

Perioperative Myocardial Ischemia: Is perioperative troponin screening cost-effective?

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Background: About 300 million surgeries are performed worldwide annually and numbers are increasing constantly¹. Myocardial injury after non-cardiac surgery (MINS) defined as a troponin elevation within 30 days after surgery², is the most frequent vascular complication and it is strongly associated with 30-day mortality³. Without systematic perioperative troponin screening, most cases of MINS may go undetected⁴. However, little is known about the economic consequences of troponin screening after noncardiac surgery⁵.

Objective: To perform a cost-effectiveness analysis of a troponin screening program to identify patients in substantial risk of MINS after major non-cardiac surgery compared with the usual care (not screening).

Methods: Our model was structured as a short-term (30 days follow-up) analysis decision-tree considering troponin screening versus usual care from a third-party payer perspective. Effectiveness was estimated from the troponin screening program in the tertiary hospital (Hospital Sant Pau; 1,477 patients)⁶. Information about costs was obtained from the analytical accounting of the hospital. All costs were calculated and expressed in euros (€) 2021 value. We calculated the incremental cost-effectiveness ratio (ICER), defined as the expected cost per one additionally MINS detected. Model robustness was explored using deterministic and probabilistic sensitivity analysis

Results: In our study the ICER was € 276.79 per additionally MINS patient detected (Table1.). The deterministic sensitivity analysis showed that undetected MINS and MINS detected due to non-ischemic causes in the usual care alternative (false negatives and false positives in screening option, respectively) were the variables which influenced most ICER 's results. Probabilistic sensitivity analysis showed that troponin screening was the best alternative in 82.82% of the simulations, assuming as threshold the weighted average value of the cost of treating one MINS (2,761 €).

Conclusions: Results of our study support the importance of perioperative troponin screening for non-cardiac surgery patients and suggest that it is cost-effective. However, full economic evaluations, including a long-term horizon, are still needed for better understanding the efficiency of troponin screening.

Funding: This study was funded by a research grant by *Fundació La Marató de TV3* (20150110).

Table 1. Model results

	Direct medical Cost	Incremental Cost*	Cases of detected MINS	Incremental cases of MINS detected	Incremental cost per additional MINS detected (ICER)
Usual Care	678,491.56		24		
Troponin Screening	734,957.13	56,465.57	228	204	276.79

*2021 euros; MINS=Myocardial Injury after non-cardiac surgery.

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