

- Title** Primary Percutaneous Coronary Intervention (PCI) and Thrombolytic Therapy (Streptokinase and Tenecteplase) in Segment Elevation Myocardial Infarction (STEMI) and Economic Evaluation
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Aim
To assess the safety, efficacy or effectiveness of primary PCI compared with streptokinase (SK) and tenecteplase (TNK) in treatment of STEMI via systematic review of literature; to conduct a local economic evaluation.

Conclusions and results
High level of retrievable evidence:

Effectiveness
Primary PCI versus SK - significant improvement in total death, non-fatal reinfarction and combined outcome (death, reinfarction and stroke incidence) in patients who receive the procedure within less than 12 hours after the onset of the STEMI symptom; Primary PCI versus TNK - no significant difference in reducing death.

Safety:
No significant difference in incidence of stroke and bleeding either in primary PCI versus SK or TNK.

Organizational
Hospital stay reduced with primary PCI, and hospital readmission higher in SK patients compared with primary PCI.

Cost/ cost-effectiveness
PCI may reduce long term total cost compared with thrombolytic agent. No head to head cost-effectiveness study comparing primary PCI with SK or TNK

Local economic evaluation
The incremental cost-effectiveness ratio (ICER) for PCI compared to SK was RM 140,532.74 per QALY gained; considered to be not cost-effective strategy by Malaysia threshold (≤ 1 GDP per capita). The TNK was dominated by SK due to its higher cost. A one way sensitivity analysis found that the cost of PCI had the highest impact on ICER. Other variable that may affect the ICER was death with primary PCI treatment. The best case scenario which included 50% reduction of primary PCI cost, and 20% reduction in ward admission yielded a lower ICER; RM 60,652.96.

Recommendations (if any)
Primary PCI can be used however economic implication has to be taken into consideration. From the best case scenario, reducing the primary PCI cost up to 50% and 20% admission cost will lead to cost-saving.

Methods
Part A (Systematic Review of Literature)
Electronic databases were searched through Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1948 to present, and Embase 1996 to 17 July 2017. Searches were also run in PubMed, FDA website and INAHTA for any published reports. No limit in the study year. Google and Google Scholar were also used to search for additional web-based materials and information about the technology. Besides, additional articles were also search by reviewing the references of retrieval articles.

Part B (Economic Evaluation)
A decision tree model built using TreeAge Pro 2017 software 2017. This model was used to estimate the costs and utility effects for patients with STEMI treated with three reperfusion therapies comparing primary PCI with either streptokinase or tenecteplase. The model was chosen for its ability to analyse the cost incurred within a short time period (six months to one year). The structure of the model was developed by consultation with cardiologist. The decision tree model included five health states: alive, non-fatal myocardial infarction, heart failure, non-fatal stroke and dead. The data used were both extracted from published literature and adopted from local data available. Sensitivity analysis also conducted based on the baseline model and a few scenario analyses were generated.

Further research/reviews required
The economic evaluation model may be applied/ manipulated with local data as well as further analyzed with Markov model for long-term result.

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