

Bioprosthetic Heart Valve Durability

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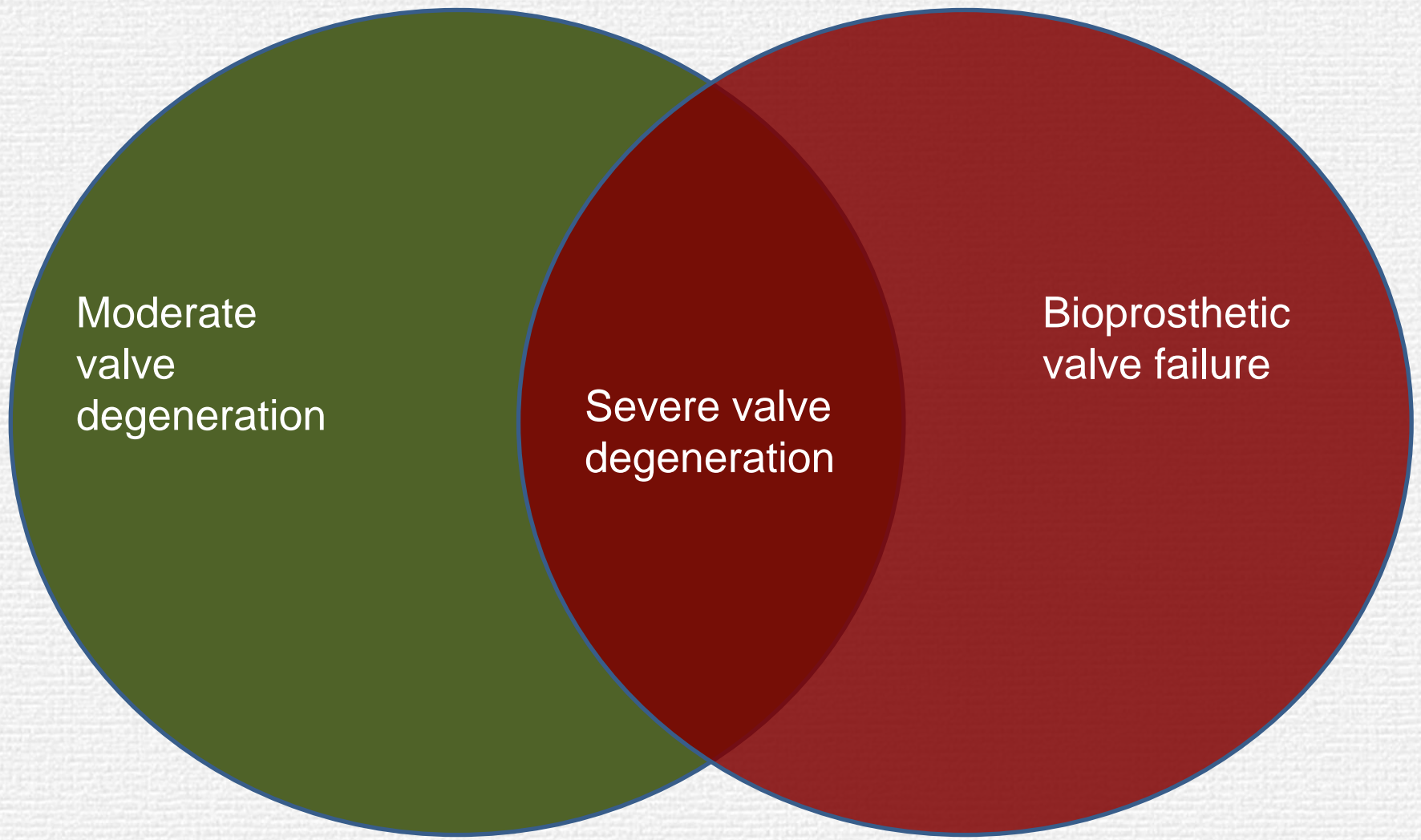
Truism

- All bioprosthetic valves will fail eventually, if the patient lives long enough

Definitions

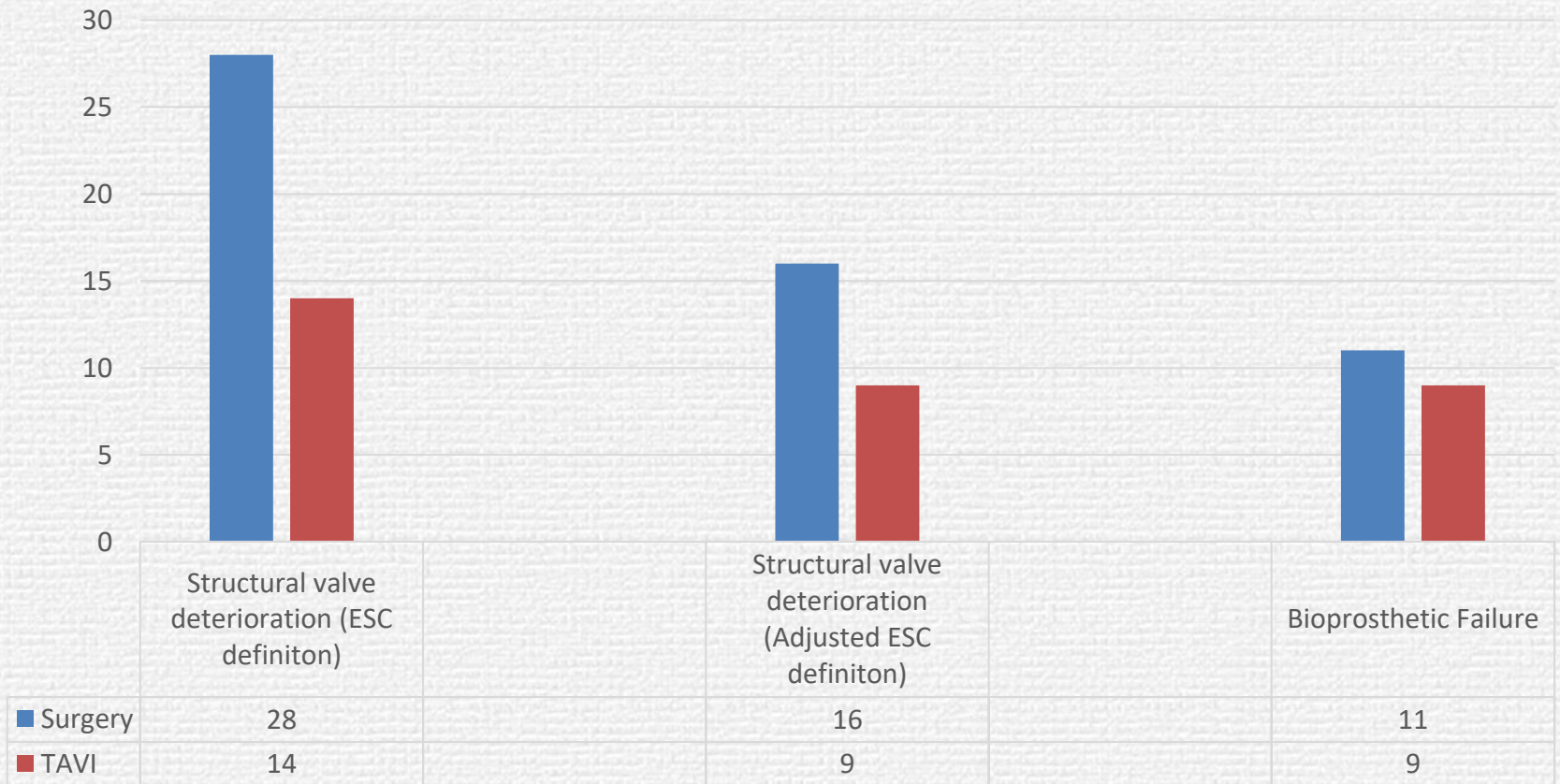
- Structural Valve Deterioration
- Bioprosthetic valve failure

Definition Venn diagram



Differing definitions....

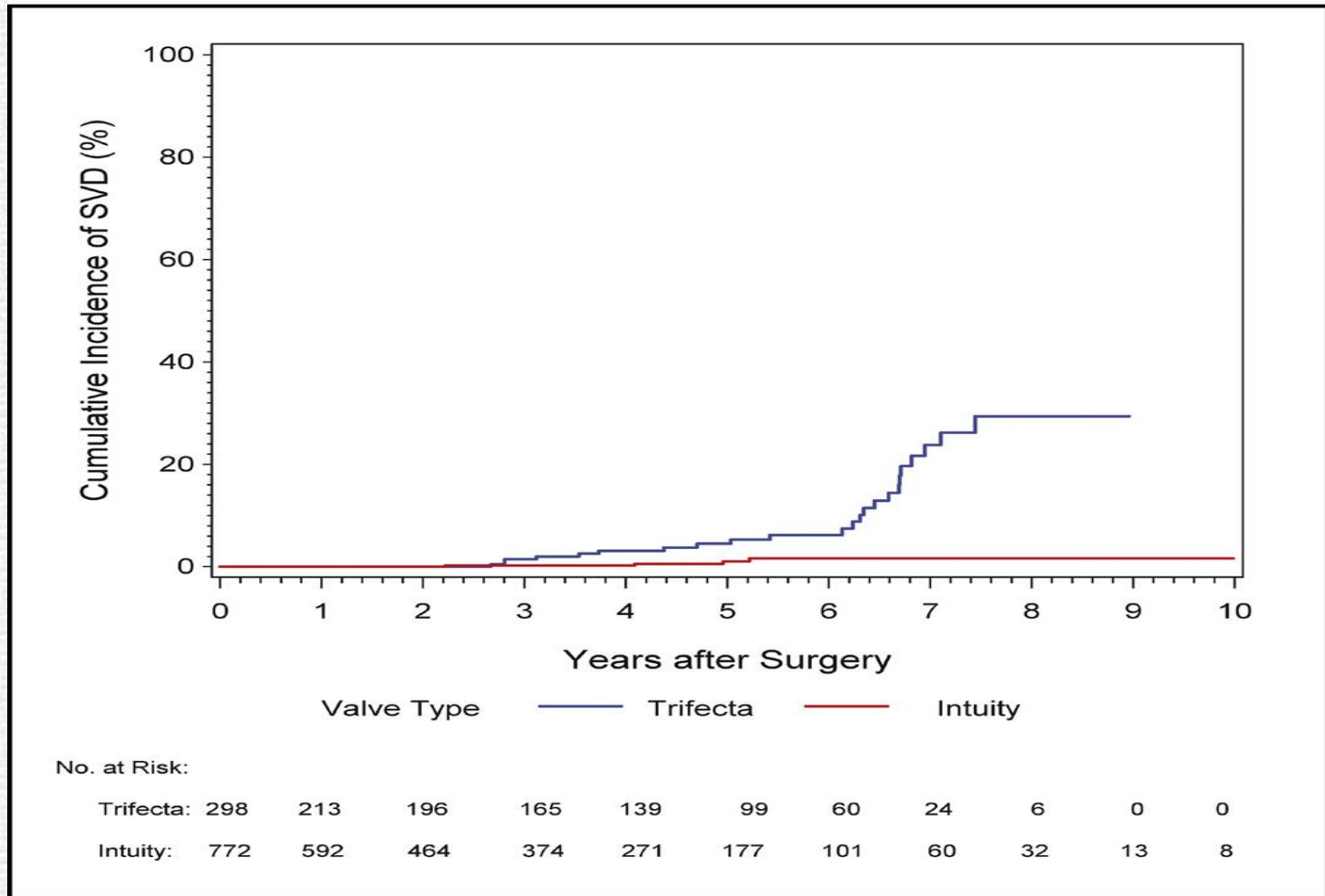
NOTION 8 years

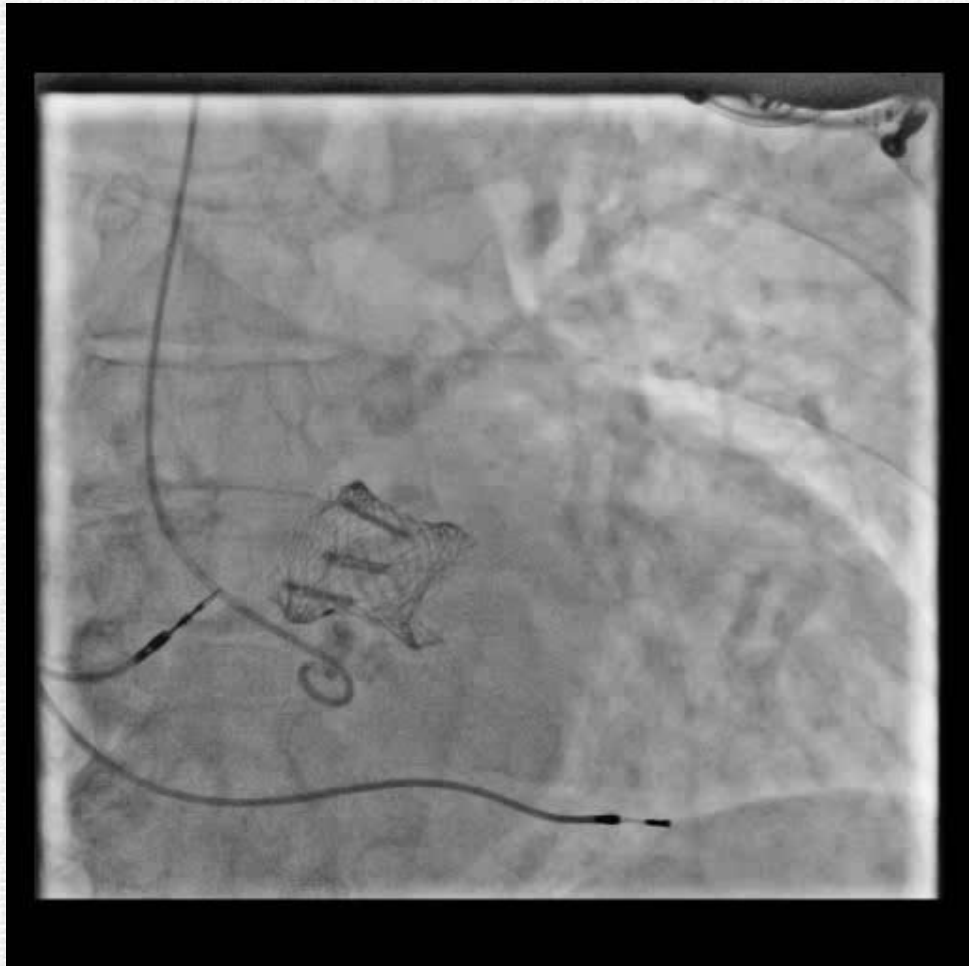


Differences

- All valves are different
- Some transcatheter valves will be excellent, some will not
- Some surgical valves will be great, some will not

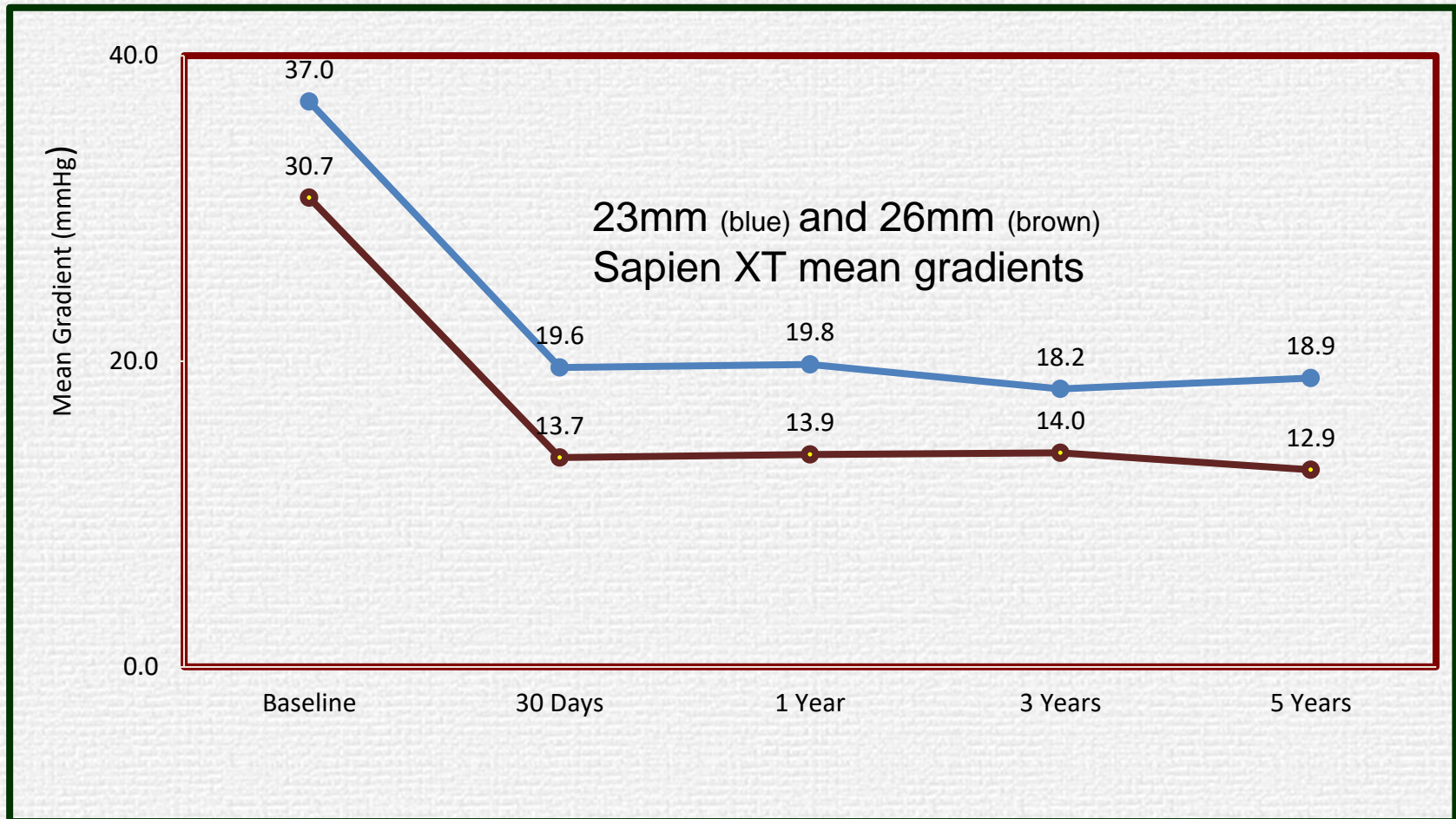
Not all valves are the same



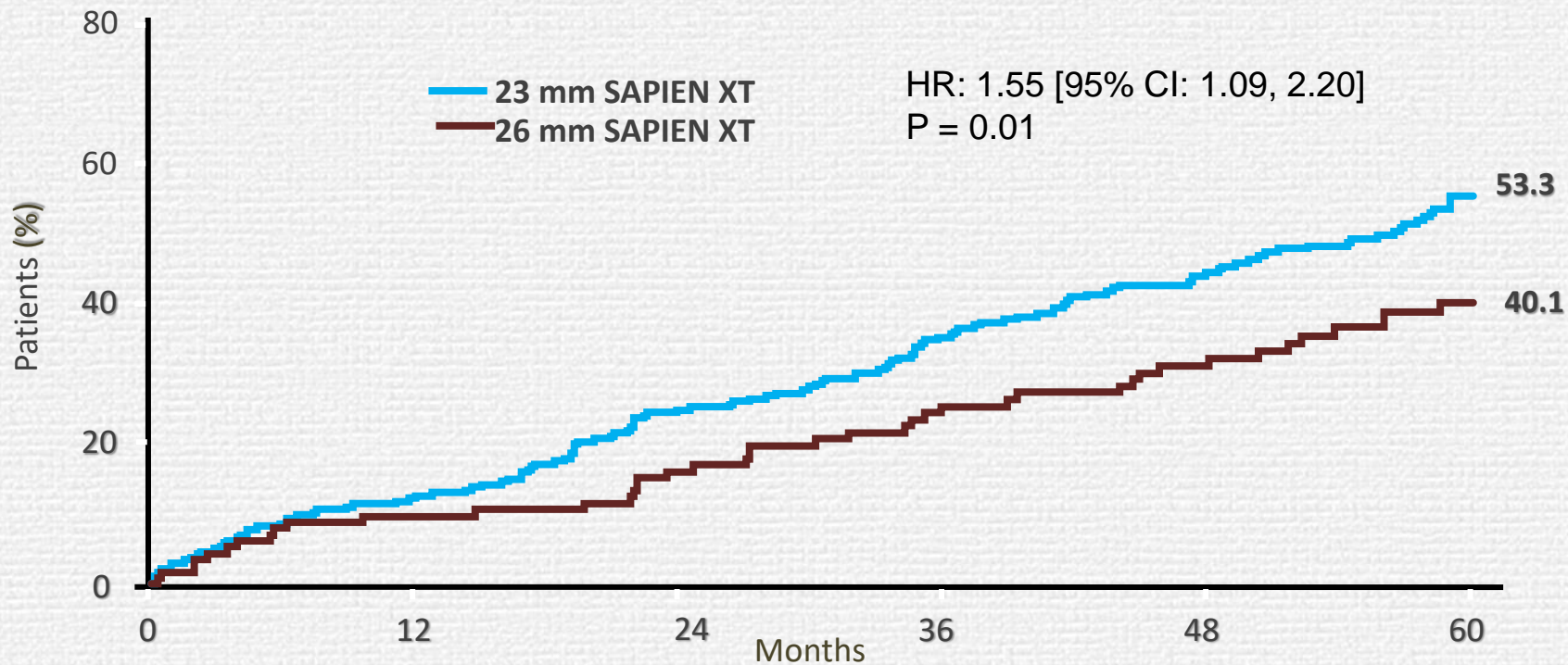


What factors affect durability?

Size of implanted valve



TAVI – Mortality by valve size (PARTNER 2)



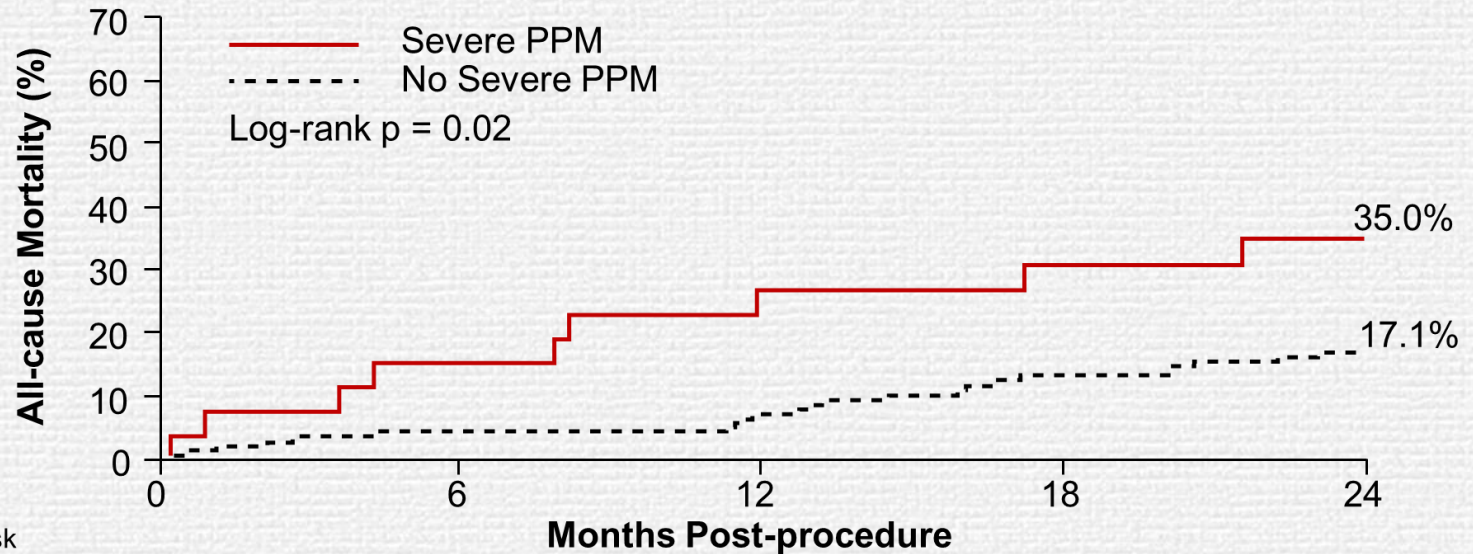
No. at risk:

	0	12	24	36	48	60
23 mm XT	252	219	184	154	121	87
26 mm XT	113	101	90	80	69	54

Patient-prosthesis mismatch

CoreValve High Risk

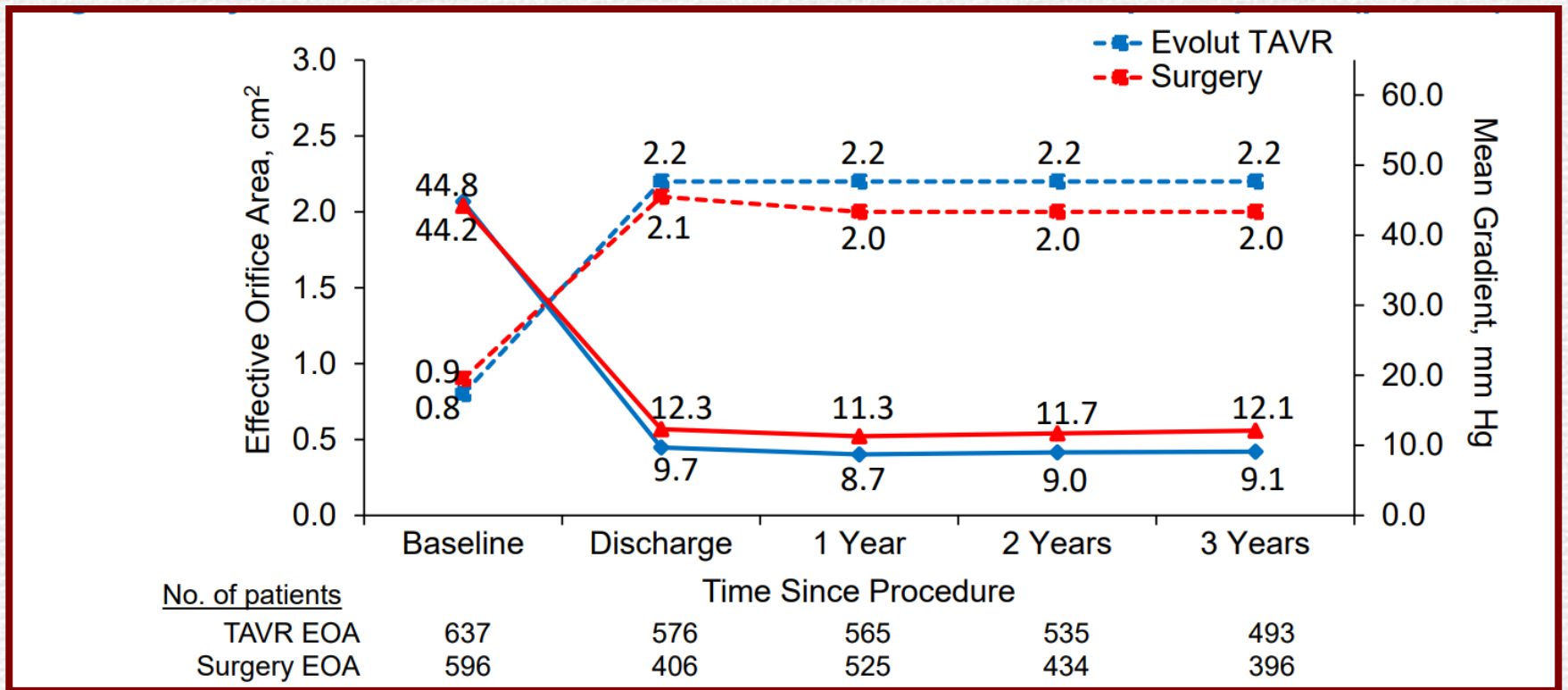
Combined TAVR and SAVR in the Lowest Annular Sizes



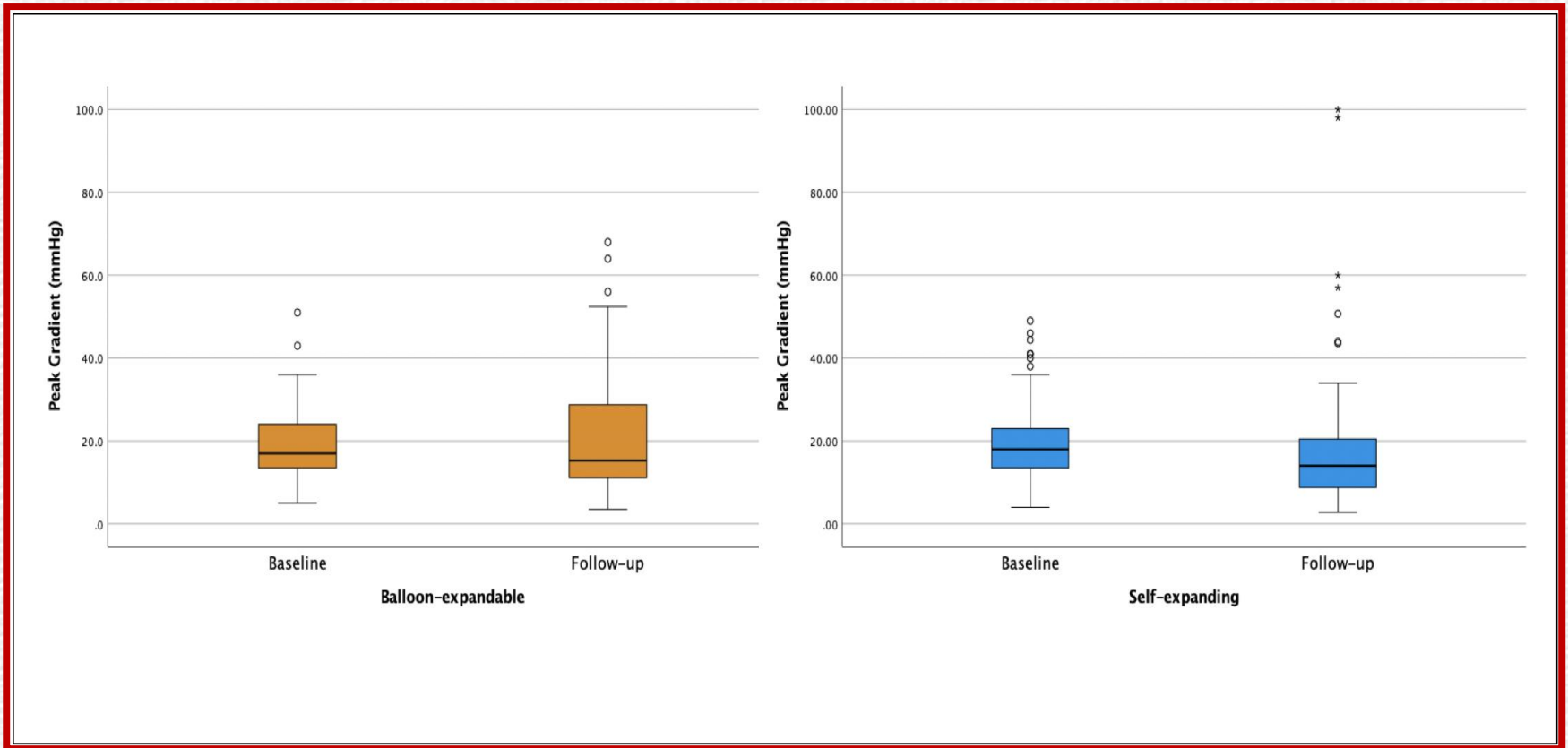
No. at risk

	0	3	6	12	24
Severe PPM	26	24	22	19	15
No Severe PPM	139	137	131	126	105

CoreValve low risk

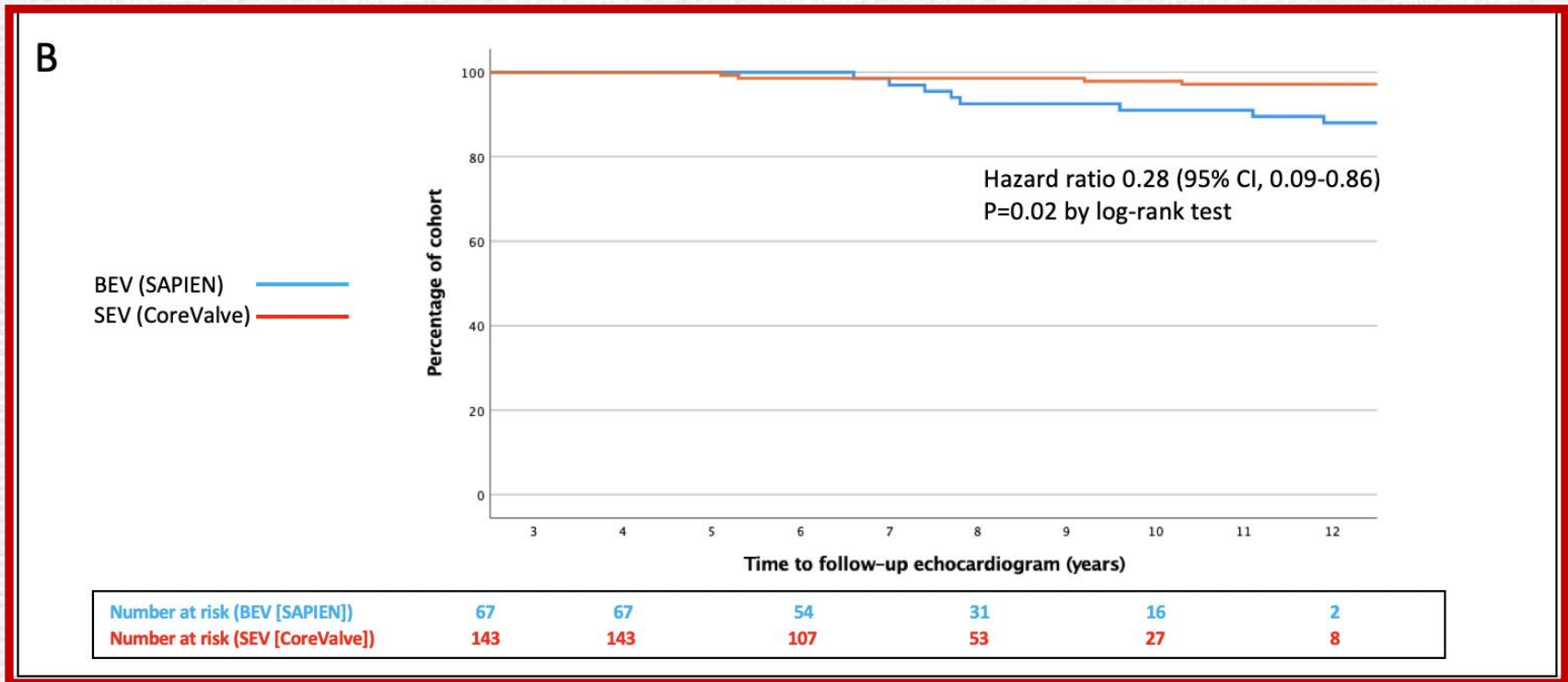


Gradient across valve



UK TAVI Registry Durability data
N. Ali et al CCI 2023

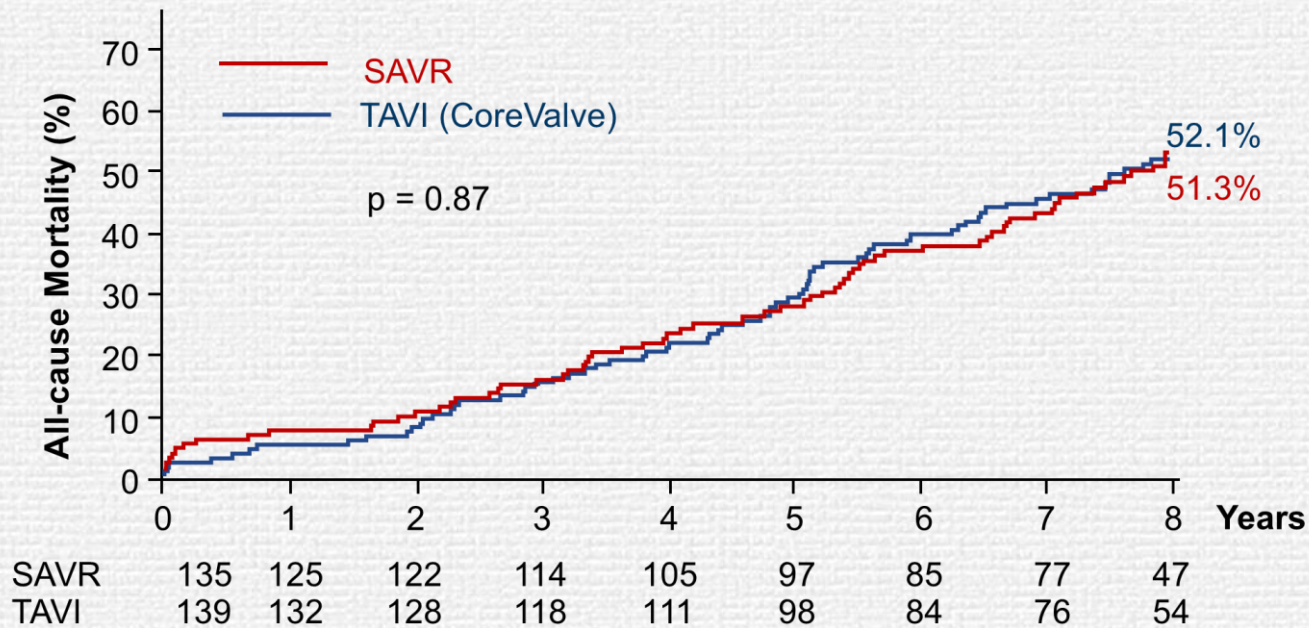
Type of valve



UK TAVI Registry Durability data
N. Ali et al CCI 2023

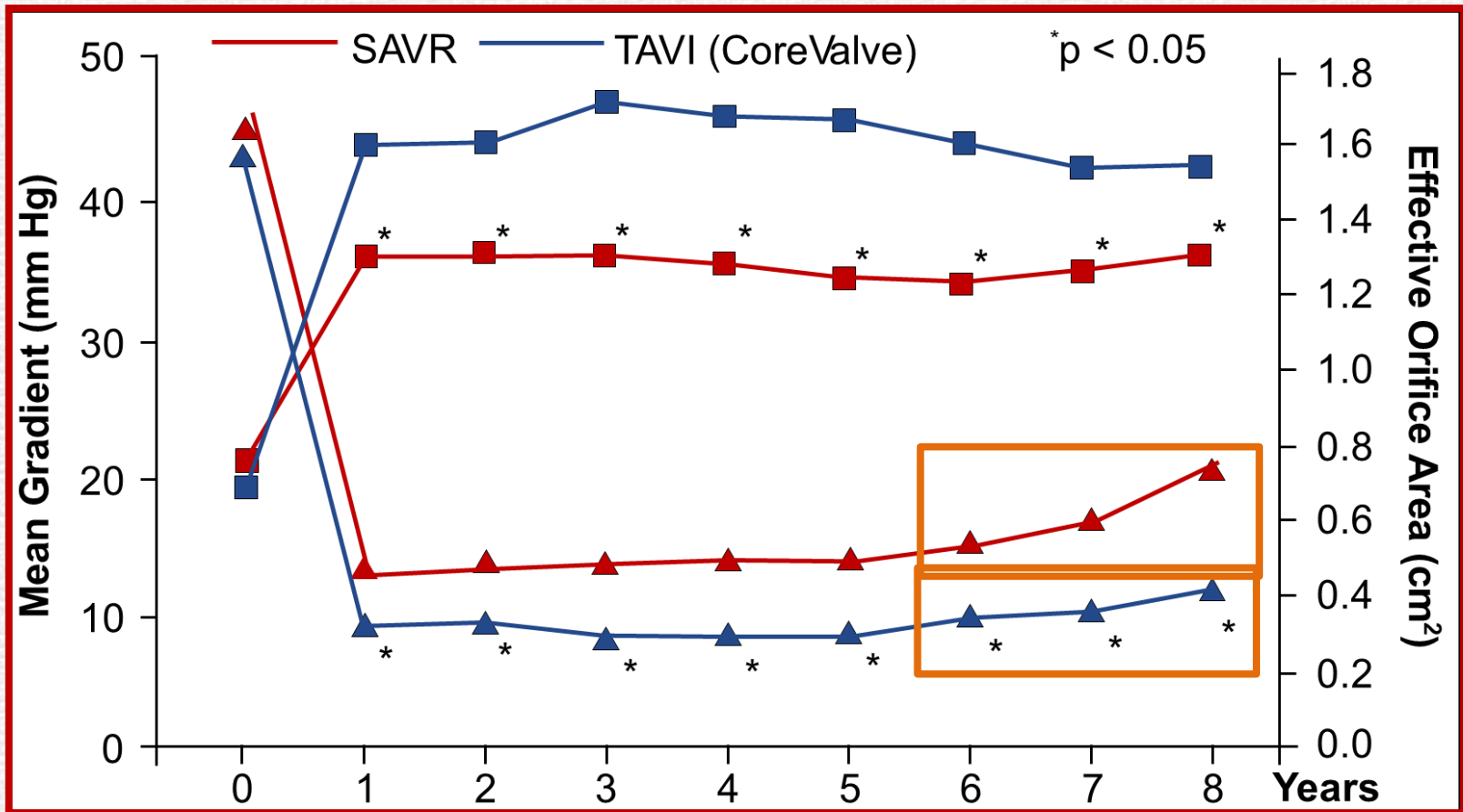
Method of implantation?

NOTION 8 yrs

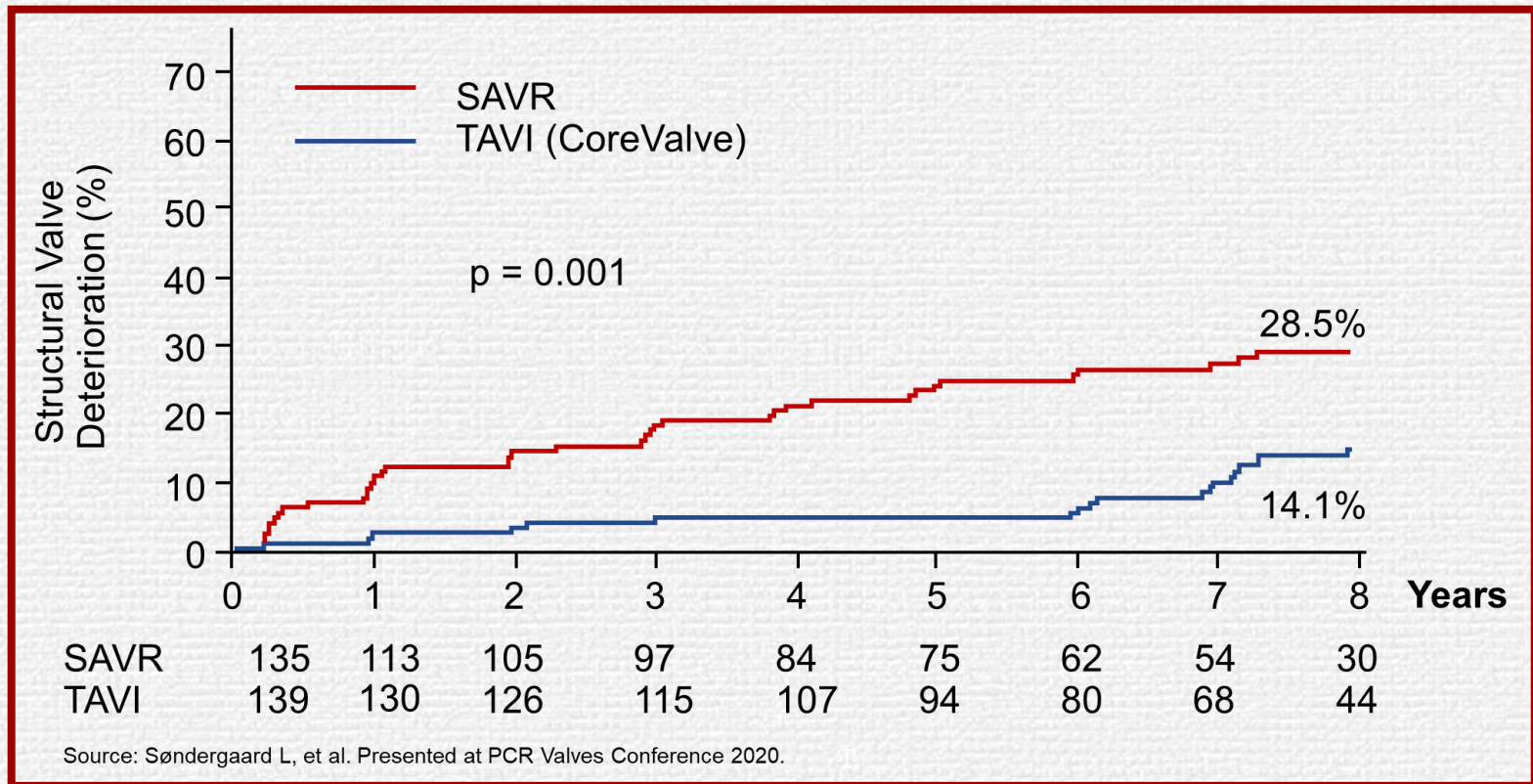


Source: Søndergaard L, et al. Presented at PCR Valves Conference 2020.

Notion Valve Performance



Notion Structural Deterioration



Meta-analysis

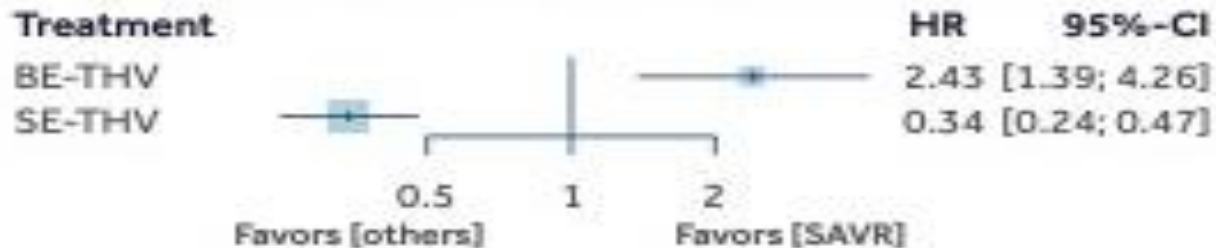
- 10 RCTS
 - 9,000 patients
 - 1 to 6 years follow-up
 - Multiple devices TAVI (SE; BE) SAVR

Key Findings

Structural Valve Deterioration[†]

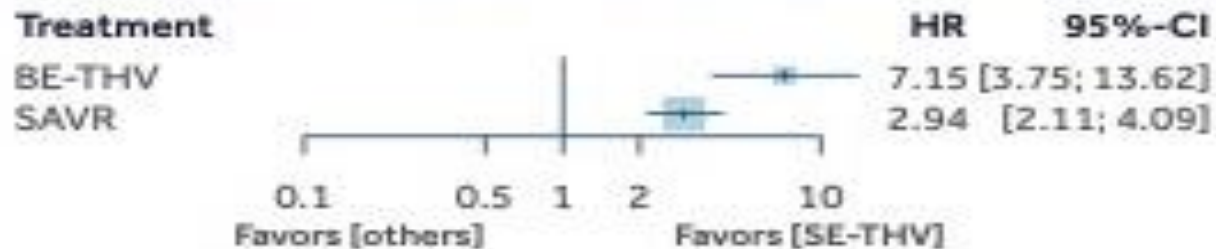
Only SE performs better than SAVR

Comparison: others versus SAVR (Random Effects Model)



SE performs better than SAVR and BE

Comparison: others versus Self-expandable (Random Effects Model)



Things we thought we knew

-are true after all

The surgical sewing ring occupies space....

- Is bad for
 - Valve area
 - Valve gradient
 - Valve longevity

Patient prosthesis mismatch....

- Implanting too small a valve
- Is commoner with surgical valves and results in
 - Higher valve gradients
 - Smaller valve areas
 - Reduced valve longevity
 - Reduced patient survival

Self-expanding supra-annular valves

- Offer better
 - Valve area
 - Valve gradients
 - Valve longevity

The larger aortic valve implant

- Is better
 - Valve gradients
 - Valve area
 - Valve longevity

Conclusions: Valve durability

- Bigger is better
- Transcatheter is better
- Self-expanding is better