Rheumatic valve disease Waikato perspective

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Factors that may predispose to sternal instability and DSWI

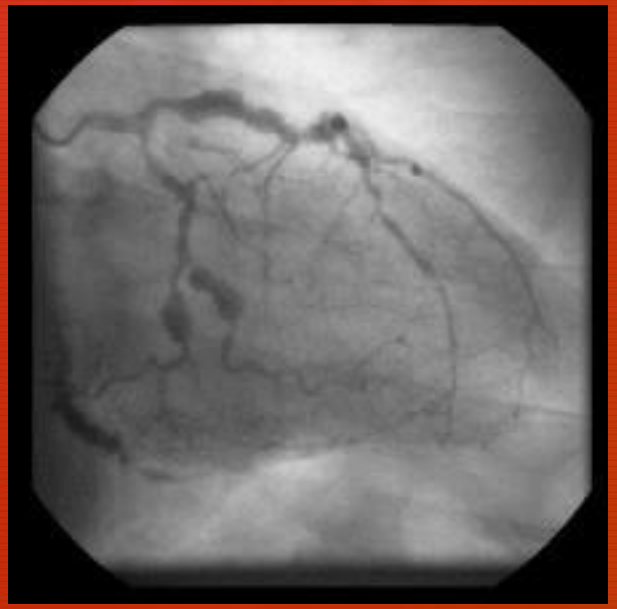
Patient Factors

- Diabetes
- COPD
- Obesity
- Osteoperosis
- Prior Cardiac Surgery
- Age
- Infection

King's College Hospital NHS Foundation Trust

Waikato District Health Board

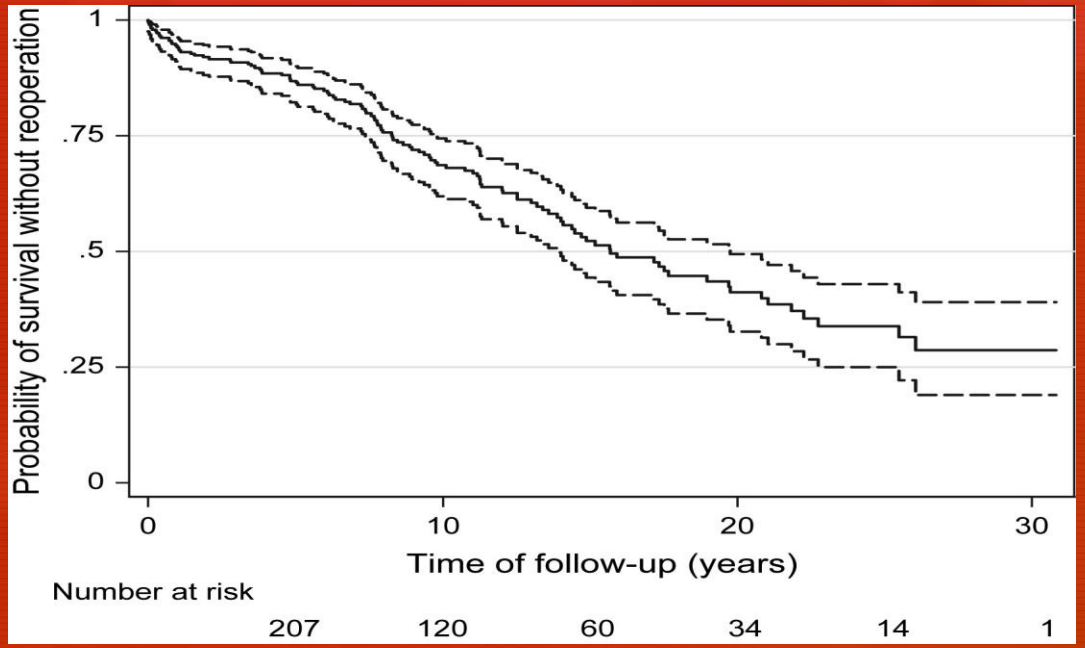
Angina and CAD



Global Problem

- Children and young adults living in low-income countries and is responsible for about 233,000 deaths annually.
- At least 15.6 million people are estimated to be currently affected by RHD with a significant number of them requiring repeated hospitalization and often unaffordable heart surgery in the next five to 20 years.
- The worst affected areas are sub-Saharan Africa, south-central Asia, the Pacific and ***indigenous populations of Australia and New Zealand***.
- Up to 1 per cent of all schoolchildren in Africa, Asia, the Eastern Mediterranean region, and Latin America show signs of the disease.

Figure 2



The Journal of Thoracic and Cardiovascular Surgery 2008 136, 476-481DOI: (10.1016/j.jtcvs.2008.02.065)

Table 1 Cost for each case of RHD prevented in regions where RHD is highly endemic

Table 1 | Cost for each case of RHD prevented in regions where RHD is highly endemic

Population/ outcome	*n*	Intervention	Unit cost (US$)	Total cost (US$)	DALY averted (US$; calculation‡)	Cost per DALY averted (US$)
Healthy children*	10,000	Vaccine	3–10	30,000–100,000	218 (287.4×0.8×0.95)	137–458
Cases of pharyngitis	100,000	Primary prevention	10–15	1.0–1.5 million	45 (287.4×0.8×0.25)	22,075–33,113
Cases of RF	39	Secondary prevention	5,890–6,620	229,710–258,180	230 (287.4×0.8)	999–1,123
Deaths§	13.65	Surgery	13,949	320,966	172 (287.4×0.6)	1,861

*Hypothetical cohort of children aged 5–14 years observed for 10 years. ‡Calculations are based on the following assumptions: for vaccination, 80% efficacy with coverage of 95%. For primary prevention, 90% efficacy, 70% of patients being symptomatic, approximately 25% of whom might seek a medical consultation. For successful secondary prevention programmes, 100% coverage by the health sector, 100% provider performance, and 80% patient compliance. For surgery (valve replacement or repair), efficacy is assumed to be 60% after 10 years. These assumptions were used to calculate DALYs averted. §Hypothetical number of deaths extrapolated from speculative RF mortality of 35% over 10 years. Figure 29-8 from Michaud, C., Rammohan, R. & Narula, J. Cost-effectiveness analysis of intervention strategies for reduction of the burden of rheumatic heart disease. *Rheumatic Fever* (eds Narula, J., Virmani, R., Reddy, K. & Tandon, R), © American Registry of Pathology, 1999). Abbreviations: DALY, disability-adjusted life year; RF, rheumatic fever; RHD, rheumatic heart disease.

Remenyi, B. *et al.* (2013) Position statement of the World Heart Federation on the prevention and control of rheumatic heart disease
Nat. Rev. Cardiol. doi:10.1038/nrcardio.2013.34

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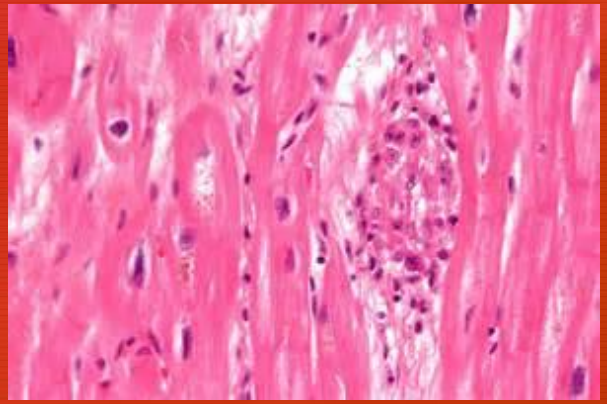
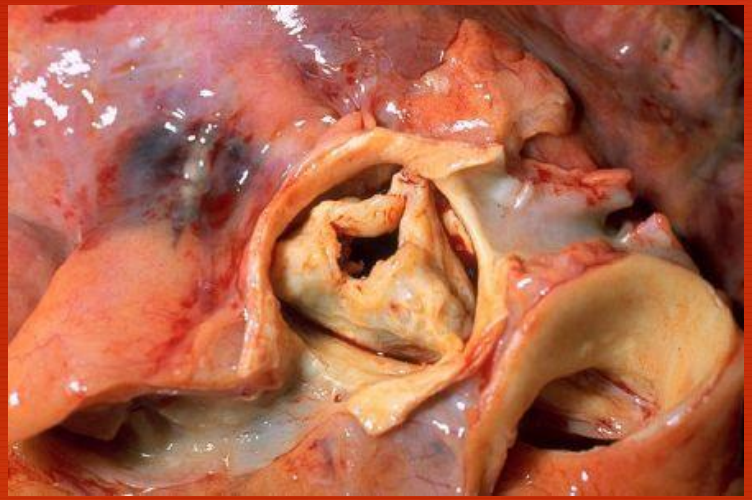
Sore Throat

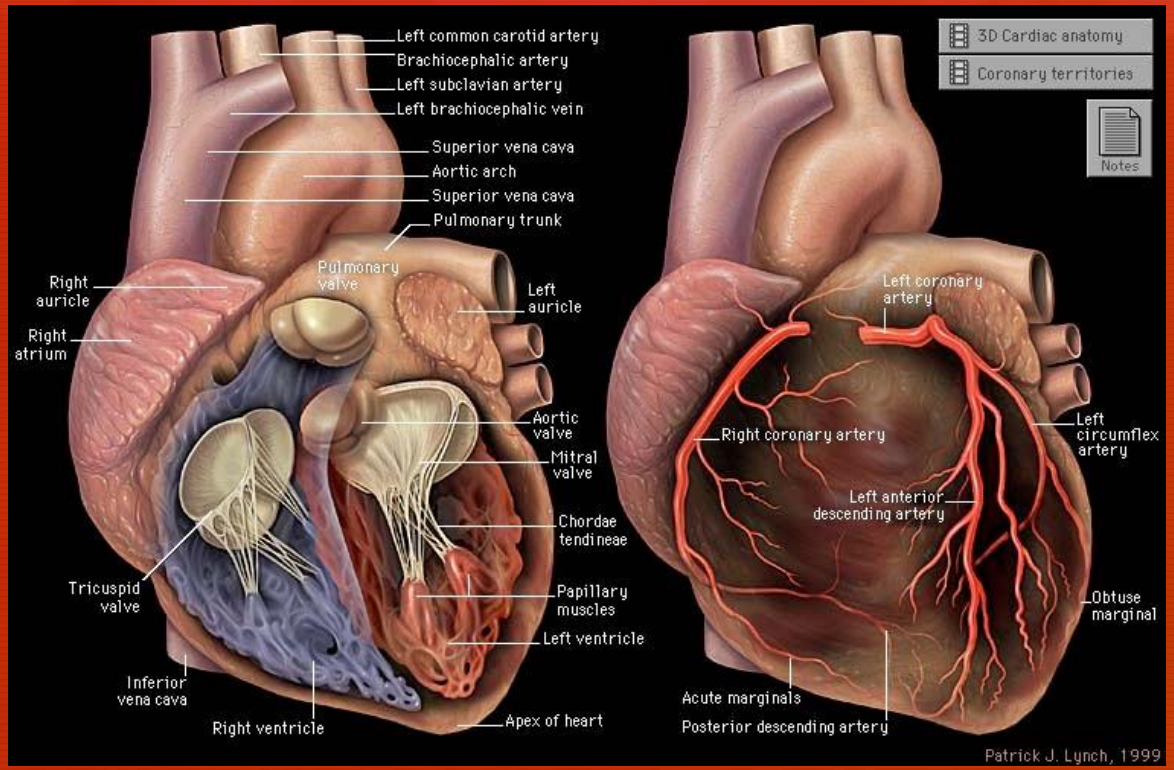




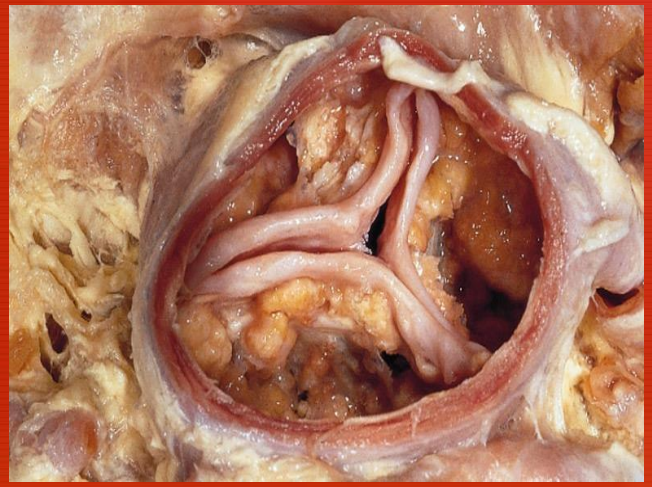
Abnormal Valve Function

- Valve Stenosis
  - Obstruction to valve flow during Hemodynamic hallmark -“pressure gradient” ~ flow// VA
- Valve Regurgitation, Insufficiency, Incompetence
  - Inadequate valve closure---→ back leakage
- Combinations of valve lesions can coexist
  - Single disease process
  - Different disease processes
  - One valve lesion may cause another

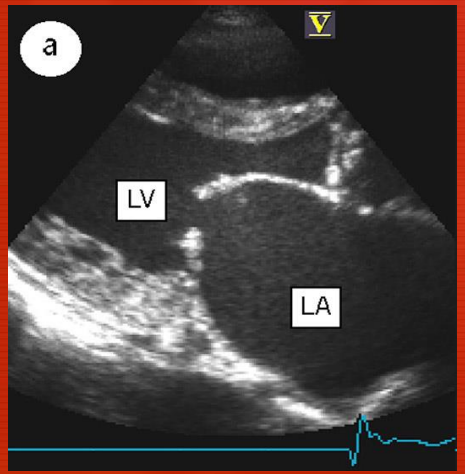
What can be affected

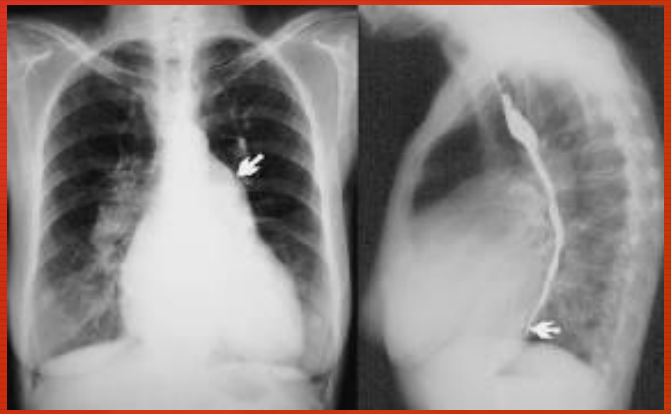


Rheumatic valves



Mitral stenosis

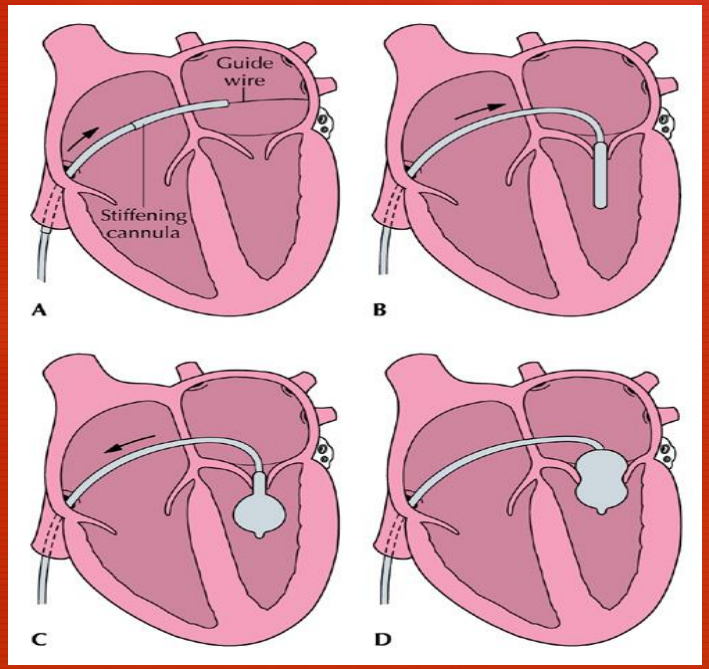


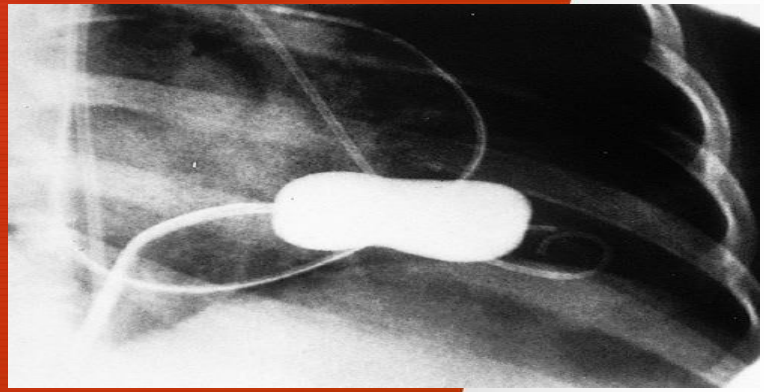


Three techniques

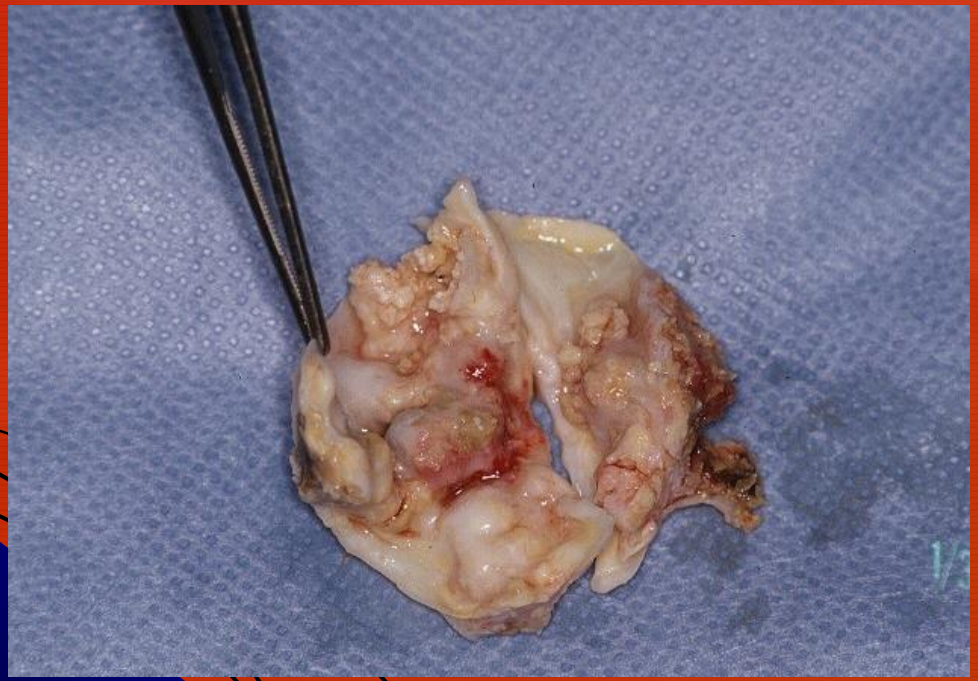
- Valve repair
- Valve replacement
- Trans catheter
  - Valvluplasty BAV
  - TAVI

Balloon Mitral Commissurotomy





IMPOSSIBLE VALVULOPLASTY



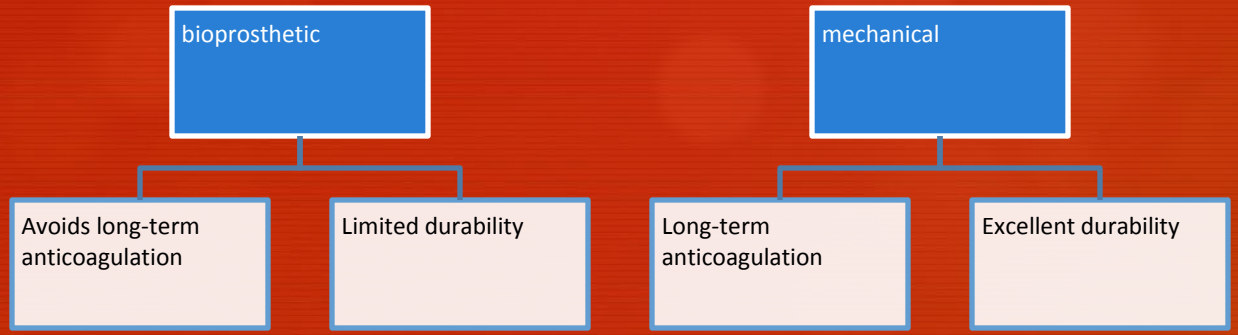
What can be done

- Approach
  - Sternotomy
  - Thoracotomy
  - Minimal access
  - Endoscopic
  - Robotic

Valve selection

Prosthetic Valves

- No “perfect” prosthetic valve
- Bioprosthetic valves versus mechanical



Myths about Mechanical Valves

- You'll Never Need Another Operation
- You can Live without Restrictions
- Risks of TE/ACH are Minimal
- Coumadin is Not a Problem

Ideal valve

- Good hemodynamic
- Quiet
- Require no anticoagulation
- Last for life time
- Cheap
- Easy to implant

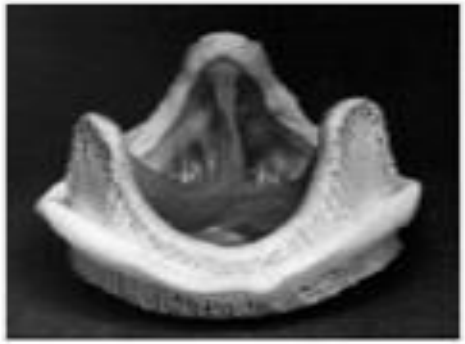
Lack of evidence

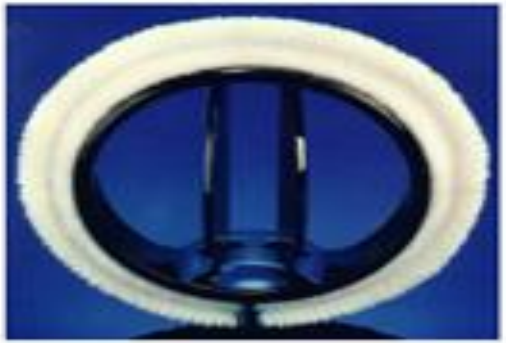
- A meta-analysis of 32 articles evaluated mortality from 15 mechanical and 23 biological valve series including 17,439 patients and 101, 819 patient-years of follow-up.

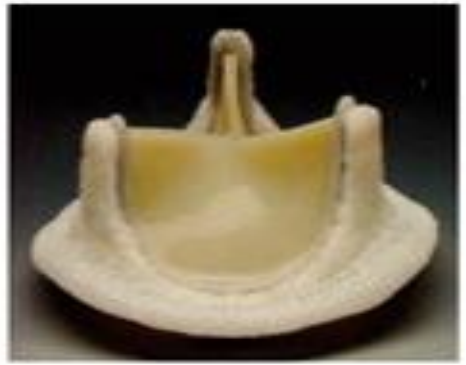
no difference in riskcorrected mortality between mechanical and bioprosthetic aortic valves regardless of patient age

choice between a tissue and mechanical valve should not be based on age alone.

- Lund O, Bland M. Risk-corrected impact of mechanical versus bioprosthetic valves on long-term mortality after aortic valve replacement. J Thorac Cardiovasc Surg. 2006;132:20 –26.





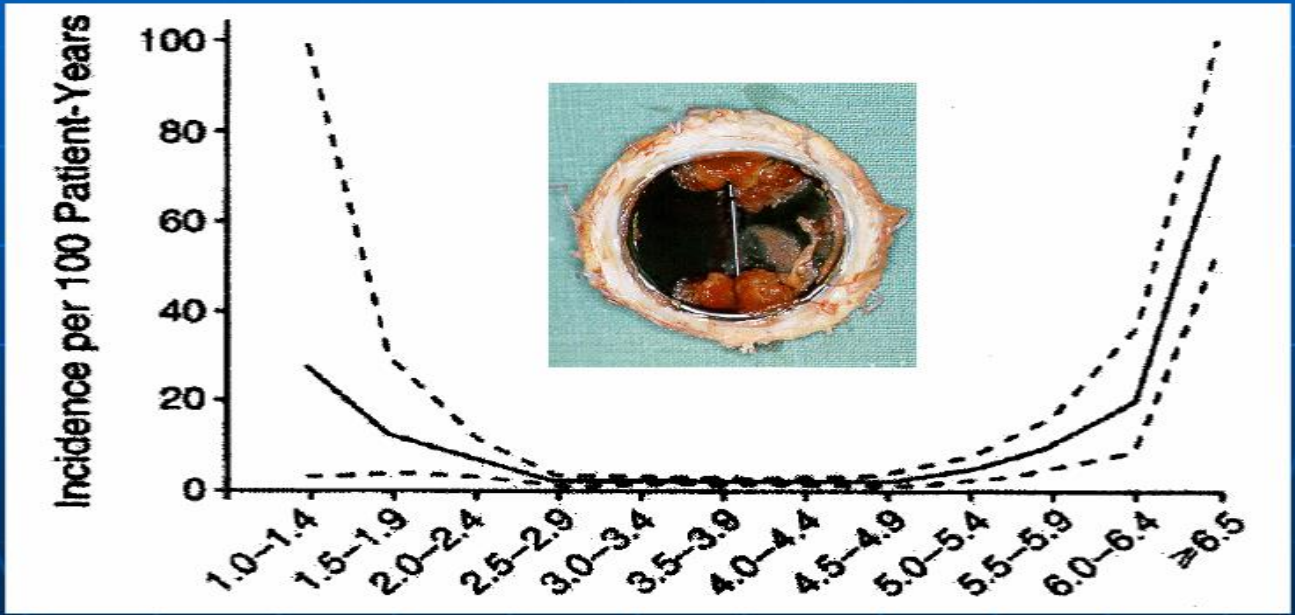


Why bioprosthesis

- Better fixation technique
- Better anticalcification technique
- Better long term result in newer generation valve
- Better surgical technique , redo less dangerous

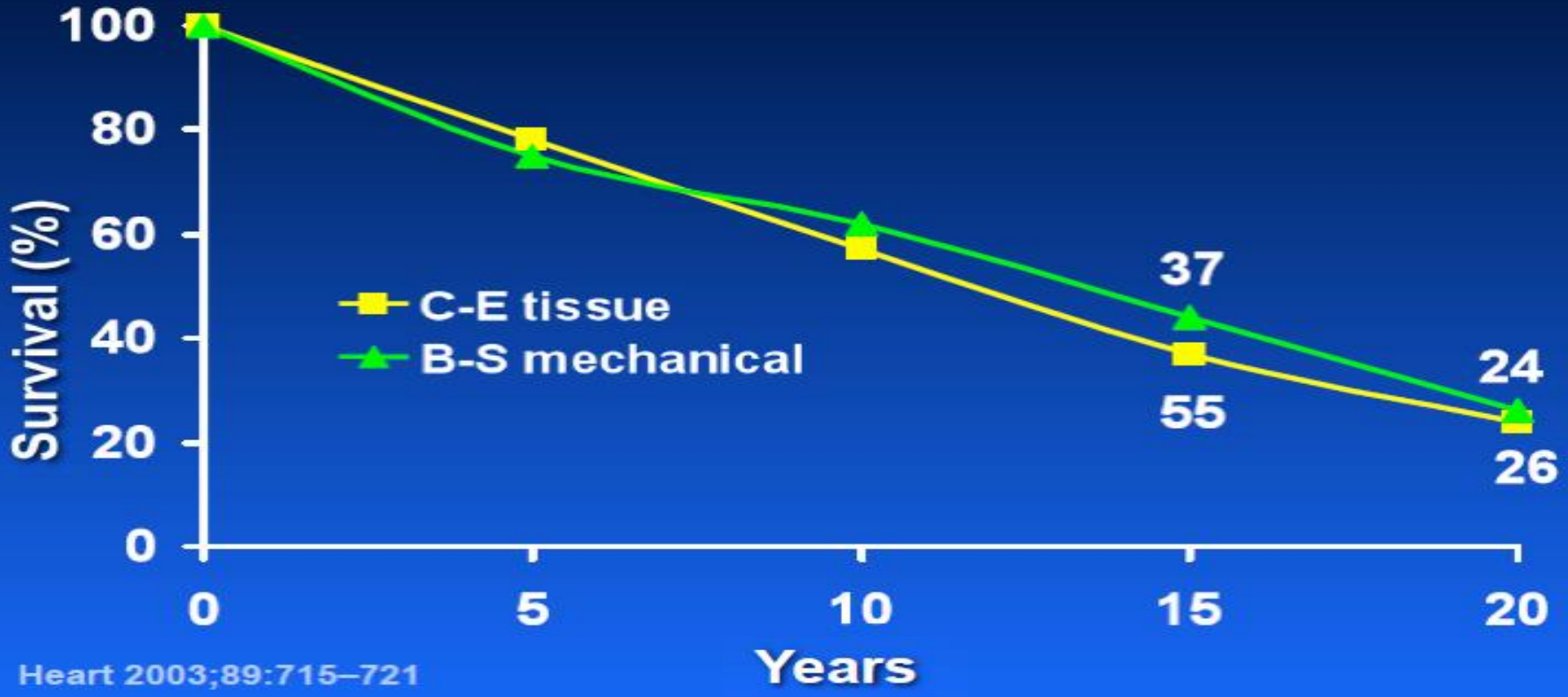
Adverse Events Are Common with Mechanical Valves

INR-Specific Incidence Of All Adverse Events



Cannegieter et al. N Engl J Med 1995;333:11

Edinburgh Valve Study
Oxenham et al.



Heart 2003;89:715–721