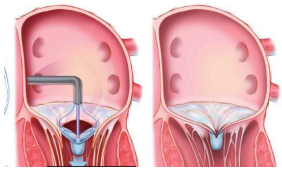
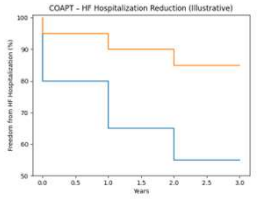
Mitral TEER

Indications
- Severe symptomatic primary MR
- Severe asymptomatic primary MR with abnormal LV remodeling
- Severe secondary mitral regurgitation despite optimized GDMT
- Moderate symptomatic secondary MR with LV dysfunction and despite GDMT
- High risk surgical candidates or declines surgery
- Favorable anatomy – flail/prolapsed scallop(s)

Contraindications
- Mitral stenosis
- Severe mitral annular calcification
- Active endocarditis
- Rheumatic valve disease
- CI to antithrombotic therapy
- Life expectancy < 1 year

FDA approved
- Abbott MitraClip 2013
- Edwards PASCAL 2022





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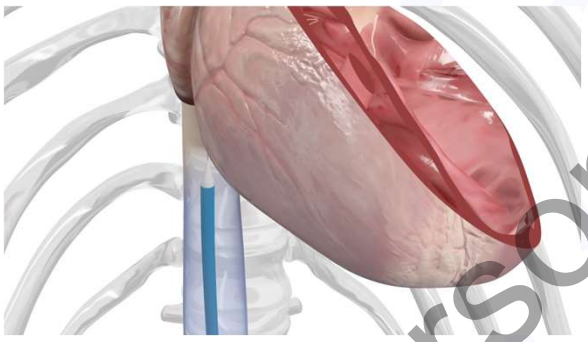
Mitral TEER procedural animation



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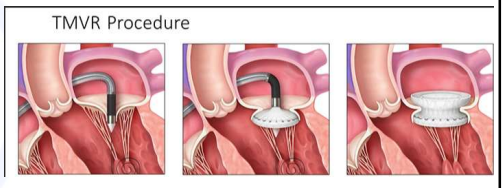
TMVR

Indications
- Severe calcific or rheumatic mitral stenosis
- Degenerated bioprosthetic MVR
- Degenerated MV ring repair
- Severe MR not amenable to mTEER due to anatomy, severe mitral annular calcification or concomitant mitral stenosis
- High risk surgical candidate or declines surgery

Contraindications
- Active endocarditis, Small LVOT, CI to anticoagulation, Life expectancy < 1 year

FDA approved
- Edwards Sapien M3 (Encircle trial) 2025

Investigational
- Medtronic Intrepid Valve APOLLO trial



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TMVR procedural animation

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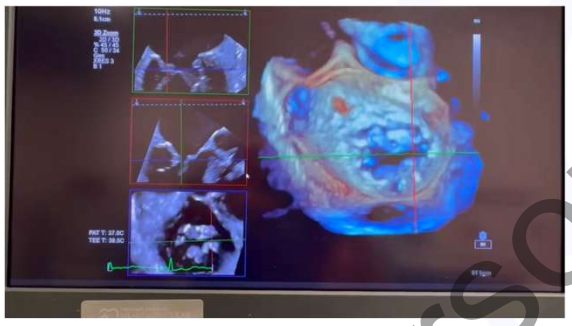
ENCIRCLE



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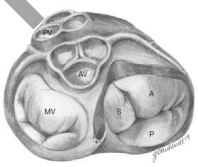
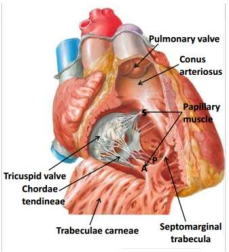
Tricuspid Innovations

TEER
TTVR
Reduced HF admissions





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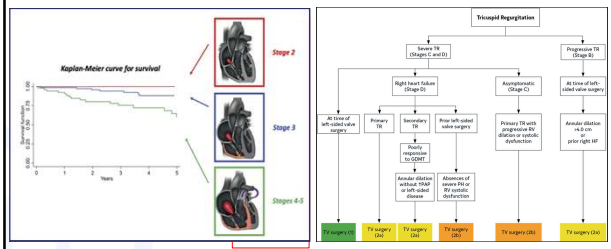
Surgery for TR



Otto et al; Circulation 2020

Zack CJ et al, J AmColl Cardiol 2017;70:2953–60

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Phenotypes of TR

Primary 5-10%

-intrinsic abnormality of the TV or subvalvular apparatus

-congenital anomalies, degenerative/prolapse, infective endocarditis, Carcinoids syndrome, trauma

Lead-induced 10-15%

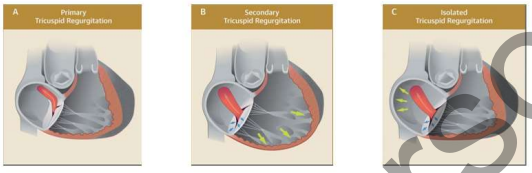
-induced or associated with pacemaker or ICD lead

Functional/ Secondary 80%

-abnormality of the annulus or ventricle

-Atrial FTR: AF, HFpEF

-Ventricular FTR: left heart disease, PH, intrinsic RV dysfunction



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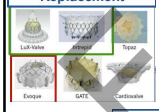
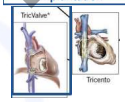
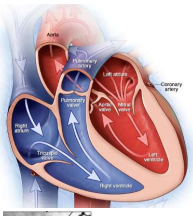
Transcatheter Therapies for TR: Device Landscape

Orthotopic Valve Replacement

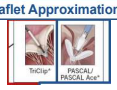


Heterotopic Valve Implantation

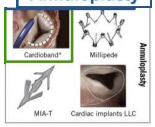




Leaflet Approximation



Annuloplasty



Red- FDA approved
Blue- in RCT/pivotal trial
Green- in early feasibility trial

Praz et al. EuroIntervention 2021;17:791-808

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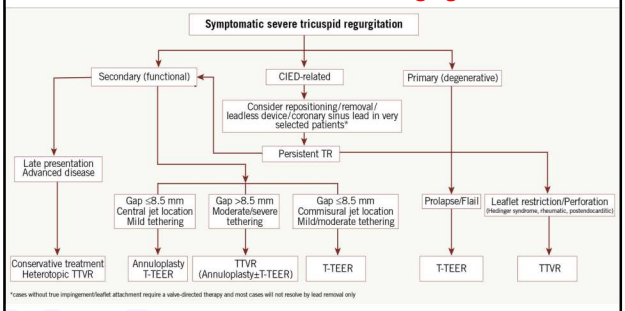
Anatomical criteria for device selection

Ensure excellent TEE/CT imaging



Praz et al. EuroIntervention 2021;17:791-808

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Tricuspid TEER – TRILUMINATE

Indications

Severe symptomatic tricuspid regurgitation

Primary/degenerative TR from TV prolapse/flail, malcoaptation

R-sided HF or sequelae of chronic R-sided congestion

High risk surgical candidate or declines surgery

Contraindications

Active endocarditis

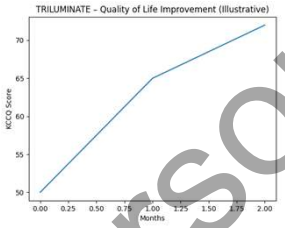
CI to antithrombotic therapy

Life expectancy < 1 year

FDA approved

Abbot TriClip 2024

- Improved KCCQ quality of life scores
  - Significant TR reduction
  - Earlier recognition improving referral patterns
  - APP role: Symptom surveillance & diuretic management



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The NEW ENGLAND JOURNAL of MEDICINE

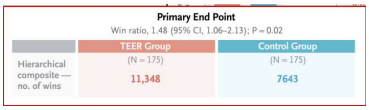
ESTABLISHED IN 1812 MAY 18, 2023 VOL. 388 NO. 20

Transcatheter Repair for Patients with Tricuspid Regurgitation

Sorajja P, et al. NEJM 2023; 388:1833-1842

- 350 pts, 55% women, 94% FTR
- 1:1 randomized to t-TEER vs OMT
- 98.8% procedural success
- 1 non-procedural death at 30 d

TRILUMINATE



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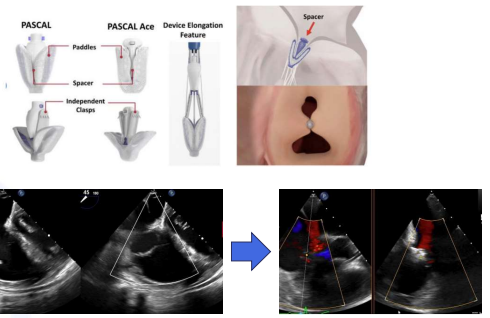
CLASP TR trial: T-TEER w/ PASCAL device



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TTVR

Indications

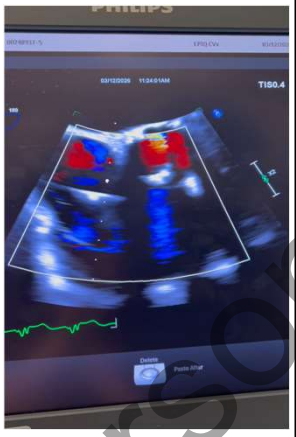
- Severe symptomatic tricuspid regurgitation not amenable to TEER
  - Functional/secondary TR from RV or RA dilation, RV lead interaction
  - R-sided HF or sequelae of chronic R-sided congestion
- High risk surgical candidate or declines surgery

Contraindications

- Active endocarditis
- CI to anticoagulation
- Severe RV dysfunction
- Severe pulmonary HTN (PASP > 70)
- Excessive annular dilatation
- Device leads which may adversely interact with bioprosthesis
- Life expectancy < 1 year

FDA approved

- Edwards Evoque bioprosthesis 2024



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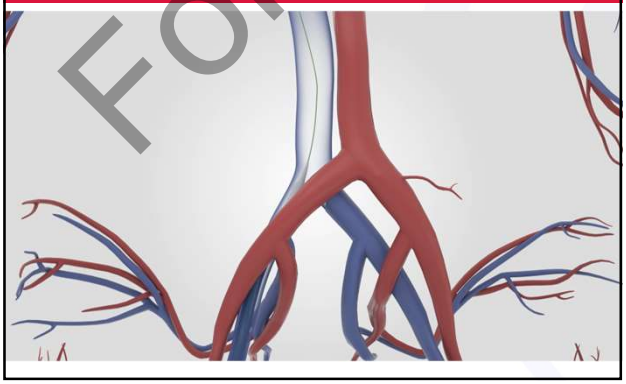
TTVR Procedural animation



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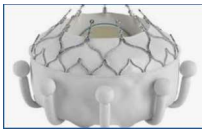
TRISCEND II trial: TTVR with Evoque valve

PCNA



Design: 2:1 randomization (Evoque vs OMT)

Population: 350 patients, 94% functional TR

Implant Success: 95%

30-Day MACE:
- 3.5% mortality
- 10.4% severe bleedin
- 24.7% PPM

Benefits:
- ✓ Enhanced KCCQ score
- ✓ Reduction in NYHA class
- ✓ Improved 6MWD

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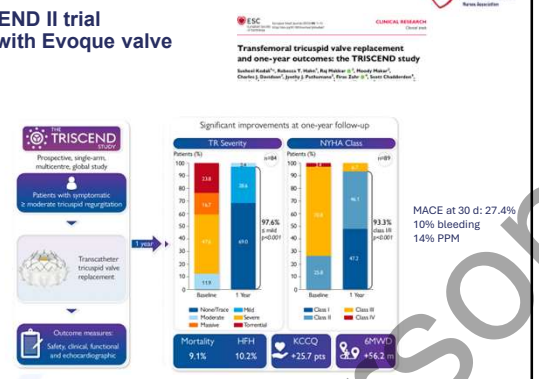
TRISCEND II trial
TTVR with Evoque valve

PCNA



MACE at 30 d: 27.4%
10% bleeding
14% PPM

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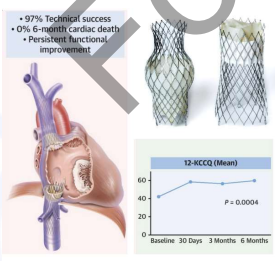
Bicaval Valve Implantation

PCNA

TRICUS EURO Study (N= 35)



Estevez-Loureiro R, et al JACC CVI 2022; 15 (13):1366-1377

TRICAV-1 trial: Heterotopic TV replacement with TricValve

Design: Prospective, single arm

Population: 50 patients, high-risk for surgery, not suitable for orthotopic TTVR or t-TEER

Exclusions: PASP > 65 mmHg, Severe RV dysfunction, LVEF < 30%

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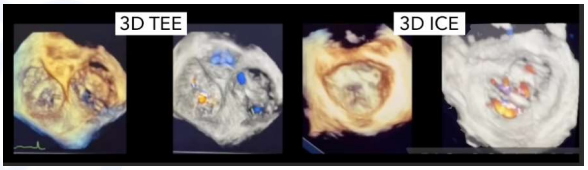
Imaging & Procedural Advances

- 3D TEE and ICE integration
  - CT fusion planning standardization
  - Real-time guidance
  - AI-enhanced procedural simulation
  - APP coordination across imaging & discharge pathways



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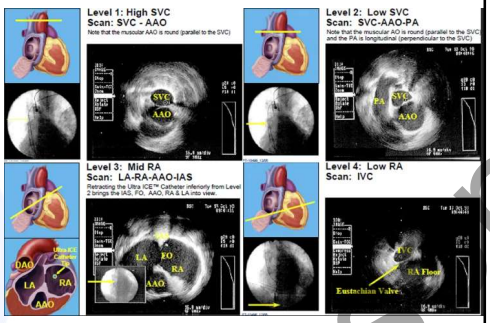
AI & Modeling

Risk prediction

Valve selection

Personalization



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What does the future look like for minimally invasive Structural Heart therapies?

- Improve patient identification and early assessment skills
- Determine appropriate timing for referrals and of intervention in relation to clinical status, and severity of disease state
- Define clinical and echocardiographic indicators to define proper anatomy and to avoid futile interventions
- Clarify the benefits of GDMT and symptom progression with referring providers and PCP offices to assure proper referrals
- Management of patient and provider procedural and symptom benefit expectations

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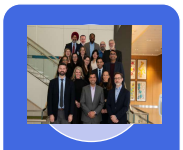
Multi-Disciplinary Team Approach



Joint Clinic

Shared Decision Making

Lifetime Planning

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APP strategies to Optimize Outcomes

Risk Stratification & Optimization Comprehensive Assessment

- Frailty screening (e.g., gait speed (5-meter walk test for each patient) & grip strength)
- Cognitive evaluation (delirium risk)
- Baseline functional status (NYHA class, KCCQ score)
- Comorbidity burden:
  - CKD
  - COPD
  - Atrial fibrillation
  - Pulmonary hypertension (especially in tricuspid disease)

Medication Optimization

- Adjust diuretics for euvolemia
- Review anticoagulation/antiplatelet strategy
- Optimize GDMT for HF prior to intervention

Metrics That Matter (Nursing-Sensitive Outcomes)

- Length of stay
- 30-day readmissions
- Functional status improvement (KCCQ)
- Patient-reported quality of life
- Goal-concordant care

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Shared Decision-Making (SDM) Integration

Using a **Heart Team approach** (cardiology, CT surgery, APPs, nursing):

Core SDM Components:

✓ Explain:
Procedure purpose (symptom relief vs survival benefit)
Alternatives (medical therapy, surgery, palliative approach)

✓ Discuss:
Risks (stroke, vascular complications, need for pacemaker, etc)
Recovery expectations

✓ Elicit:
Patient goals (longevity vs quality of life vs independence)

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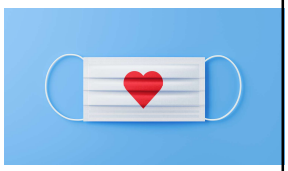
Key Takeaways

- Transcatheter therapies are now standard across all valve positions
- Trial data supports durability & improved quality of life
- APPs are central to optimization and long-term outcomes
- Structural heart programs continue to expand with rapid evolution, and this is mostly APP driven



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Thank You

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