The HEART TEAM 2.0 – where will we be in 2030?

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Evidence and Guidelines in Aortic Stenosis


PARTNER 1A
CoreValve HR

PARTNER 1B
CoreValve ER

PARTNER 2A
NOTION I

SURTAVI

PARTNER 3
Evolut LOW RISK

Low
TAVI – SUMMARY OF CLINICAL PERFORMANCE

Patient Perspectives

BENEFITS

- Improved quality of life
- Less invasive, repeatable
- Better resource utilization

RISKS

- Mortality
- Procedural complications
- Re-admissions

Healthcare Perspectives

Re-admissions
Better resource utilization
Less invasive, repeatable
Improved quality of life
Mortality
Procedural complications
TAVI - Paradigm Shift in the Care of Patients with AS

**Procedure**
- Less invasive
- Not requiring cardiopulmonary bypass and prolonged ventilation

**Risks**
- Lower mortality (TF approach)
- Lower risk of stroke
- Lower risk of new-onset atrial fibrillation, bleeding events, kidney injury

**Early Outcomes**
- Shorter hospitalization
- Faster return to normal life
- Better quality of life

**Long-term Follow-up**
- Valve-in-valve feasible
- No need for long-term anticoagulation
Past

Heart Team

- Cardiologist
- Interventional cardiologist
- Cardiac surgeon
- Cardiac imaging expert
- Geriatrician

SAVR candidates

Not suitable for SAVR = Indication for TAVI
The Heart Team will weigh clinical and anatomic characteristics to identify the best treatment option for individual patients with transfemoral TAVI replacing SAVR as default therapy.
TAVI or SAVR

Clinical factors

Age

Anatomical factors

TAVI or SAVR
FACTORS FAVOURING SAVR

- Severe coronary artery disease
- Suspicion of endocarditis
- Severe primary mitral regurgitation
- Severe tricuspid regurgitation
- Septal hypertrophy requiring myectomy
TAVI or SAVR

Clinical factors

Age

Anatomical factors
FACtORS FAVOURING SAVR

- **LARGE ANNULUS (OUT OF RANGE FOR TAVI)**
- **AORTIC ROOT DISEASE**
- **BICUSPID ANATOMY**
- **HEAVY CALCIFICATION**
- **HIGH RISK OF CORONARY OBSTRUCTION**
- **UNFAVORABLE ACCESS FOR TAVI**
TREATMENT OF SEVERE AORTIC STENOSIS

Surgical era

Type of prosthesis
- Mechanical valve
- Tissue valve

HOW TO TREAT

How to treat

HOW TO CHOOSE

How to choose
- Age
- Risk scores

WHO MAKES THE CHOICE

Who makes the choice
- Cardiac surgeon

TAVI era

Type of intervention
- TAVI
- SAVR

Clinical and anatomic factors

CLINICAL

ANATOMIC

ASSOCIATED CONDITIONS

Heart Team
Evolution of Treatment Strategies for VHD

**Past**
- Onset of severe symptoms

**Future**
- Early intervention
- Surgery or Transcatheter
- Local or Center of Excellence

**WHEN**

**HOW**

**WHERE**
Tiered System of Care for Patients with VHD - Structure

Level II - Primary Valve Center

Level I - Comprehensive Valve Center

General Cardiologists/Primary Care/Longstanding Healthcare Providers
**Tiered System of Care for Patients with VHD - Process**

**Level II - Primary Valve Center**
- Expertise and resources to perform TF TAVI, isolated SAVR, MR repair

**Level I - Comprehensive Valve Center**
- Capability to perform all approved interventional procedures

**Initial recognition and triage of patients with VHD and matching the patient with required center expertise based on disease complexity**

**Bidirectional communication and ongoing education**
STANDARDS FOR QUALITY OF CARE

Performance Metrics

- Procedural volume
- Clinical outcomes

**based on prespecified thresholds for low-medium-high volume

Certified Operators

- Training
- Minimum number of procedures
- Ongoing education

Clinical outcomes*

* mortality, neurological events, vascular complications, major bleeding, patient-reported health status
**Factors to Consider for Triaging Patients into a Tiered System**

**Patient-related**
- Disease complexity (e.g., primary mitral regurgitation)
- Associated conditions (e.g., endocarditis, coronary artery disease, ventricular arrhythmias, LV dysfunction)

**Center-related**
- Technical expertise
- Multidisciplinary team
- Performance outcomes
- Public reporting of results
Tiered System of Care for Patients with VHD - Research Activity

Level II - Primary Valve Center

Level I - Comprehensive Valve Center

First-in-man Early Feasibility

Pivotal Device Trials

Investigator-Initiated Single-or Multi-center Studies
**Basic Tools Needed for Optimal Care Delivery**

- Electronic medical record systems including digital data of any diagnostic imaging procedure
- Intensive care unit
- Dedicated valve coordinator
IMAGING FOR DIAGNOSIS AND TREATMENT OF VHD

Multimodal Imaging

Fusion Imaging

- TEE/TOE 3D
- MSCT
- MRI

CT-Fluoro Fusion
3D TEE-Fluoro Fusion
Cardiac Roadmapping
MRT-Angio Fusion
**THE MULTIDISCIPLINARY TEAM**

**Composition**
- Interventional cardiologist
- Cardiac surgeon
- Echocardiographic and radiographic image specialist
- Clinical cardiology valve expertise
- Heart failure specialist
- Cardiovascular anesthesiologist
- Nurse practitioner/physician assistant for pre- and periprocedural care
- Valve coordinator/program navigator

**Roles**
- Meet regularly to review cases
- Research consensus on patient management
- Review outcomes
- Assess quality
Future

General Overview of Management Approach

- Complex VHD patients
- Coronary Artery Disease
- Multivalve Disease
- Ascending Aorta Pathology
- Requiring Re-operation
- With Prior Chest Radiation
- GUCH

Level I - Comprehensive Valve Center
Level II - Primary Valve Center
HEART TEAM 2030 – TRAINING OF CV SPECIALISTS

• Medical school
• Cardiovascular medicine (2-3 years)
  – Common trunk training for any CV specialist
• Subspecialty training in cardiovascular medicine/surgery
  – Imaging
  – Medical management
  – Intervention
  – CV surgery
# Specialization According to Disease Specific Pathways

<table>
<thead>
<tr>
<th>Coronary Artery Disease</th>
<th>Valvular Heart Disease</th>
<th>Thrombo-Cardiology</th>
<th>Heart Failure</th>
<th>Electrophysiology</th>
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<td>CHF</td>
<td>AF</td>
<td>Pediatric</td>
<td>Life style</td>
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<td>SVT</td>
<td>GUCH</td>
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<td>VAD</td>
<td>VT, VF</td>
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<td>Arterial Hypertension</td>
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<td>Cardiogenic Shock</td>
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<td>DVT</td>
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<td>PPM, CRT, ICD</td>
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<td>Diabetes</td>
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<td>PAD</td>
<td>Multivalve</td>
<td>AF</td>
<td></td>
<td>Device extraction</td>
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<td>Genetics</td>
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</tbody>
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- **Cardiac Imaging (ECHO, CT, MRI, Nuclear)**
- **Intensive and Intermediate Cardiac Care Unit**
- **Ambulatory Care/Hospital Ward**
## Disease Specific Heart Teams

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The Growing Burden of Valvular Heart Disease (VHD)

Projected global population aged 60 years or older

- 0.5 billion
- 1 billion
- 2.1 billion
- 3.1 billion

Source: United Nations Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2017 Revision
Produced by: United Nations Department of Public Information

UK population projections of significant VHD

CONTEMPORARY BURDEN OF NATIVE VALVE DISEASE

Iung B et al, Circulation. 2019 Sep 12. doi: 10.1161/CIRCULATIONAHA.119.041080

CONCORDANCE BETWEEN CLASS I INDICATION AND PERFORMED/SCHEDULED INTERVENTION

<table>
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<th>Intervention</th>
<th>Class I</th>
<th>%</th>
<th>[95% CI]</th>
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<tr>
<td>Aortic stenosis</td>
<td>1009</td>
<td>1271</td>
<td>79.4 [77.1-81.6]</td>
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<tr>
<td>Aortic regurgitation</td>
<td>114</td>
<td>147</td>
<td>77.6 [69.9-84.0]</td>
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<tr>
<td>Mitral stenosis</td>
<td>115</td>
<td>168</td>
<td>68.5 [60.8-75.4]</td>
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<tr>
<td>Primary mitral regurgitation</td>
<td>294</td>
<td>414</td>
<td>71.0 [66.4-75.3]</td>
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Currently, approximately 115,000 patients can be considered potential TAVI candidates in Europe.

This number might increase up to over 175,000 if indications for TAVI expand to low-risk patients.

These findings have major implications for health care resource planning in the 29 individual countries.

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