

# Expanding Indications for Rapid Deployment Aortic Valve Replacement: Five-year Outcomes from a Single-center Experience

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# Background

- **Rapid deployment aortic valve replacement (RD[AVR])**
    - : excellent *short-term* and *long-term* clinical outcomes
    - : Indications were highly selective, involving *severe aortic stenosis*
- Laufer et al. EJCTS, 2017*

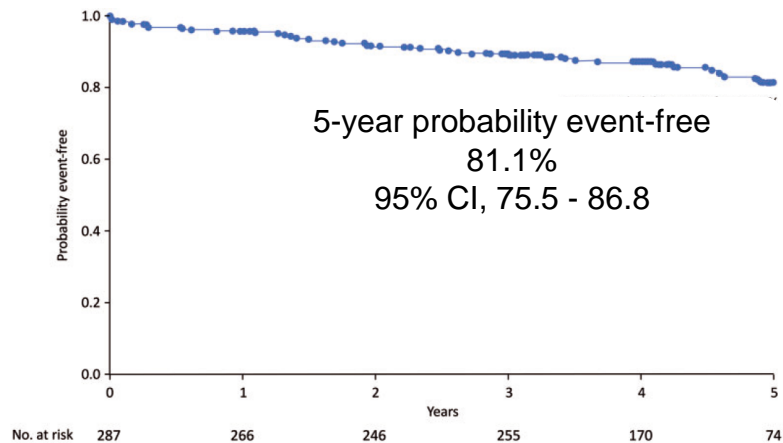


Figure 2: Kaplan-Meier survival estimate.

Table 3: Haemodynamic outcomes

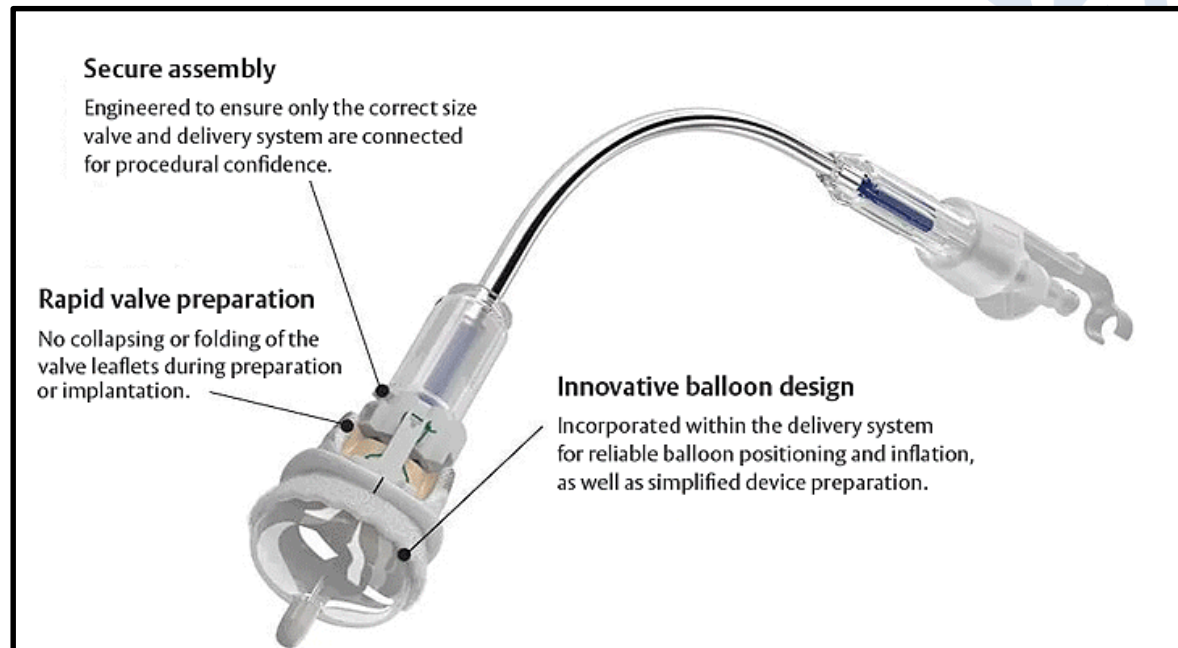
Parameter	Postoperative discharge mean $\pm$ SD (n)	1 year mean $\pm$ SD (n)	P-value to postoperative discharge	3 years mean $\pm$ SD (n)	P-value to postoperative discharge	5 years mean $\pm$ SD (n)	P-value to postoperative discharge
Aortic EOA (continuity equation) (cm <sup>2</sup> )	1.7 $\pm$ 0.2 (178)	1.7 $\pm$ 0.2 (211)	0.932	1.7 $\pm$ 0.2 (177)	0.205	1.6 $\pm$ 0.3 (57)	0.077
EOA index (cm <sup>2</sup> /m <sup>2</sup> )	0.9 $\pm$ 0.1 (165)	0.9 $\pm$ 0.1 (187)	0.253	0.9 $\pm$ 0.1 (154)	0.915	0.9 $\pm$ 0.2 (51)	0.686
Mean systolic gradient of AV (by continuous wave) (mmHg)	10.6 $\pm$ 4.2 (226)	9.0 $\pm$ 3.5 (230)	0.326	9.6 $\pm$ 4.3 (185)	0.389	10.5 $\pm$ 5.4 (59)	0.188
Peak systolic gradient of AV (by continuous wave) (mmHg)	20.0 $\pm$ 7.6 (227)	16.9 $\pm$ 6.1 (230)	0.242	17.6 $\pm$ 7.4 (185)	0.776	18.9 $\pm$ 9.3 (59)	0.426
Left ventricular mass (g)	217.8 $\pm$ 62.5 (100)	184.3 $\pm$ 47.7 (178)	0.107	186.9 $\pm$ 48.0 (135)	0.397	191.6 $\pm$ 44.2 (37)	0.583
Left ventricular mass index (g/m <sup>2</sup> )	117.6 $\pm$ 32.1 (93)	100.5 $\pm$ 23.5 (162)		100.8 $\pm$ 23.9 (123)		104.7 $\pm$ 23.4 (34)	
Cardiac index (l/min)/m <sup>2</sup> )	2.7 $\pm$ 0.6 (176)	2.6 $\pm$ 0.7 (191)	0.344	2.6 $\pm$ 0.6 (157)	0.608	2.6 $\pm$ 0.5 (52)	0.567
LVEF (%)	62.0 $\pm$ 10.0 (134)	63.3 $\pm$ 9.3 (146)	0.693	62.5 $\pm$ 8.1 (76)	0.346	60.0 $\pm$ 12.5 (6)	0.484

n is the number of subjects.

SD: standard deviation; AVR: aortic valve replacement; EOA: effective orifice area, LVEF: left ventricular ejection fraction.

# Background

- **Previous exclusion criteria**  
: pure aortic regurgitation, infective endocarditis, and bicuspid aortic valves.
- **The RD valve was first used in 2016 at our institution.**



# Purpose

- To evaluate **early-** and **mid-term clinical outcomes** up to 5 years
- To assess **early-** and **mid-term hemodynamic outcomes**
  
- For various indications like
  - **Isolated or concomitant RDAVR**
  - **bicuspid aortic valve, pure aortic regurgitation and infective endocarditis**

# Methods

- **A single center, retrospective study**
- **From June 2016 to July 2023**
- **Overall 344 patients who underwent AVR with Edwards Intuity**

# Methods

- Evaluation of clinical outcomes
  - **Early outcomes** : Operative mortality, Postoperative complications
  - **Mid-term outcomes** : Overall survival, Freedom from cardiac death, Freedom from aortic valve-related events (AVREs)
- Evaluation of hemodynamic outcomes
  - Early, 1-year, 3-year, and 5-year **Echocardiographic follow-up** was done after AVR

# Methods

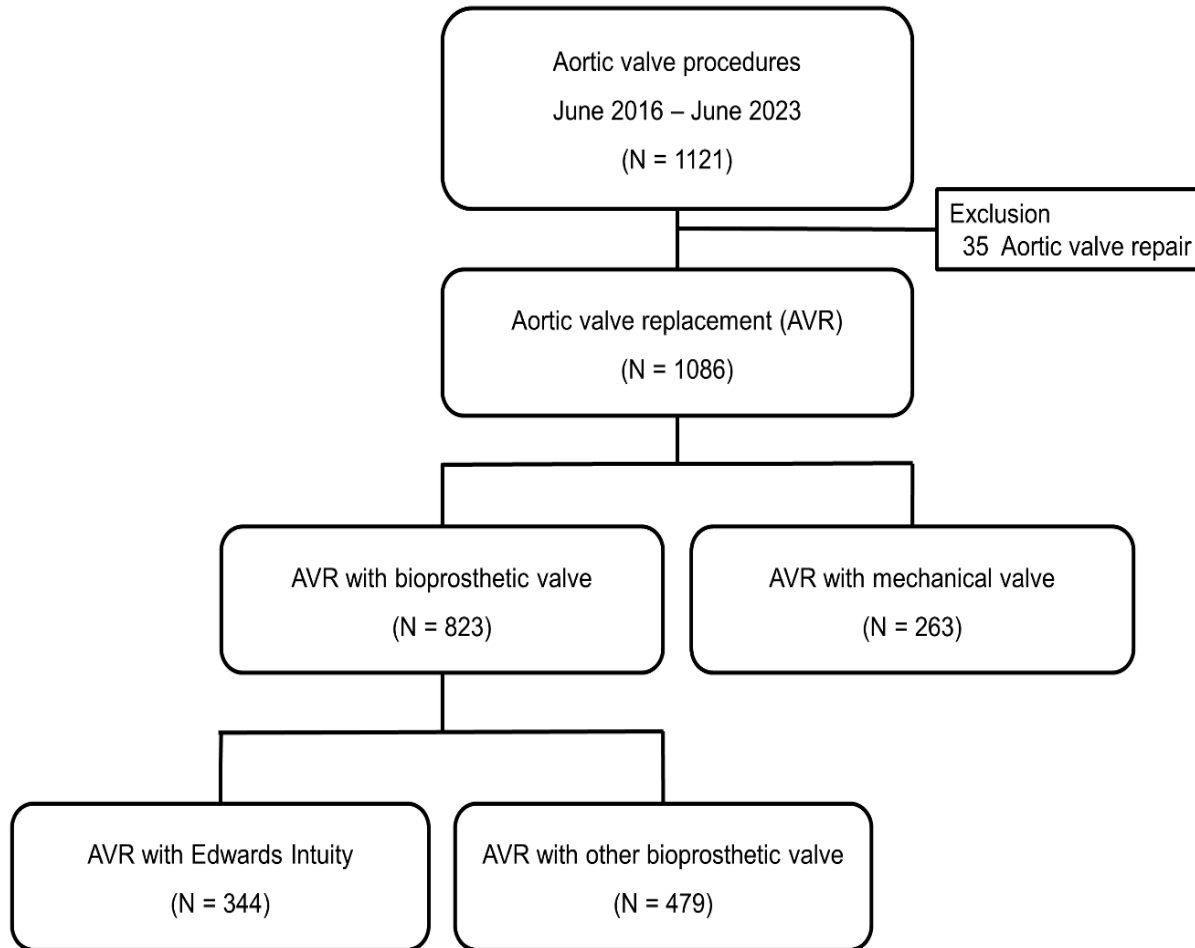


Figure 1. Flow diagram of patient enrollment.

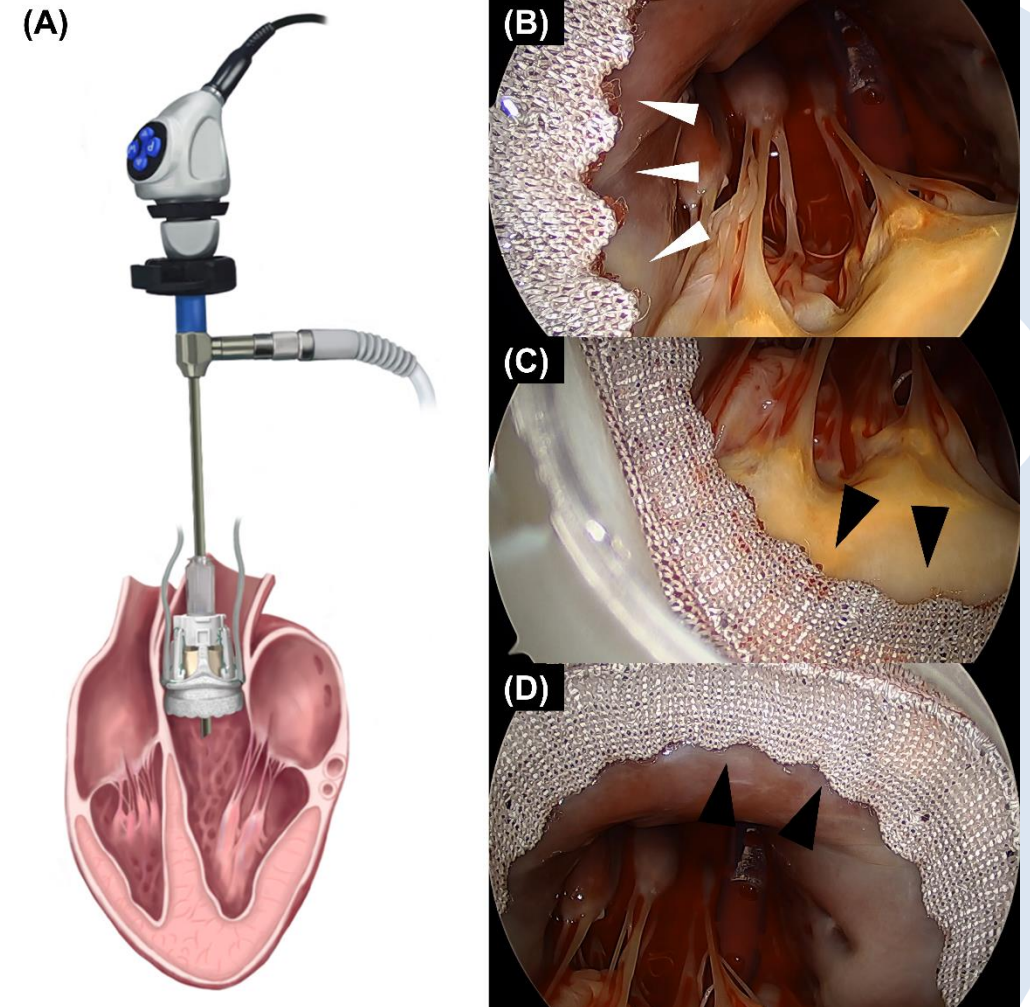


Figure 2. Operative techniques of RDAVR using videoscope

# Results

## Baseline characteristics

Variable	Study population (n = 344)
Female, n (%)	159 (46.2%)
Age	68.9 ± 9.8
BSA	1.66 ± 0.19
Risk factors, n (%)	
Stroke	29 (8.4%)
CKD	71 (20.6%)
Dialysis	15 (4.4%)
CAD	68 (19.8%)
Afib	41 (11.9%)
EF < 35%	17 (4.9%)
Etiology	
Degenerative	123 (35.8%)
Bicuspid	176 (51.2%)
Rheumatic	10 (2.9%)
Infectious	4 (1.2%)
Connective tissue ds.	2 (0.6%)
PVF	8 (2.3%)
Pure AR	20 (5.8%)
Emergency op	5 (1.5%)

## Op data

Variable	Study population (n = 344)
Isolated AVR, n (%)	90 (26.2%)
Concomitant op, n (%)	
Aorta	168 (48.8%)
MV	70 (20.3%)
Maze	31 (9.0%)
TV	24 (7.0%)
CABG	19 (5.5%)
Procedural times	
CPB time, mins	164 (143, 195)
ACC time, mins	112 (94, 134)
Valve size, n (%)	
19 mm	50 (14.5%)
21 mm	106 (30.8%)
23 mm	94 (27.3%)
25 mm	59 (17.2%)
27 mm	35 (10.2%)

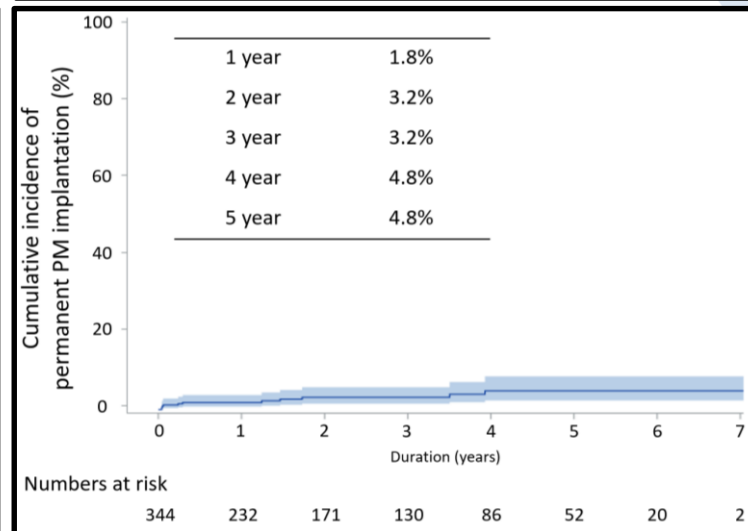
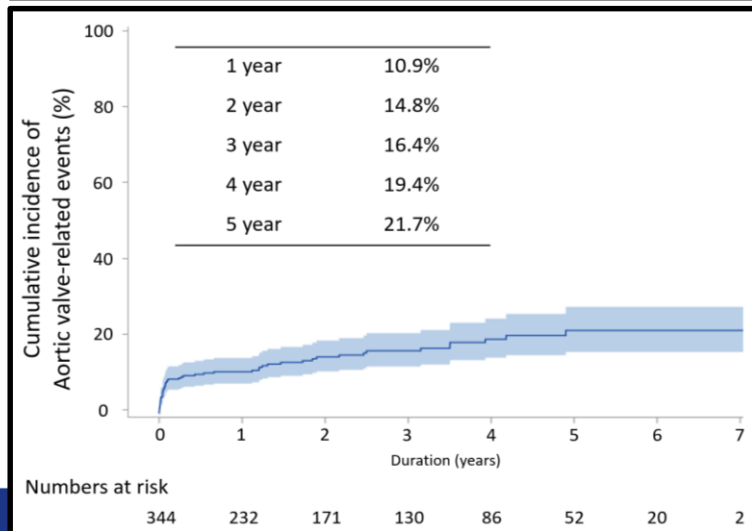
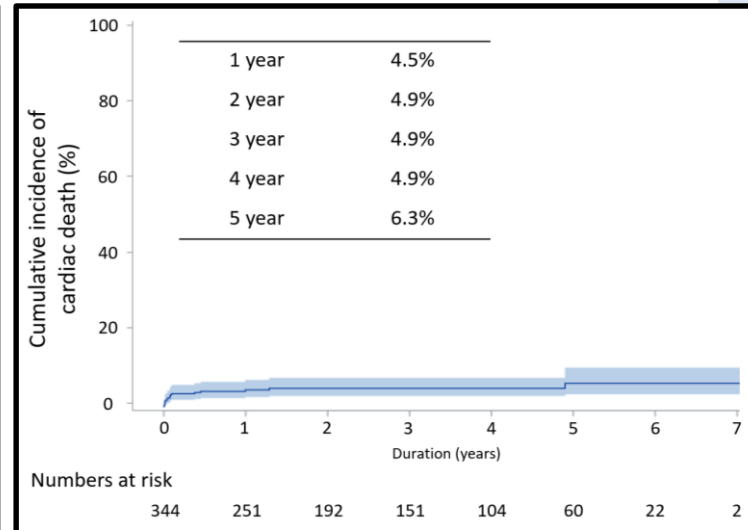
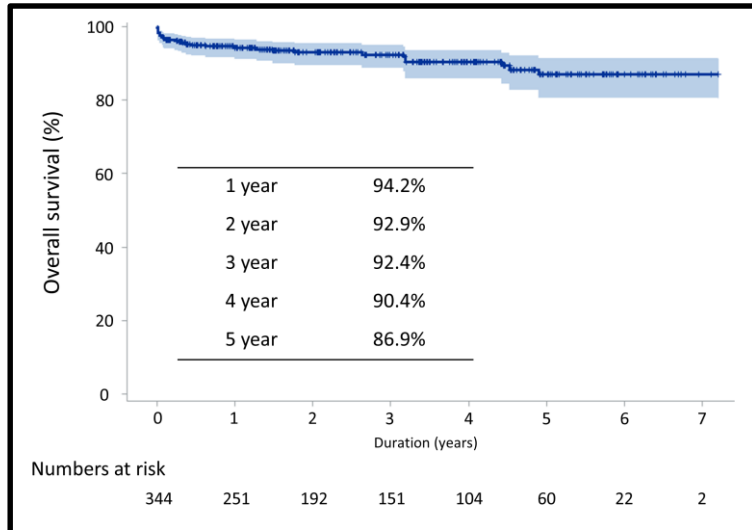
## Early clinical outcomes

Variable	Study population (n = 344)
Op mortality, n (%)	11 (3.2%)
Postop cx, n (%)	
POAF	133 (38.7%)
AKI	51 (14.8%)
Respiratory cx	36 (10.5%)
Low cardiac output	12 (3.5%)
Bleeding reop	12 (3.5%)
Stroke	10 (2.9%)
PPM implantation	5 (1.5%)
Mediastinitis	3 (0.9%)
Infective endocarditis	0 (0.0%)



# Results

## Mid-term clinical outcomes

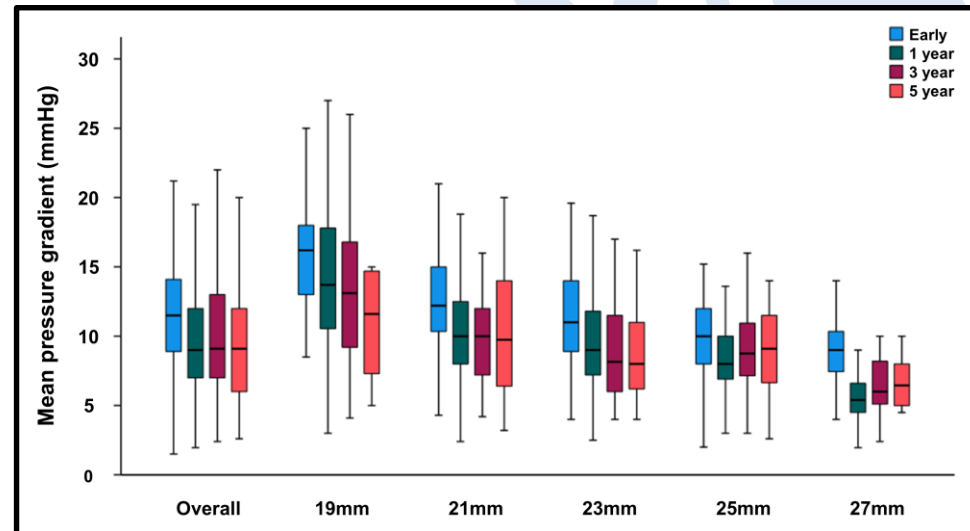
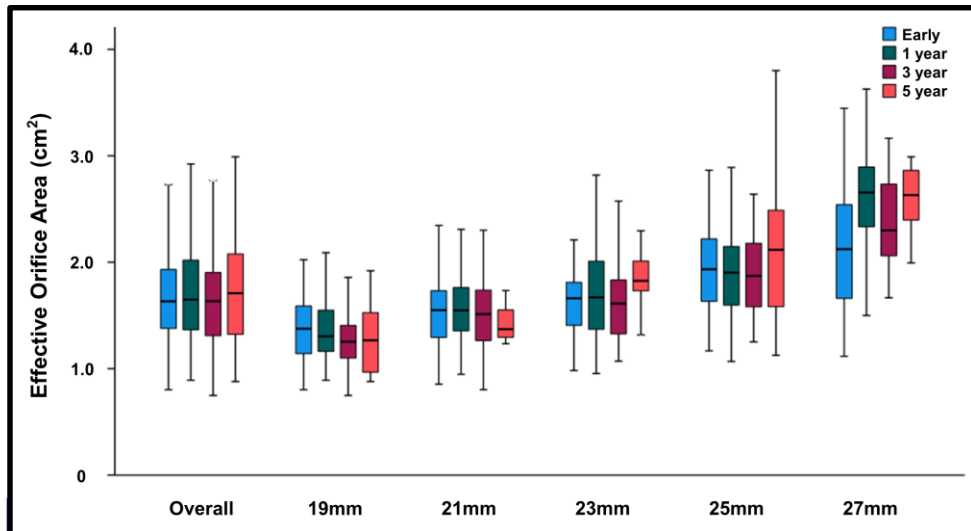
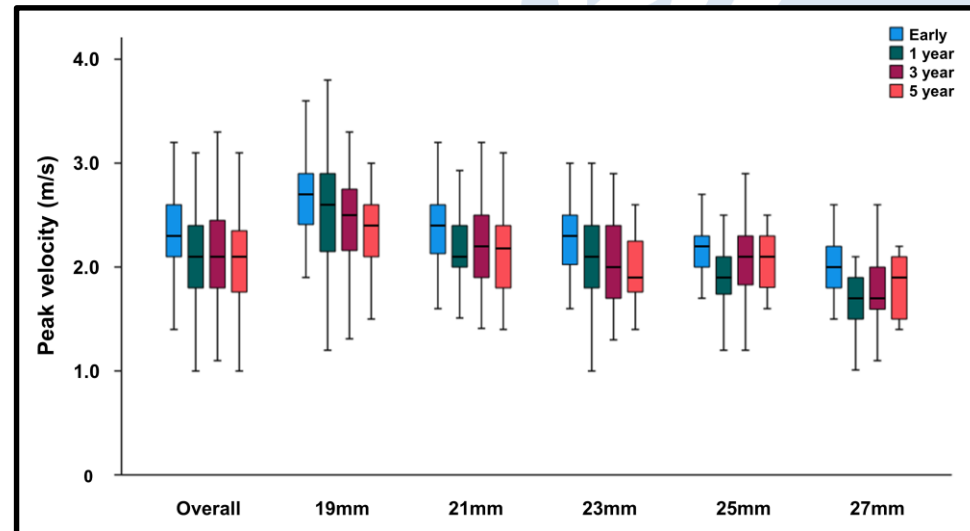
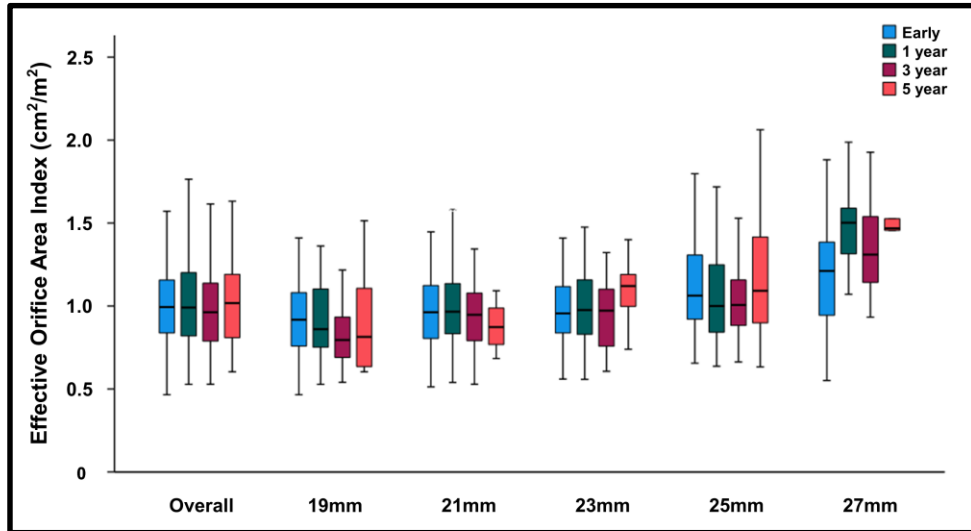


PostOp 5 years

- ▶ Overall survival : 86.9 %
- ▶ Cardiac death : 6.3 %
- ▶ AVREs : 21.7 %
- ▶ PPI : 4.8 %

# Results

## Hemodynamic outcomes



# Conclusion

- **Isolated or concomitant AVR using RD valves**

: for various aortic valve diseases

bicuspid aortic valve, pure aortic regurgitation, and infective endocarditis

: *excellent clinical and hemodynamic outcomes* for up to 5 years.

