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# Cost-benefit analysis of mechanical thrombectomy in India

## Background

Acute ischemic stroke imposes a heavy financial burden on the country's economic system. The aim was to account for the economic loss caused by stroke and to determine the cost benefit for the state's economy when investing in mechanical thrombectomy (MT).

## Method

The economic loss caused by stroke was assessed based on the human capital approach, measuring the loss of productivity due to premature mortality in patients with stroke, the morbidity of stroke survivors, and the informal care given by family members. Clinical and cost data were available from the published literature.

## Results

Around ₹200 000 can be saved by the state's economy in the first year per each patient when treated with MT. The ROI for the state's economy was 3, meaning that 3 rupee could be saved by every rupee invested in MT.

## Conclusion

Investing in MT results in a positive ROI and reduces the financial burden of the country's economic system. Specific policies are needed to enhance patient access to MT.

Content shown here is only applicable to the Asia Pacific region.



# Budget impact analysis of mechanical thrombectomy with stent-retrievers for acute ischemic stroke in Australia

## Background

Mechanical thrombectomy (MT) has been repeatedly found to be cost-effective in Australia and internationally, which means it is an efficient management option versus thrombolysis alone. Efficiency allows the decision-maker to be guided in the selection of a strategy for maximum collective benefit. As efficiency does not guarantee funding sustainability, a budgetary impact analysis was undertaken specifically for the Australian context.

## Method

A budget impact model was designed to project direct medical costs of IV-tPA+ MT with SR vs. IV-tPA alone over a five-year period from a healthcare perspective. Our model was created based on previously published Australian healthcare costs. Mid-term and long-term care costs were projected based on anticipated mRS (modified Rankin Scale) scores as reported in two major publications: the Hermes meta-analysis and the EXTEND-IA trial.

## Results

This analysis of the budget impacts of mechanical thrombectomy + thrombolysis, compared to thrombolysis alone, found that by treating 1,909 patients with MT in 2019, the Australian health system saved an estimated A\$9.6 million in that year alone. Over five years, an estimated A\$25.6 million will be saved for the same cohort of patients due to better patient outcomes leading to reduced long-term expenditure (ongoing rehabilitation, disability support and healthcare). If the number of patients treated with MT were to increase, so too would the savings. Modeling shows that treating 3,500 stroke patients with MT would deliver savings of A\$17.6 million in the first year alone, and A\$47 million over five years.

## Conclusion

Mechanical thrombectomy with stent-retrievers is an investment that provides significant cost-savings over time.

Content shown here is only applicable to the Asia Pacific region.



# Budget impact analysis of mechanical thrombectomy in the Netherlands

## Background

Health insurance often funds a limited number of mechanical thrombectomy (MT) procedures in a hospital. The objective was to provide economic evidence in order to increase the number of MT procedures reimbursed by health insurance.

## Method

A budget impact model was designed to assess direct medical costs of MT vs. medical therapy alone over a three-year period from a health insurance perspective. Specific DRGs were provided and healthcare costs were available from a Dutch publication.

## Results

MT was found to be a more economical option for the health insurance. When considering 70 additional patients treated in one year, the total cost savings was of 209,229€ after five years. The final cost savings of 510 patients treated over a three-year period was of 2,360,834€ after eight years.

## Conclusion

MT is a cost savings option for the health insurance. The higher procedure costs are offset by the subsequent lower healthcare costs. The cost savings allows an increase in the number of MT procedure reimbursed by the health insurance.

Content shown here is only applicable to the Europe/Middle East region.



# Budget impact analysis of mechanical thrombectomy with stent-retrievers for acute ischemic stroke in Madrid

## Background

The aim of this budget impact (BI) analysis was to demonstrate the economic sustainability of mechanical thrombectomy (MT) with stent-retrievers (SR) vs IV-tPA alone in the Community of Madrid (CAM) over a five-year period.

## Method

A BI model was designed to project direct medical costs of IV-tPA+ MT with SR vs. IV-tPA alone over a five-year period from a regional CAM perspective. Our model was created based on previously published Spanish healthcare costs. Acute, mid-term and long-term care costs were projected based on anticipated mRS (modified Rankin Scale) scores as reported in the REVASCAT trial.

## Results

MT was found to be a more economical option with annual savings starting at year 1. There were savings of 16% or approximately 75 million euros over five years utilizing the REVASCAT mRS repartition. Each time an MT procedure is performed, about 15,029€ per patient and per year are saved for the CAM regional healthcare system: most of this occurring during the second and third years, with savings of 23% and 18% respectively.

## Discussion

MT is the more economical option beginning in the first year. Our analysis suggests that over a five-year period, compared to treatment with IV-tPA alone, treating eligible stroke patients with mechanical thrombectomy with stent-retrievers will save the CAM up to 75 million euros or 15,029€ per patient and per year.

## Conclusion

Mechanical thrombectomy with stent-retrievers is an investment in Madrid's community health and provides significant cost-savings over time.

Content shown here is only applicable to the Europe/Middle East region.



# Budget impact analysis of the introduction of mechanical thrombectomy in the treatment of acute ischemic stroke in France

## Background

In 2015, the increase of mechanical thrombectomy (MT) techniques in the treatment of acute ischemic stroke (AIS) in France has raised the question of the cost of these technologies for payors. This study assessed the budgetary impact (BI) of MT with stent retriever (SR) in combination with intravenous thrombolysis (IVT) for eligible patients compared to IVT alone in the treatment of AIS in France.

## Method

A BI model was developed to estimate medical and non-medical costs of the combined strategy (IVT + MT with SR) compared to IVT alone over a five-year period for the French health insurance (HI). MT activity was estimated based on the previous years. Efficacy data were collected from the Hermès meta-analysis. Medical costs were obtained from the HI rate base and the literature on stroke-related costs in France. Non-medical costs such as disability pension (DP), daily sickness allowance (DSA), and constant attendance allowance (CAA) were collected from the French HI website and were estimated according to the disability level. A discount rate of 4% was applied. Costs were expressed in 2017 euros. The analysis was performed using Excel 2010.

## Results

A total of 21,622 MTs were estimated from 2015 to 2019. The annual BI was respectively \$14,001,507; \$12,513,143; \$3,358,746; \$-7,659,792; \$-20,587,671, from 2015 to 2019. The 5-year NBI was estimated at \$1,625,932 with a net benefit starting from the fourth year in favor of the MT with SR strategy. DP, DSA, CAA and follow-up medical costs were lower for the combined strategy. Sensitivity analysis showed that follow-up medical costs were the parameter that most influenced BI.

## Conclusion

This study showed that using MT with SR combined with IVT generates economic benefits for the French HI due to the reduction of follow-up medical costs and non-medical costs associated with disability.

Content shown here is only applicable to the Europe/Middle East region.



## Cost-benefit analysis in Brazil

### Background

Acute ischemic stroke imposes a heavy financial burden on a country's economic system. The aim was to determine the economic loss caused by stroke and to evaluate the cost benefit for the state's economy when investing in Mechanical Thrombectomy (MT).

### Method

The economic loss caused by stroke was assessed utilizing the human capital approach, measuring the loss of productivity due to premature mortality in patients with stroke, the morbidity of stroke survivors, and the informal care provided by family members. Clinical and cost data were available from the published literature.

### Results

The ROI for the state's economy was 4 (age of the stroke onset was 60 years old), therefore 4 \$BRL could be saved by every \$BRL invested in MT with SR

### Conclusion

Investing in MT results in a positive ROI and a reduction of financial burden on the country's economic system. Specific policies are needed to enhance patient access to MT.



Content shown here is only applicable to the South America region.

## Cost analysis FPE vs non-FPE

### Background

The first-pass effect (FPE) was described as a predictor of a good clinical outcome (captured by the mRS scale) in patients with acute ischemic stroke. The mRS score has direct consequences on stroke care and related medical expenses. The aim was to determine the cost implications of achieving FPE vs non-FPE.

### Method

A life-time model was developed for 4 European countries (France, Italy, Spain and the UK) adopting the healthcare perspective. Functional outcomes were derived from TRACK study and mortality based on unspecific death risk of EU general population and relative risk of dying according to mRS state. All costs were available from published literature and updated to 2018 Euro.

### Results

Within 90 days, achieving FPE vs. non-FPE resulted in a cost saving of 1,239€. In the long term, achieving FPE saves 21,164€ in patient life-time medical expenses, contributing with a 60% cost reduction on stroke care expenditure.

### Conclusion

FPE leads to short and long-term cost savings. Procedural strategies to achieve FPE should be considered in order to contribute to stroke care cost reduction.