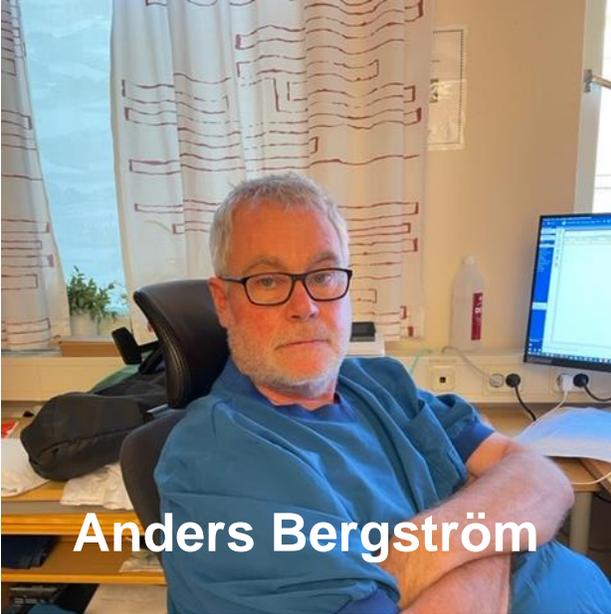


**VOC**

**Regionmöte Jönköping  
2024-03-20**



Anders Bergström



Mohammad Rah



Aleksandra Krzynska



Marcus Lindenberger



Sofia Sunnerud



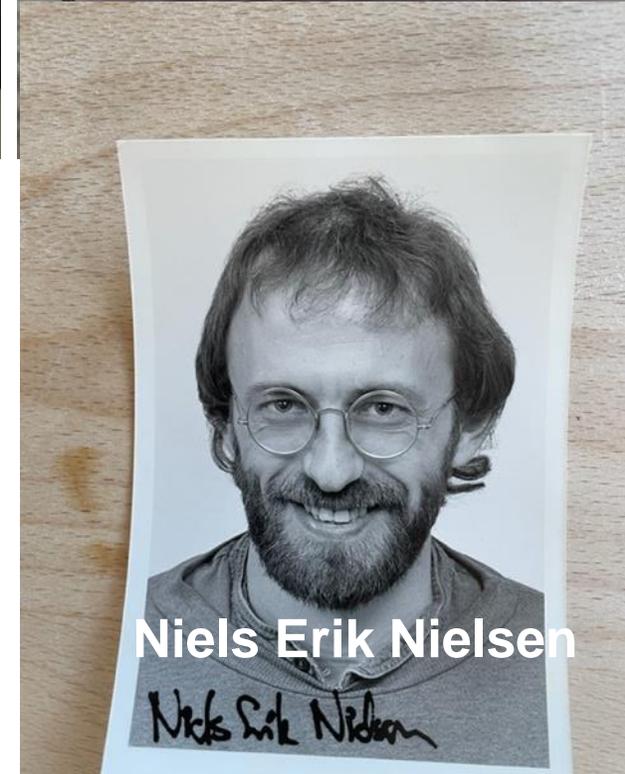
Georgios Koiliadis



Shiba Younus



Art Östring



Niels Erik Nielsen

Niels Erik Nielsen



**Helena Berg**



**Christina Bovin**

**Camilla Kindholm**

# Invasiva delen

- VOC-ronden rekommenderar kateterburen intervention hos 64% och kirurgi hos 36% av alla patienter. För AS rekommenderas TAVI hos 70%.
- TAVI-fall (+andra kateterkandidater) diskuteras primärt på TAVI-rond.
- Läkare från VOC-verksamheten och klin fys, thoraxkirurg, BMA från klin fys, anesthesi- och op.personal från thorax.
- Seldinger lab 1 tisdag-fredag:
  - Tisdag+ fredag + 2.torsdag: Hjärtkat, PFO/ASD, PTMV, annat
  - Onsdag: TAVI
  - 2. torsdag: Mitraclip, Triclip, annat i generell anesthesi (PVL, LAAO)

# Age is now the key determining factor in deciding between TAVI or SAVR in sAS patients requiring treatment<sup>1</sup>

Order of initial decision criteria as per ESC/EACTS VHD guidelines<sup>1,2</sup>

**2017**



1. Surgical risk, including age



2. Anatomical and procedural factors

**2021**



1. Age



2. Surgical risk



3. Anatomical and procedural factors

The evidence supporting these changes originated from multiple clinical trials that were systematically assessed for quality<sup>1</sup>

EACTS: European association for cardiothoracic surgery; ESC: European society of cardiology; SAVR: surgical aortic valve replacement; TAVI: transcatheter aortic valve implantation; VHD: valvular heart disease

1. Vahanian A, Beyersdorf F, Praz F *et al.* 2021 ESC/EACTS Guidelines for the management of valvular heart disease. *Eur Heart J.* 2022;43:561–632. 2. Baumgartner H, Hung J, Bermejo J. *et al.* Recommendations on the echocardiographic assessment of aortic valve stenosis: a focused update from the European Association of Cardiovascular Imaging and the American Society of Echocardiography. *Eur Heart J Cardiovasc Imaging.* 2017;18:254-275.

# The 2021 ESC/EACTS VHD Guidelines outline a new referral and treatment pathway for aortic stenosis patients

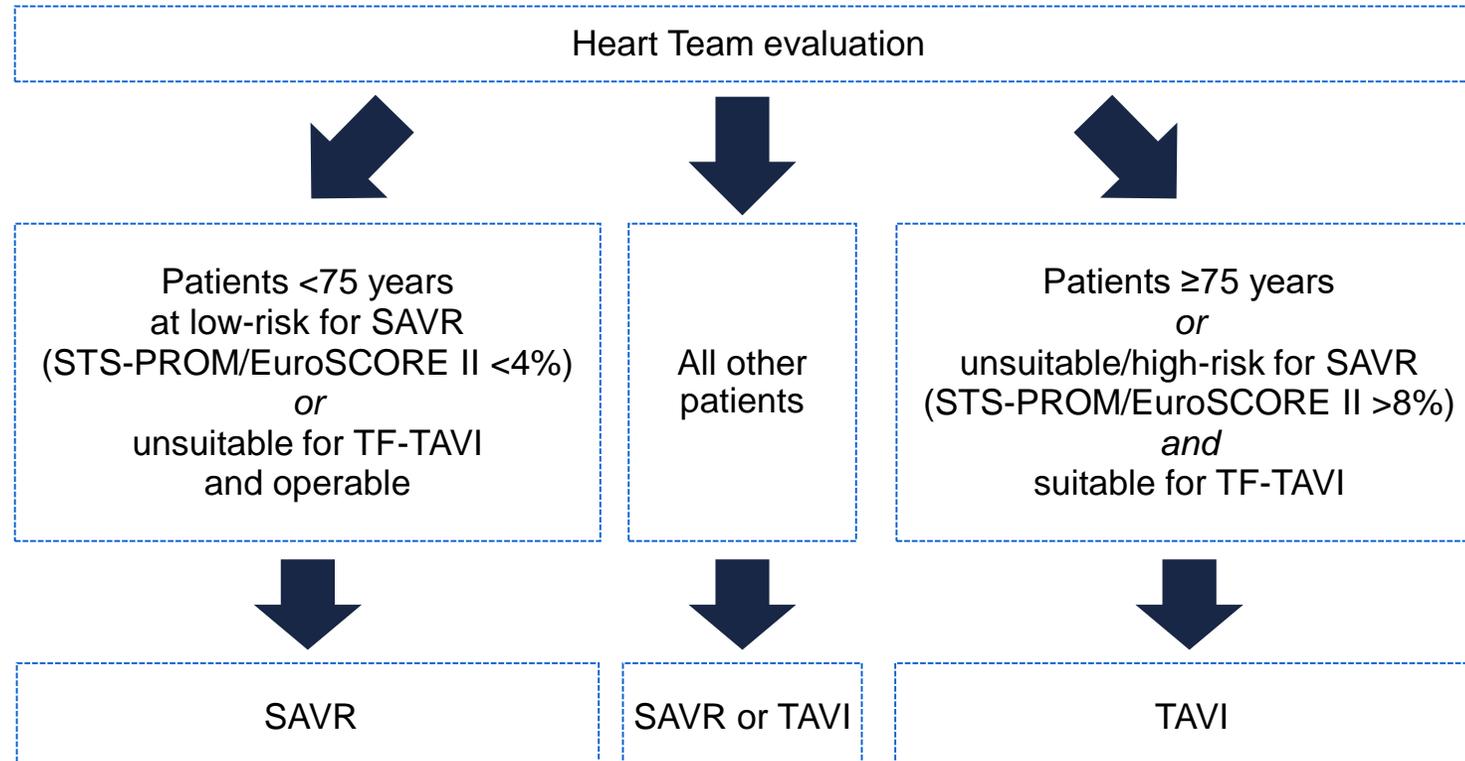
- All sAS patients\* should now be referred to the Heart Team for a treatment evaluation<sup>1</sup>
- The guidelines recommend TF-TAVI as the preferred mode of intervention in patients  $\geq 75$  years of age<sup>†</sup>, as well as for additional patient groups  $< 75$  years of age<sup>1</sup>
- The Heart Team recommendation should be discussed with the patient, who can then make an informed treatment decision between the option of TAVI or SAVR<sup>1</sup>

\*With a treatment indication <sup>†</sup>Based on evaluation of clinical, anatomical and procedural factors

EACTS: European association for cardiothoracic surgery; ESC: European society of cardiology; SAVR: surgical aortic valve replacement; TF-TAVI: transfemoral transcatheter aortic valve implantation; VHD: valvular heart disease

1. Vahanian A, Beyersdorf F, Praz F *et al.* 2021 ESC/EACTS Guidelines for the management of valvular heart disease. *Eur Heart J.* 2022;43:561–632.

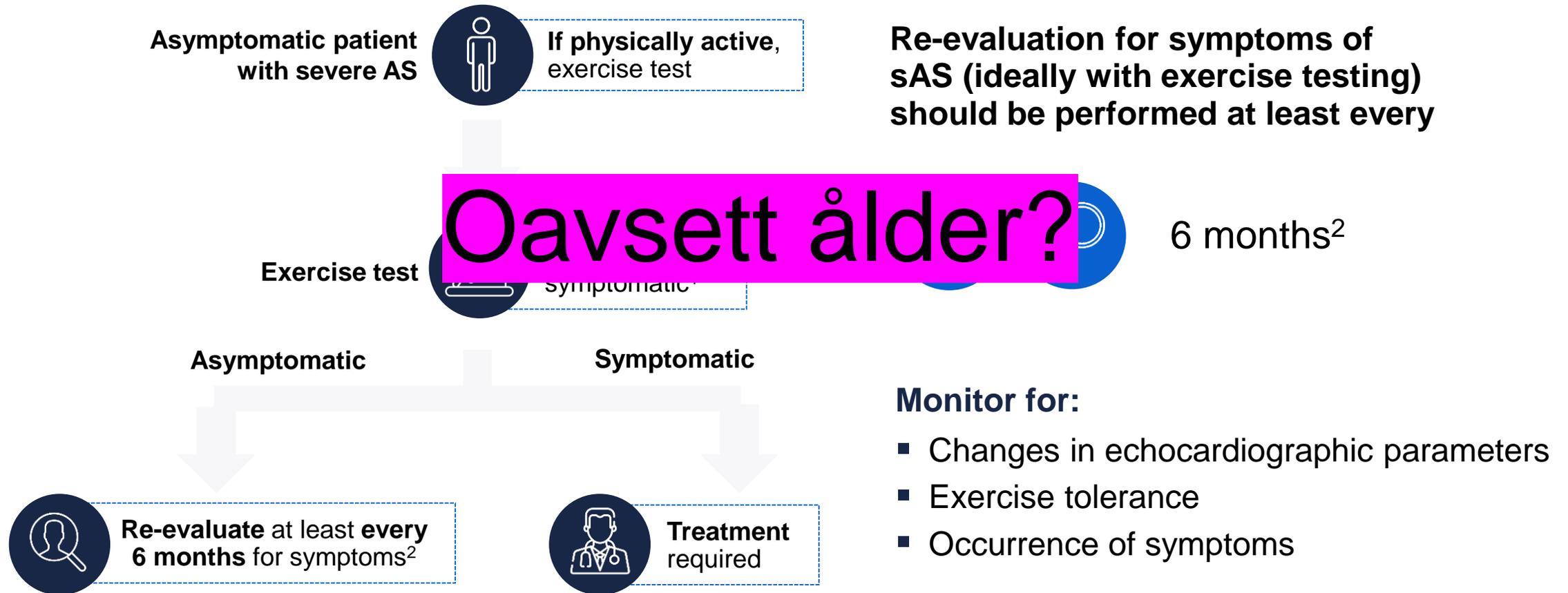
# 2021 ESC/EACTS VHD Guidelines have introduced a new standard of care for all patients with sAS\* $\geq 75$ years of age: TF-TAVI



\*With a treatment indication

EACTS: European Association for Cardio-Thoracic Surgery; ESC: European society of cardiology; EuroSCORE II: European system for cardiac operative risk evaluation; SAVR: surgical aortic valve replacement; STS-PROM: Society of Thoracic Surgeons predicted risk of mortality; TF-TAVI: transfemoral transcatheter aortic valve implantation; VHD: valvular heart disease  
1. Vahanian A, Beyersdorf F, Praz F *et al.* 2021 ESC/EACTS Guidelines for the management of valvular heart disease. *Eur Heart J.* 2022;43:561–632.

# Exercise testing is recommended for unmasking symptoms in patients who appear asymptomatic<sup>1</sup>



AS: aortic stenosis; sAS: severe aortic stenosis

1. Généreux P, Stone GW, O'Gara PT *et al.* Natural History, Diagnostic Approaches, and Therapeutic Strategies for Patients With Asymptomatic Severe Aortic Stenosis. *J Am Coll Cardiol.* 2016;67:2263-2268. 2. Baumgartner H, Hung J, Bermejo J. *et al.* Recommendations on the echocardiographic assessment of aortic valve stenosis: a focused update from the European Association of Cardiovascular Imaging and the American Society of Echocardiography. *Eur Heart J Cardiovasc Imaging.* 2017;18:254-275

# Kateterklaffar vi använder

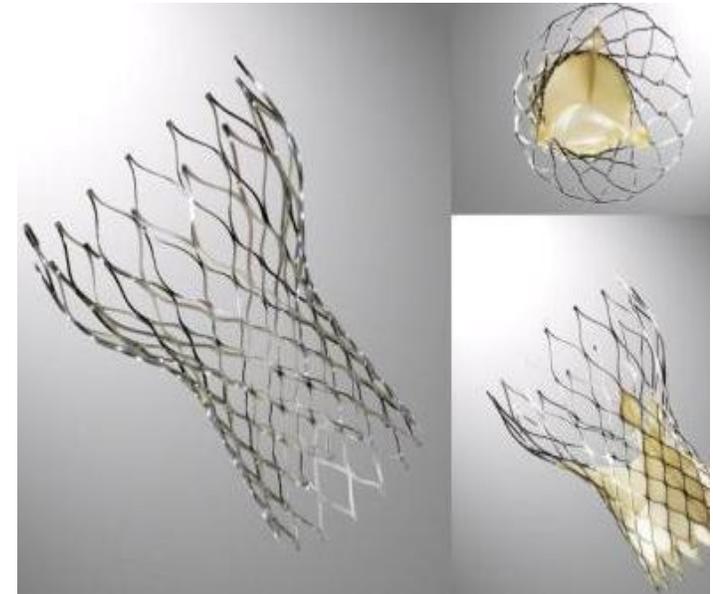
Evolut  
(Medtronic)

Edwards Sapien THV



- Tri-leaflet bovine pericardial tissue treated with TheraFix Process

- Balloon expandable stainless steel stent for sutureless implantation

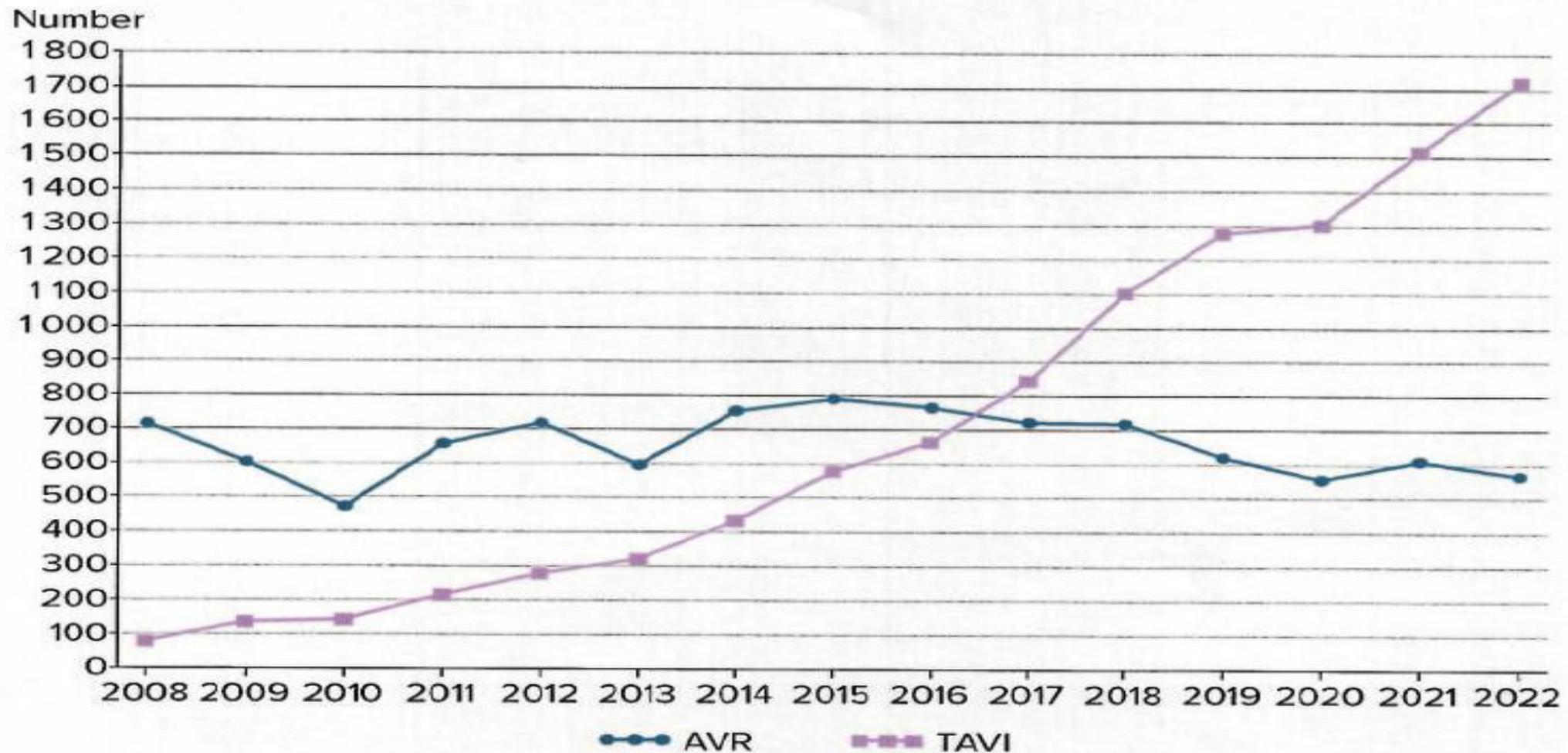


## Edwards

- Ballongexpanderad kalv
- "One-shot"
- Kontrast: 0 ml
- 20,23,26,29
- French 14 -16
- Stentlängd 18-22mm
- Transarteriell + transapikal
- Rapid pacing x 1 (klaff)
- Paravalv läckage (+)
- PPM-risk: +

## Evolut + övriga

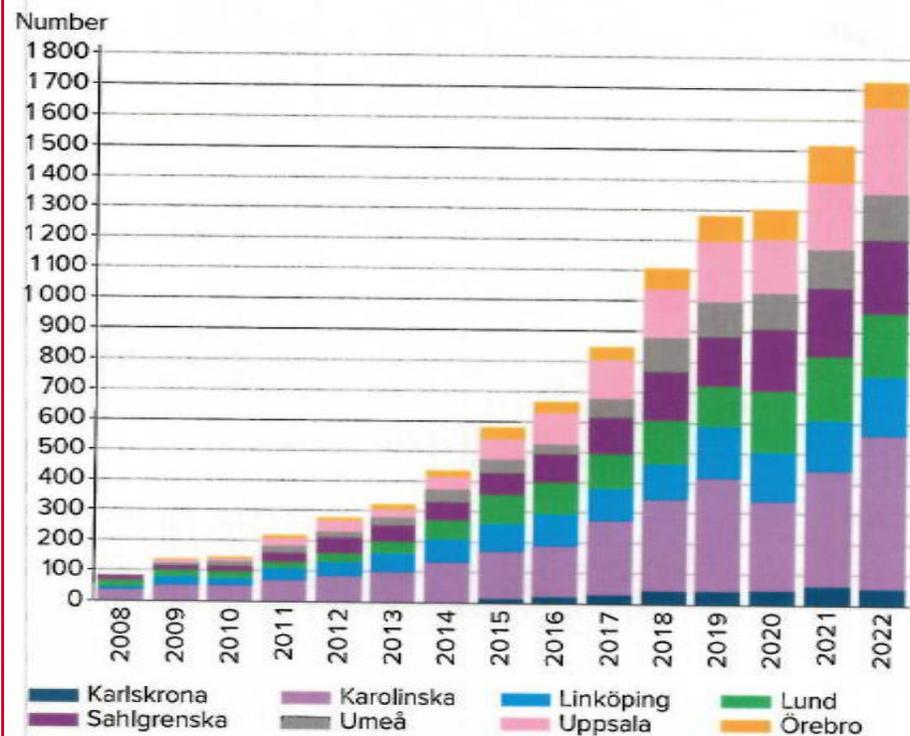
- Självexpanderande gris
- Repositionerbar till viss del
- Kontrast: 40 – 150 ml
- 23,26,29,31,34
- French 14-16
- Stentlängd 55-52 mm
- Transarteriell
- Rapid pacing x 1-2 (pre/postdil)
- Paravalv läckage +
- PPM-risk ++



**Figure 24.** Number of isolated aortic valve surgeries and TAVI procedures, 2008–2022.

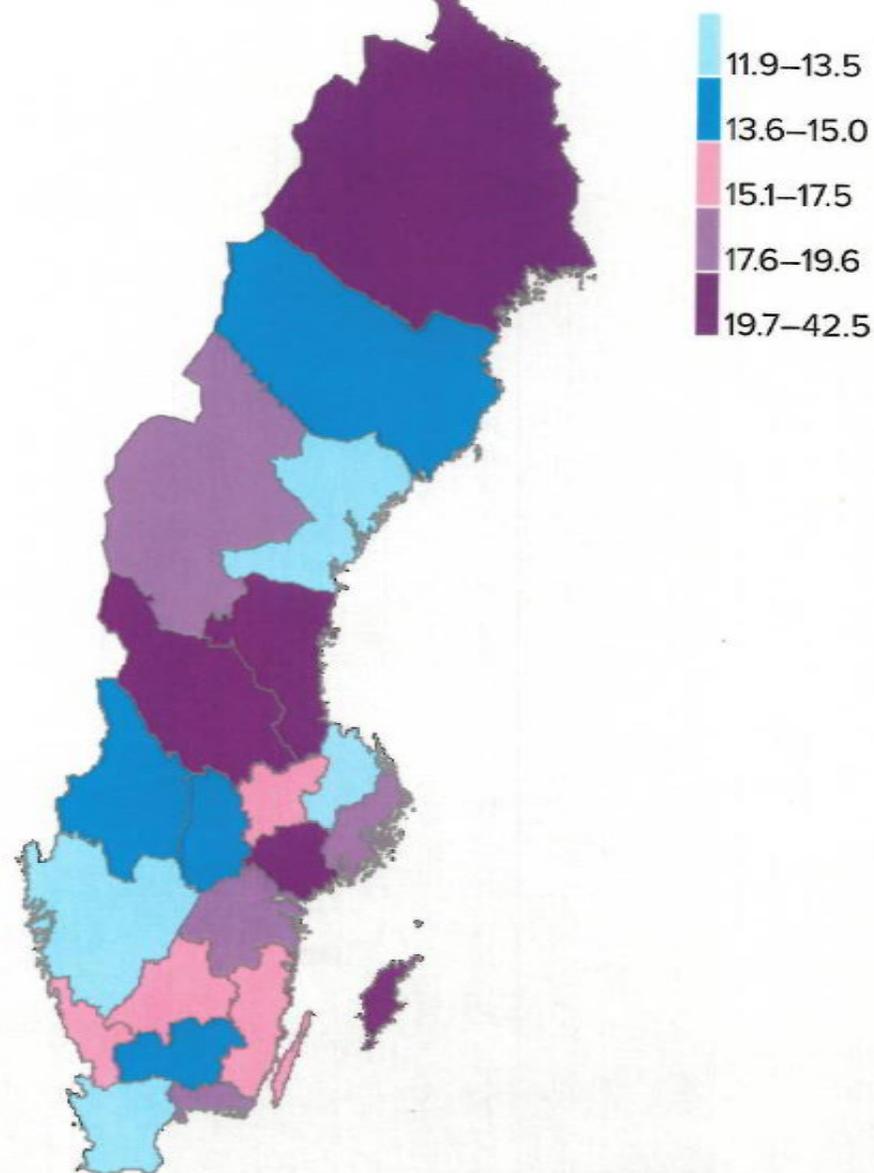
In 2022, the number of TAVI procedures were almost 3 times the number of aortic valve surgeries.

Note that aortic valve surgery with concomitant CABG is excluded from the analysis due to varying indications for the surgery.



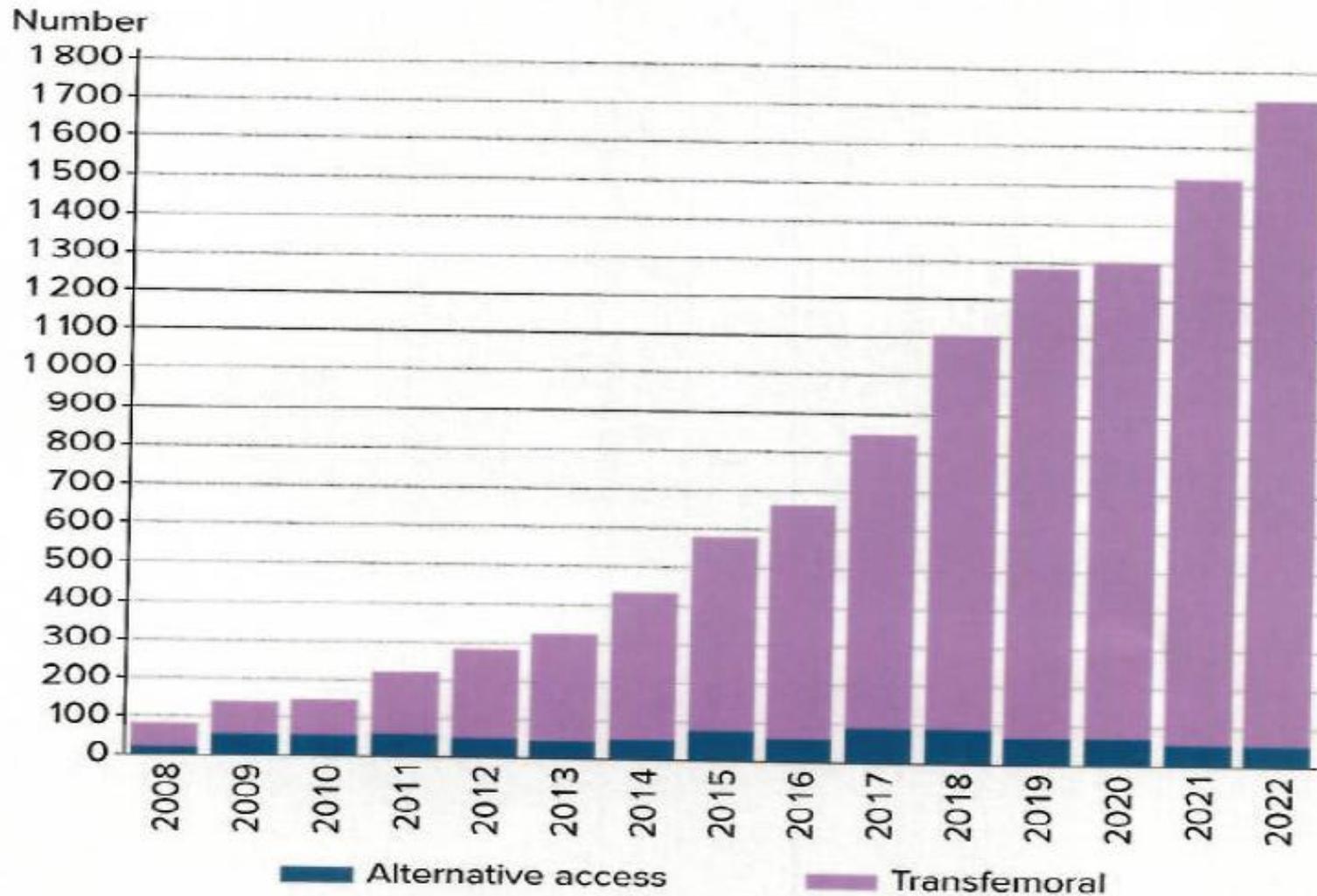
**Figure 1.** Number of TAVI procedures, per centre and year, 2008–2022.

The total number of TAVI procedures increased by 13 % to 1721 in 2022. Details on the numbers of procedures can also be found in Table 2. Karolinska, Sahlgrenska, Linköping and Umeå increased their number of procedures for 2022, while there was a decrease in number of procedures in Örebro, Lund and Karlskrona compared to 2021.

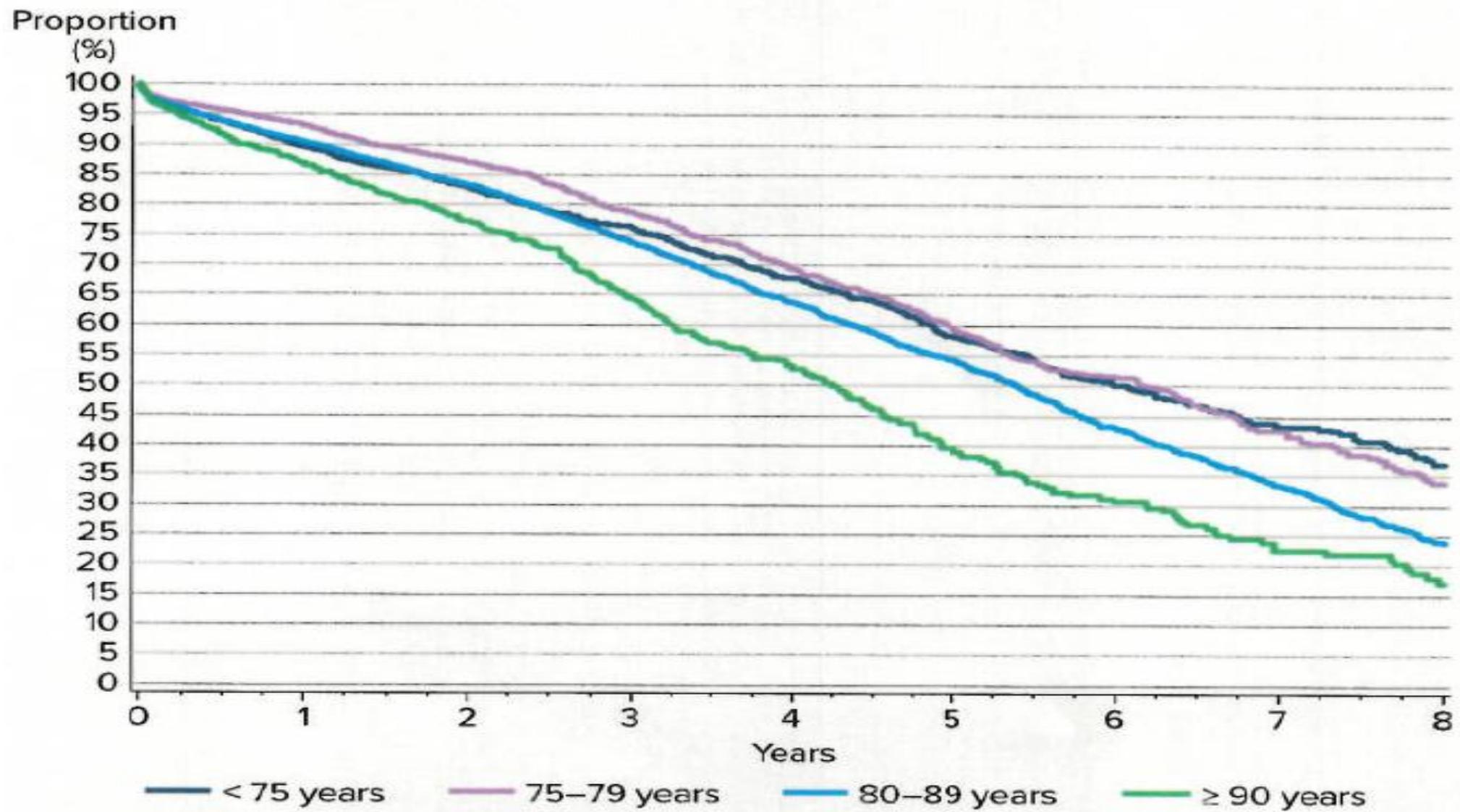


**Figure 2.** Number of TAVI procedures, per 100 000 inhabitants, 2022.

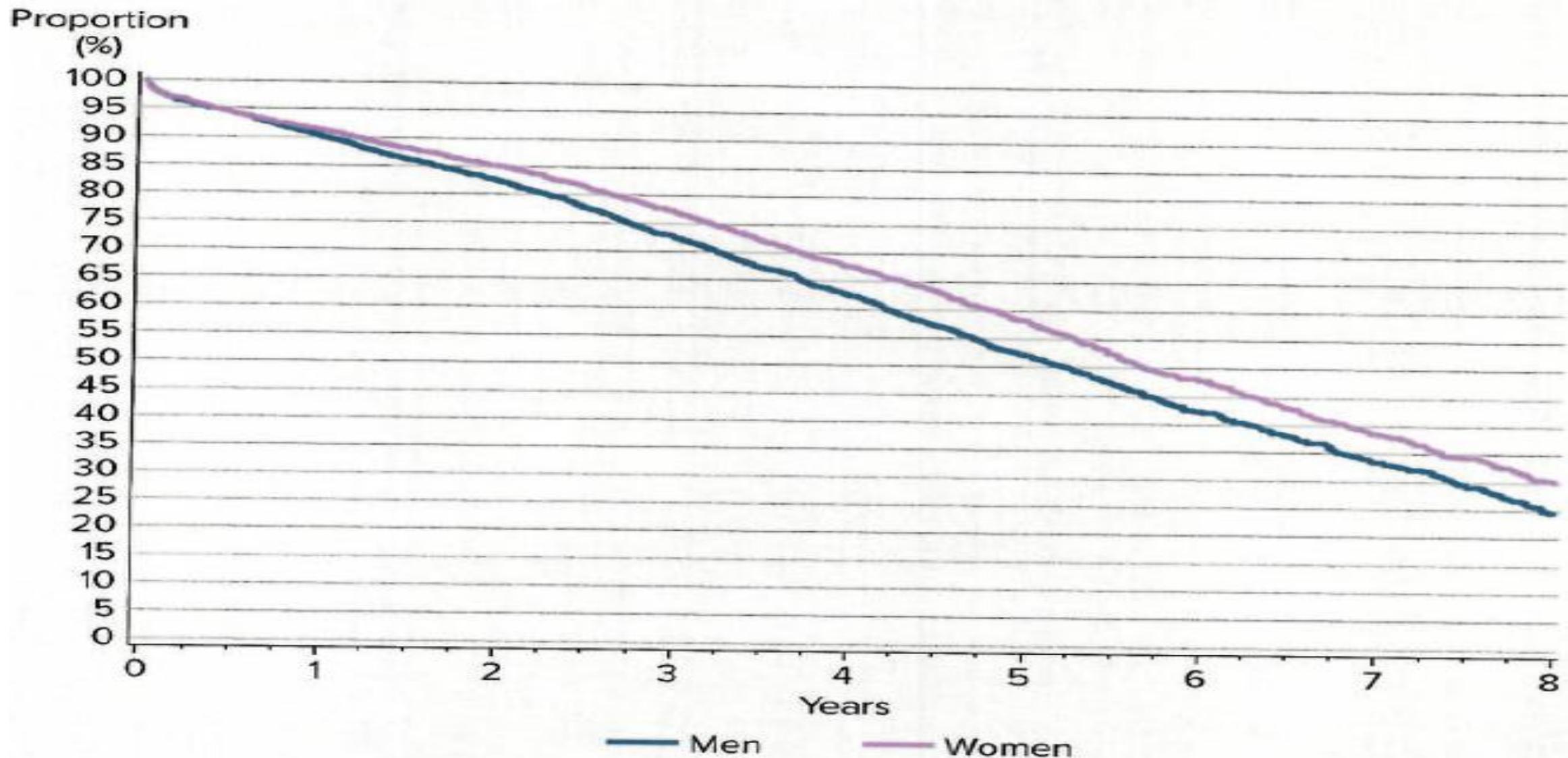
The number of TAVI procedures per 100 000 inhabitants in the different counties of Sweden still shows marked differences. For the less populated counties, some of the differences might be random fluctuations due to low case number. Data are calculated on patients' place of residency, not on the hospital completing the procedure.



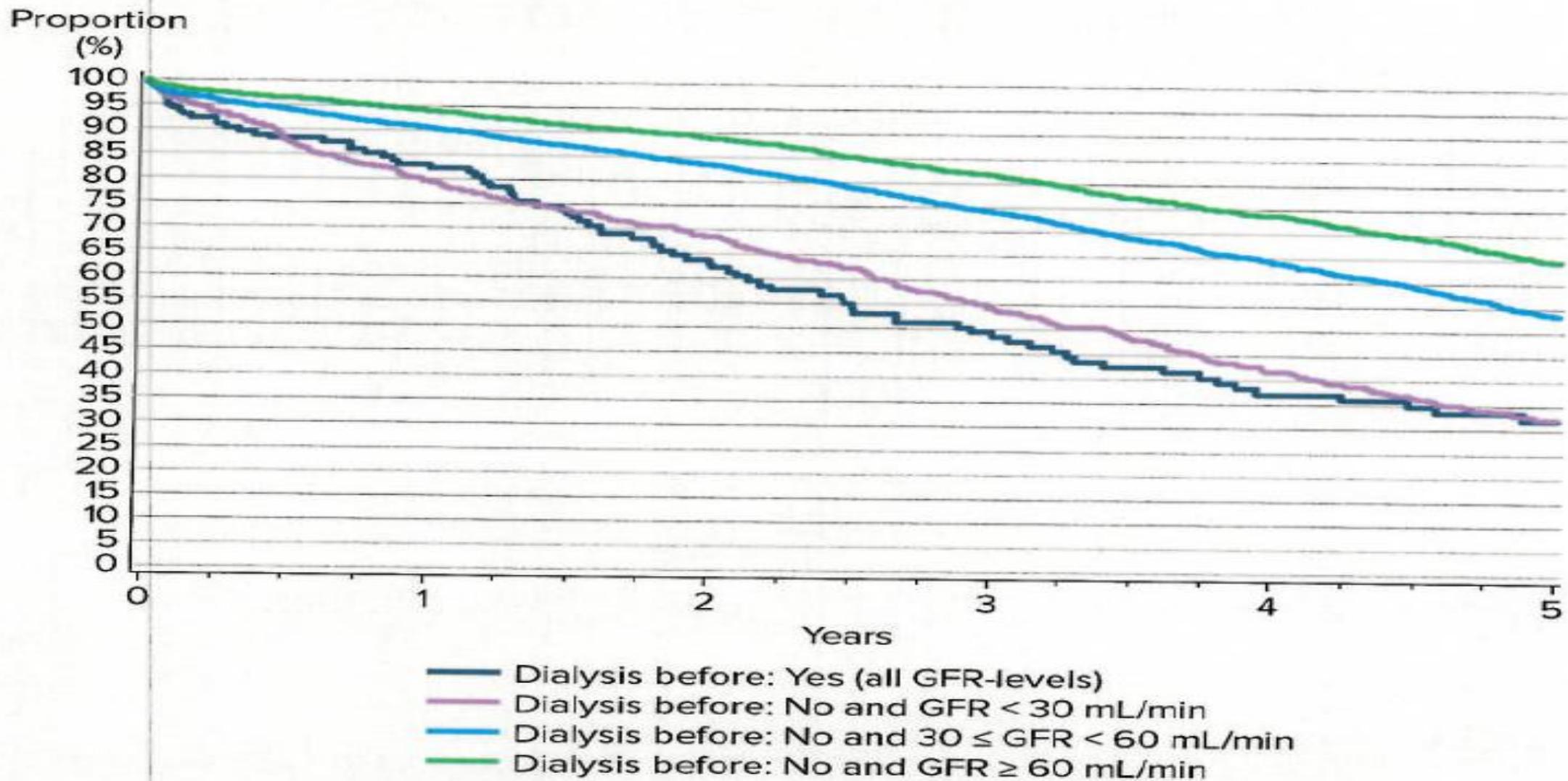
**Figure 8.** Number of TAVI procedures, per access type and year, 2008–2022. The transfemoral access route is the predominant choice (97 %). Alternative (non-femoral) access routes include transapical, subclavian and transaortic access.



**Figure 16.** Eight-year survival after TAVI according to Kaplan-Meier, per age group, 2008–2022. Long-term survival after TAVI is only slightly worse with higher age. The probable reason is that the patient selection is stricter with higher age. Total eight-year survival is about 30 %, with an almost linear mortality of about 10 % per year.



**Figure 18.** Eight-year survival after TAVI according to Kaplan-Meier, per sex, 2008–2022. The long-term survival is slightly better in women, like in the general population.



**Figure 17.** Five-year survival after TAVI according to Kaplan-Meier, per kidney function group, 2012–2022.

Long-term survival after TAVI is considerably worse in patients with decreased kidney function. The patients on chronic dialysis before TAVI did not have worse mortality than the GFR < 30 mL/min group. Glomerular filtration rate (GFR) was calculated according to Cockcroft-Gault. A lower GFR corresponds to worse kidney function.

| Description                                    | Karolinska | Uppsala | Linköping | Karlskrona | Lund | Sahlgrenska | Örebro | Umeå | Total      |
|--|------------|---------|-----------|------------|------|-------------|--------|------|------------|
| Major vascular complication (%)                | 3.4        | 1.4     | 5.2       | 0.0        | 1.4  | 3.3         | 1.2    | 2.6  | <b>2.7</b> |
| Major bleeding (%)                             | 3.4        | 0.7     | 2.1       | 1.9        | 2.9  | 2.1         | 0.0    | 1.9  | <b>2.2</b> |
| Stroke (%)                                     | 0.6        | 1.8     | 2.1       | 1.9        | 2.9  | 0.4         | 1.2    | 1.9  | <b>1.4</b> |
| Aortic regurgitation (postop grade II-III) (%) | 3.8        | 1.1     | 0.5       | 0.0        | 1.4  | 1.7         | 0.0    | 0.6  | <b>1.8</b> |
| New permanent pacemaker (%)                    | 6.0        | 5.0     | 2.6       | 1.9        | 7.2  | 16.2        | 1.2    | 11.0 | <b>7.1</b> |
| 30-day mortality (%)                           | 0.2        | 1.1     | 2.1       | 0.0        | 4.5  | 3.0         | 1.2    | 2.6  | <b>1.7</b> |
| EuroSCORE II (%)                               | 5.1        | 4.1     | 6.0       | 4.4        | 7.1  | 6.5         | 4.7    | 6.6  | <b>5.7</b> |
| One-year mortality 2021 (%)                    | 6.2        | 5.1     | 9.8       | 8.5        | 7.0  | 8.6         | 11.7   | 10.0 | <b>7.8</b> |

**Table 1.** Key outcome measures, per hospital, 2022.

The rates of major complications are low, but there is still room for improvement. The complications are reported according to the VARC-2 definitions, during index hospitalisation if not stated otherwise. The complications are site-reported and therefore differences between hospitals should be interpreted with caution.

# Väntelista

- **TAVI 107 pat**

- prio 1 37 pat

- prio 2 33 pat

- prio 3 37 pat

**Clip** 9 pat (4 Mitraclip, 5 Triclip)

**LAAO** 5 pat

**PVL** 3 pat

**Diverse** 2 pat

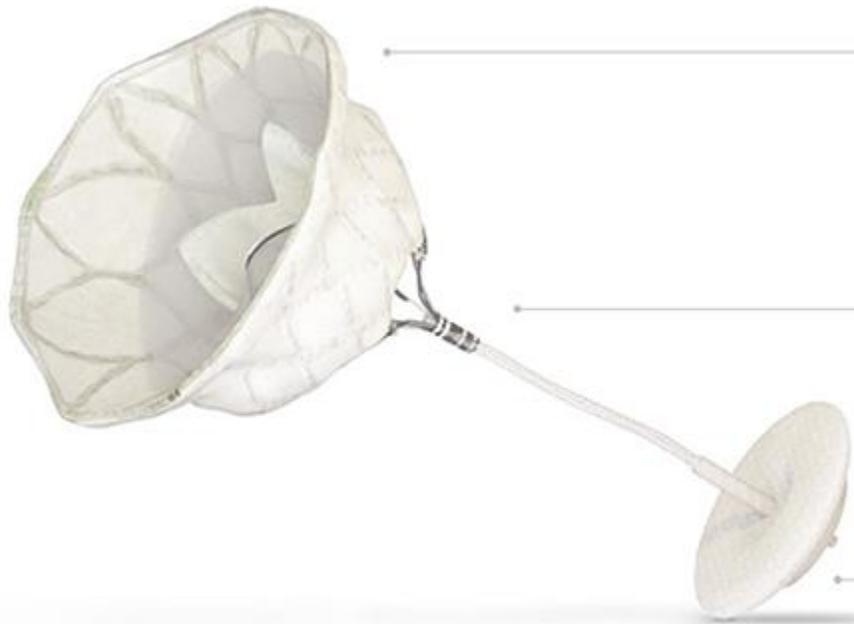
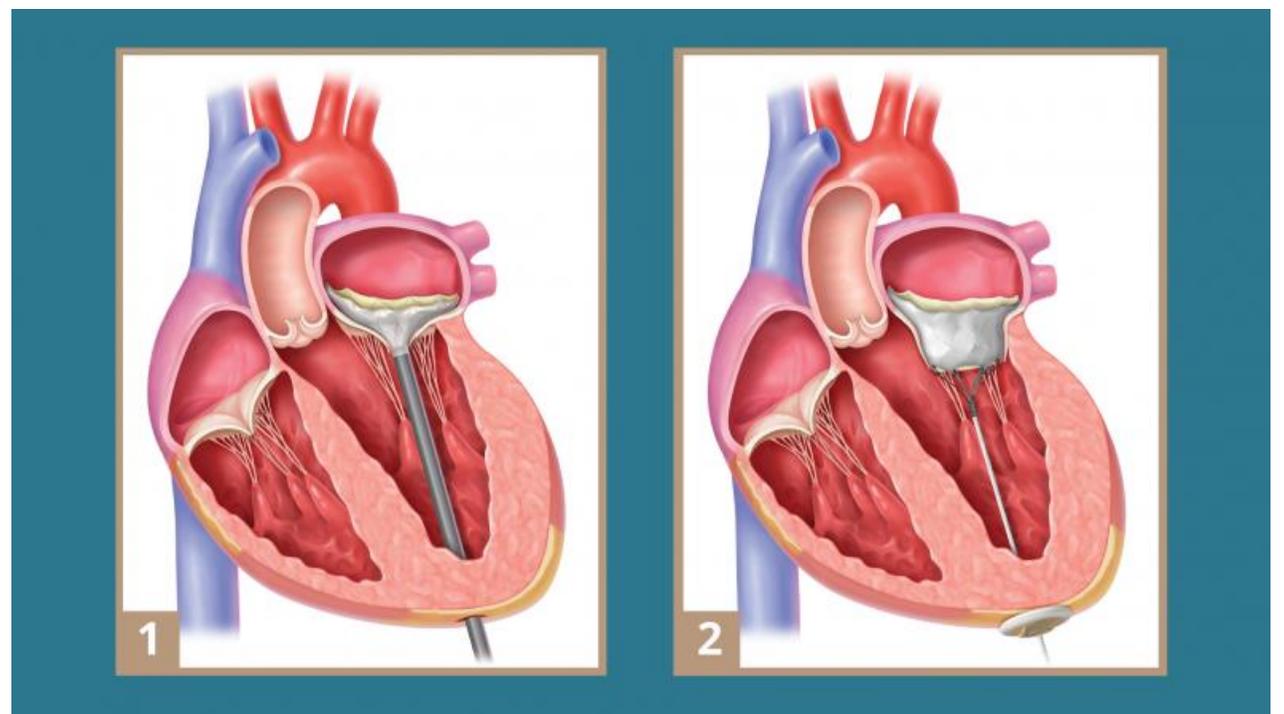
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**PFO/ASD** 48 pat

**Hjärtkat** 17 patienter

**PTMV + övriga** 4 patienter

# Tendyne-klaff



## VALVE DESIGN

- Dual-frame, tri-leaflet, bioprosthetic valve
- Outer frame contoured to mitral annulus
- Multiple valve sizes and profiles to address broad range of patient anatomies

## TETHER DESIGN

- Enables full retrievability through duration of procedure
- Repositionable for optimal placement

## APICAL PAD

- Placed over ventricular access site

**Pris 340.000 skr**

# Jena-klaff

Klaff vid aortainsufficiens

**Pris ? skr**

# Evoque-klaff

## EVOQUE Tricuspid Valve Replacement System

**Unique valve design** engages leaflets, chords, and annulus to achieve secure placement



**Atraumatic anchors** compatible with pre-existing leads and respect the native anatomy

**Conforming frame** designed to achieve optimal retention force

**Multiple sizes** offer treatment for a broad range of tricuspid pathologies and anatomies (44, 48, 52 mm)

**28F transfemoral delivery system** with multiple planes of flexion and depth control

CAUTION: Investigational device. Limited by Federal (or United States) law to investigational use.

**Pris 425.000 skr**

# Framtiden/utmaningar

- Mer TAVI-tid
- Mer anestesitid för övriga interventioner som kräver assistans från anesthesi
- Kateterburen mitralisklaff, kateterburen tricuspidalisklaff, TAVI-klaff vid aortainsufficiens
- Nya medarbetare

"PowerPoint slides are like children:  
No matter how ugly they are, you'll think  
they're beautiful if they're yours."



Scott Adams  
The Joy of Work

|              | <b>2008</b>   | <b>2009</b>   | <b>2010</b>   | <b>2011</b>   | <b>2012</b>   | <b>2013</b>   | <b>2014</b>   | <b>2015</b>   | <b>2016</b>   | <b>2017</b>   | <b>2018</b>   | <b>2019</b>   | <b>2020</b>   | <b>2021</b>   | <b>2022</b>   |
|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|              | <b>Number</b> |
| Karolinska   | 36            | 50            | 48            | 69            | 83            | 97            | 132           | 155           | 165           | 247           | 301           | 371           | 292           | 381           | 502           |
| Uppsala      | .             | 6             | 4             | 22            | 33            | 22            | 37            | 64            | 98            | 121           | 158           | 195           | 173           | 219           | 282           |
| Linköping    | 7             | 26            | 24            | 38            | 45            | 62            | 74            | 89            | 105           | 102           | 114           | 169           | 162           | 164           | 194           |
| Karlskrona   | .             | .             | .             | .             | .             | .             | .             | 12            | 20            | 26            | 43            | 42            | 45            | 59            | 54            |
| Lund         | 20            | 20            | 23            | 20            | 29            | 40            | 64            | 96            | 105           | 117           | 143           | 136           | 202           | 215           | 208           |
| Sahlgrenska  | 15            | 15            | 19            | 31            | 53            | 50            | 58            | 71            | 91            | 116           | 159           | 158           | 201           | 220           | 242           |
| Örebro       | .             | 6             | 10            | 13            | 14            | 20            | 22            | 40            | 38            | 43            | 70            | 88            | 102           | 128           | 84            |
| Umeå         | .             | 13            | 16            | 24            | 20            | 31            | 44            | 50            | 40            | 70            | 116           | 119           | 124           | 130           | 155           |
| <b>Total</b> | <b>78</b>     | <b>136</b>    | <b>144</b>    | <b>217</b>    | <b>277</b>    | <b>322</b>    | <b>431</b>    | <b>577</b>    | <b>662</b>    | <b>842</b>    | <b>1 104</b>  | <b>1 278</b>  | <b>1 301</b>  | <b>1 516</b>  | <b>1 721</b>  |

**Table 2.** Number of TAVI procedures, per centre and year, 2008–2022.

Exact case numbers for all centres for all years. See also Figure 1.