



Aortic Valve Preservation* Surgery

Retaining the living
aortic valve

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- ▶ No disclosures





Despite refinements in mitral valve repair techniques over the past 30 years, treatment of aortic valvular disease continues to center on **valvular replacement (AVR)**.

AVR in the young patient

- ▶ AVR is a well established and reproducible procedure
 - ▶ Allows placement of a mechanical or bioprosthetic valve
 - ▶ TAVR has proven to be an extremely disruptive technology → huge increase in bioprosthetic AVR
- ▶ However, valve replacement does result in future morbidity and excess mortality
- ▶ This is especially true in the young patient



Observed and Relative Survival After Aortic Valve Replacement

Per Kvidal, MD,* Prof. Reinhold Bergström, PhD,‡ Lars-Gunnar Hörter, PM, BA,§
Elisabeth Ståhle, MD, PhD†

Uppsala and Stockholm, Sweden

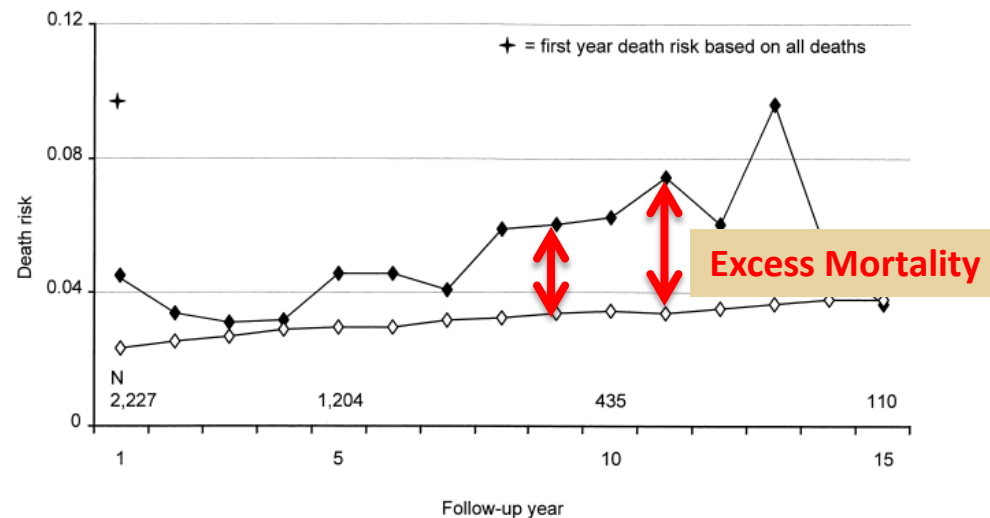


Figure 2. The annual observed (solid diamonds) and expected (open diamonds) death risk after primary AVR in patients who survived the first postoperative month (n = 2,227). The numbers (N) of patients at risk and the first year death risk are given.

Kvidal et al. JACC 2000



MECHANICAL AVR IN THE YOUNG

Long-term outcomes after elective isolated mechanical aortic valve replacement in young adults

Ismail Bouhout, MSc,^a Louis-Mathieu Stevens, MD, PhD,^b Amine Mazine, MSc,^a Nancy Poirier, MD,^a Raymond Cartier, MD,^a Philippe Demers, MD,^a and Ismail El-Hamamsy, MD, PhD^a

1997-2006: 469 isolated mechanical AVR <65 years

Mean follow-up: 9.1 ± 3.5 years

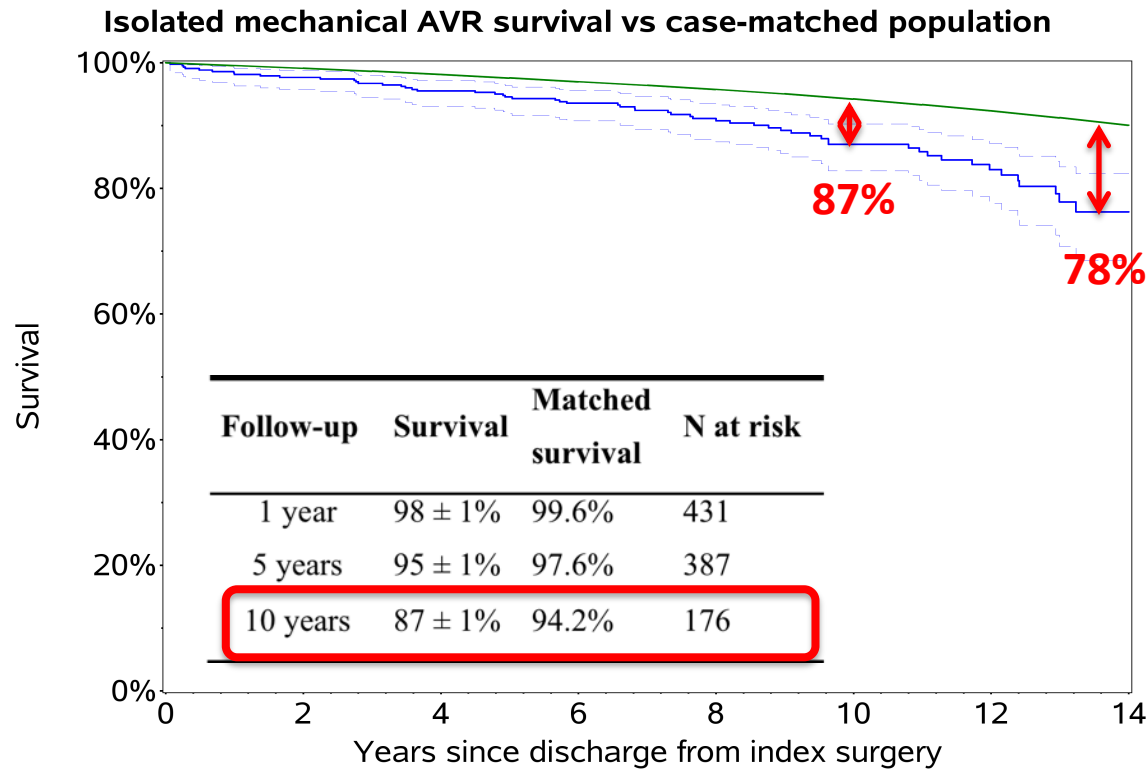
Follow-up 95% complete (4099 patient-years)

Mean age: 53.2 ± 9.2

Bouhout et al. JTCVS 2014



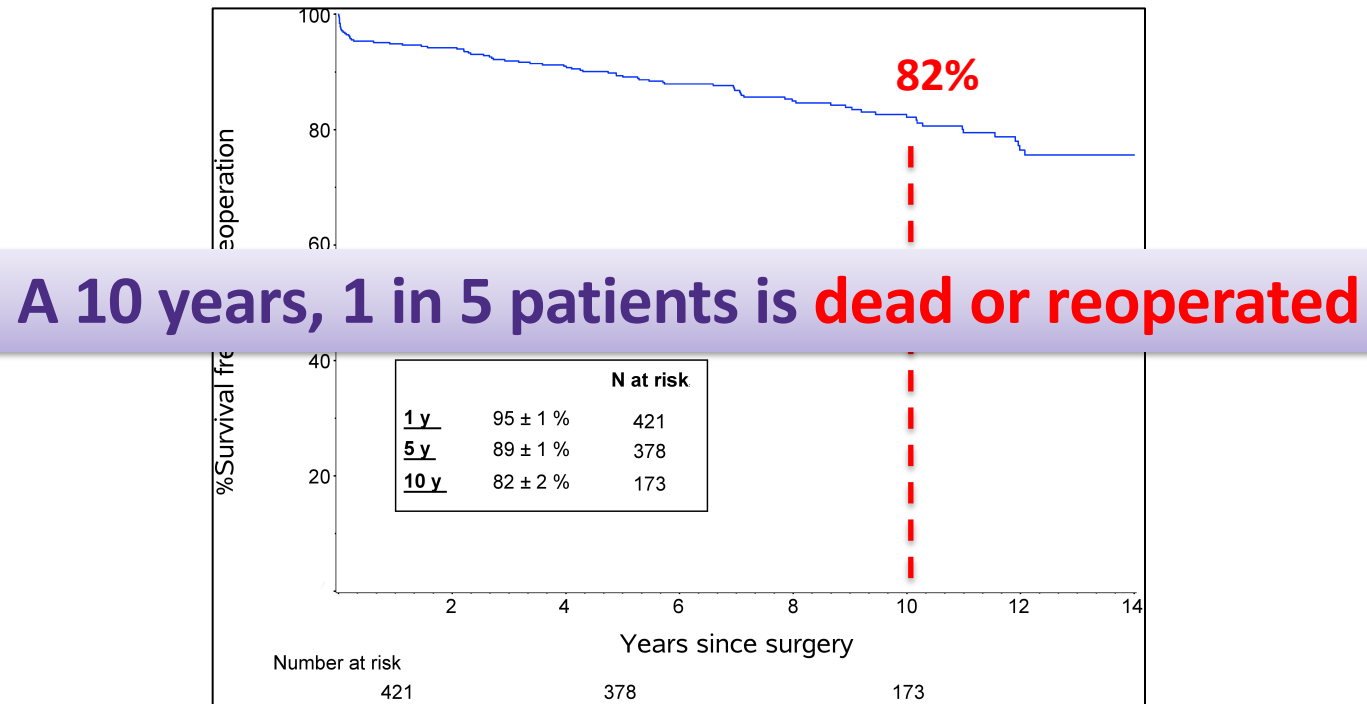
SURVIVAL – MECHANICAL AVR



Bouhout et al. JTCVS 2014



SURVIVAL FREE FROM REOPERATION



Bouhout et al. JTCVS 2014



Repair rationale

- ▶ AVR is associated with excess mortality and patients' fall off expected life curve
 - ▶ This is true even with mechanical AVR
- ▶ This survival deficit is especially true in young patients!
- ▶ Aortic valve repair allows for restoration of the “living aortic valve complex” and potentially decreases long-term morbidity/mortality seen with AVR
 - ▶ No anticoagulation
 - ▶ Durable



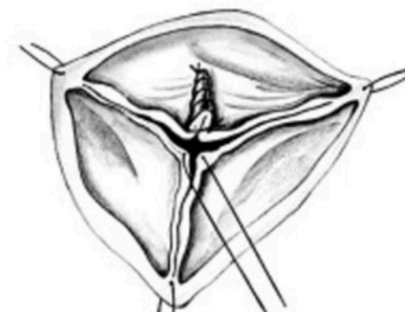
Principles of Aortic Valve Repair

▪ Annuloplasty

- ▶ External subannular ring (e.g. Lansac ring)
- ▶ Internal ring (HAART)
- ▶ Suture annuloplasty
- ▶ Valve sparing root replacement (David V)

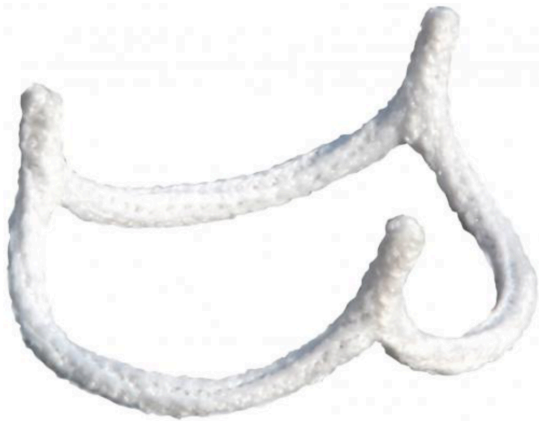
▪ Leaflet Repair

- ▶ Plication
- ▶ Nodule release
- ▶ De-calcification
- ▶ BAV cleft closure
- ▶ Fenestration repair



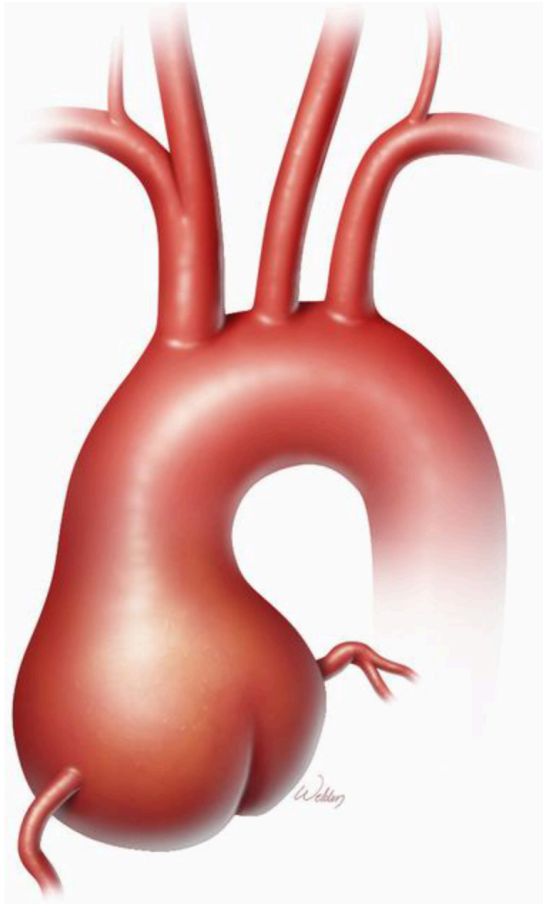
Standardization- HAART ring

Annuloplasty ring for TAV and BAV repairs

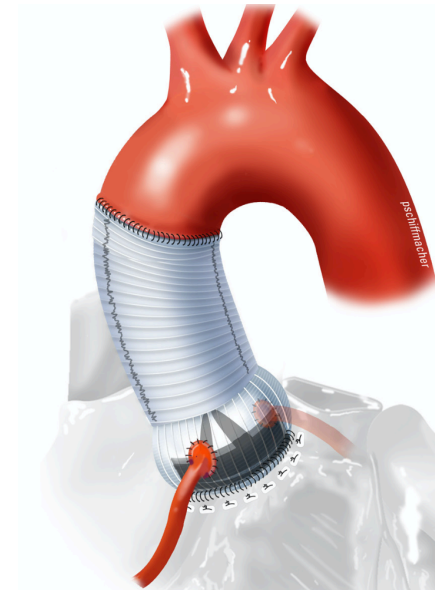




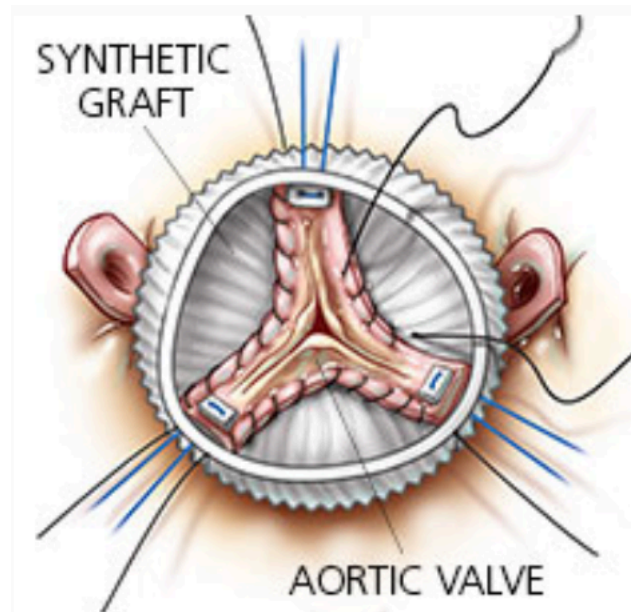
What about aortic root aneurysms?



- **Classically, treated with a composite valved conduit**
 - Bentall procedure



Valve Sparing Root Replacement (VSRR)



- **Standard of care at UWMC for root aneurysm with repairable aortic valve**
- **Used in a variety of settings:**
 - AI, acute type A dissection, BAV





Traditional AI Algorithm

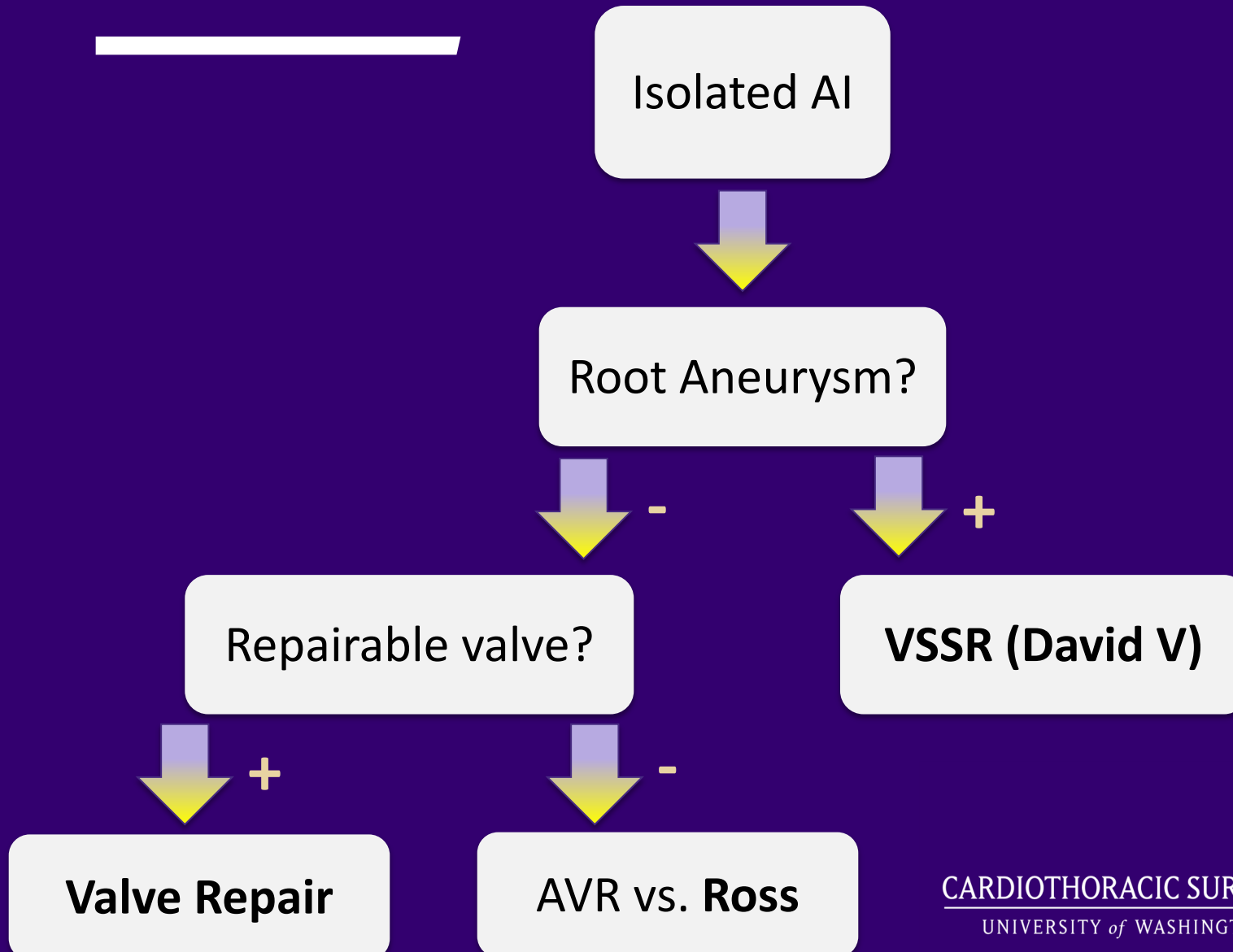
Isolated AI



AVR



Novel UWMC AI Algorithm



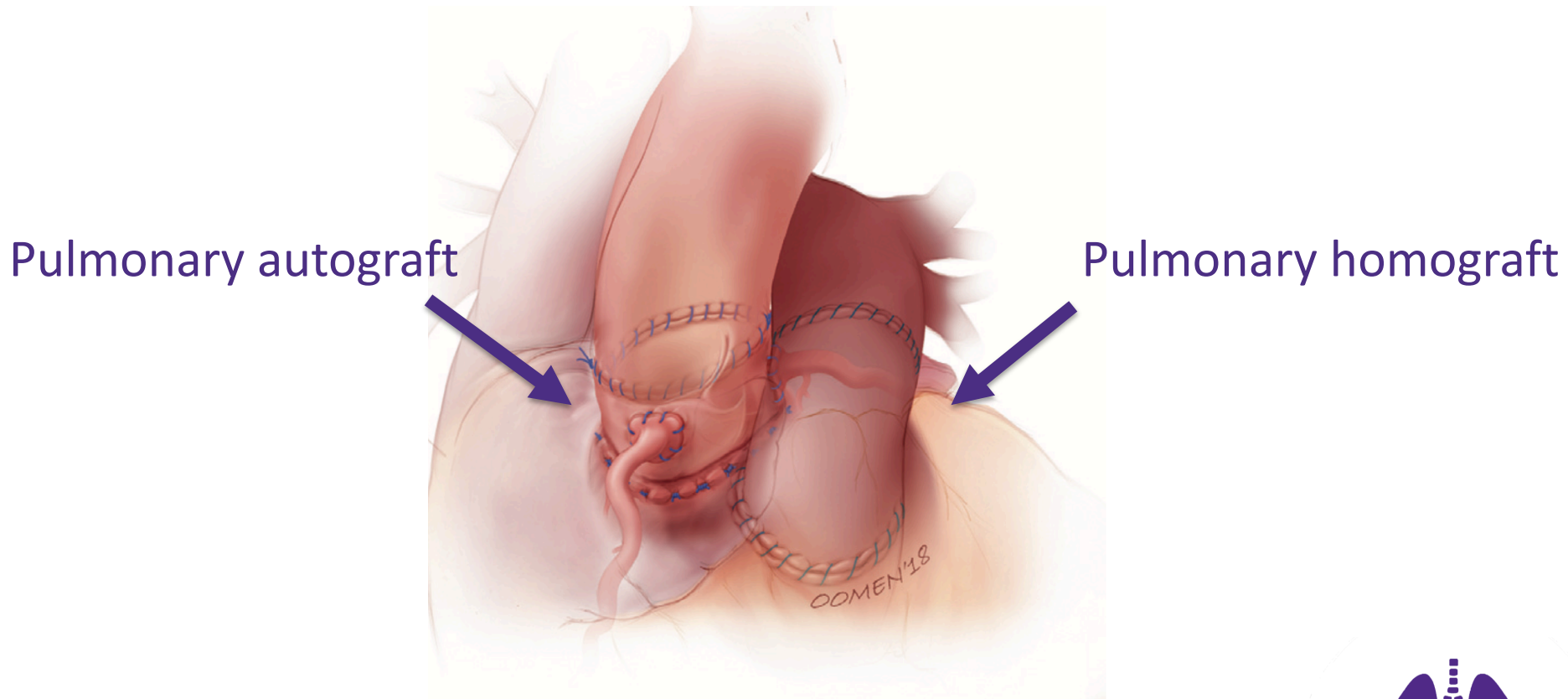
What about aortic stenosis (AS)?



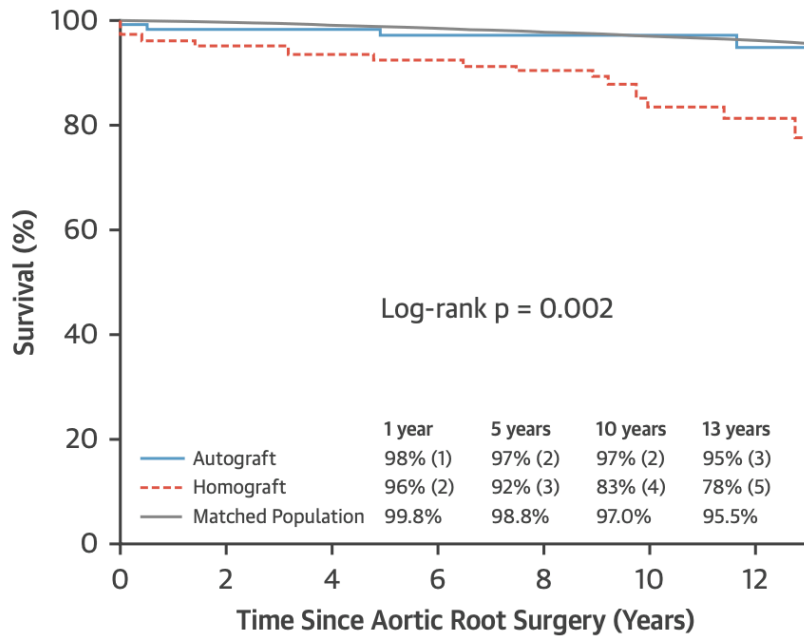
In general, valves with significant AS are not repairable



Ross Procedure



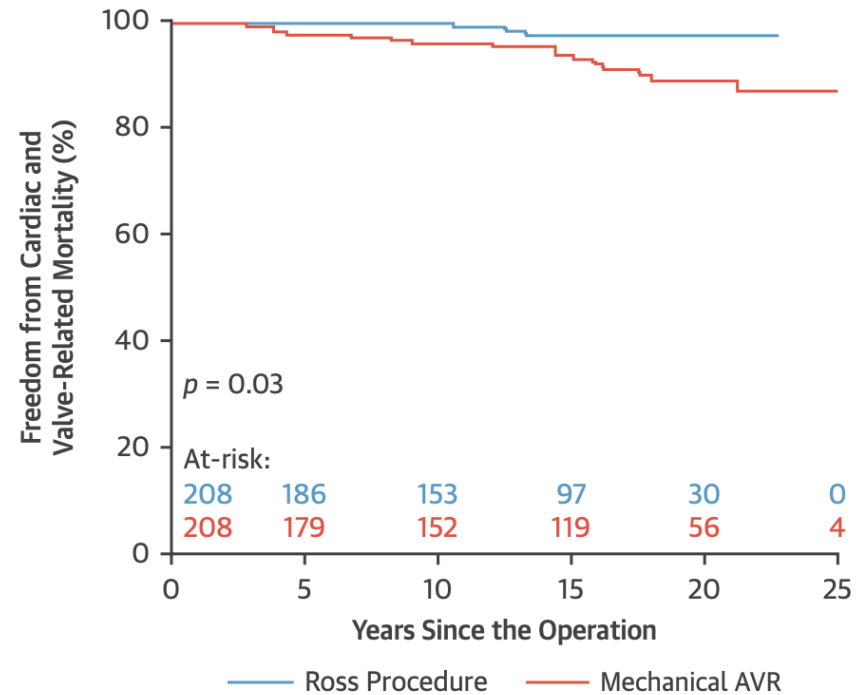
Ross vs. AVR



Number at risk

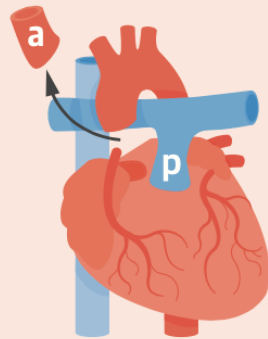
Autograft	108	103	102	101	91	66	34
Homograft	108	101	99	98	86	52	33

El-Hamamsy et al. Lancet 2010

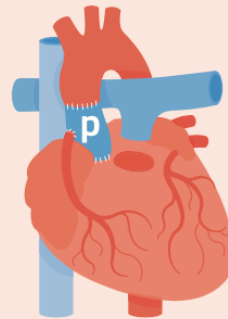


Mazine et al. Circulation 2016

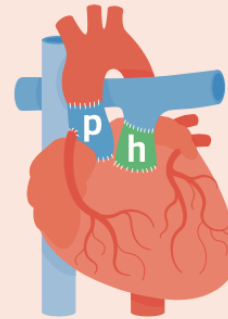




The diseased aortic valve is removed



The pulmonic valve replaces the aortic valve



A homograft replaces the pulmonic valve

Advantages

- ✓ Excellent long-term survival
- ✓ Excellent quality of life
- ✓ Avoidance of anticoagulation
- ✓ Superior hemodynamics
- ✓ Low rates of valve-related complications

Potential Pitfalls

- ⚠ Technical complexity
- ⚠ Potential long-term failure of two valves
- ⚠ Complexity of reoperations



Ross at UWMC

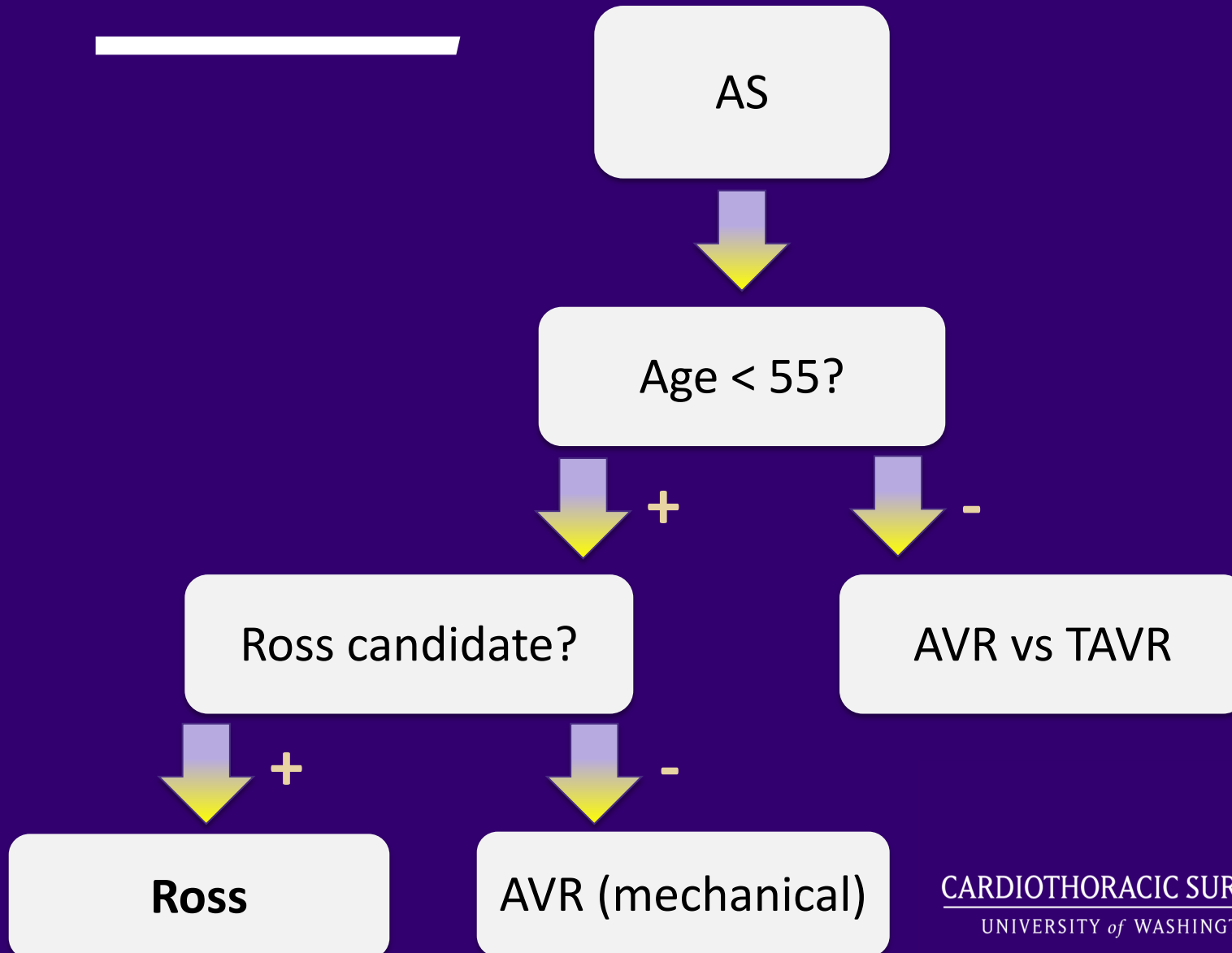
Pre-op



Post-op



Novel UWMC AS Algorithm



Conclusions

- ▶ AVR has consequences
- ▶ Retaining the “living aortic valve complex” with valve repair/VSRR/Ross has value in properly selected patients

