

VALVULAR HEART DISEASE AND PULMONARY CIRCULATION

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Conflicts of Interest

Speaker/advisor/Research Grants from Edwards Lifesciences and Boehringer-Ingelheim

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- **Valvular heart disease**

- Epidemiology
- Aortic stenosis
- Secondary mitral regurgitation
- Infective endocarditis

- **Pulmonary circulation**

- **Congenital heart disease**

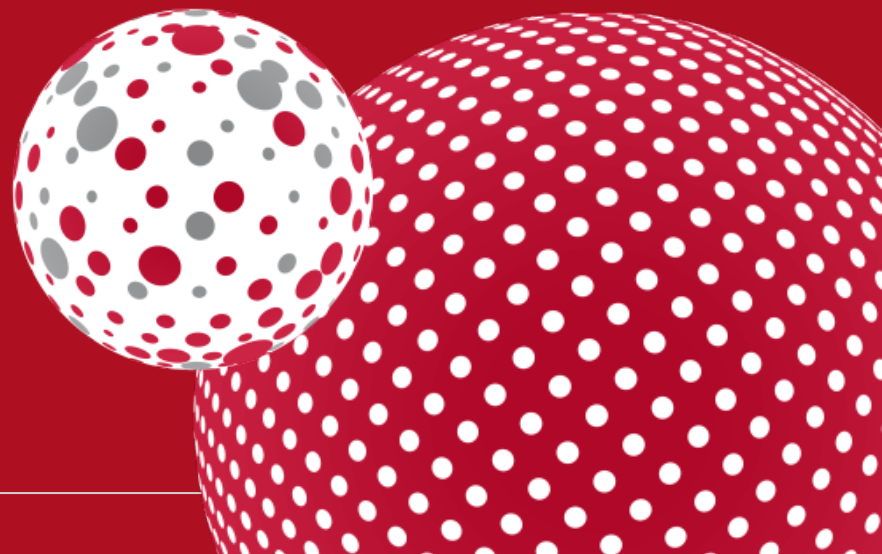
VALVULAR HEART DISEASE

Epidemiology

Aortic stenosis

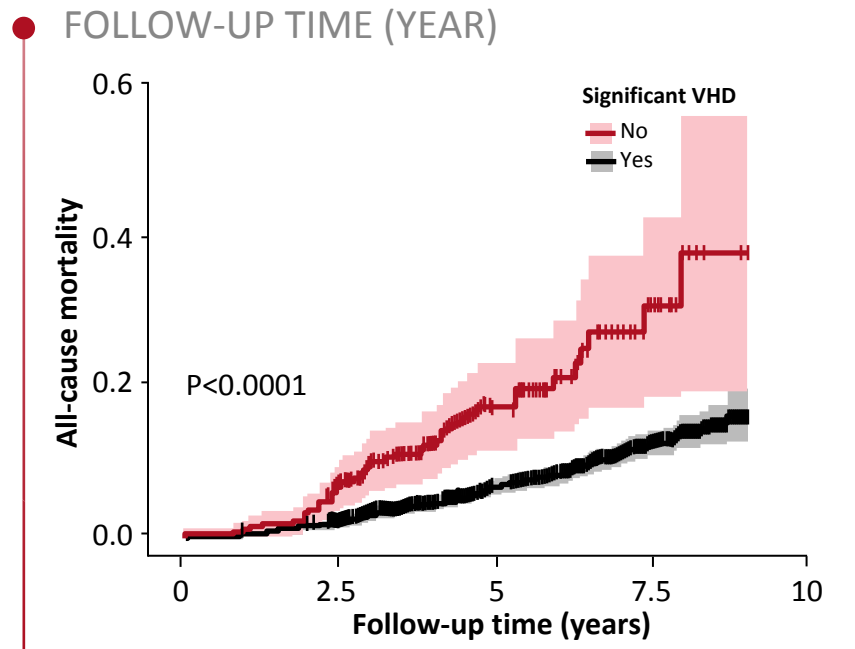
Secondary mitral regurgitation

Infective endocarditis



OxValve-Survive: Impact of valvular disease in the community

- Echocardiographic screening in 3511 patients.
- 288 (8.2%) had $\geq$ moderate valvular disease.
- Adjusted HR for mortality $\geq$ moderate VHD 1.92 [1.38-2.67] mild VHD 1.16 [0.89-1.50].



Rheumatic heart disease screening in Bornean Malaysia

- Rheumatic heart disease screening in school age children.
- Echocardiographic screening (portable V-scan) of 211 children (mean age 10 yrs).
- 81 (38%) had suspected heart disease.

Handheld echocardiography findings	n (%)
Normal finding	130 (61.6)
Borderline RHD (WHO criteria)	76 (36.0)
Congenital heart disease	5 (2.4)



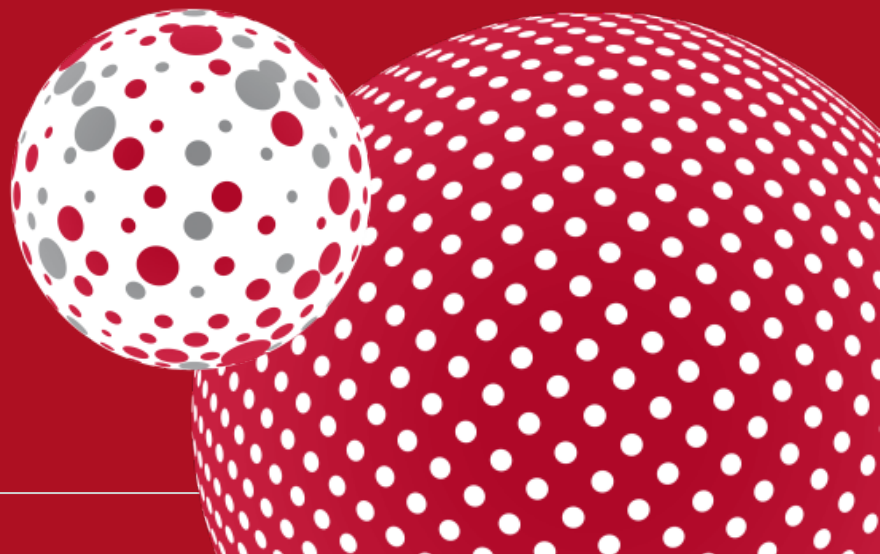
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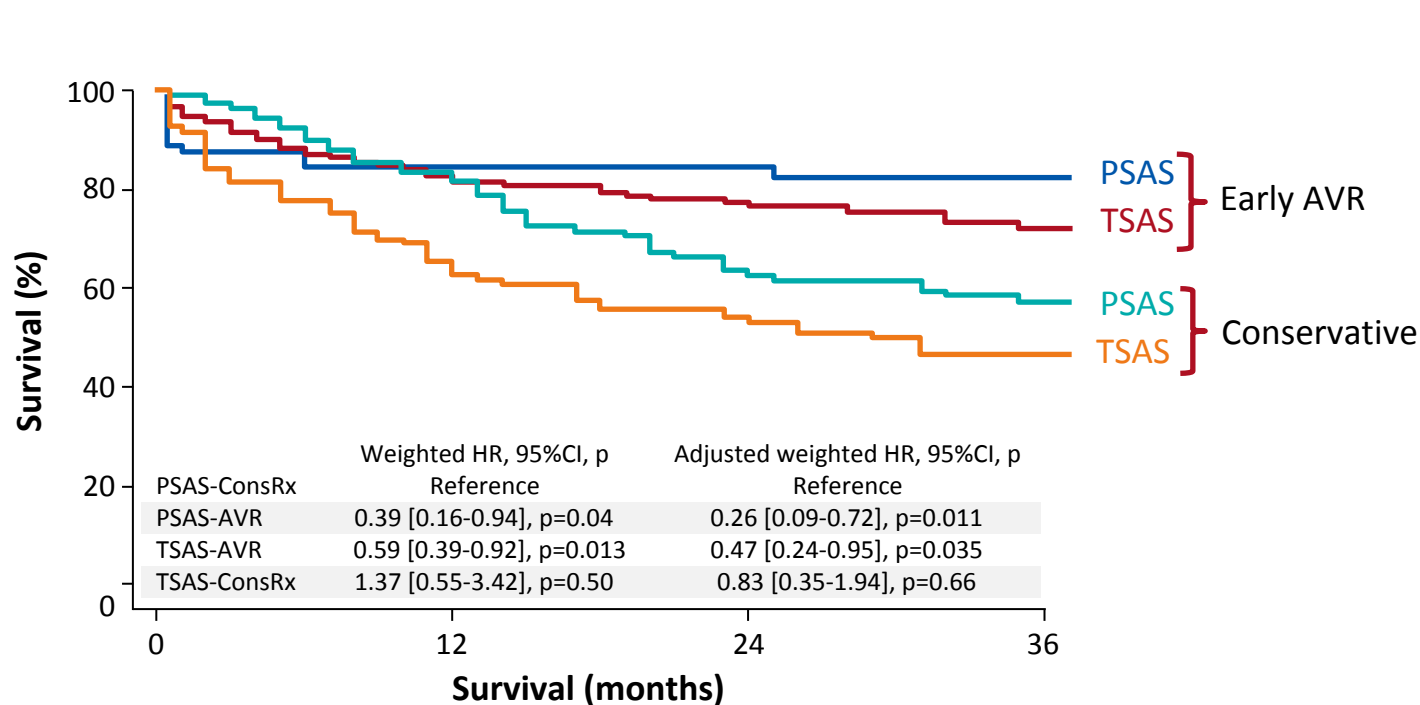
Infective endocarditis



True and pseudo-severe aortic stenosis (TOPAS group)

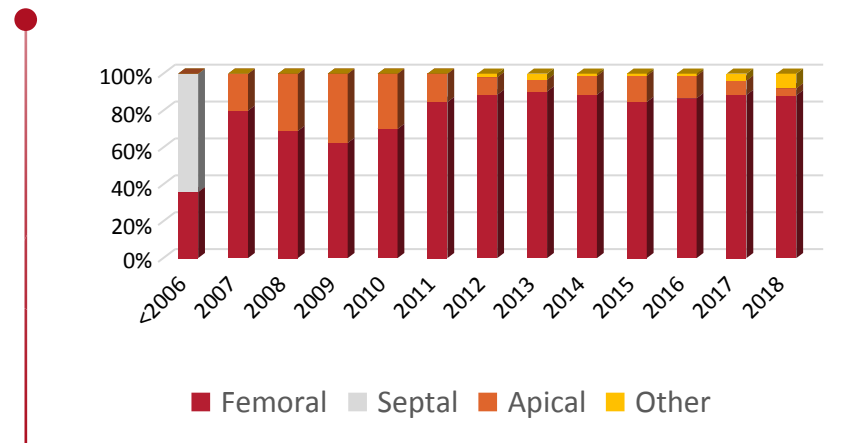
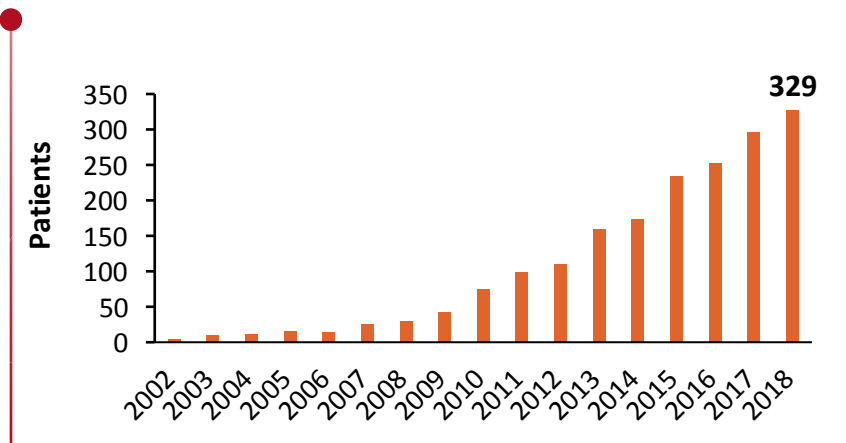
- **430 patients with low-flow low-gradient aortic stenosis ($AVA \leq 1.0 \text{ cm}^2$ or $0.6 \text{ cm}^2/\text{m}^2$, mean gradient $<40 \text{ mmHg}$ and LV stroke volume $\leq 35 \text{ ml/m}^2$)**
- **Classification using calcium score, macroscopic examination and projected valve area**
 - 297 (69%) true-severe AS (TSAS)
 - 133 (31%) pseudo-severe AS (PSAS)
- **Early SAVR or TAVI (< 3 months) was performed in 274 patients (57% overall, 72% of TSAS, 45% of PSAS)**

Survival benefit of AVR in TSAS vs. PSAS



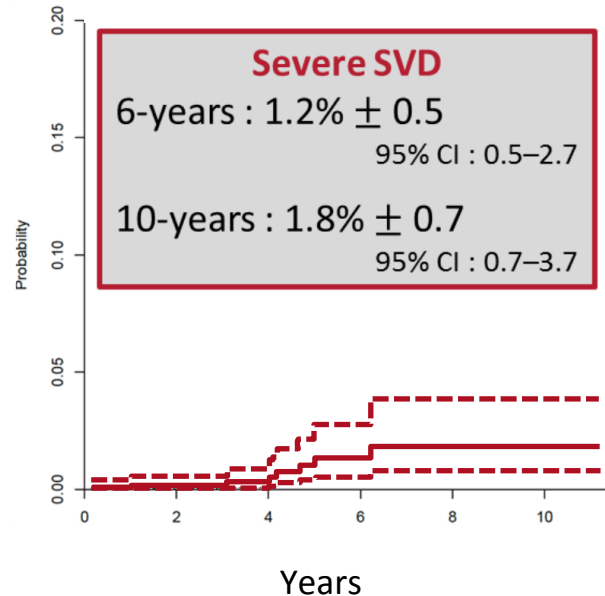
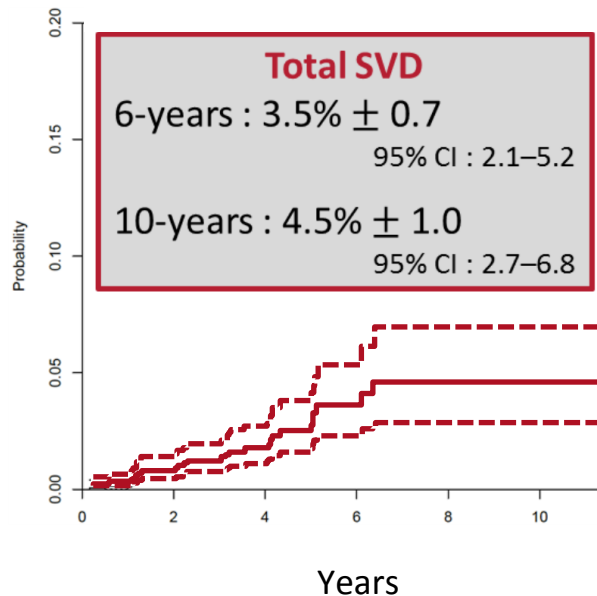
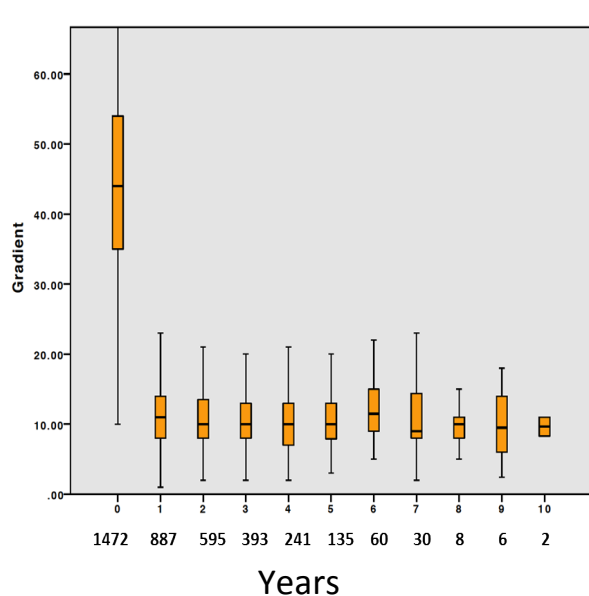
15-year experience of TAVI

	2002 – 2006 Cribier-Edwards	2006 – 2010 SAPIEN	2010-2014 SAPIEN XT	2014 – 2018 SAPIEN 3 CoreValve	P
Age (year)	81.7 ± 7.0	82.9 ± 6.9	84.0 ± 6.7	83.8 ± 6.7	0.14
Log. EuroSCORE (%)	29.5 ± 6.1	28.1 ± 3.0	17.3 ± 10.5	15.3 ± 9.5	<0.001



Structural valve deterioration

Cumulative risk using competing risk analysis



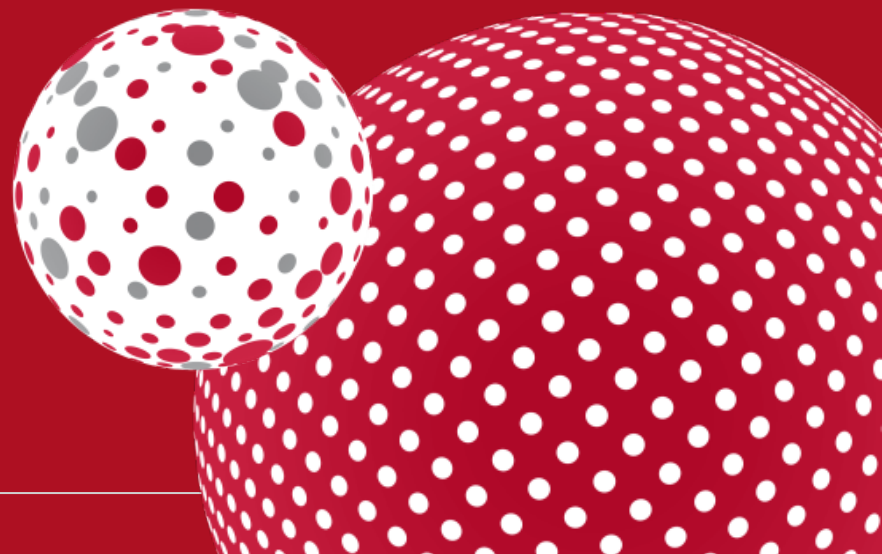
VALVULAR HEART DISEASE

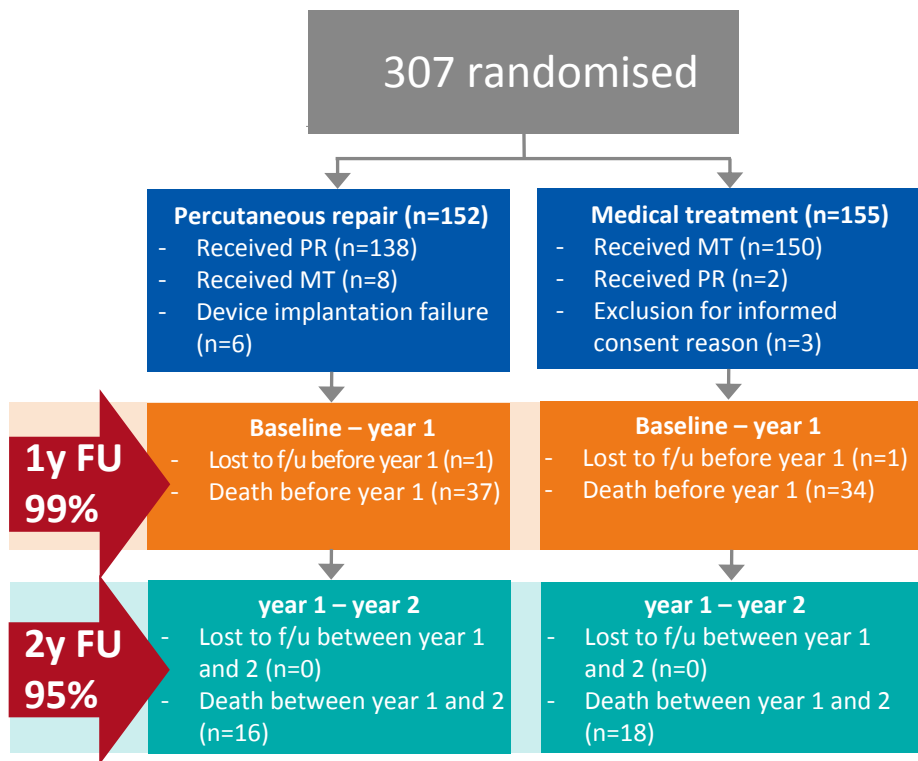
Epidemiology

Aortic stenosis

Secondary mitral regurgitation

Infective endocarditis

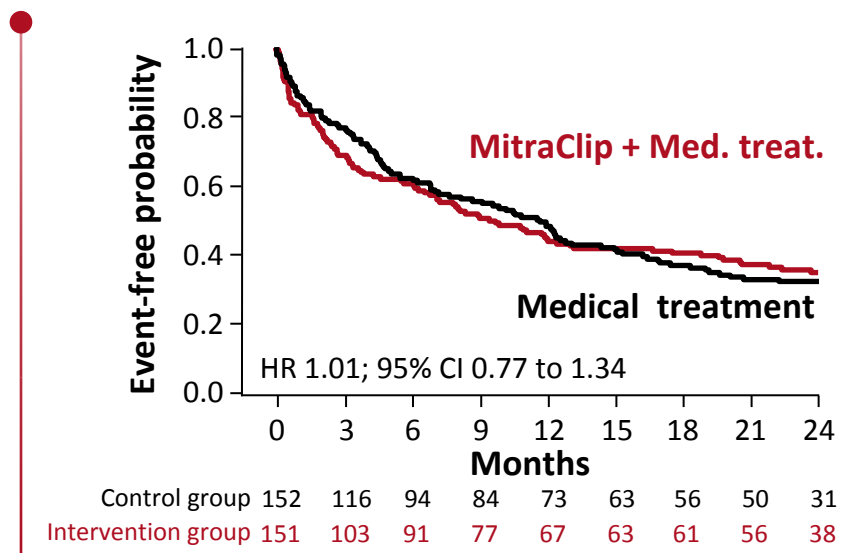




● ITT Primary composite endpoint

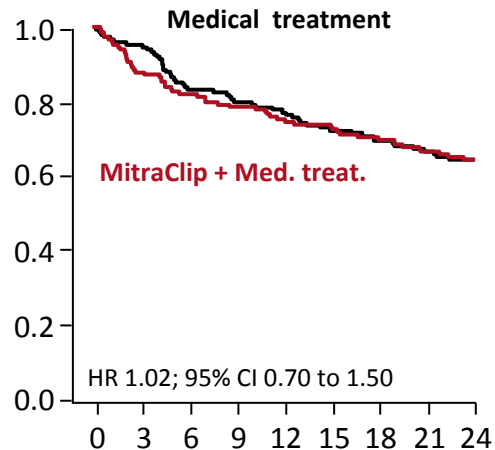
(95% follow-up)

- All-cause death
- First unplanned rehospitalisation for HF

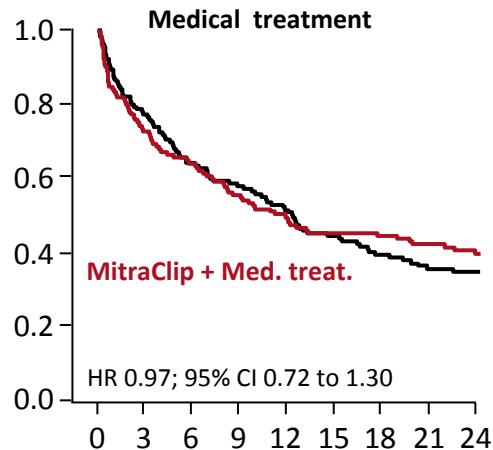


Secondary endpoints

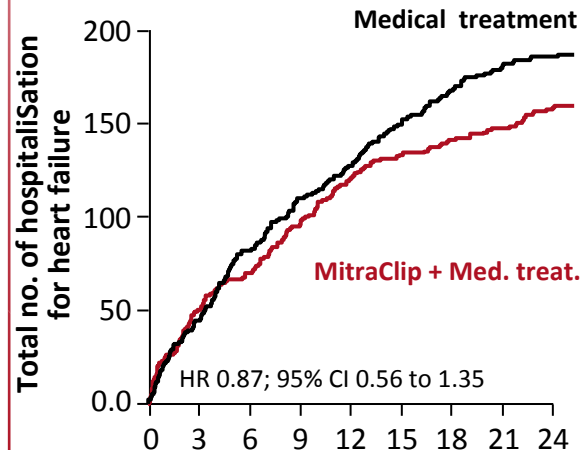
● All-cause mortality



● Incidence of first hospitalisation for HF



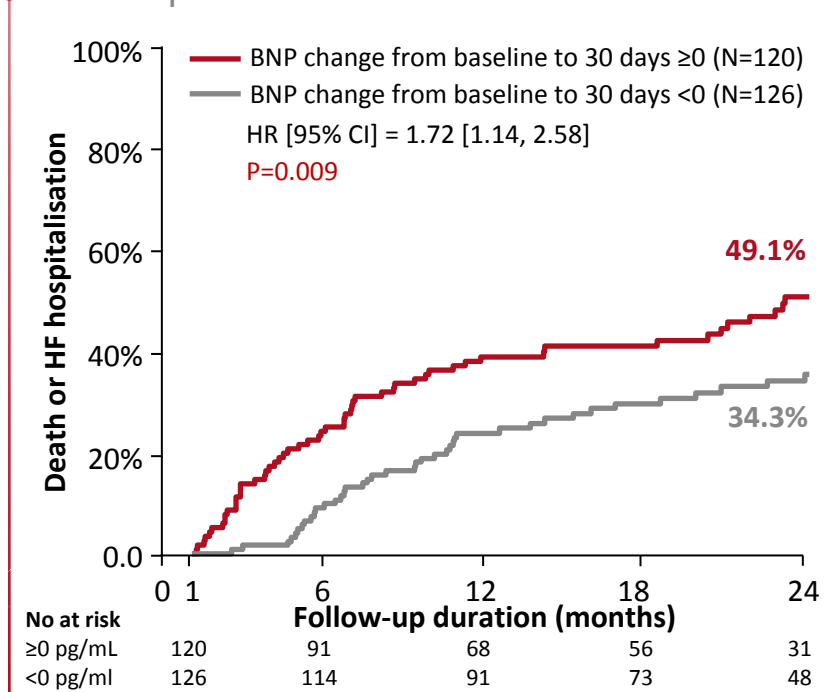
● Cumulative incidence of hospitalisation for HF



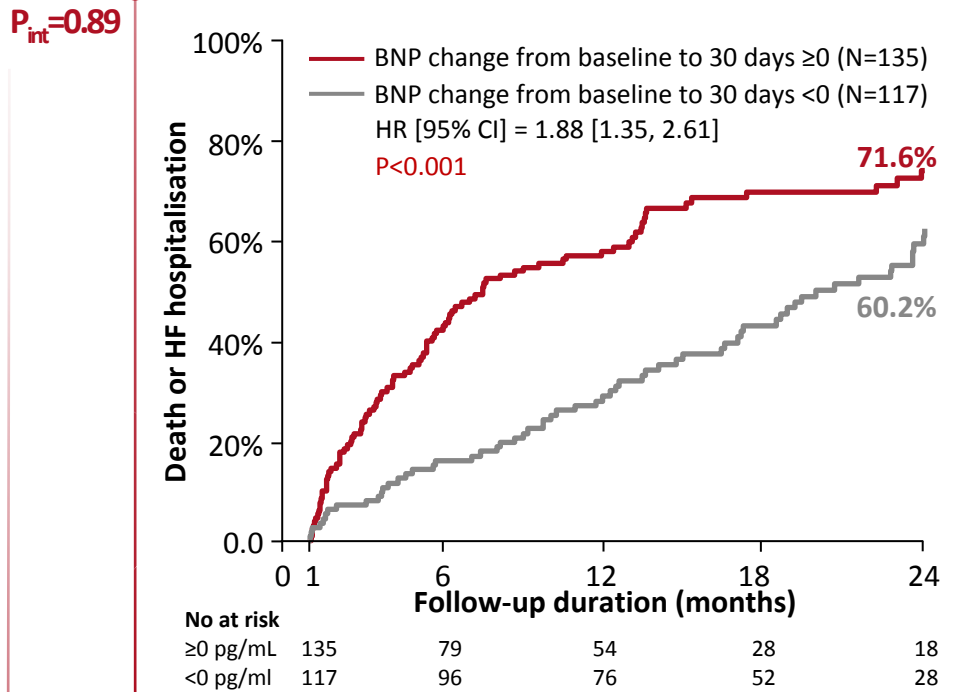
COAPT Trial: Changes in BNP and outcomes

Death or HF hospitalisation from 30 Days – 24 Months

MitraClip + GDMT



GDMT ALONE



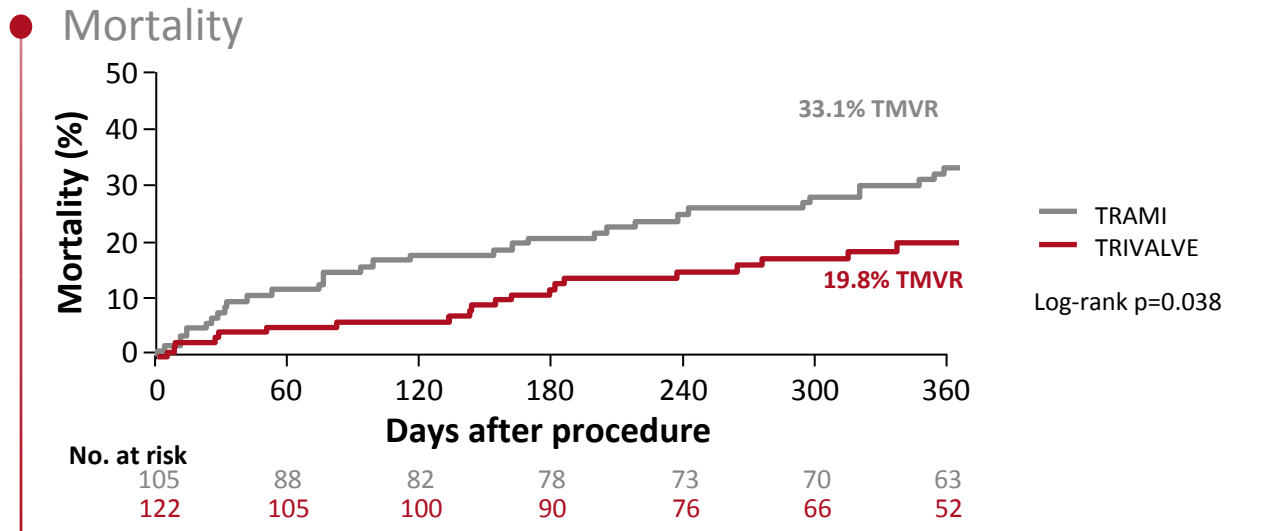
COAPT Trial: Changes in BNP and outcomes

- Greater reduction in BNP during follow-up with MitraClip than GDMT
- Improved clinical outcomes with MitraClip compared to GDMT alone regardless of baseline BNP levels and BNP changes over time

Multivariable predictors of death / HF	Hazard ratio [95% CI]	P value
BNP at baseline (per 100 pg/mL)	1.04 [1.03, 1.05]	<0.0001
BNP increase from baseline to 30 days (per 100 pg/mL)	1.02 [1.01, 1.04]	<0.0001
Randomised to MitraClip	0.46 [0.35, 0.61]	<0.0001
Use of hydralazine or nitrates	2.13 [1.53, 2.94]	<0.0001
EROA (per 10 mm ²)	1.14 [1.05, 1.23]	0.0009
Prior atrial fibrillation	1.42 [1.07, 1.88]	0.02
KCCQ summary score (per 5 points)	0.96 [0.93, 0.99]	0.02
Diabetes	1.39 [1.05, 1.84]	0.02
Race (Caucasian)	1.49 [1.06, 2.10]	0.02
LVESV (per 10 mL)	1.03 [1.00, 1.05]	0.02

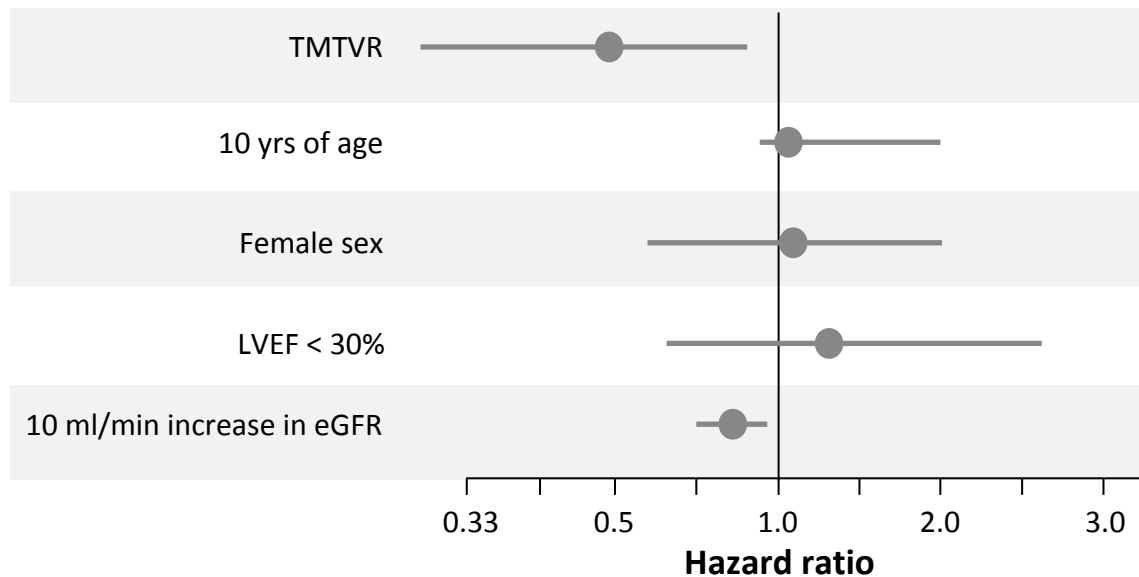
TriValve and TRAMI Registries: Combined tricuspid and mitral vs. isolated mitral valve repair

- **228 patients with severe MR and severe TR**
 - 106 treated using MitraClip in mitral position only (TRAMI)
 - 122 treated using MitraClip in mitral and tricuspid position (TriValve)



TriValve and TRAMI Registries: Combined tricuspid and mitral vs. isolated mitral valve repair

● Multivariate analysis of 1-year mortality



→ TMTVR was independently associated with better survival as compared to TMVR alone

→ HR 0.51 (0.28 – 0.91)

→ p = 0.023

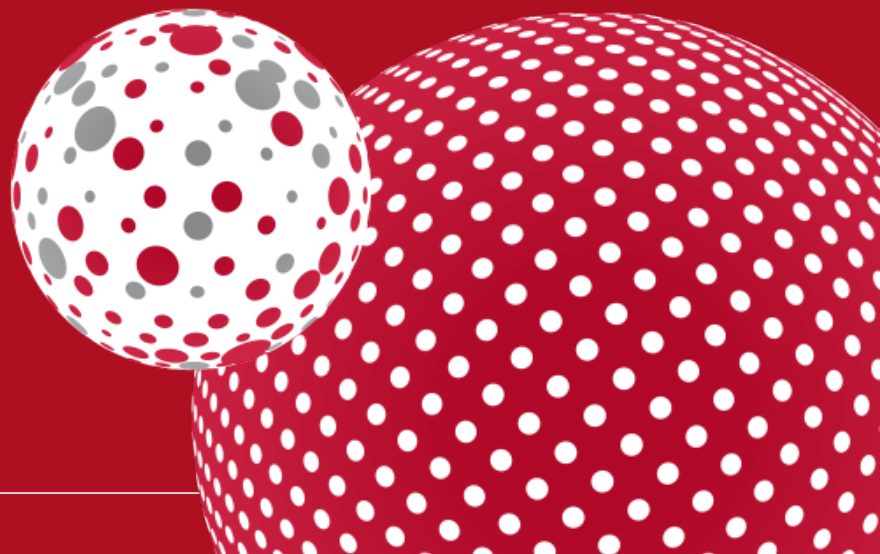
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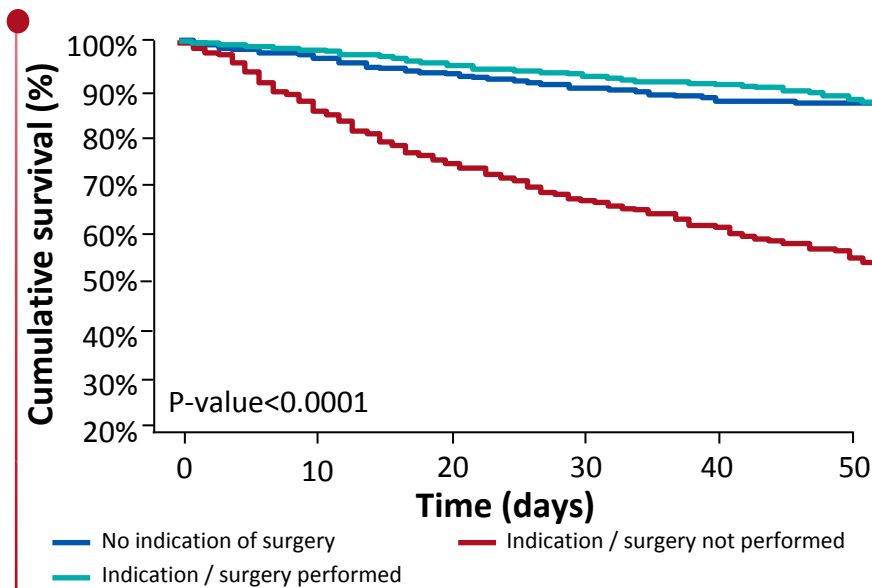
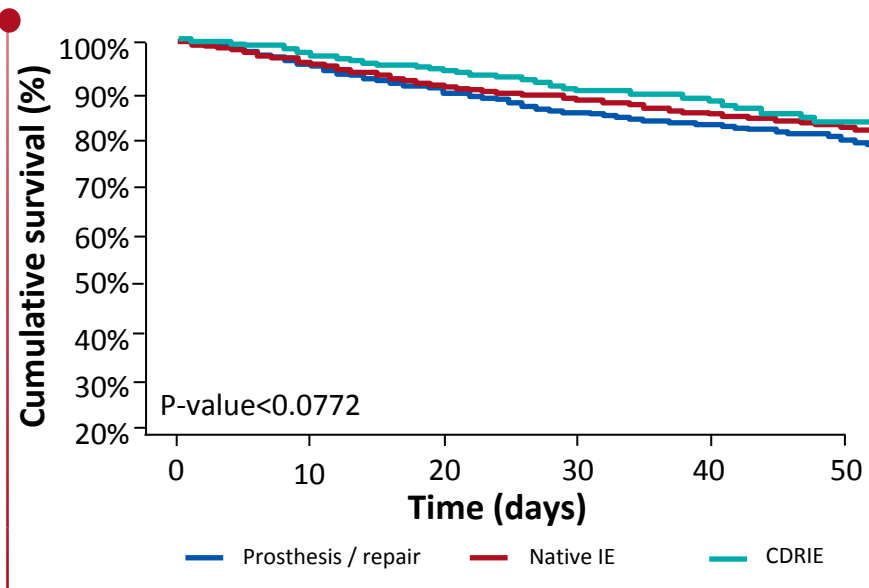
EORP EURO-ENDO Registry

- 3 116 patients included from 156 centres in 40 countries

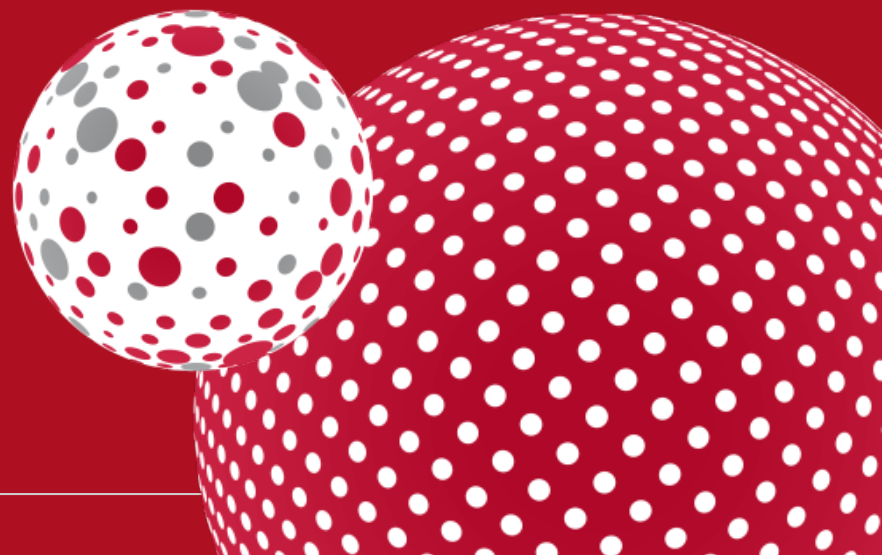


EORP EURO-ENDO Registry

- Registry 1-month mortality
- In-hospital mortality 17.6%



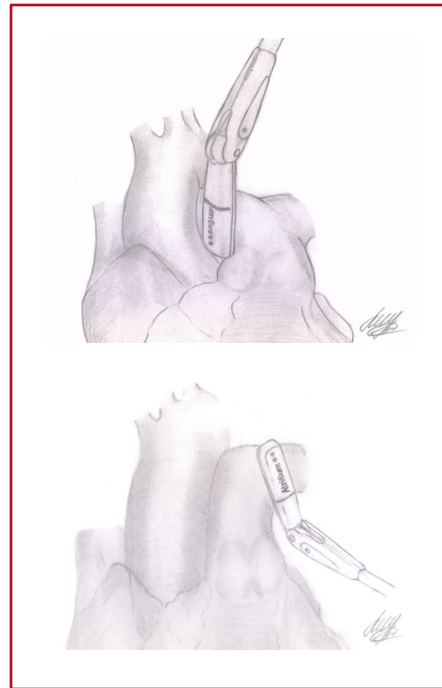
PULMONARY CIRCULATION



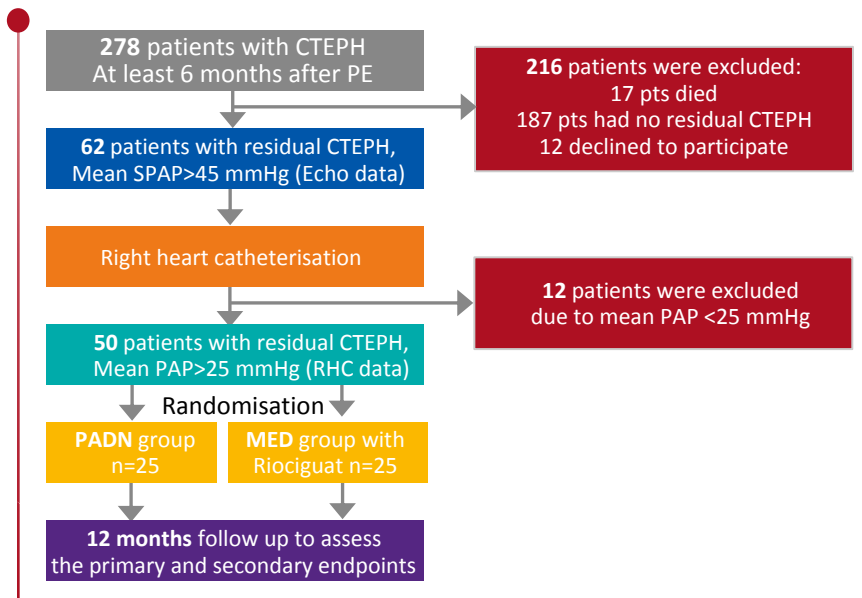
Pulmonary artery ablation during open mitral valve surgery

50 patients with mean PAP ≥ 40 mmHg and nitric oxide positive test randomised:

- Mitral surgery alone
- Mitral surgery + epicardial pulmonary artery ablation (right and left PA)
- **Mean age 55 yrs, mean PAP 51 mmHg; 28% repair**
- **No early death**
 - Mean PAP 24 h after surgery:
 - 50.6 ± 5.3 to 34.6 ± 9.9 mmHg in ablation group from
 - 51.3 ± 6.3 to 47.2 ± 8.5 mmHg in non-ablation group
 - 6MWT at 12 months after surgery (475 ± 21 m vs. 335 ± 18 m, $p = 0.002$)

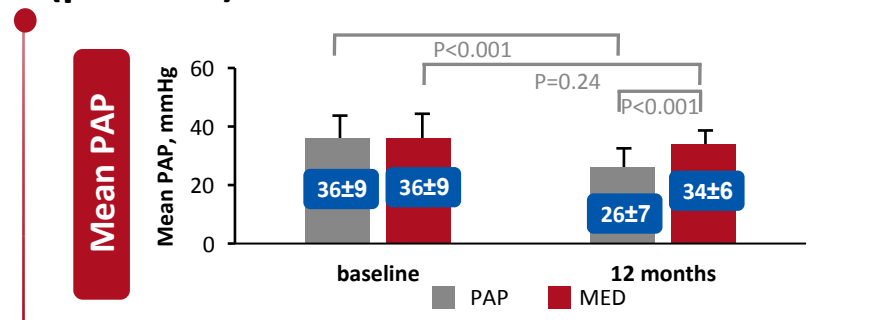


Pulmonary artery denervation for residual pulmonary hypertension after pulmonary endarterectomy

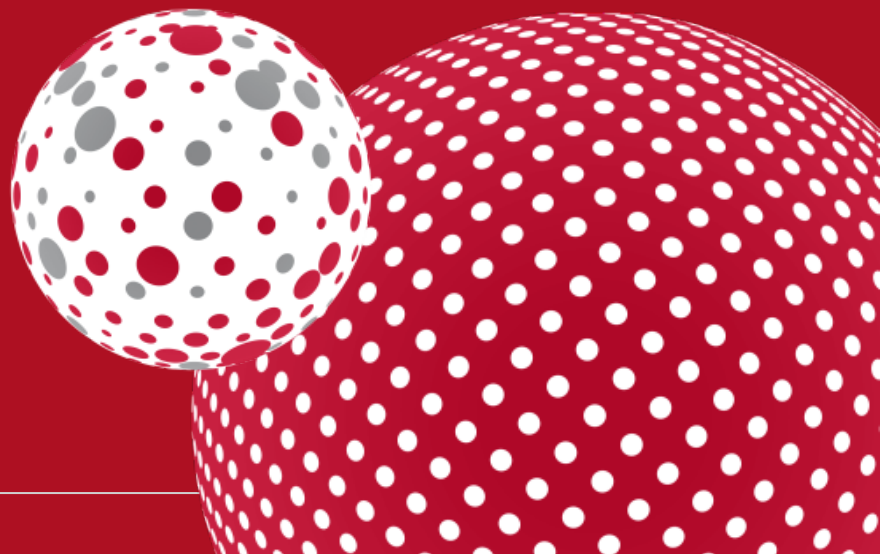


Pilot, randomised, double-blind, sham controlled study

- Mean pulmonary vascular resistance at 1 year:
258±135 dyn/sec/cm⁻⁵ in the PADN group
149±73 dyn/sec/cm⁻⁵ in the MED group
(p=0.001)

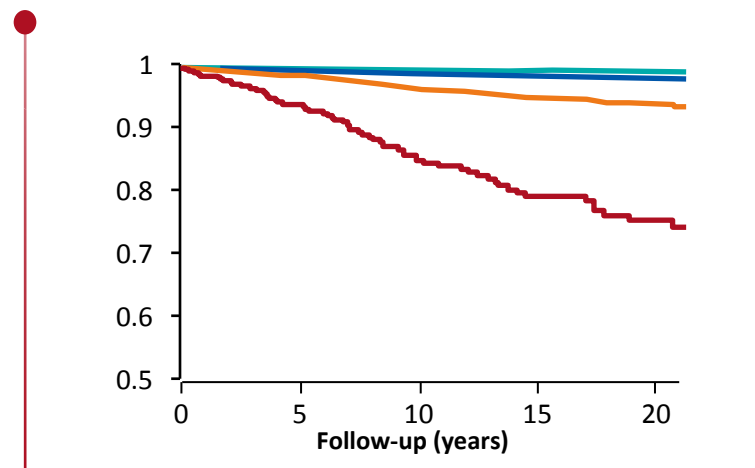
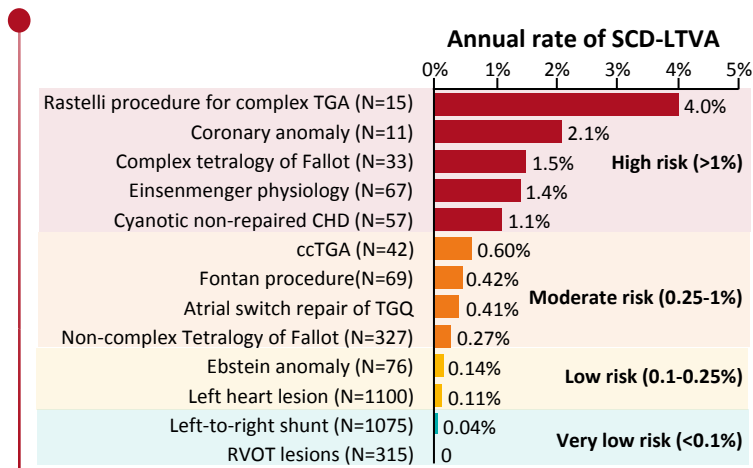


CONGENITAL HEART DISEASE



Lesion-specific risk for sudden cardiac death or life-threatening ventricular arrhythmias in adults with congenital heart disease

3 311 consecutive ACHD patients prospectively followed up to 25 years
71 events (53 SCDs and 18 life-threatening ventricular arrhythmias)



Area under the ROC curve: 0.81 in the derivation cohort, 0.78 in a validation cohort

- Better knowledge of prognosis of valvular heart disease and durability of TAVI.
- New insights from randomised trials on transcatheter therapy of secondary mitral valve disease.
- Contemporary presentation and management of infective endocarditis.
- Perspectives on transcatheter therapies in the treatment of particular presentations of pulmonary hypertension.
- Improved risk stratification of arrhythmias in adults with congenital heart disease.