

# The Last 10 Year TAVR and Achievement of ASAN MEDICAL CENTER

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# 2002, First-In-Man TAVR



**Alain Cribier**



***2022,  
We Are Now Celebrating  
The 20<sup>th</sup> Anniversary !***



# TIMELINE IN THE EVOLUTION OF TAVR



**34 Years Since the Original Idea !**

Adapted from Michael Mack, MD, MACC.

# *Current Status of TAVR*

## *Where We Are ?*

# *Current 2 Devices*



**Evolut R**



**SAPIEN 3**

# TAVR Trials

|  | STS Score  | Age       |
|--|------------|-----------|
| <u><i>Inoperable Population</i></u>              |            |           |
| PARTNER IB Trial (2010)                          | 11.6       | 83        |
| <u><i>High Risk Population (&gt;8)</i></u>       |            |           |
| PARTNER IA Trial (2011)                          | 11.8       | 84        |
| CoreValve US Pivotal Trial (2014)                | <b>7.4</b> | <b>83</b> |
| <u><i>Intermediate Risk Population (4-8)</i></u> |            |           |
| PARTNER II Trial (2016)                          | 5.8        | 82        |
| <u><i>Low Risk Population (&lt;4)</i></u>        |            |           |
| NOTION Trial (2015)                              | 3.0        | 79        |
| PARTNER III (2019)                               | 1.9        | 73        |
| Evolut Low Risk Trial (2019)                     | 1.9        | 74        |



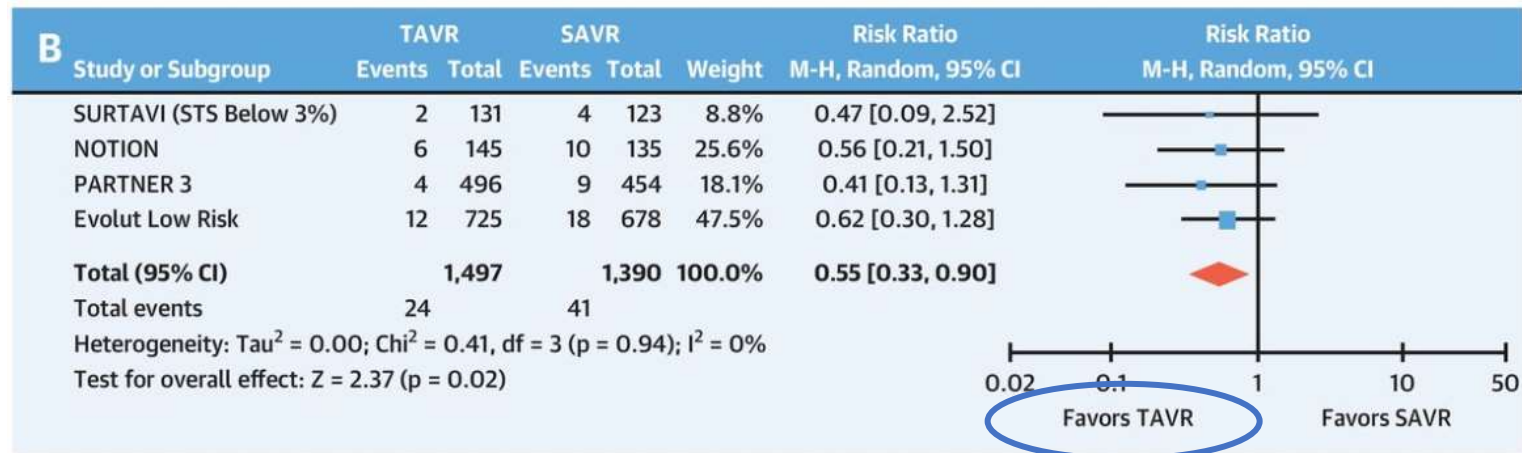
# TAVR Trials In Low Risk

## Metanalysis of RCTs (n=2,887)

All  
Death



Cardio-  
Vascular  
Death



**TAVR is Better !**



# TAVR is Better !

TAVR @ 30 days, as compared with surgery,  
had a lower incidence of

- disabling stroke (0.5% vs. 1.7%),
- bleeding complications (2.4% vs. 7.5%),
- acute kidney injury (0.9% vs. 2.8%),
- atrial fibrillation (7.7% vs. 35.4%).

# TAVR is Better !

TAVR @ 30 days, as compared with surgery,  
had a higher incidence of

- moderate or severe paravalvular aortic regurgitation (3.5% vs. 0.5%),
- pacemaker implantation (17.4% vs. 6.1%),

Michael J. Mack, M.D., et al, N Engl J Med 2019; 380:1695-1705, for the PARTNER 3 Investigators\*  
Jeffrey J. Popma, M.D., et al, N Engl J Med 2019; 380:1706-1715, for the Evolut Low Risk Trial Investigators\*

# TAVR is Better !

TAVR @ 1 year, as compared with surgery had

- lower aortic-valve gradients (8.6 mmHg vs. 11.2 mmHg),
- larger effective orifice areas (2.3 cm<sup>2</sup> vs. 2.0 cm<sup>2</sup>).

**US FDA Approved TAVR in 2019**  
**for Low Risk Patients**



# **Standard Performance of TAVR** **for High-Risk AS patients @ 30 days (VARC-2\*)**

|                                     |                 |
|-------------------------------------|-----------------|
| <b>All-cause mortality</b>          | <b>&lt; 3%</b>  |
| <b>Major (disabling) strokes</b>    | <b>&lt; 2%</b>  |
| <b>Major vascular complications</b> | <b>&lt; 5%</b>  |
| <b>New permanent pacemakers</b>     | <b>&lt; 10%</b> |
| <b>Mod-severe PVR</b>               | <b>&lt; 5%</b>  |

# *Recent New*



**SAPIEN 3**



**SAPIEN 3 Ultra**

# SAPIEN 3 Ultra

30 days (TVT registry, 2021)

| n=1,324                     | S3U TAVI |
|-----------------------------|----------|
| All-cause mortality         | 0.9%     |
| All-cause stroke            | 1.2%     |
| Major vascular complication | 1.1%     |
| New permanent pacemaker     | 6.0%     |
| Moderate or severe PVL      | 0.5%     |
| Life-threatening bleeding   | 0.0%     |

# Current TAVR Outcomes Are Good Enough !

## Standard Performance (VARC-2\*) for AS patients (@ 30 days)

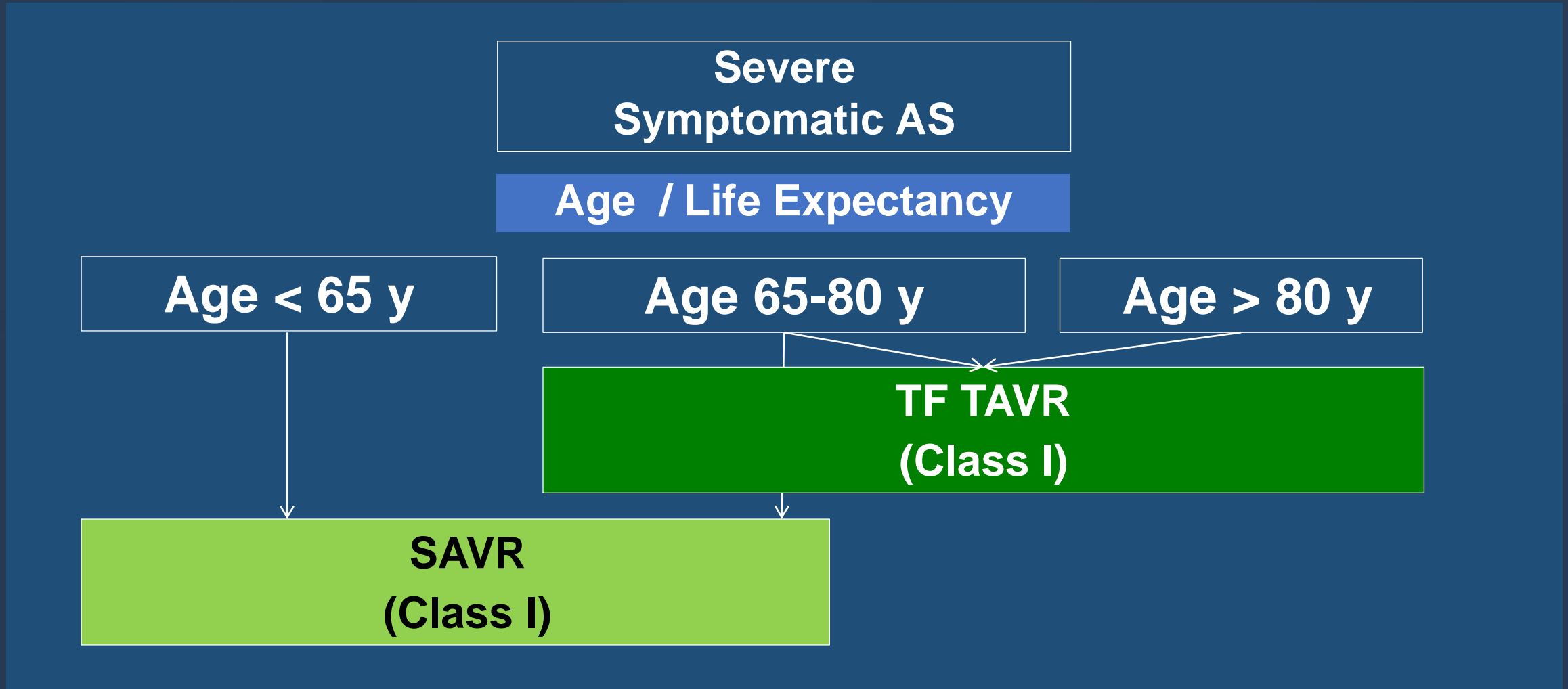
|                              |       |
|------------------------------|-------|
| All-cause mortality          | < 3%  |
| Major (disabling) strokes    | < 2%  |
| Major vascular complications | < 5%  |
| New permanent pacemakers     | < 10% |
| Mod-severe PVR               | < 5%  |

## SAPIEN 3 Ultra

|      |
|------|
| 0.9% |
| 1.2% |
| 1.1% |
| 6.0% |
| 0.5% |



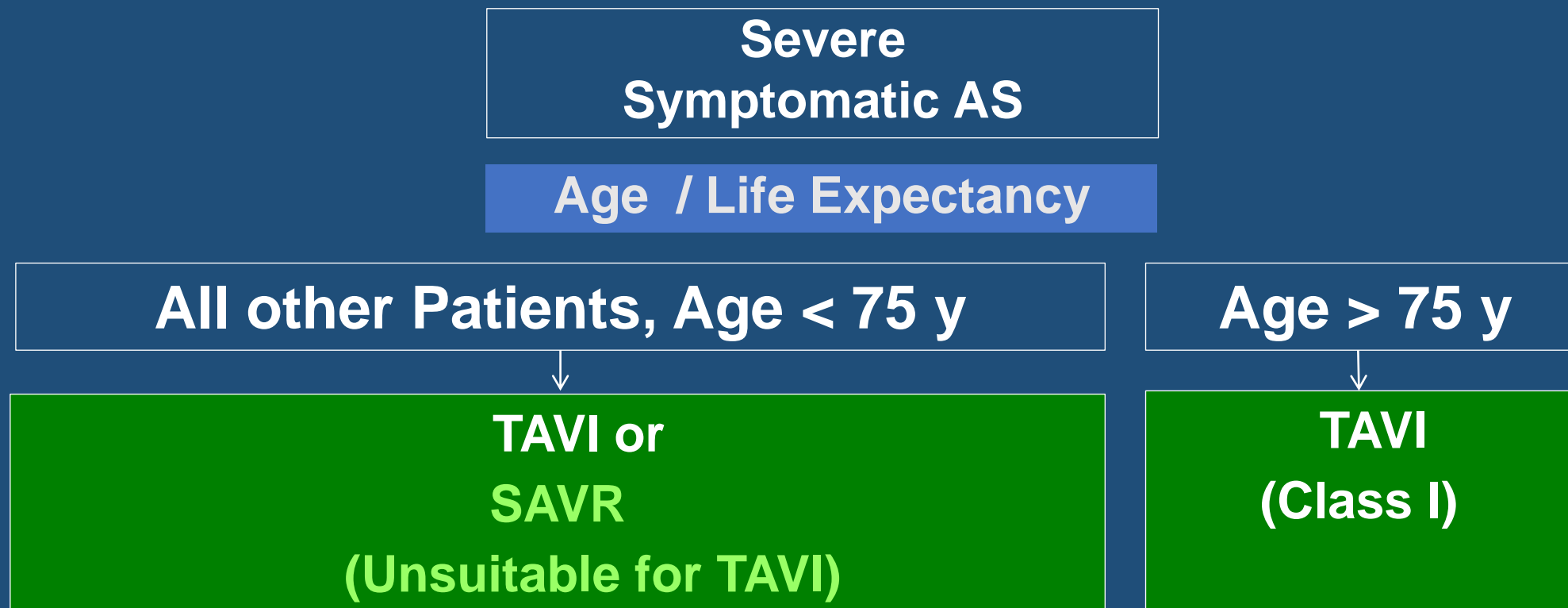
# 2020 AHA/ACC Guidelines



2020 ACC/AHA Guideline for the Management of Patients With Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

Originally published 17 Dec 2020, February 2, 2021 Vol 143, Issue 5

# 2021 ESC/EACTS Guidelines



# 2021 Conceptual Guidelines

Severe  
Symptomatic AS

Age / Life Expectancy

Whenever You Choose  
Tissue Valve



**TAVR Is Choice !**  
**SAVR for Only Unsuitable TAVR**

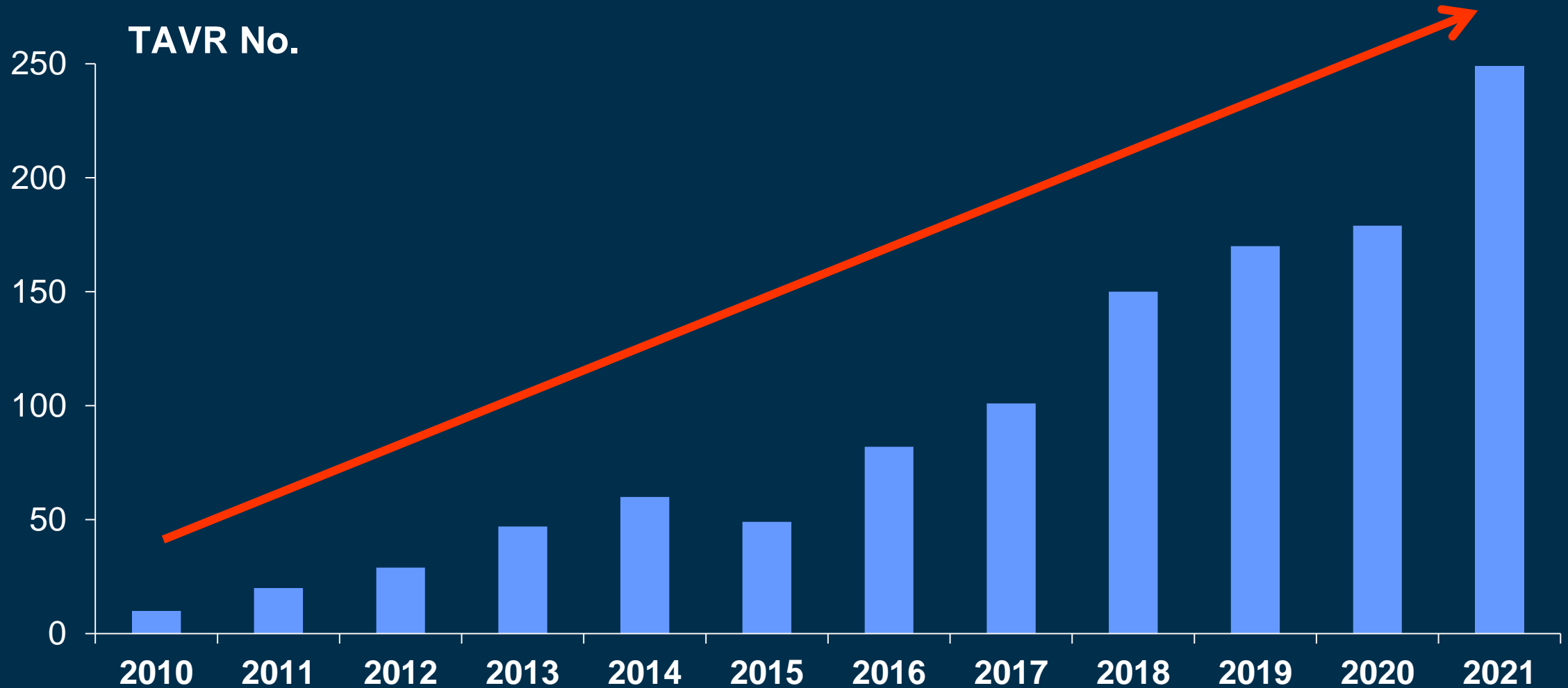
# *First TAVR in AMC* *at 2010*



# TAVR Case Increased at AMC

*N=1300, 2022/7*

*over 250 cases/yr*



# TAVR in AMC

## *What is the Difference ?*

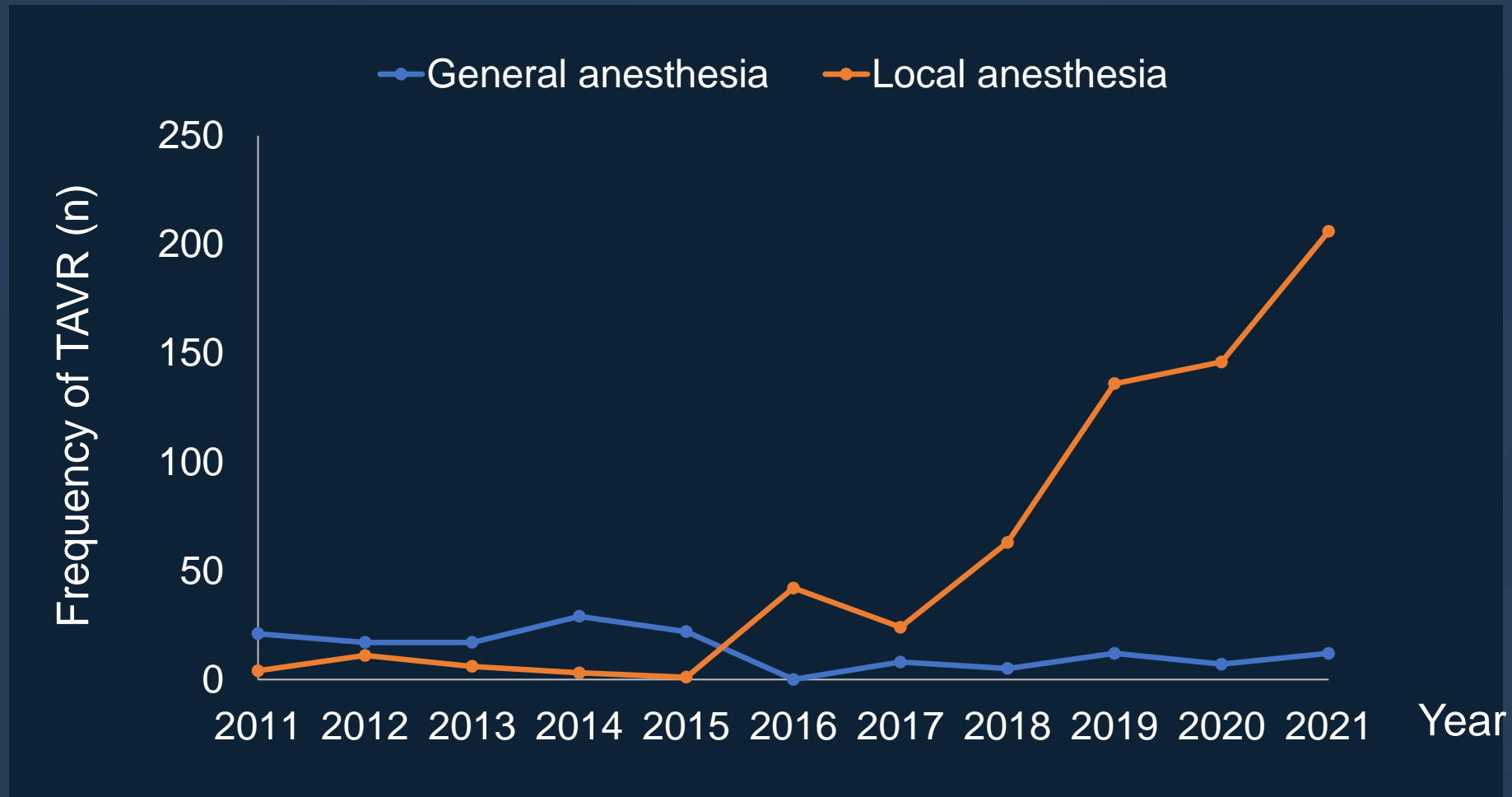
1. Perfect “Heart Team” Collaboration
2. “Minimalist Approach” (MAC, >95%)  
*Simplify the Procedure*
3. “CT Algorithm for Device Selection”  
*Pre-TAVR Meticulous CT Measurement*

# ***“Minimalist Approach” (MAC)***

## **TAVR in AMC**

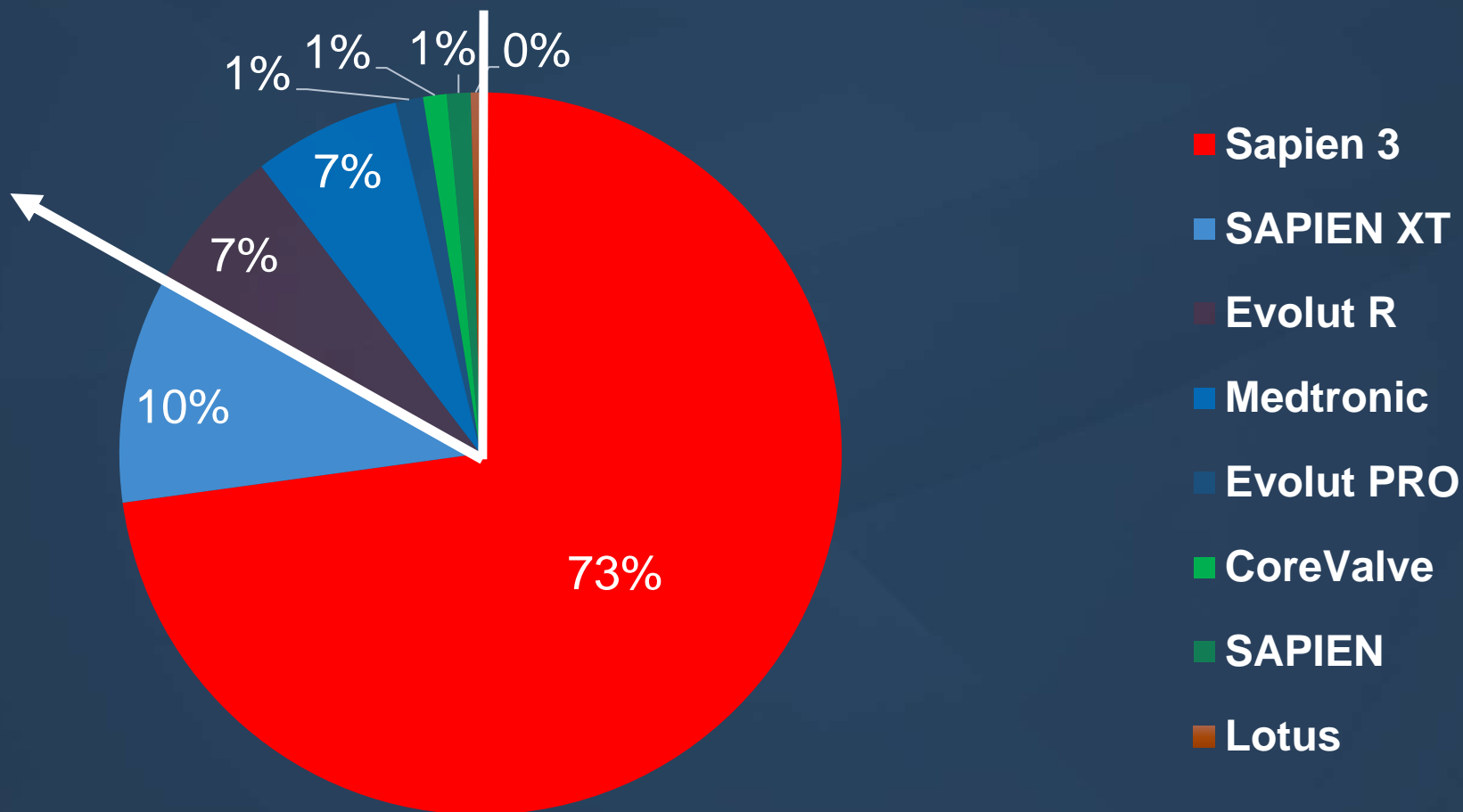
- No General Anesthesia,
- No TEE
- 30 min. Procedure
- One Day stay in CCU
- No Complications
- Discharge on Day #3
- Cardiac Rehabilitation Program

# *“Minimalist Approach” (MAC)* TAVR in AMC





# TAVR Devices in AMC



# TAVR in AMC

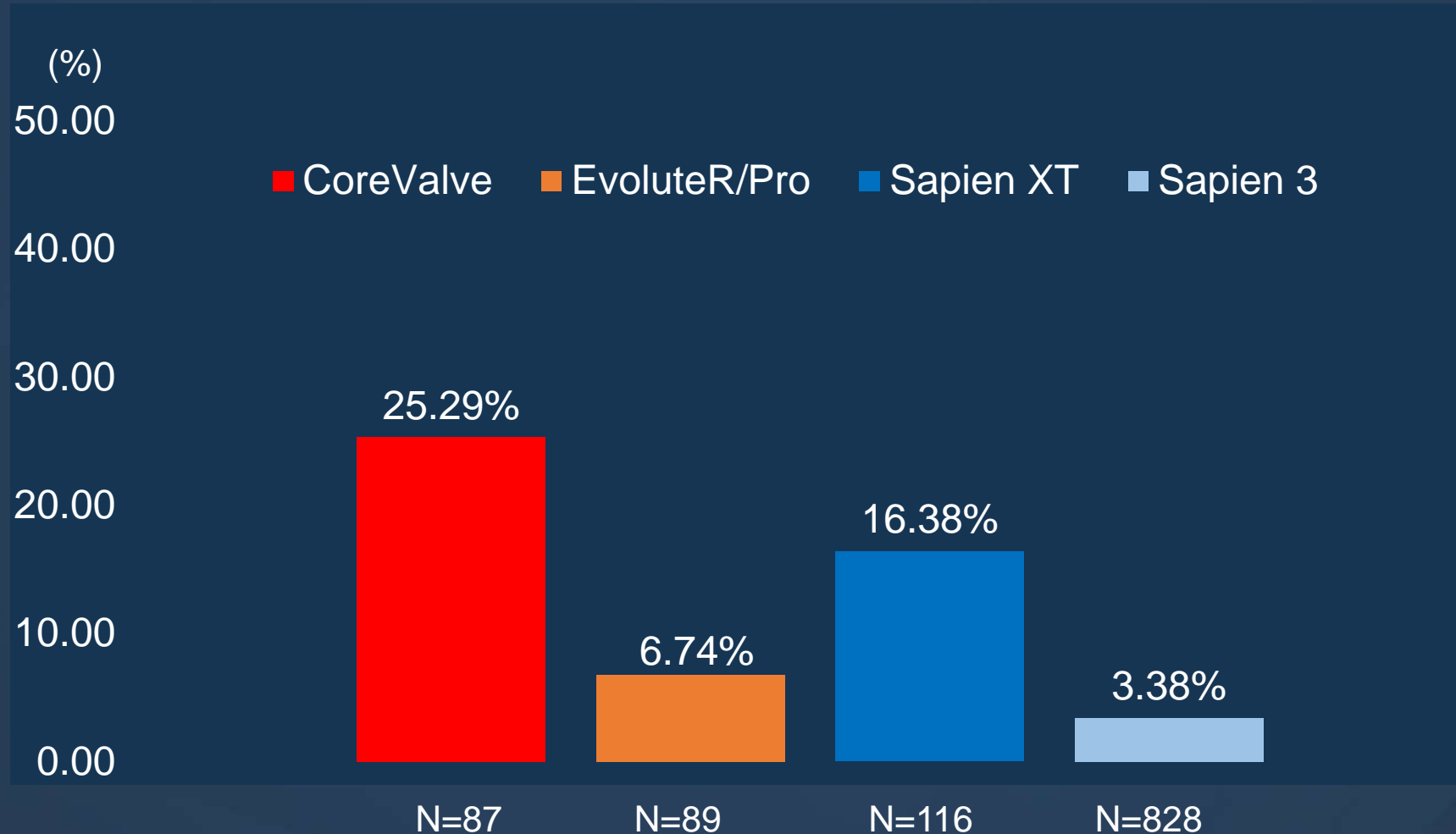
|                             | N = 1137     |
|-----------------------------|--------------|
| Age, years                  | 80.18 ± 5.44 |
| Male sex                    | 536 (47.14%) |
| BMI, kg/m <sup>2</sup>      | 25.67 ± 5.7  |
| STS risk score (%)          | 4.06 ± 2.86  |
| DM                          | 397 (34.9%)  |
| Hypertension                | 900 (79.1%)  |
| Atrial fibrillation         | 139 (12.4%)  |
| Coronary artery disease     | 274 (24.1%)  |
| Previous MI                 | 41 (3.6%)    |
| Previous stroke             | 134 (11.7%)  |
| Peripheral vascular disease | 59 (5.1%)    |
| Chronic Kidney Disease      | 44 (3.87%)   |
| COPD                        | 141 (12.4%)  |
| LV Ejection fraction, %     | 58.87 ± 10.6 |

# *Procedural Outcomes*

## TAVR in AMC

|                                | Overall<br>(N = 1137) |
|--------------------------------|-----------------------|
| Procedural success             | 1101 (96.8%)          |
| Conversion to surgery          | 14 (1.2%)             |
| Coronary obstruction           | 3 (0.2%)              |
| Implantation of two valves     | 20 (1.7%)             |
| New permanent pacemaker        | 79 (6.9%)             |
| PVL ≥ moderate                 | 49 (4.3%)             |
| Major vascular complication    | 61 (5.3%)             |
| Length of hospital stay (days) | 10.67 ± 1.2           |

# Incidence of PPM TAVR in AMC



# 30 Days Outcomes (Overall)

## TAVR in AMC

|                           | Overall<br>(N = 1137) |
|---------------------------|-----------------------|
| Death, all                | 20 (1.7%)             |
| Cardiac death             | 13 (1.1%)             |
| Non-cardiac death         | 7 (0.6%)              |
| Stroke, all               | 42 (3.7%)             |
| Disabling                 | 12 (1.0%)             |
| Non-disabling             | 30 (2.6%)             |
| Death or disabling stroke | 28 (2.4%)             |
| Bleeding                  | 406 (35.7%)           |
| Life-threatening          | 48 (4.2%)             |
| Major                     | 154 (13.5%)           |

# 30 Days Outcomes (Recent 1 year Performance) TAVR in AMC

|                                  | Overall<br>(N = 262) |
|----------------------------------|----------------------|
| Death, all                       | 5 (1.9%)             |
| Cardiac death                    | 3 (1.1%)             |
| Non-cardiac death                | 2 (0.7%)             |
| Stroke, all                      | 4 (1.5%)             |
| Disabling                        | 1 (0.3%)             |
| Non-disabling                    | 3 (1.1%)             |
| Death or disabling stroke        | 10 (3.8%)            |
| Bleeding, life-threatening       | 0 (0.0%)             |
| Permanent pacemaker implantation | 8 (3.0%)             |



# 1 year Outcomes TAVR in AMC

|                           | Overall<br>(N = 1137) |
|---------------------------|-----------------------|
| Death, all                | 79 (6.9%)             |
| Cardiac death             | 23 (2.0%)             |
| Non-cardiac death         | 56 (4.9%)             |
| Stroke, all               | 60 (5.2%)             |
| Disabling                 | 15 (1.3%)             |
| Non-disabling             | 45 (3.9%)             |
| Death or disabling stroke | 89 (7.8%)             |
| Rehospitalization         | 75 (6.5%)             |
| Infective endocarditis    | 17 (1.4%)             |

# Outcomes of TAVR

## Standard Performance (VARC-2\*) for AS patients (@ 30 days)

|                              |       |
|------------------------------|-------|
| All-cause mortality          | < 3%  |
| Major (disabling) strokes    | < 2%  |
| Major vascular complications | < 5%  |
| New permanent pacemakers     | < 10% |
| Mod-severe PVR               | < 5%  |

**AMC  
All**

**AMC  
2021**

1.7%

1.9%

1.0%

0.3%

5.3%

0.0%

6.9%

3.0%

4.3%

1.1%

***“Minimalist Approach” (MAC)***  
***Improved Clinical Outcomes !***

# TAVR in AMC

## Baseline Characteristics

|                        | Overall<br>(N = 1137) | General<br>Anesthesia<br>(N = 276) | Conscious<br>Sedation (MAC)<br>(N = 861) | P value |
|------------------------|-----------------------|------------------------------------|--|---------|
| Age                    | 80.1 ± 5.4            | 79.7 ± 5.52                        | 80.3 ± 5.41                              | 0.11    |
| Male sex               | 536 (47.1%)           | 141 (51.1%)                        | 395 (45.8%)                              | 0.15    |
| BMI, kg/m <sup>2</sup> | 25.6 ± 5.7            | 23.6 ± 3.36                        | 26.36 ± 2.6                              | 0.24    |
| STS risk score, %      | 4.06 ± 2.86           | 4.51 ± 3.35                        | 3.92 ± 2.67                              | 0.008   |
| DM                     | 397 (34.9%)           | 94 (34.1%)                         | 303 (35.2%)                              | 0.78    |
| HTN                    | 900 (79.1%)           | 239 (86.6%)                        | 661 (76.7%)                              | 0.001   |
| Atrial fibrillation    | 139 (12.4%)           | 35 (12.7%)                         | 104 (12.5%)                              | 0.87    |
| CAD                    | 274 (24.1%)           | 81 (29.3%)                         | 193 (22.42%)                             | 0.63    |
| Previous MI            | 41 (3.6%)             | 16 (5.8%)                          | 25 (2.9%)                                | 0.04    |
| Previous stroke        | 134 (11.7%)           | 29 (10.5%)                         | 105 (12.2%)                              | 0.51    |
| PVD                    | 59 (5.1%)             | 29 (10.5%)                         | 30 (3.4%)                                | <0.001  |
| Chronic Kidney Disease | 44 (3.8%)             | 16 (5.8%)                          | 28 (3.2%)                                | 0.08    |
| COPD                   | 141 (12.4%)           | 43 (15.5%)                         | 98 (11.3%)                               | 0.08    |

# TAVR in AMC

## Procedural Characteristics

|                                    | Overall<br>(N = 1137) | General<br>Anesthesia<br>(N = 276) | Conscious<br>Sedation(MAC)<br>(N = 861) | P value |
|------------------------------------|-----------------------|------------------------------------|---|---------|
| Aortic-valve area, cm <sup>2</sup> | 0.63 ± 0.15           | 0.62 ± 0.18                        | 0.63 ± 0.14                             | 0.52    |
| AV Vmax, m/s                       | 4.82 ± 0.79           | 4.85 ± 0.87                        | 4.81 ± 0.77                             | 0.44    |
| Mean gradient, mmHg                | 57.1 ± 20.2           | 59.1 ± 22.6                        | 56.5 ± 19.3                             | 0.09    |
| Bicuspid AV                        | 114 (10.4%)           | 22 (8.0%)                          | 92 (10.6%)                              | 0.24    |
| LV EF, %                           | 58.8 ± 10.6           | 57.1 ± 12.1                        | 59.4 ± 10.2                             | 0.003   |
| Device type                        |                       |                                    |   | <0.001  |
| Balloon-expandable                 | 956 (84.1%)           | 169 (61.2%)                        | 787 (91.4%)                             |         |
| Self-expandable                    | 181 (15.9%)           | 107 (38.7%)                        | 74 (8.59%)                              |         |

# TAVR in AMC

## Procedural Outcomes

|                                | Overall<br>(N = 1137) | General<br>Anesthesia<br>(N = 276) | Conscious<br>Sedation(MAC)<br>(N = 861) | P value |
|--------------------------------|-----------------------|------------------------------------|---|---------|
| Procedural success             | 1101<br>(96.8%)       | 252 (91.3%)                        | 849 (98.6%)                             | <0.001  |
| Conversion to surgery          | 14 (1.2%)             | 7 (2.5%)                           | 7 (0.8%)                                | 0.053   |
| Coronary obstruction           | 3 (0.2%)              | 0 (0.0%)                           | 3 (0.3%)                                | 0.75    |
| New permanent pacemaker        | 79 (6.9%)             | 36 (13.0%)                         | 43 (4.9%)                               | <0.001  |
| PVL ≥ moderate                 | 49 (4.3%)             | 18 (6.5%)                          | 31 (3.6%)                               | 0.056   |
| Major vascular complication    | 61 (5.3%)             | 30 (10.8%)                         | 31 (3.6%)                               | <0.001  |
| Length of hospital stay (days) | 10.6 ± 1.2            | 10.7 ± 2.3                         | 10.6 ± 0.6                              | 0.554   |

# TAVR in AMC

## 30 Days Outcomes

|                           | Overall<br>(N = 1137) | General<br>Anesthesia<br>(N = 276) | Conscious<br>Sedation(MAC)<br>(N = 861) | P value |
|---------------------------|-----------------------|------------------------------------|---|---------|
| Death, all                | 20 (1.7%)             | 12 (4.3%)                          | 8 (0.9%)                                | <0.001  |
| Cardiac death             | 13 (1.1%)             | 8 (2.9%)                           | 5 (0.5%)                                | 0.005   |
| Non-cardiac death         | 7 (0.6%)              | 4 (1.4%)                           | 3 (0.3%)                                | 0.11    |
| Stroke, all               | 42 (3.7%)             | 15 (5.4%)                          | 27 (3.14%)                              | 0.11    |
| Disabling                 | 12 (1.0%)             | 4 (1.4%)                           | 8 (0.9%)                                | 0.69    |
| Non-disabling             | 30 (2.6%)             | 11 (3.9%)                          | 19 (2.2%)                               | 0.16    |
| Death or disabling stroke | 28 (2.4%)             | 15 (5.4%)                          | 13 (1.5%)                               | 0.001   |
| Bleeding                  | 406 (35.7%)           | 136 (49.2%)                        | 270 (31.3%)                             | <0.001  |
| Life-threatening          | 48 (4.2%)             | 27 (9.7%)                          | 21 (2.4%)                               | <0.001  |
| Major                     | 154 (13.5%)           | 71 (25.7%)                         | 83 (9.6%)                               | <0.001  |



# Outcomes of TAVR

## Standard Performance (VARC-2\*) for AS patients (@ 30 days)

|                              |       |
|------------------------------|-------|
| All-cause mortality          | < 3%  |
| Major (disabling) strokes    | < 2%  |
| Major vascular complications | < 5%  |
| New permanent pacemakers     | < 10% |
| Mod-severe PVR               | < 5%  |

AMC  
All

AMC  
“MAC”

1.7%

0.9%

1.0%

0.9%

5.3%

3.6%

6.9%

4.9%

4.3%

3.6%

# *TAVR in AMC*

## *Sapien3* vs *Evolut R*

# TAVR in AMC

## Baseline Characteristics

|                        | Overall<br>(N = 1137) | Balloon<br>Expandable<br>(N = 956) | Self<br>Expandable<br>(N = 181) | P value |
|------------------------|-----------------------|------------------------------------|---------------------------------|---------|
| Age                    | 80.1 ± 5.4            | 80.1 ± 5.5                         | 80.1 ± 4.9                      | 0.91    |
| Male sex               | 536 (47.1%)           | 457 (47.8%)                        | 79 (43.6%)                      | 0.34    |
| BMI, kg/m <sup>2</sup> | 25.6 ± 5.7            | 26.0 ± 3.4                         | 23.8 ± 3.4                      | 0.28    |
| STS risk score, %      | 4.06 ± 2.86           | 4.07 ± 2.93                        | 4.04 ± 2.46                     | 0.88    |
| DM                     | 397 (34.9%)           | 338 (35.3%)                        | 59 (32.6%)                      | 0.52    |
| HTN                    | 900 (79.1%)           | 755 (78.9%)                        | 145 (80.1%)                     | 0.80    |
| Atrial fibrillation    | 139 (12.4%)           | 115 (12.0%)                        | 24 (13.2%)                      | 0.73    |
| CAD                    | 274 (24.1%)           | 231 (24.1%)                        | 43 (23.7%)                      | 0.98    |
| Previous MI            | 41 (3.6%)             | 35 (3.6%)                          | 6 (3.3%)                        | 0.99    |
| Previous stroke        | 134 (11.7%)           | 116 (12.1%)                        | 18 (9.9%)                       | 0.47    |
| PVD                    | 59 (5.1%)             | 48 (5.0%)                          | 11 (5.0%)                       | 0.68    |
| Chronic Kidney Disease | 44 (3.8%)             | 41 (4.2%)                          | 3 (1.6%)                        | 0.14    |
| COPD                   | 141 (12.4%)           | 110 (11.51%)                       | 31 (17.1%)                      | 0.048   |

# TAVR in AMC

## Baseline Characteristics

|                        | Overall<br>(N = 1137) | Balloon<br>Expandable<br>(N = 956) | Self<br>Expandable<br>(N = 181) | P value |
|------------------------|-----------------------|------------------------------------|---------------------------------|---------|
| Age                    | 80.1 ± 5.4            | 80.1 ± 5.5                         | 80.1 ± 4.9                      | 0.91    |
| Male sex               | 536 (47.1%)           | 457 (47.8%)                        | 79 (43.6%)                      | 0.34    |
| BMI, kg/m <sup>2</sup> | 25.6 ± 5.7            | 26.0 ± 3.4                         | 23.8 ± 3.4                      | 0.28    |
| STS risk score, %      | 4.06 ± 2.86           | 4.07 ± 2.93                        | 4.04 ± 2.46                     | 0.88    |
| DM                     | 397 (34.9%)           | 338 (35.3%)                        | 59 (32.6%)                      | 0.52    |
| HTN                    | 900 (79.1%)           | 755 (78.9%)                        | 145 (80.1%)                     | 0.80    |
| Atrial fibrillation    | 139 (12.4%)           | 115 (12.0%)                        | 24 (13.2%)                      | 0.73    |
| CAD                    | 274 (24.1%)           | 231 (24.1%)                        | 43 (23.7%)                      | 0.98    |
| Previous MI            | 41 (3.6%)             | 35 (3.6%)                          | 6 (3.3%)                        | 0.99    |
| Previous stroke        | 134 (11.7%)           | 116 (12.1%)                        | 18 (9.9%)                       | 0.47    |
| PVD                    | 59 (5.1%)             | 48 (5.0%)                          | 11 (5.0%)                       | 0.68    |
| Chronic Kidney Disease | 44 (3.8%)             | 41 (4.2%)                          | 3 (1.6%)                        | 0.14    |
| COPD                   | 141 (12.4%)           | 110 (11.51%)                       | 31 (17.1%)                      | 0.048   |

# TAVR in AMC

## Procedural Characteristics

|  | Overall<br>(N = 1137) | Balloon<br>Expandable<br>(N = 956) | Self<br>Expandable<br>(N = 181) | P value |
|--|-----------------------|------------------------------------|---------------------------------|---------|
| <b>Aortic-valve area, cm<sup>2</sup></b> | 0.63 ± 0.15           | 0.63 ± 0.15                        | 0.60 ± 0.17                     | 0.014   |
| <b>AV Vmax, m/s</b>                      | 4.82 ± 0.79           | 4.8 ± 0.8                          | 4.9 ± 0.9                       | 0.13    |
| <b>Mean gradient, mmHg</b>               | 57.1 ± 20.2           | 56.4 ± 19.5                        | 60.4 ± 23.1                     | 0.03    |
| <b>Bicuspid AV</b>                       | 114 (10.4%)           | 93 (9.7%)                          | 21 (11.6%)                      | 0.52    |
| <b>LV EF, %</b>                          | 58.8 ± 10.6           | 59.0 ± 10.3                        | 57.9 ± 11.7                     | 0.23    |
| <b>Approach site</b>                     |                       |                                    |                                 | <0.001  |
| <b>Transfemoral</b>                      | 1106 (97.2%)          | 927 (96.9%)                        | 179 (98.9%)                     |         |
| <b>Transapical</b>                       | 29 (2.5%)             | 29 (3.03%)                         | 0 (0.0%)                        |         |
| <b>Transaortic</b>                       | 2 (0.1%)              | 0 (0.0%)                           | 2 (1.1%)                        |         |

# TAVR in AMC

## Procedural Outcomes

|                                | Overall<br>(N = 1137) | Balloon<br>Expandable<br>(N = 956) | Self<br>Expandable<br>(N = 181) | P value |
|--------------------------------|-----------------------|------------------------------------|---------------------------------|---------|
| Device success                 | 1101<br>(96.8%)       | 933 (97.5%)                        | 168 (92.8%)                     | 0.002   |
| Conversion to surgery          | 14 (1.2%)             | 11 (1.1%)                          | 3 (1.6%)                        | 0.95    |
| Coronary obstruction           | 3 (0.2%)              | 3 (0.3%)                           | 0 (0.0%)                        | 1.00    |
| New permanent pacemaker        | 79 (6.9%)             | 51 (5.3%)                          | 28 (15.4%)                      | <0.001  |
| PVL ≥ moderate                 | 49 (4.3%)             | 36 (3.7%)                          | 13 (7.1%)                       | 0.06    |
| Major vascular complication    | 61 (5.3%)             | 43 (4.5%)                          | 18 (9.9%)                       | 0.005   |
| Length of hospital stay (days) | 10.6 ± 1.2            | 10.6 ± 1.15                        | 10.7 ± 1.6                      | 0.28    |

# TAVR in AMC

## 30 Days Outcomes

|                           | Overall<br>(N = 1137) | Balloon<br>Expandable<br>(N = 956) | Self<br>Expandable<br>(N = 181) | P value |
|---------------------------|-----------------------|------------------------------------|---------------------------------|---------|
| Death, all                | 20 (1.7%)             | 16 (1.6%)                          | 4 (2.2%)                        | 0.84    |
| Cardiac death             | 13 (1.1%)             | 9 (0.9%)                           | 4 (2.2%)                        | 0.27    |
| Non-cardiac death         | 7 (0.6%)              | 7 (0.7%)                           | 0 (0.0%)                        | 0.52    |
| Stroke, all               | 42 (3.7%)             | 32 (3.3%)                          | 10 (5.5%)                       | 0.22    |
| Disabling                 | 12 (1.0%)             | 8 (0.8%)                           | 4 (2.2%)                        | 0.20    |
| Non-disabling             | 30 (2.6%)             | 24 (2.5%)                          | 6 (3.3%)                        | 0.71    |
| Death or disabling stroke | 28 (2.4%)             | 21 (2.2%)                          | 7 (3.8%)                        | 0.28    |
| Bleeding                  | 406 (35.7%)           | 331 (34.6%)                        | 75 (41.4%)                      | 0.09    |
| Life-threatening          | 48 (4.2%)             | 33 (3.4%)                          | 15 (8.2%)                       | 0.006   |
| Major                     | 154 (13.5%)           | 111 (11.6%)                        | 43 (23.7%)                      | <0.001  |



# Outcomes of TAVR

## Standard Performance (VARC-2\*) for AS patients (@ 30 days)

|                              |       | AMC<br>All | AMC<br>SAPIEN | AMC<br>Core |
|------------------------------|-------|------------|---------------|-------------|
| All-cause mortality          | < 3%  | 1.7%       | 1.6%          | 2.2%        |
| Major (disabling) strokes    | < 2%  | 1.0%       | 0.8%          | 2.2%        |
| Major vascular complications | < 5%  | 5.3%       | 4.5%          | 9.9%        |
| New permanent pacemakers     | < 10% | 6.9%       | 5.3%          | 15.4%       |
| Mod-severe PVR               | < 5%  | 4.3%       | 3.7%          | 7.1%        |

# *Remaining Issues of TAVR*

## *Durability*

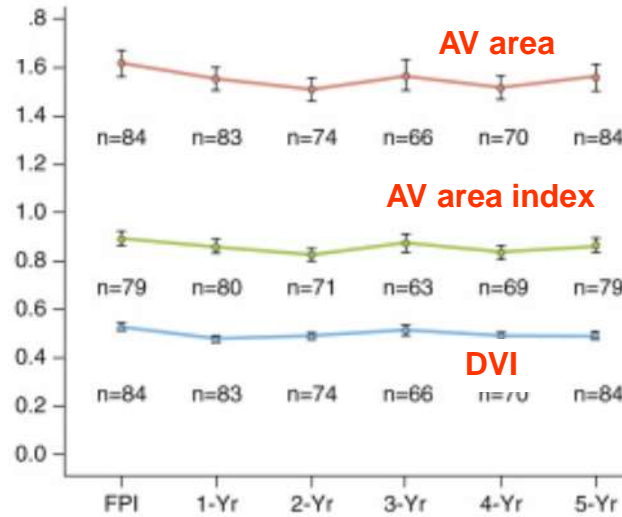
# *A Report From the PARTNER I Trial at 5 Year*

Long-Term Valve Performance of TAVR and SAVR:

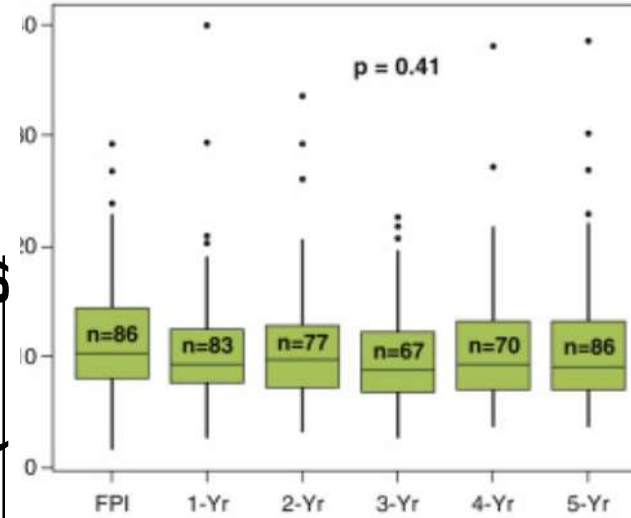
Melissa A. Daubert, et al, JACC Cardiovascular Imaging, 2017, Volume 10, Issue 1, 15-25

# PARTNER I at 5 Year

TAVR

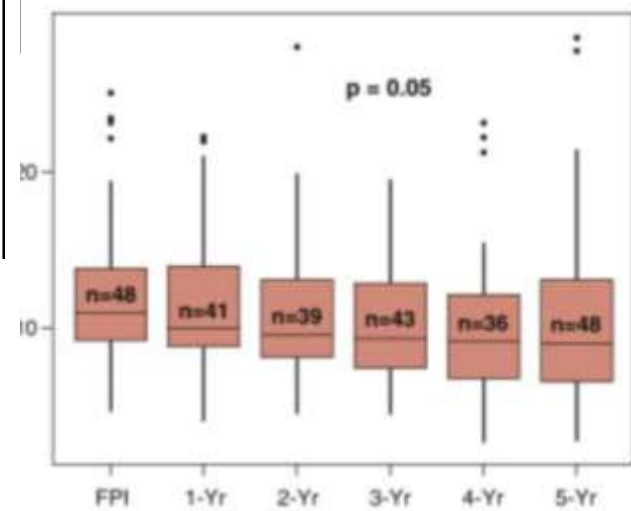
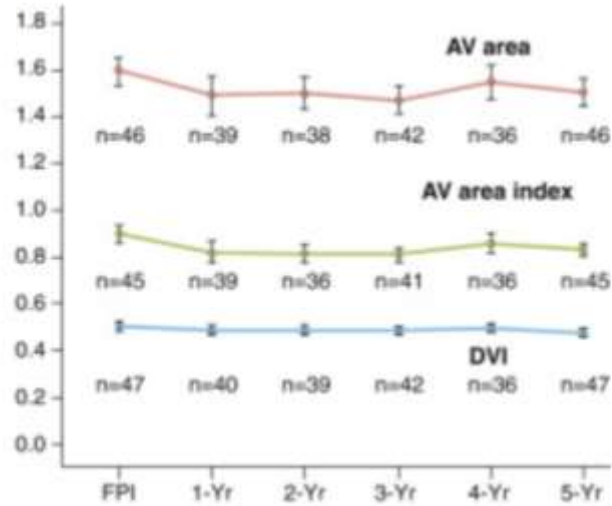


Mean Gradient (mmHg)



SAVR

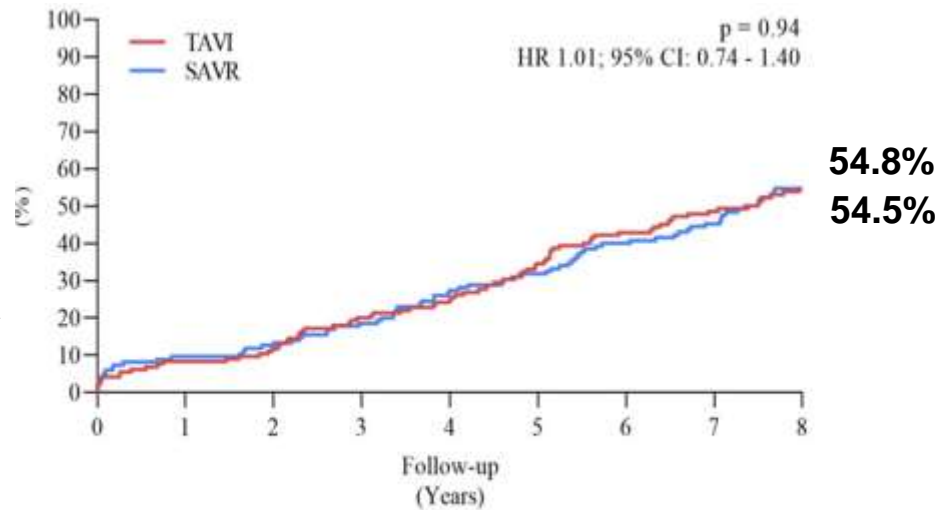
Doppler Velocity Index



# NOTION at 8 Year

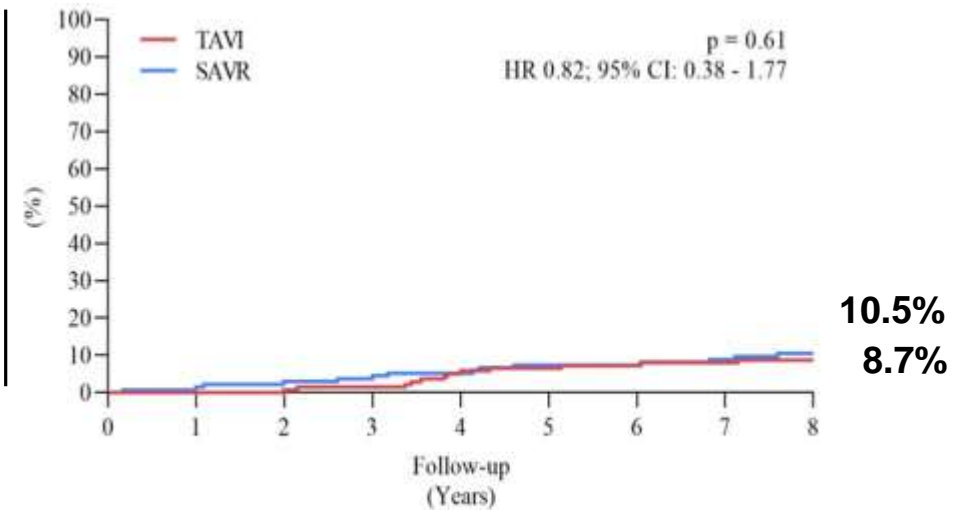
# Aortic Bioprosthetic Valve Failure 8 years after Transcatheter and Surgical Aortic Valve

## All Death, Stroke or MI



|      |     |     |     |     |     |    |    |    |    |
|------|-----|-----|-----|-----|-----|----|----|----|----|
| TAVI | 145 | 133 | 128 | 116 | 110 | 93 | 81 | 73 | 60 |
| SAVR | 135 | 122 | 118 | 110 | 99  | 92 | 80 | 73 | 54 |

## BPV Failure



|      |     |     |     |     |     |    |    |    |    |
|------|-----|-----|-----|-----|-----|----|----|----|----|
| TAVI | 145 | 133 | 128 | 118 | 109 | 96 | 82 | 73 | 60 |
| SAVR | 135 | 125 | 121 | 113 | 103 | 94 | 82 | 73 | 55 |

***At 5~8 Years After TAVR,  
TAVR Is Still Comparable with Surgery !***

# Remaining Issues Of TAVR,

## *We need more data*

- Bicuspid AV disease
- Bioprosthetic valve failure (aortic and mitral)
- Severe asymptomatic AS
- Low-flow, low-gradient AS
- Moderate AS + CHF
- High-risk AR
- Routine use of cerebral protection device ?



# TAVR in AMC, 2022

*Whenever you choose tissue valve, (at any age or at any cases) TAVR has become the standard of treatment in patients with symptomatic severe aortic stenosis(>65y).*

*SAVR would be considered only for patients who are not suitable for TAVR.*