

# Valve Selection for SAVR

**Mechanical Valve: It Is Still Strong.**

Byung Chul Chang, MD, PhD, FAHA  
CHA University Medical Center



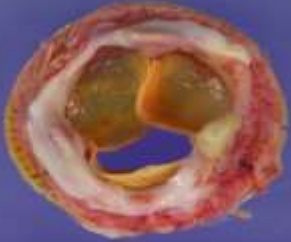
# TAVR is not inferior to SAVR

Yes, it is

in aged patients of high,  
intermediate, and low risk

**For Early Outcome**

# Common Causes of Tissue Valve Failure



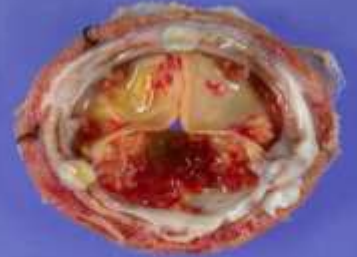
Tissue tearing



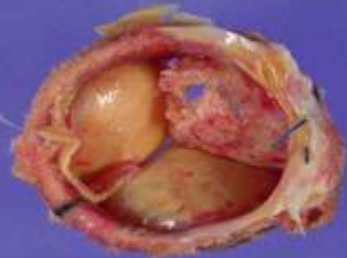
Tissue tearing



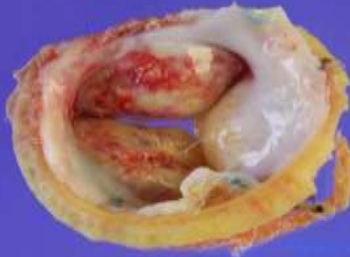
Calcification



Calcification



Perforation



Pannus

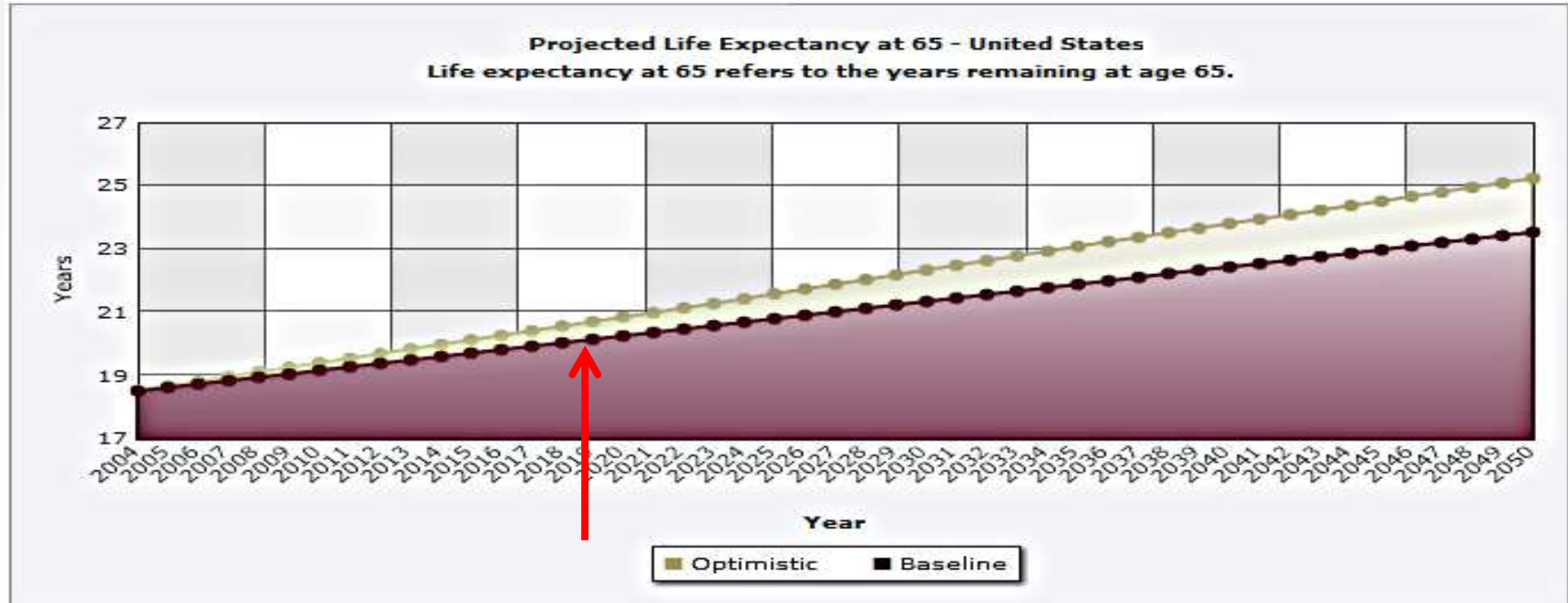


Infection; *H. aphro*,

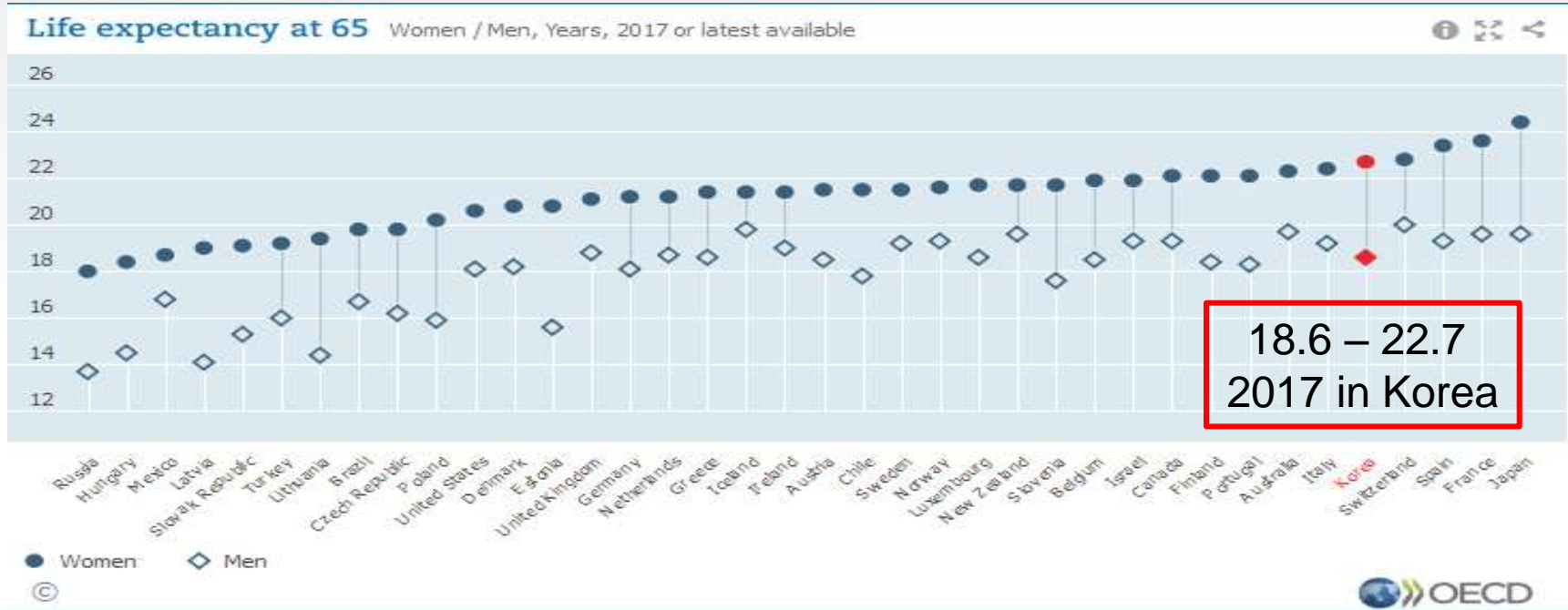


Iresa induced

# Projected Life Expectancy at 65 (2004-2050)



# Life Expectancy at 65



Expect 20 years more at 65  
for Korean!

# Bioprosthesis

Durability?

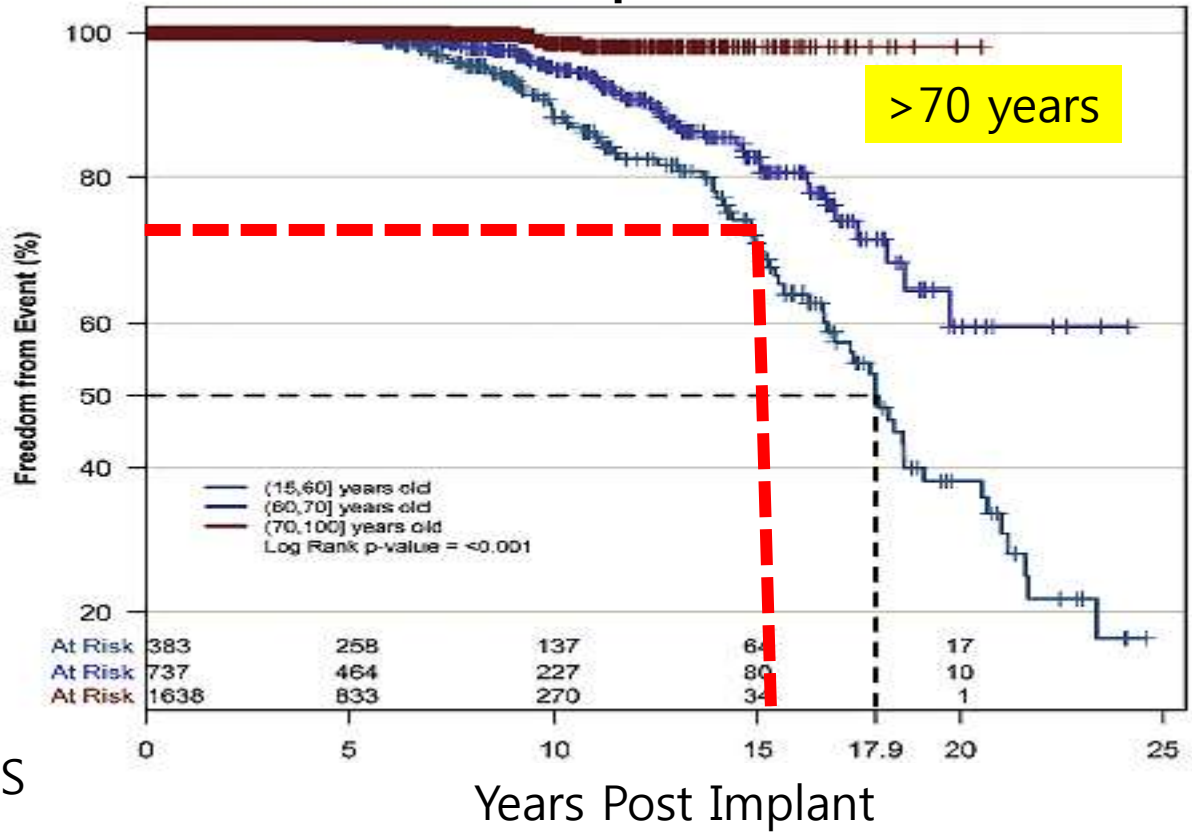
Less anticoagulation related complications?

Better long-term survival?

# Very Long-Term Outcomes of the Carpentier-Edwards Perimount Valve in Aortic Position

Thierry Bourguignon, MD, A  
 Alain Mirza, MD, Claudia L  
 Michel Marchand, MD, and  
 Department of Cardiac Surgery, Tours Uni  
 Switzerland

## Free from Explant due to SVD



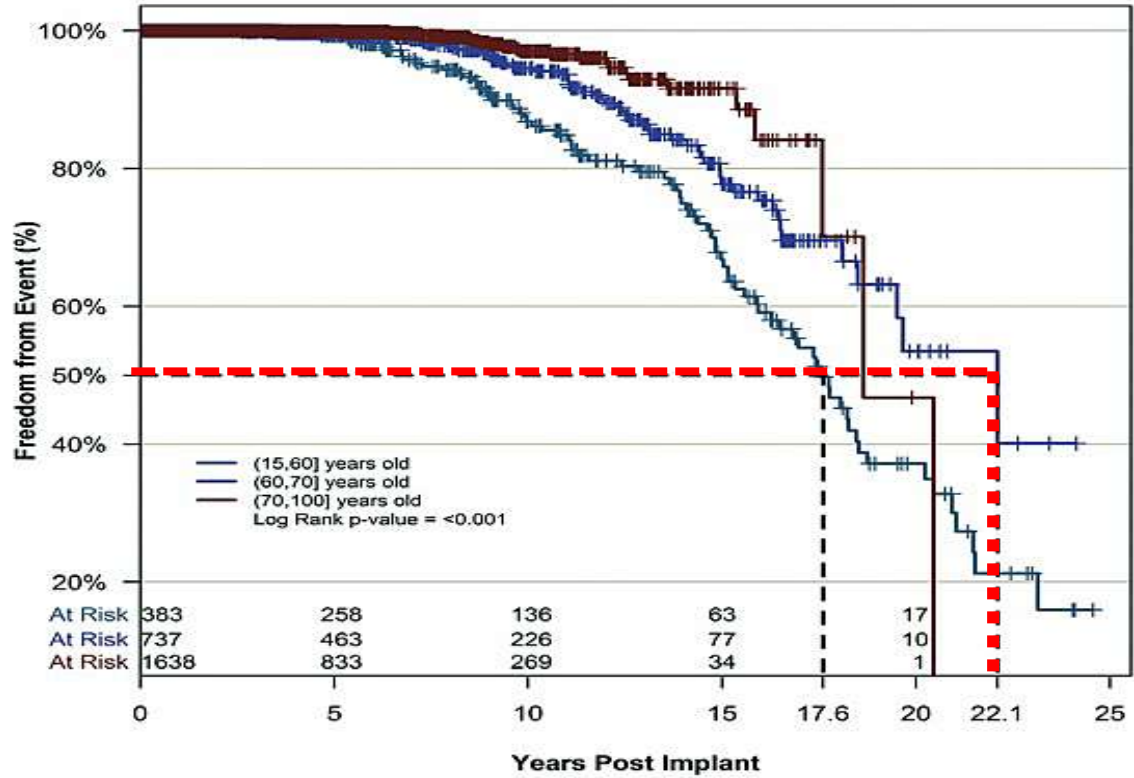


# Very Long-Term Outcomes of the Carpentier-Edwards Perimount Valve in Aortic Position

Thierry Bourguignon, MD, Anne Alain Mirza, MD, Claudia Loar, MD, Michel Marchand, MD, and Michel...

Department of Cardiac Surgery, Tours University Hospital, Tours, France  
 Department of Cardiac Surgery, University of Zurich, Switzerland

Free from SVD by age groups



# Mechanical Prosthesis

Better Durability

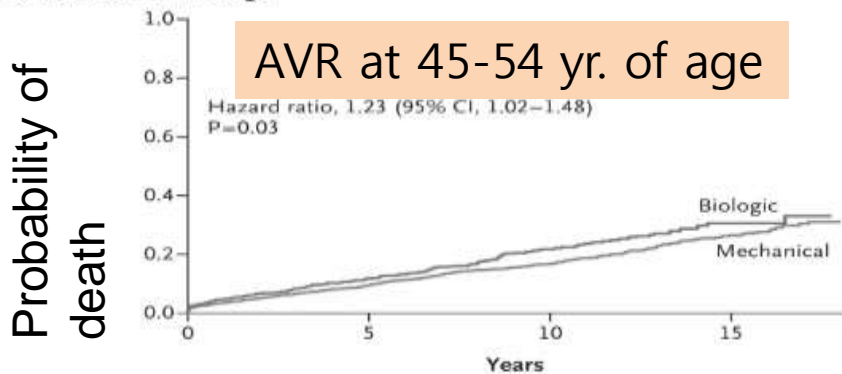
More anticoagulation related complications?

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ORIGINAL ARTICLE

# Mechanical or Biologic Prostheses for Aortic-Valve and Mitral-Valve Replacement

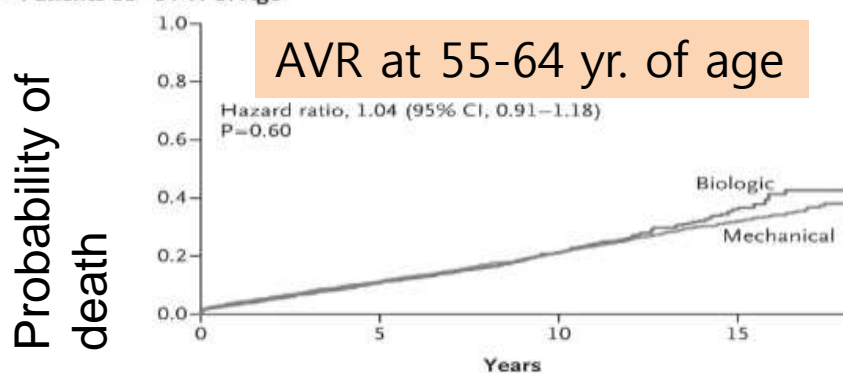
A Patients 45–54 Yr of Age



No. at Risk

|            |        |        |       |       |
|------------|--------|--------|-------|-------|
| Biologic   | 1187.1 | 745.1  | 406.7 | 98.0  |
| Mechanical | 2421.7 | 1548.1 | 853.8 | 300.0 |

B Patients 55–64 Yr of Age



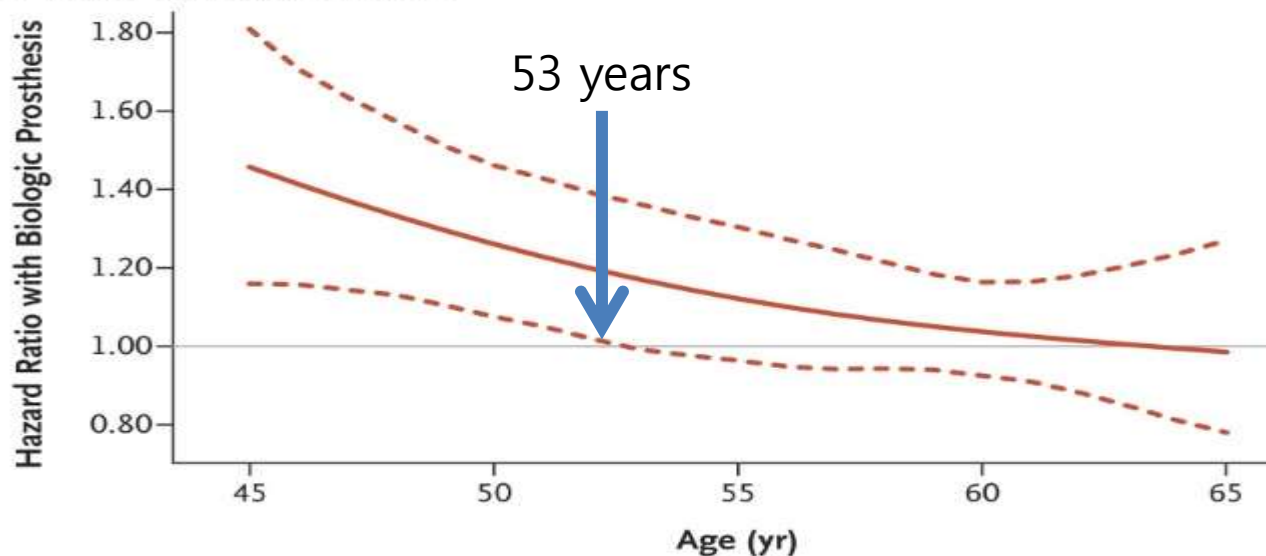
No. at Risk

|            |        |        |        |       |
|------------|--------|--------|--------|-------|
| Biologic   | 2636.0 | 1553.0 | 768.9  | 170.5 |
| Mechanical | 3684.7 | 2117.5 | 1110.1 | 313.0 |

ORIGINAL ARTICLE

# Mechanical or Biologic Prostheses for Aortic-Valve and Mitral-Valve Replacement

A Aortic-Valve Replacement



ORIGINAL ARTICLE

# Mechanical or Biologic Prostheses for Aortic-Valve and Mitral-Valve Replacement

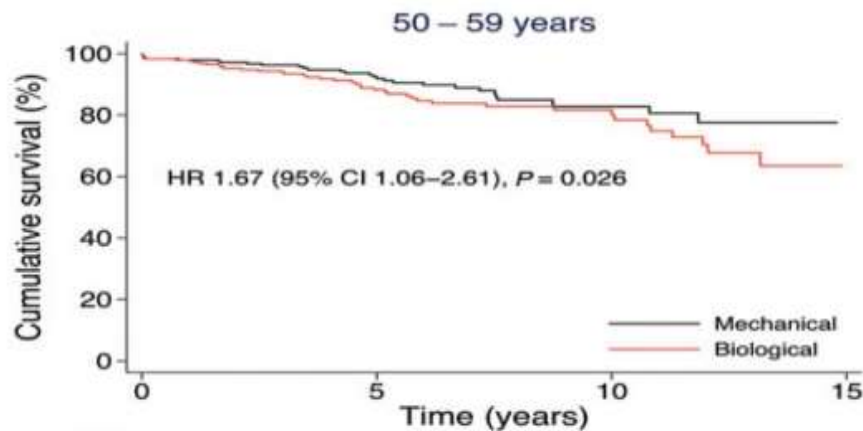
Andrew B. Goldstone, M.D., Ph.D., Peter Chiu, M.D., Michael Baiocchi, Ph.D.,  
Bharathi Lingala, Ph.D., William L. Patrick, M.D., Michael P. Fischbein, M.D., Ph.D.,  
and Y. Joseph Woo, M.D.

## CONCLUSIONS

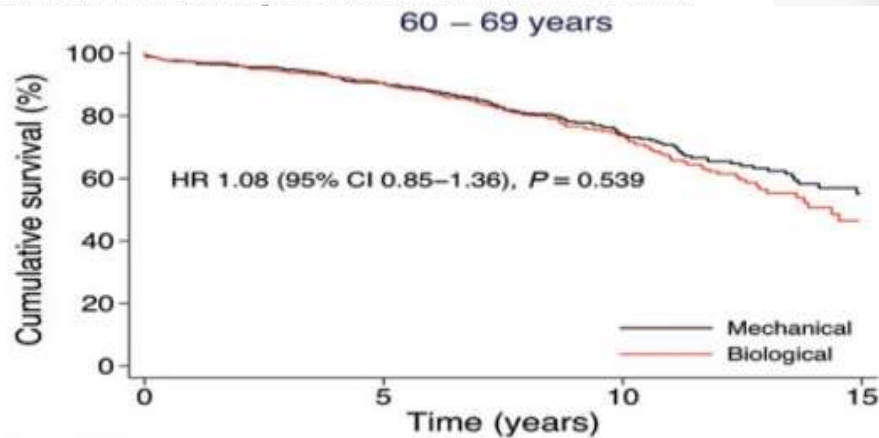
**The long-term mortality benefit that was associated with a mechanical prosthesis**, as compared with a biologic prosthesis, persisted until 70 years of age among patients undergoing mitral-valve replacement and **until 55 years of age among those undergoing aortic-valve replacement.**

# Aortic valve replacement with mechanical vs. biological prostheses in patients aged 50–69 years

Natalie Glaser<sup>1,2</sup>, Veronica Jackson<sup>1,2</sup>, Martin J. Holzmann<sup>3,4</sup>,  
Anders Franco-Cereceda<sup>1,2</sup>, and Ulrik Sartipy<sup>1,2\*</sup>



| Number at risk |     |     |    |   |  |
|----------------|-----|-----|----|---|--|
| Mechanical     | 287 | 151 | 48 | 5 |  |
| Biological     | 287 | 140 | 52 | 7 |  |



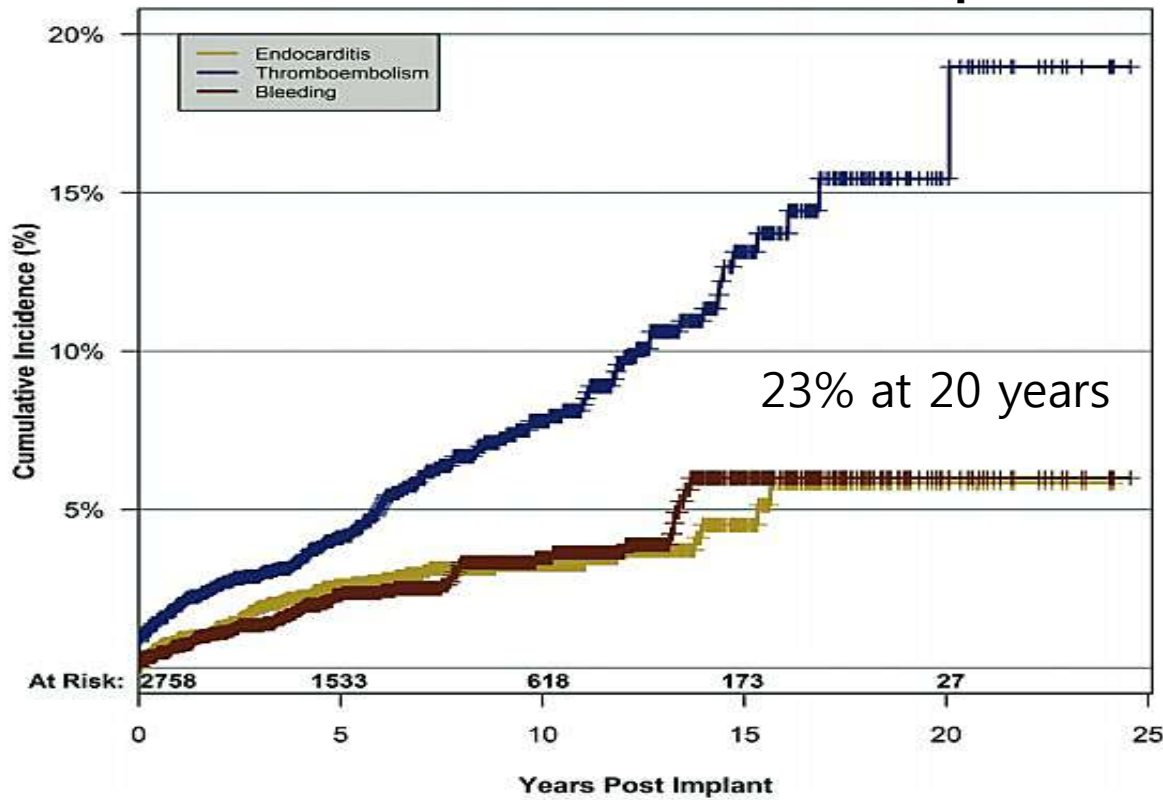
| Number at risk |     |     |     |    |  |
|----------------|-----|-----|-----|----|--|
| Mechanical     | 751 | 480 | 182 | 30 |  |
| Biological     | 751 | 503 | 158 | 18 |  |

# Very Long-Term Outcomes of the Carpentier-Edwards Perimount Valve in Aortic Position

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Department of Cardiac Surgery, Tours University Switzerland

### Cumulative incidence of Valve-R-Complication



**Incidence of Reoperation  
will be increasing after 15 years!**



# Valve Selection for SAVR in 50-60s

Long-term survival for 15yrs; propensity score-matched cohort

- **Mechanical; better in 50s**

- Goldstone AB\* up to 54 Sweden NEJM 2017

- Glaser N\*\* in 50-59 California Eur Heart J 2015

- Similar results in 50-65 Harvard JTCVS 2014
  - McClure RA\*

- Similar results in 50-69 New York JAMA 2014
  - Chiang YP

- ✓ Risk of reoperation is higher in biological(HR: 2.36\*\*)
- ✓ Risk of major bleeding is lower in biological(HR:0.49\*\*)

\*: differences are diverging at 15 years

# Selection of Prosthetic Valves

|   | COR | LOE |
|---|-----|-----|
| Choice of valve intervention and prosthetic valve type should be a shared decision process  | I   | C   |
| A bioprosthesis is recommended in patients of any age for whom anticoagulant therapy is contraindicated, cannot be managed appropriately, or is not desired | I   | C   |
| A mechanical prosthesis is reasonable for AVR or MVR in <b>patients &lt;60 y of age</b> who do not have a contraindication to anticoagulation               | IIa | B   |
| A bioprosthesis is reasonable in <b>patients &gt;70 y of age</b>  | IIa | B   |
| <b>Either a bioprosthetic or mechanical valve is reasonable</b> in patients <b>between 60 y and 70 y of age</b>   | IIa | B   |
| the Ross procedure when performed by an experienced surgeon, may be considered in young patients  | IIb | C   |



# Valve Selection for SAVR

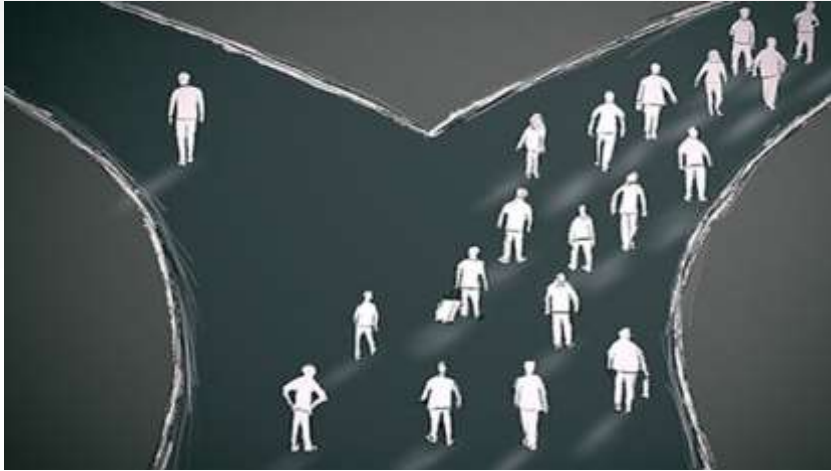
Mechanical valve:

**It Is Still Strong in 50's and 60's.**

# Prosthesis for TAVI is Tissue

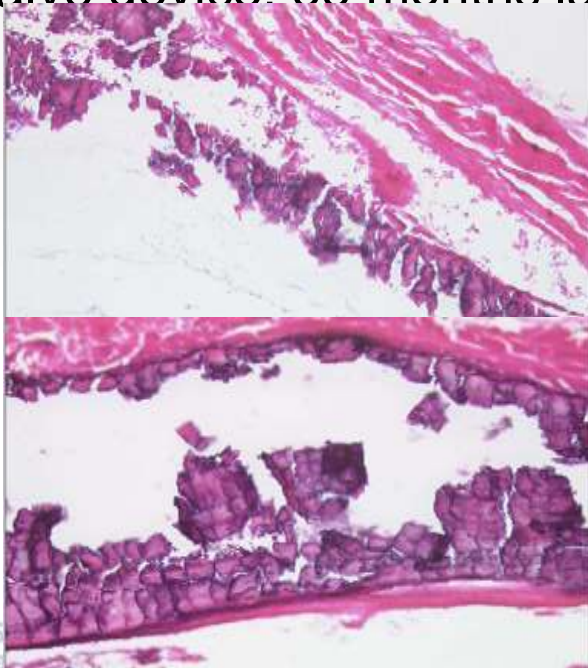
Is it acceptable for 50s-60s?

# Right prosthesis to right patient



# Early Degeneration Core Valve

63 year old male patient underwent TAVR, using a first generation 29 mm Core Valve device. 33 months later, the patient's condition was deteriorated



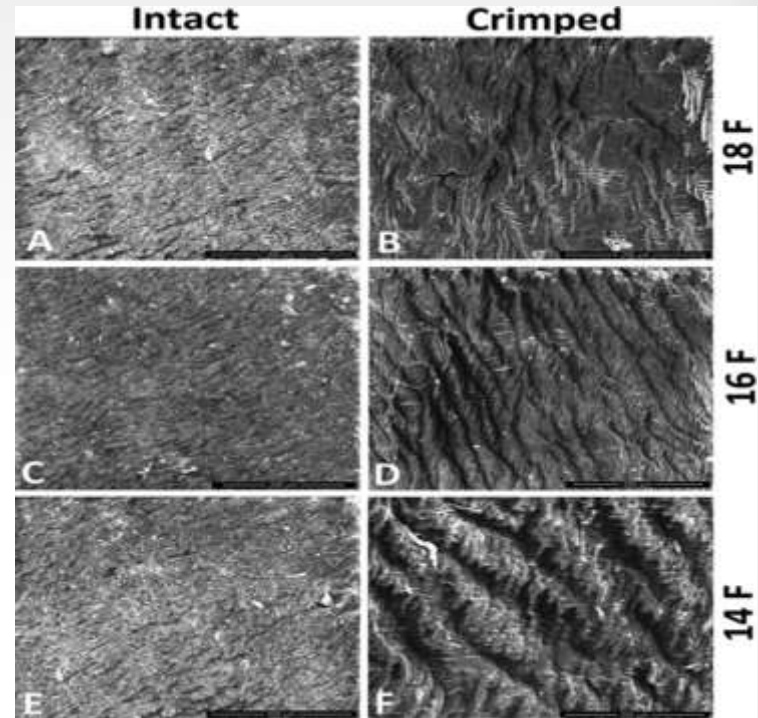
# TAVI Bioprosthesis

Excellent early outcomes upto 5 years

**Conclusions.** Significant tissue damage was observed at the surface layers of the leaflets. In the deeper tissue layers, damage was substantial for 14F crimping; however,

it became less significant but still visible for larger collapse profiles.

**Crimping may induce substantial structural damage to pericardial leaflets that does not improve with time.**



Alavi SH et al 2014 ATS