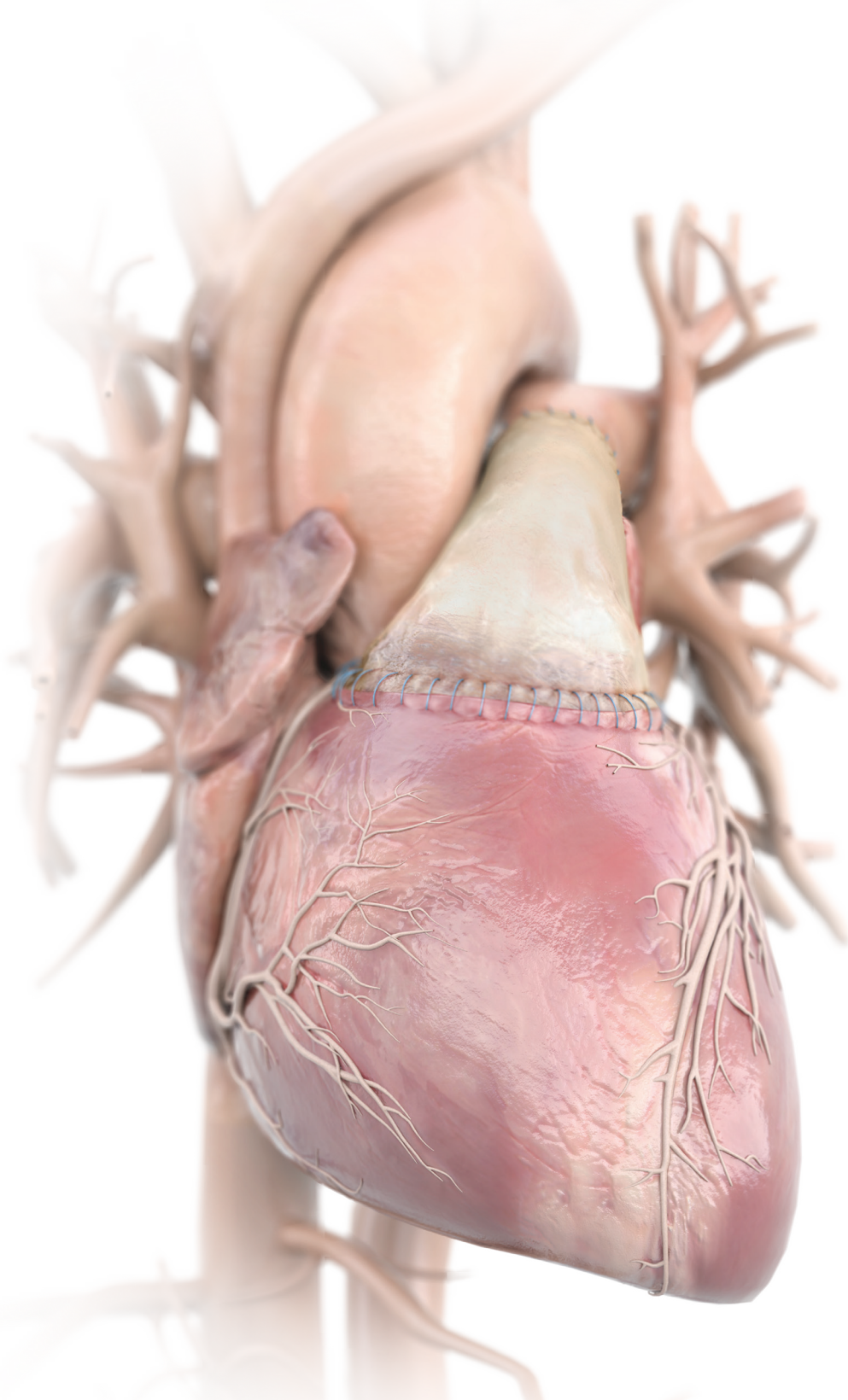


# Revival of the Ross Procedure

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The growing compendium of data confirms that the Ross procedure, a living valve substitute in the aortic position, provides optimal outcomes in young adults when performed safely and reproducibly in high volume centers. There is no other aortic valve replacement (AVR) option that provides near-normal root dynamics and valve performance, both at rest and with exercise, like the Ross procedure.<sup>1</sup> Additionally, in the challenging patient population of young adults with aortic valve disease, the Ross procedure provides significantly better long-term survival and freedom from valve-related reintervention compared to prosthetic AVR.<sup>1-3</sup>

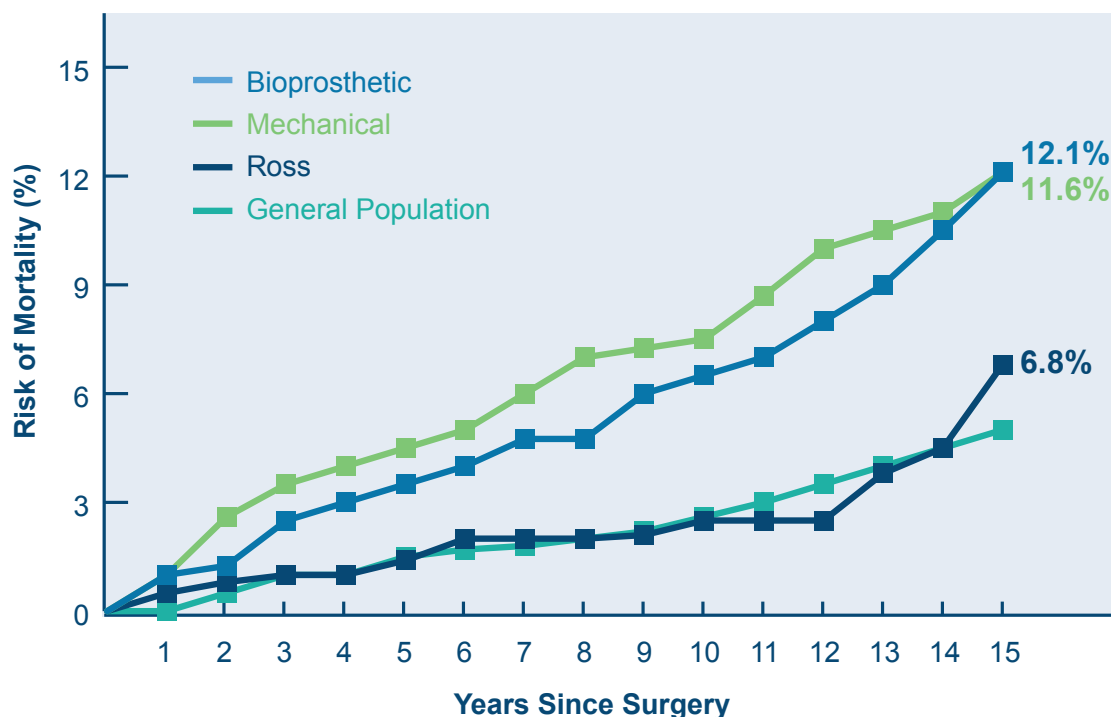
## Restored Survival in Young Patients

The Ross procedure consistently remains the only AVR option proven to restore patient survival to that of the age-matched and gender-matched population,<sup>1-3</sup> with recent publications providing long-term outcomes from 20- to 25-year follow-up periods.<sup>2,4-5</sup>

### Key Ross Survival Data Sets:

- A propensity-matched analysis with 434 patients in each cohort compared long-term outcomes after the Ross procedure to prosthetic aortic valve replacement in adults aged 18-50 years. Actuarial survival after the Ross procedure at 15 years was 93.1%.<sup>1</sup> (Figure 1)
- A statistical analysis of the long-term clinical outcome summaries from 9 contemporary Ross series including 4,327 patients with a mean age of 38.2 years indicates a mean survival at 15 years was 91.4%.<sup>3</sup>
- A cohort of 2,444 patients with a mean age of 44.1 years demonstrated actuarial survival at 25 years of 75.8% with no statistical difference from the general population.<sup>2</sup>

**Figure 1: Long-Term Cumulative Incidence of All-Cause Mortality Compared with the Matched U.S. General Population<sup>1</sup>**

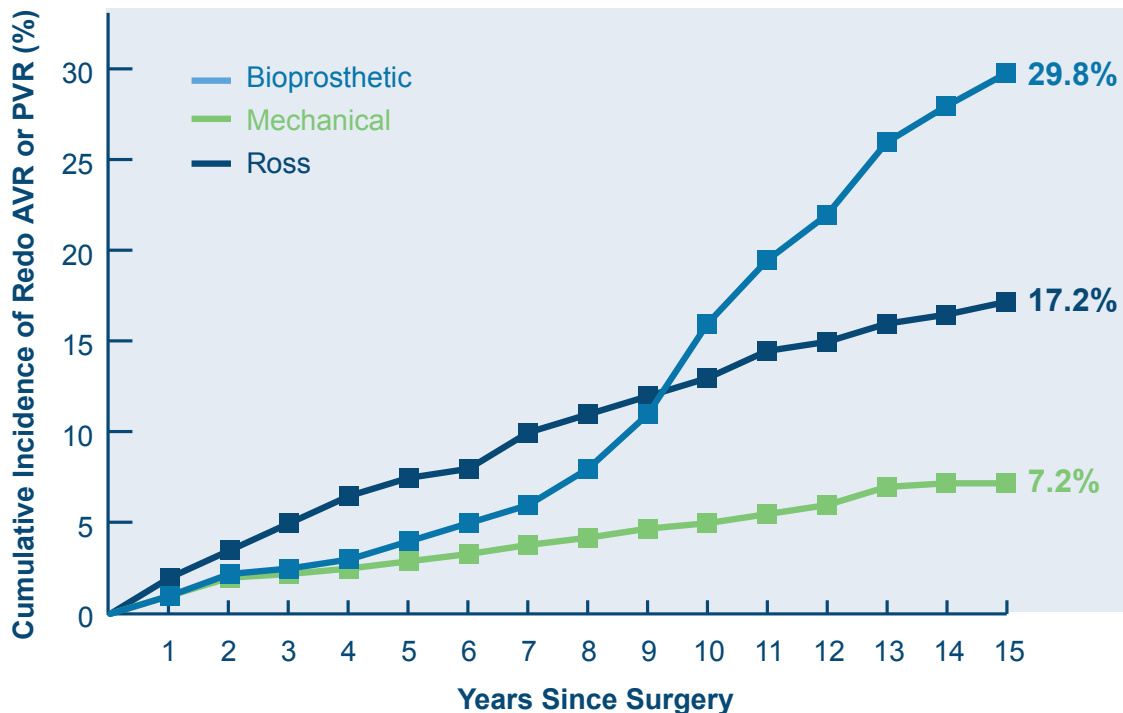


## Reduced Risk of Reintervention

As the use of bioprosthetic valves in young patients is increasing, so are the rates of structural valve deterioration and reoperation of those valves. Supporters of bioprosthetic valve use in young patients often criticize the Ross procedure by posturing that it turns aortic valve disease into double valve disease, thus increasing the risk of reoperation.

However, recent data disproves this criticism by demonstrating that the Ross procedure is associated with a significantly lower cumulative risk of reintervention for both the autograft and pulmonary homograft compared to bioprosthetic AVR.<sup>1,6</sup>

**Figure 2: Long-Term Cumulative Incidence of Any Aortic and/or Pulmonary Reoperation<sup>1</sup>**



### Key Ross Reintervention Data Sets:

- A multicenter cohort including 466 Ross procedure patients with a mean age of 47 years demonstrated the cumulative incidence of reintervention at 6 years was 3±1%. All patients received a decellularized cryopreserved pulmonary homograft (SynerGraft® Pulmonary Valve) and a total of 4 patients required reintervention: 3 for homograft stenosis and 1 for homograft endocarditis.<sup>7</sup>
- The risk for pulmonary homograft dysfunction proves to be greatest within the first 18-24 months following surgery, but systematic oversizing of the homograft and the use of decellularized cryopreserved pulmonary homograft has proven to mitigate the hemodynamic impact of homograft stenosis.<sup>1,3,7</sup> Optimal results are seen when the implanted homograft is larger than the pulmonary autograft, and rarely <25 mm in diameter.<sup>3</sup>
- At 15 years, the Ross procedure was associated with a lower cumulative risk of reintervention for both the autograft and pulmonary homograft, and lower risk of endocarditis than bioprosthetic AVR.<sup>1</sup> (Figure 2)
- Large contemporary series from 9 high volume Ross centers have demonstrated rates of freedom from Ross-related reintervention ranging from 75% to 94% at 15 years.<sup>3</sup>
- Long-term Ross procedure follow-up at 25 years presented 70.5% freedom from autograft reintervention and 74.3% freedom from right-ventricular outflow tract (RVOT) reintervention.<sup>2</sup>

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