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A cost utility analysis of robotic versus open mitral valve repair in mitral valve regurgitation

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Objectives: For the first time this study carried out a cost-utility analysis comparing open surgical repair versus robotic minimally invasive surgical repair for Mitral Regurgitation. The respective benefits and costs of each treatment option gained from data in published literature have been analysed and subsequent suggestions for the allocation of resources and treatment recommendation will be offered.

Methods: The analysis was performed by including intraoperative and post-operative costs of the interventions and costs of the most prevalent complications associated with each operation. Thus, the Quality Adjusted Life Years (QALYs) calculated will guide the decision of resource allocation by assessing whether the added cost of robotic surgery is justified given the NICE (National Institute of Clinical Excellence) threshold of £30,000/QALY. The choice of perspective taken is through the lens of the British National Healthcare System.

Results: The Incremental cost-effectiveness ratio (ICER) calculated was £4781.44/QALY. This ICER shows that if robotic surgery was to become gold standard, the NHS would be paying £4781.44/QALY gained per patient. Considering robotic surgery is associated with fewer complications for patients but also has a cost per QALY below the NICE threshold of £30,000/QALY, it seems that this is a fitting alternative to open heart mitral valve repair. After a sensitivity analysis accounting for the initial robotic capital investment the ICER resulted to £22,379.94/QALY, still below NICE's threshold.

Conclusion: Our results have shown that robotic assisted minimally invasive repair of the mitral valve is a cost-effective option and can be implemented in the British national healthcare setting.