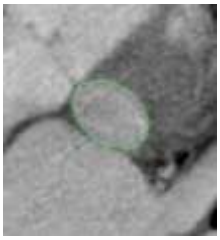
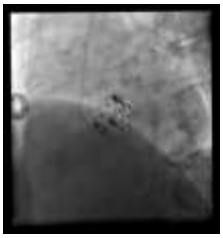
Paravalvular leak after TAVI: How to manage?

Ahmed M. ElGuindy, MD, MRCP, FACC
Aswan Heart Centre





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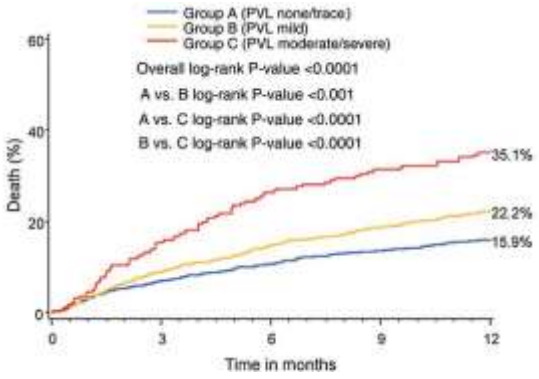
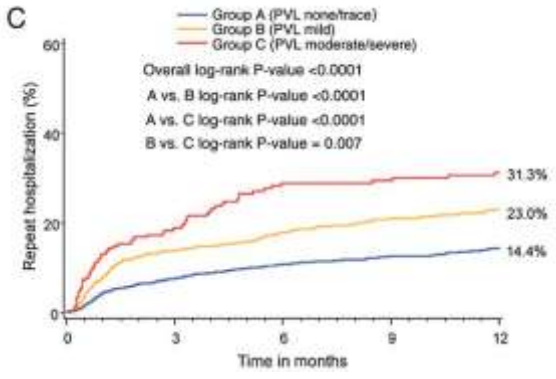
Imperial College London

Why do we care?

PARTNER 1





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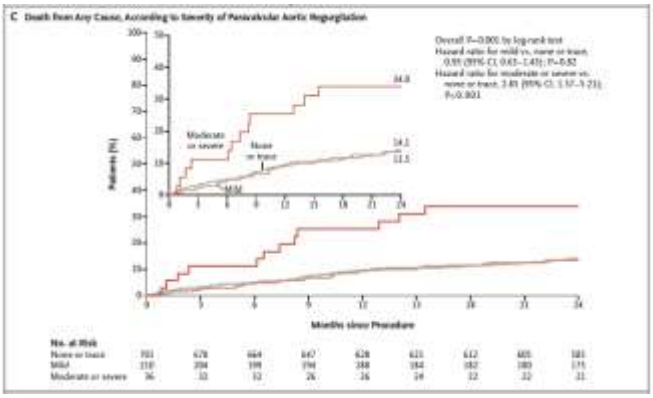
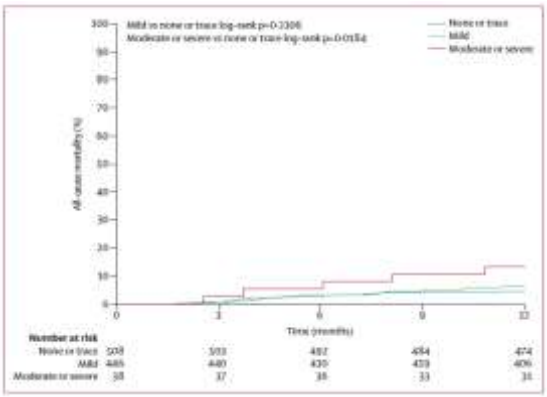
Why do we care?

PARTNER 2A



SAPIEN 3



Grading severity

Clinical Guidelines Kappetein et al

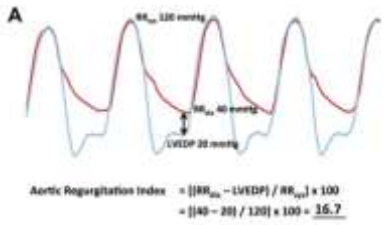
Updated standardized endpoint definitions for transcatheter aortic valve implantation: The Valve Academic Research Consortium-2 consensus document*

A. Pieter Kappetein, Stuart J. Head, Philippe Généreux, Nicolo Piazza, Nicolas M. van Mieghem, Eugene H. Blackstone, Thomas G. Brott, David J. Cohen, Donald E. Cutlip, Geerit-Anne van Es, Rebecca T. Hahn, Ajay J. Kirtane, Mitchell W. Krucoff, Susheel Kodali, Michael J. Mack, Reyasa Mehran, Josep Rodés-Cabau, Pascal Vranckx, John G. Webb, Stephan Windecker, Patrick W. Serruys, and Martin B. Leon

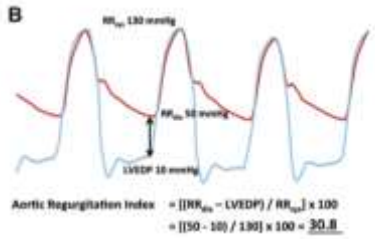
	Prosthetic aortic valve regurgitation		
	Mild	**Moderate**	**Severe**
Semiquantitative parameters			
Diastolic flow reversal in the descending aorta—PW	Absent or brief early diastolic	Intermediate	Prominent, holodiastolic
Circumferential extent of prosthetic valve paravalvular regurgitation (%)**	<10%	10%-29%	≥30%
Quantitative parameters‡			
Regurgitant volume (mL/beat)	<30 mL	30-59 mL	≥60 mL
Regurgitant fraction (%)	<30%	30-49%	≥50%
EROA (cm^2)	0.10 cm^2	0.10-0.29 cm^2	≥0.30 cm^2

Grading severity

The ARI

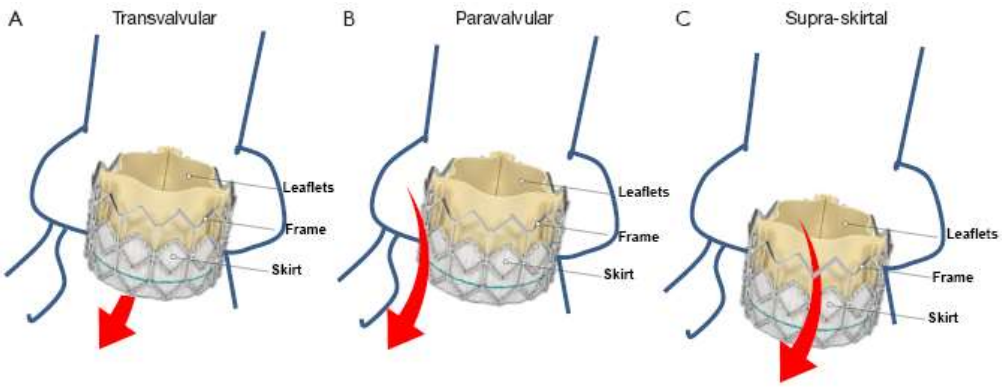


Mod AR



No AR

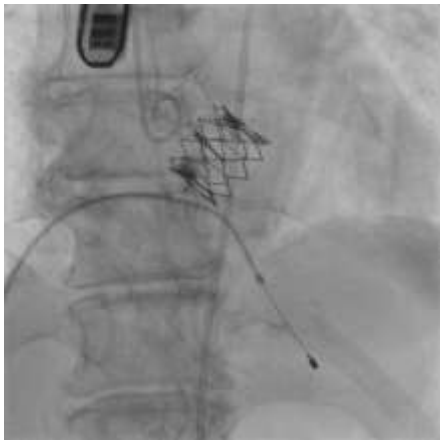
Mechanisms



Stahli et al. CDT 2013

When should we intervene?

A. More than mild regurgitation

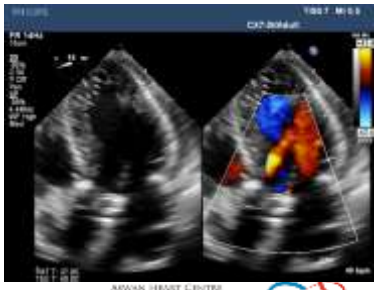


When should we intervene?

A. More than mild regurgitation

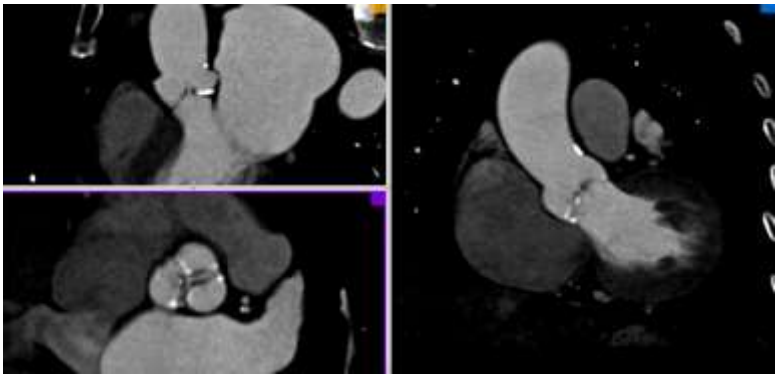
Borderline cases:

Consider ARI and other factors



When should we intervene?

B. Realistic chances: respect the anatomy



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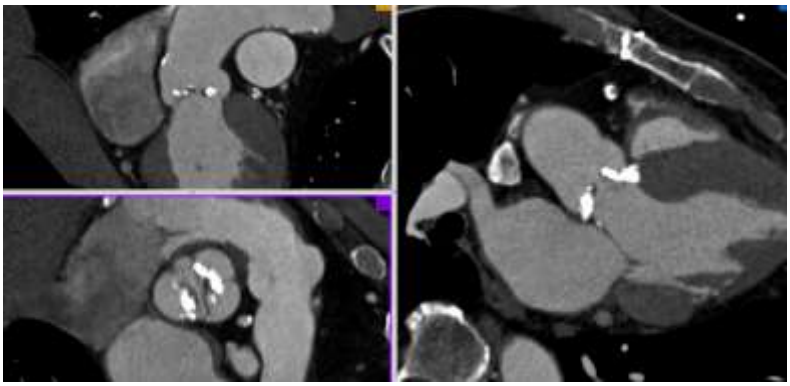

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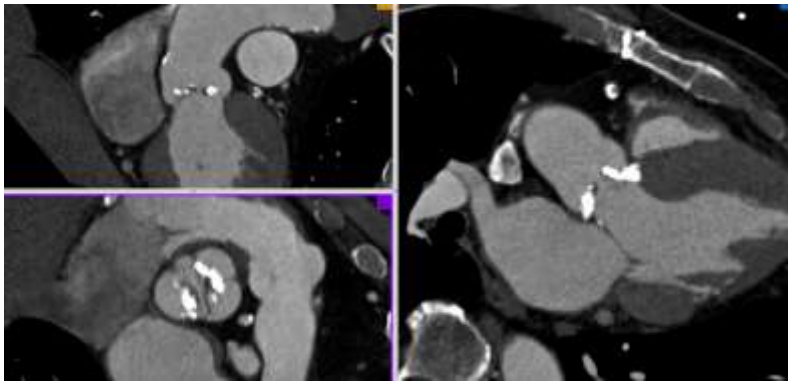
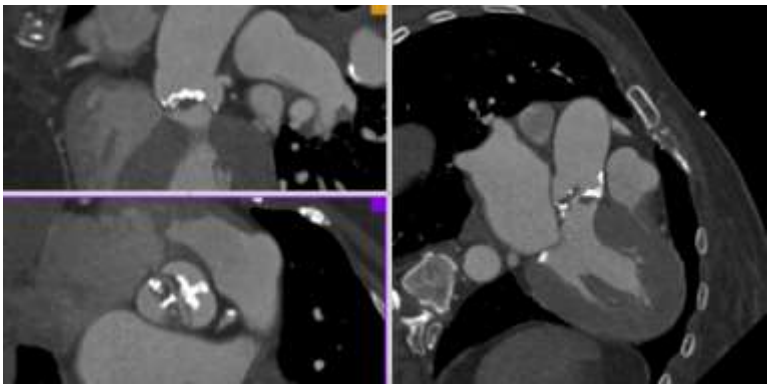


When should we intervene?

B. Realistic chances: risk vs. benefit?



When should we intervene?

C. Common sense/sound judgment: respect the clinical scenario

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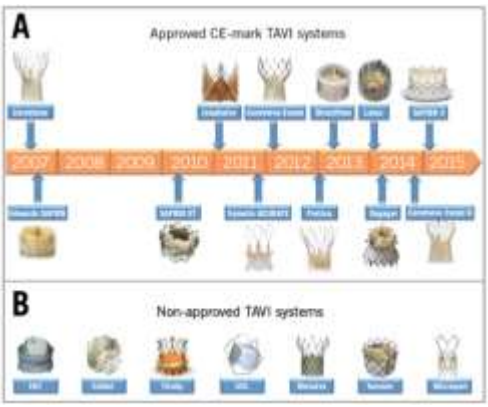
When should we intervene?

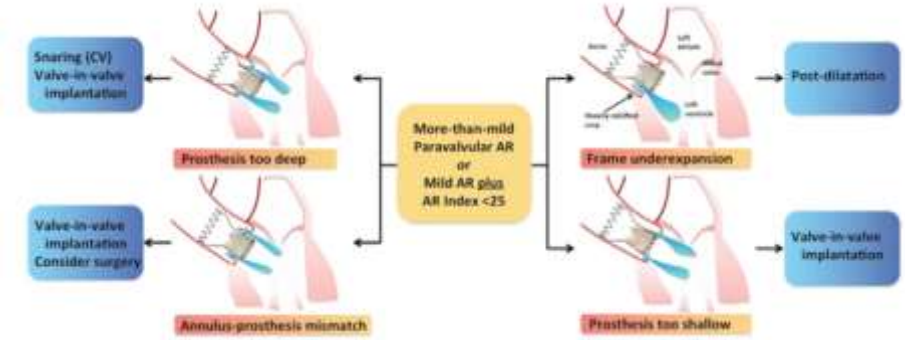
D. Know your valve platform



How to intervene?

A. Self-expandable valves

- WAIT!



Werner et al. Jap Circ 2014

How to intervene?

B. Balloon-expandable valves

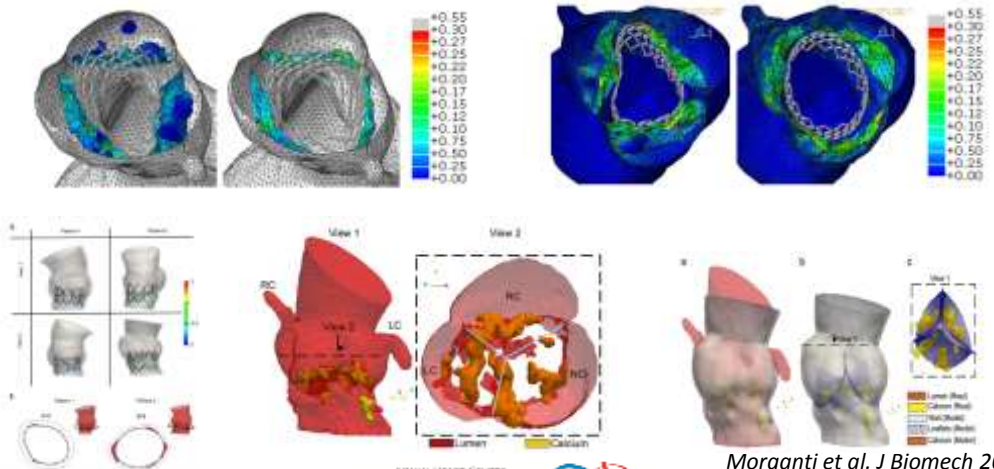
- Post-dilatation: same balloon with 2 extra ccs
- ViV: high/low implantation or transvalvular regurgitation
- Plug (AVP II/IV)

Personalized/Precision Medicine

Personalized medicine is a **medical** procedure that separates patients into different groups—with **medical** decisions, practices, interventions and/or products being tailored to the individual patient based on their predicted response or risk of disease.

Wikipedia

Predicting PAR: Simulation programs



Morganti et al. J Biomech 2014

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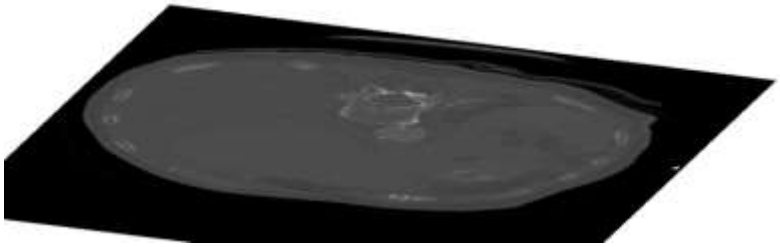
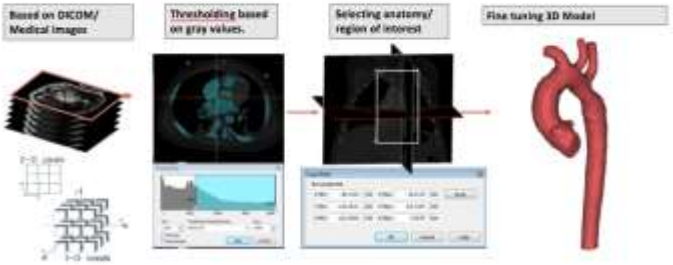
Predicting PAR: Simulation programs



FEops TAVIGUIDE®

3D Segmentation



AHC BIOMEDICAL ENGINEERING & INNOVATION DEPARTMENT
Courtesy of Dr. Ing. Heba Aguib

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Take Home Message

- The best way to manage PAR after TAVI is preventing it
  - Preprocedural CT and careful sizing
  - Newer generation valves
- Trade-off between PAR and risk annular rupture (+/- stroke)
- More than mild PAR needs to be addressed
- Intervention depends on
  - Degree of regurgitation
  - Valve type
  - Anatomical considerations
  - Clinical scenario
- When affordable, don't leave mild PAR
- Simulation programs might prove to be helpful in the future