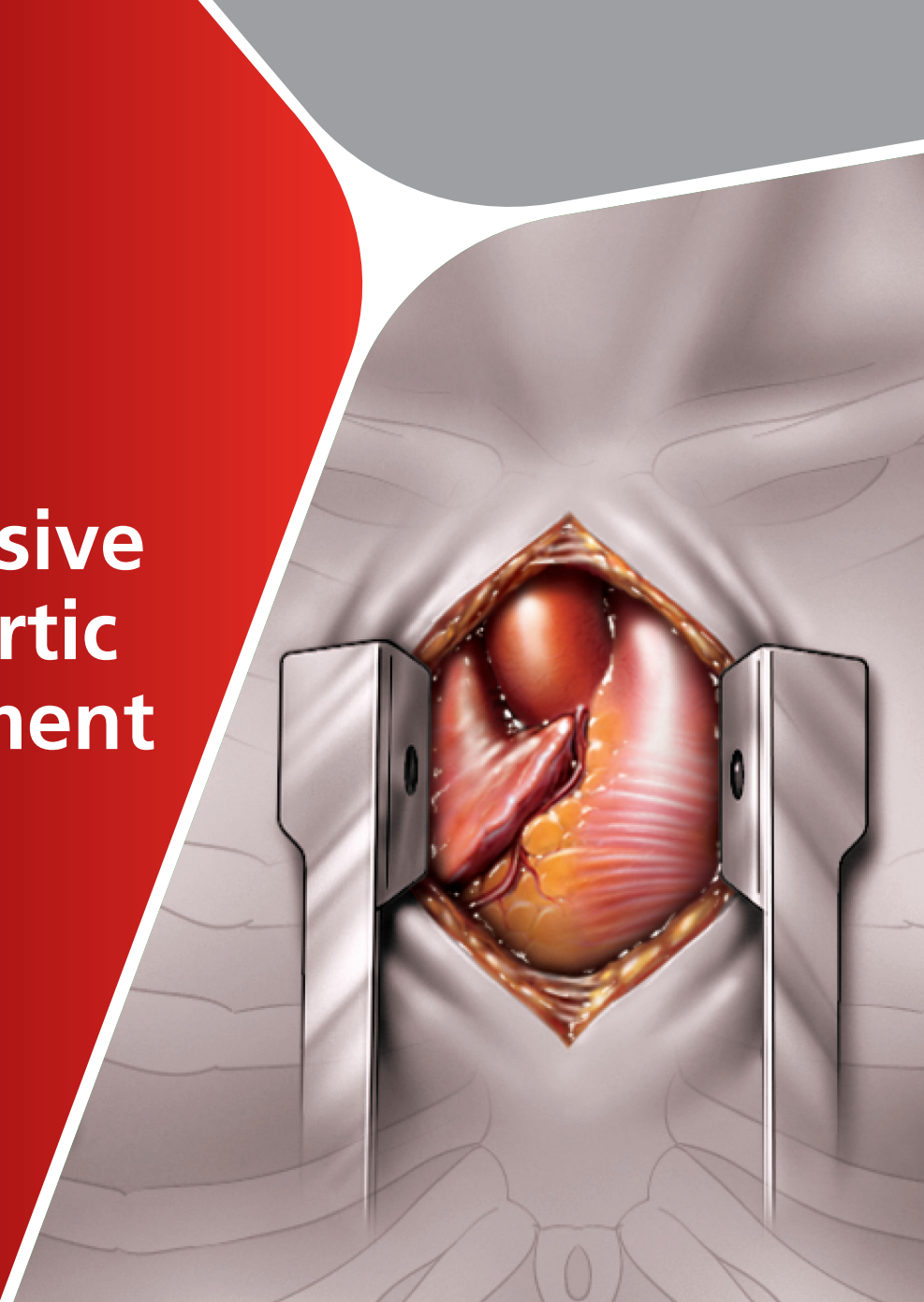


Minimally Invasive Surgery for Aortic Valve Replacement











MINIMISE
Coming together to improve MIS AVR



Aims of MIS

Minimally invasive surgery (MIS) for aortic valve replacement (AVR) aims to reduce “invasiveness” of surgery, while maintaining the same efficacy and safety of a conventional approach.¹ Compared to full sternotomy (FS), MIS for AVR aims to:

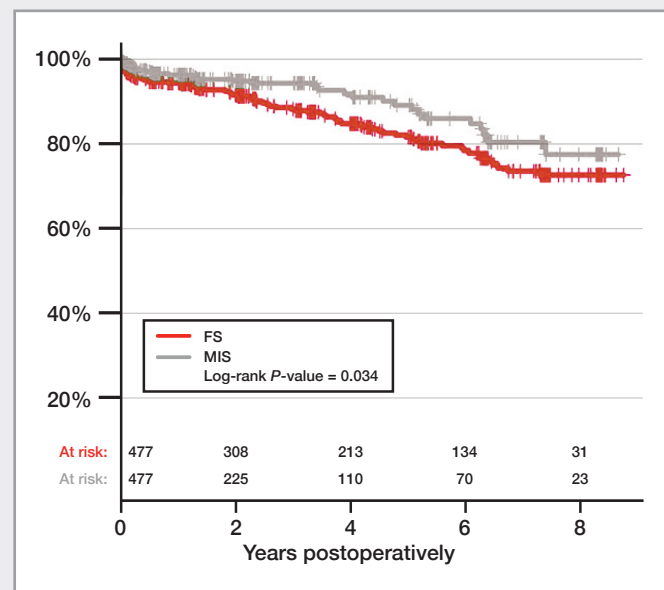
-  **Provide faster recovery**^{1,2}
-  **Reduce blood loss**¹
-  **Provide better aesthetics**^{2,3}
-  **Decrease morbidity**^{1,4}
-  **Decrease ventilation time**^{1,5}
-  **Reduce trauma**^{2,6}
-  **Decrease post-operative pain**^{1,2,6}
-  **Improve survival**⁷

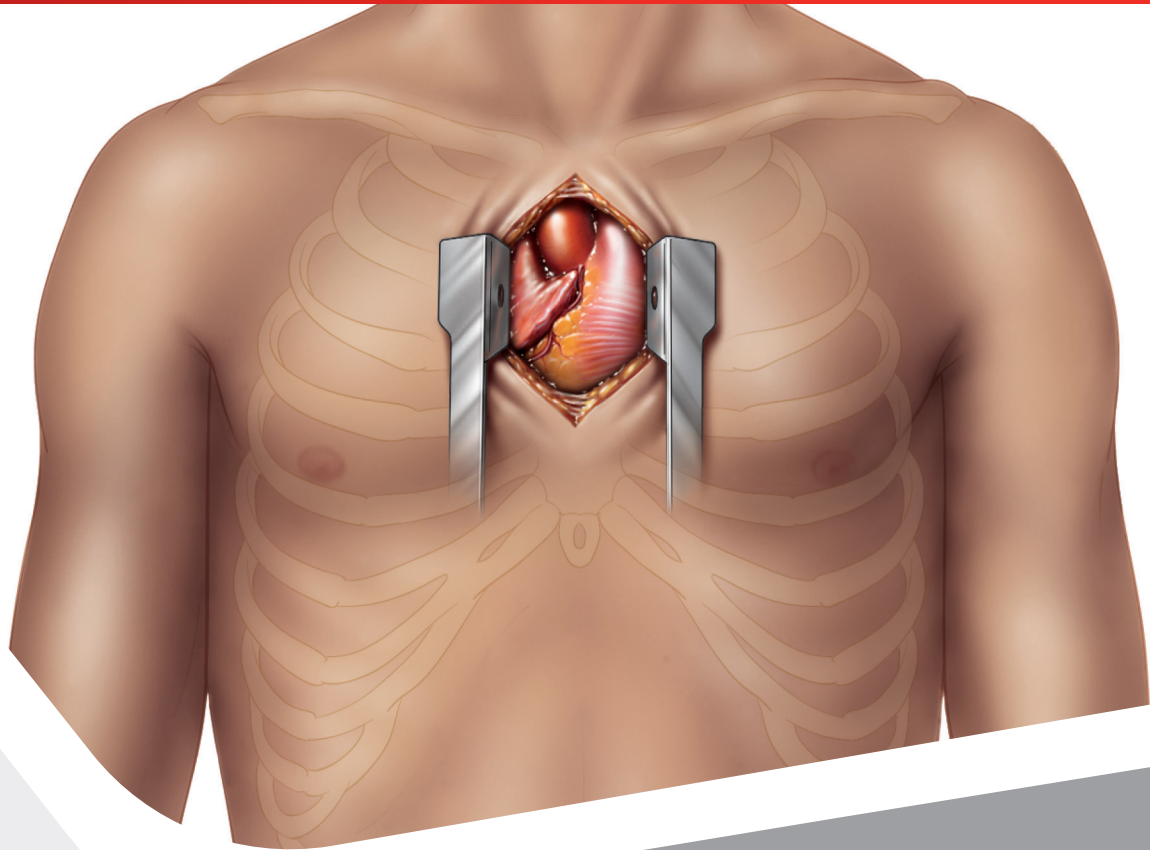
- As MIS is less invasive, it is particularly advantageous in patients with comorbidities such as obesity⁸ and COPD⁹, as it is important that these patients maintain chest wall continuity
- In recent years there has been a significant increase in patient demand for MIS⁹

Safety of MIS

- Clinical studies demonstrate comparable safety data for MIS and FS^{7,10,11}
- MIS shows superior safety results when considering:
 - Mortality
 - In a recent study of 954 propensity-matched patients, in-hospital mortality was reduced with MIS (0.4%) compared to FS (2.3%; $p=0.013$)⁷
 - MIS is also related to an increase in long-term survival in comparison to FS (Figure 1)⁷
 - Blood loss
 - A meta-analysis involving 4,586 patients showed an average of 79 ml less blood loss with MIS compared to FS¹¹
 - One study showed transfusions were needed in 20% of MIS compared to 27.9% of FS patients ($p\leq 0.003$)¹²

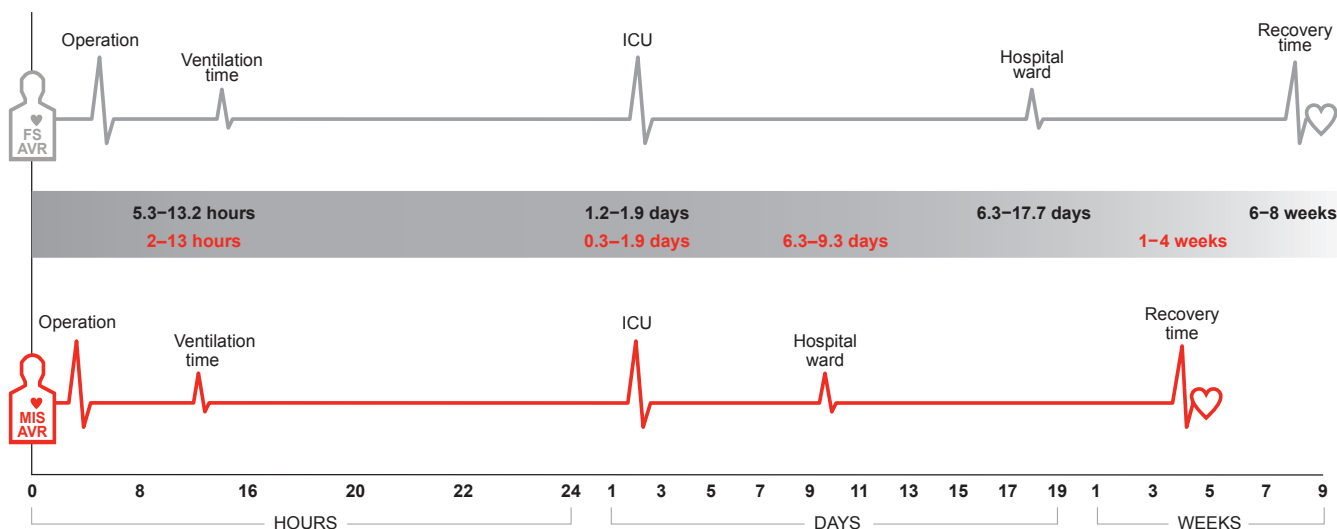
Figure 1: The long-term survival of 954 propensity-matched patients who underwent MIS for AVR⁷





Minimally invasive surgery for aortic valve replacement aims to reduce “invasiveness” of surgery, while maintaining the same efficacy and safety of a conventional approach¹

Patient timeline for minimally invasive surgery (MIS) compared to full sternotomy (FS)^{13,14}



Duration of ventilation mean difference = -1.56 hours (95% CI-3.48,0.36), p=0.11¹³

ICU stay mean difference = -0.57 days (-0.64,0.42), p=0.003¹³

Hospital ward stay mean difference = -2.03 days (-4.12,0.05), p=0.06¹³

Recovery time FS = 6-8 weeks compared with MIS = 1-4 weeks¹⁴

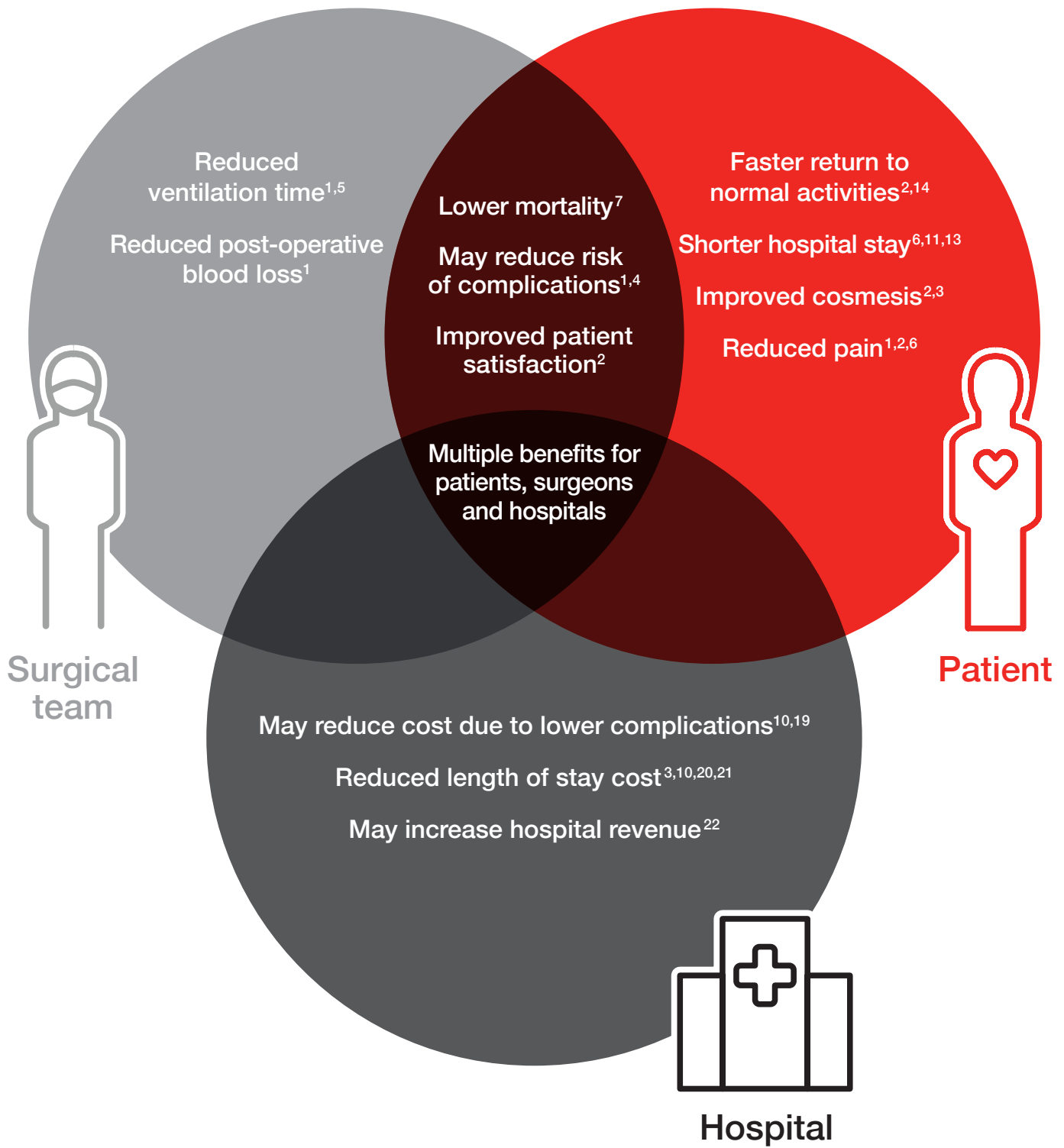
The above graph is a visual representation of the data referenced, with the longest time found in the literature for each point depicted. This does not represent a strict timeline for recovery from MIS and FS.

Consequently, patients who undergo MIS are likely to return to normal activities faster than people who undergo FS.^{13,14}

Key Considerations of MIS

- MIS is more complex and technically demanding than FS due to¹:
 - Deeper operative field
 - Limited working space for exposure and implantation of the valve
 - New equipment and methods
- MIS is associated with longer cross clamp times and longer cardiopulmonary bypass times, which can lead to increased mortality and complications^{15,16}
- MIS for AVR is associated with a learning curve¹¹
- Rapid deployment valves help to simplify the procedure of MIS. By decreasing the cross clamp and coronary bypass times, they help to overcome the limitations of the technique^{5,11,17,18}

Benefits of MIS



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