PMD73

COST-EFFECTIVENESS OF MECHANICAL THROMBECTOMY USING STENT-RETRIEVER AFTER INTRAVENOUS T-PA COMPARED WITH INTRAVENOUS T-PA ALONE IN THE TREATMENT OF ACUTE ISCHEMIC STROKE DUE TO LARGE VESSEL OCCLUSION IN SPAIN

de Andrés-Nogales F[1], Álvarez M[2], de Miquel MÁ[3], Segura T[4], Gil A[5], Cardona P[3], Casado MÁ[1], Nogueira RG[6], Dávalos A[7].
[1]Pharmacoeconomics & Outcomes Research Iberia, Pozuelo de Alarcón (Madrid), Spain, [2] Health Economics & Outcomes Research, Medtronic Ibérica, S.A., Madrid, Spain, [3]Hospital Univeritari de Bellvitge, L'Hospitalet de Llobregat, Spain, [4]Complejo Hospitalario Universitario de Albacete, Albacete, Spain, [5]Hospital Universitario de Cruces, Barakaldo, Spain, [6]Emory University School of Medicine, Atlanta, GA, USA, [7]Hospital Universitari Germans Trias i Pujol, Badalona, Spain.

OBJECTIVE

To assess the cost-effectiveness of **stent-retriever mechanical thrombectomy after intravenous tissue plasminogen activator (IV t-PA) compared with IV t-PA alone** in acute ischemic stroke patients with confirmed occlusions in the proximal anterior intracranial circulation and absence of large ischemic core lesions in Spain.

METHODS

- A **Markov state transition model** was developed to estimate health outcomes expressed as life years gained (LYG) and quality adjusted life years (QALY), and costs over **patients' lifetime.**
- It included **7 health states defined by the modified Rankin scale (mRS)** (0, no symptoms; 6, death)
- The model was divided in an **acute phase** (stroke onset-90 days) and a **rest-of-life phase** (90 days-death). Treatment effect occurred in the acute phase (Figure 1).
- **Patients' characteristics and clinical effectiveness** (mRS at 90 days) were obtained from SWIFT PRIME clinical trial[1].
- **Adverse events rates** were obtained from REVASCAT study[2].
- Annual **recurrence rates** were applied to the rest-of-life phase: 4.91% (90 days-1 year) and 2.01% (1 year-death)[3].
- **Utility values** were obtained from the Oxford Vascular Study[4].
- A **Spanish National Health System perspective** was considered.
- An **annual discount rate of 3%** was applied to costs and health outcomes[5].
- **Direct costs (€, 2016)** included acute and long-term management, treatment (mechanical thrombectomy, IV t-PA and non-thrombolytic treatment) and adverse event management. Alternative scenarios also considered formal care (nursing/residential care costs) (Table 1).
- **Resource utilization and costs** were obtained from available published data and endorsed by an expert panel[6-10].
- **Deterministic and probabilistic sensitivity analyses** were performed to examine the robustness of the results.

Figure 1. Markov model structure

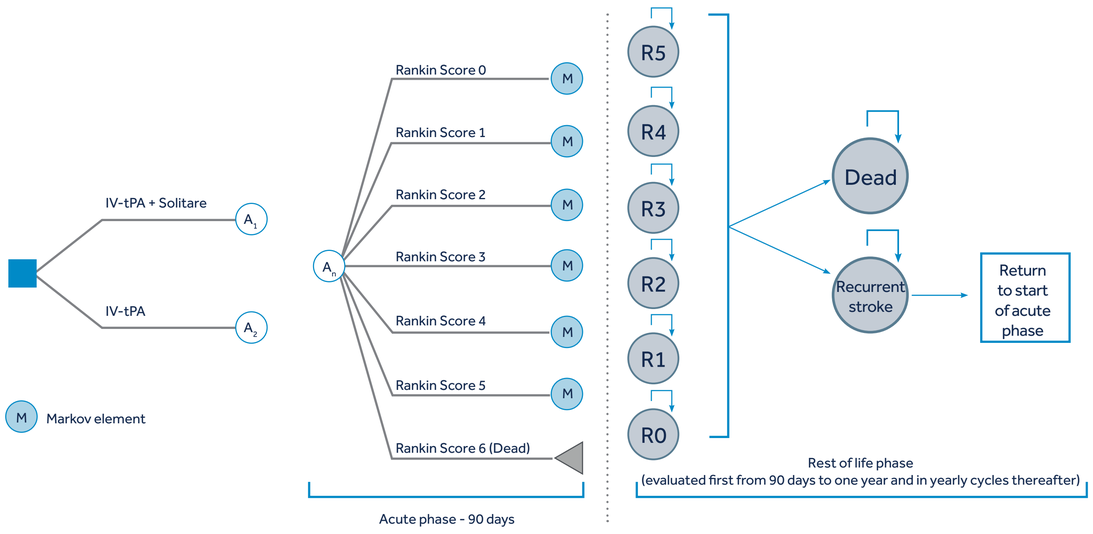


Table 1. Direct costs of acute ischemic stroke

ACUTE AND LONG-TERM COSTS			
	Acute care costs[6]	Long-term costs[6]	Formal care costs[7]
mRS 0	€4,563.00	€1,296.00	€1,380.06
mRS 1	€5,070.00	€1,440.00	€1,533.40
mRS 2	€5,577.00	€1,584.00	€1,686.74
mRS 3	€6,255.90	€22,485.60	€9,488.60
mRS 4	€6,951.00	€24,984.00	€26,601.30
mRS 5	€7,646.10	€27,482.40	€37,701.40
mRS 6	€3,912.75[8]	-	-
TREATMENT COSTS[9,10]			
Mechanical Thrombectomy			€7,026.17
IV t-PA thrombolysis			€1,029.98
Non-thrombolytic treatment			€624.50
ADVERSE EVENT MANAGEMENT COSTS[9,10]			
Symptomatic intracranial hemorrhage			€15,500.02
Malignant cerebral edema requiring hemicraniectomy			€15,971.13

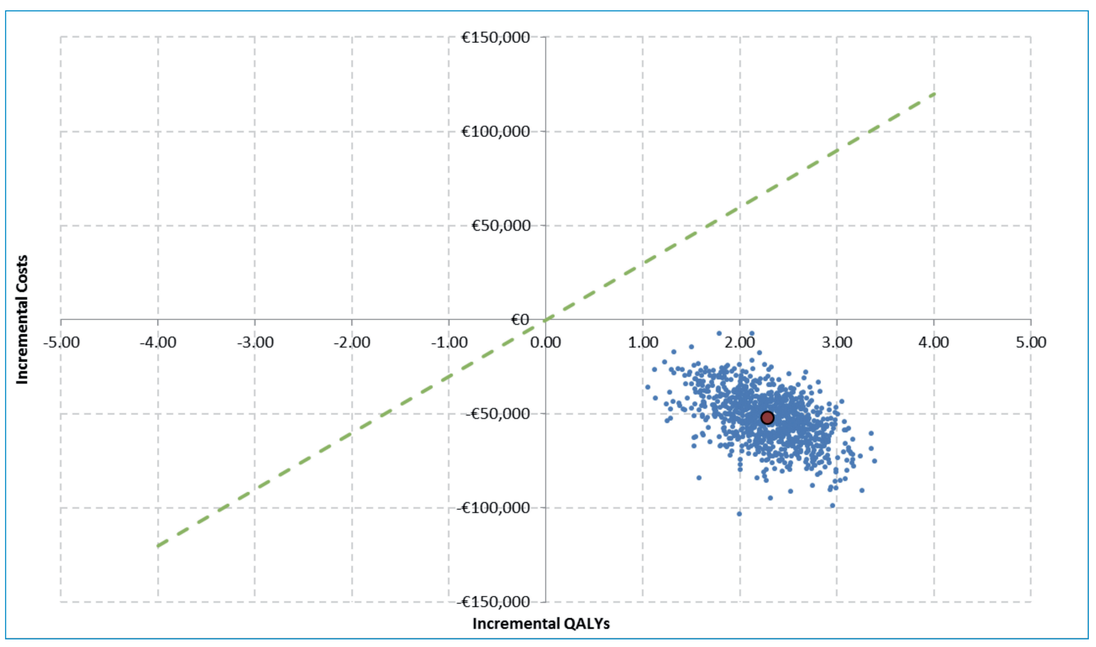
RESULTS

- Mechanical thrombectomy after IV t-PA resulted in a **more effective and less costly therapy** than IV t-PA alone over patients' lifetime (base case scenario).
- **In alternative scenarios** with time horizons ≥ 2 years, the combined therapy was considered dominant versus IV t-PA, whether including or not formal care costs.
- Considering 1-year time horizon, mechanical thrombectomy plus IV t-PA led to an **ICUR of €15,044/QALY** gained versus IV t-PA alone, whilst it resulted in a **dominant alternative** when formal care costs were included.
- Starting age, utility values, discount rate and relative risk of dying were the analysis key drivers (Deterministic Sensitivity Analysis).
- Probabilistic analysis showed **the combined therapy was dominant in 100% of the 1,000 simulations performed** (Figure 2).

Table 2. Cost-effectiveness analysis results

	Solitaire + IV t-PA	IV t-PA	Incremental value
COSTS			
Treatment costs	€8,428	€1,606	€6,822
Adverse events costs	€743.83	€1,195.46	-€451.63
Acute management costs	€5,630	€6,083	-€453
Long term management costs	€105,624	€157,668	-€52,044
Stroke recurrence costs	€3,441	€1,691	€1,749
TOTAL COST	**€123,866**	**€168,244**	**-€44,378**
HEALTH RESULTS			
Total QALYs gained	7.62	5.11	2.51
LYG	11.708	10.536	1.172
ICUR (Incremental Cost-Utility Ratio)	**Dominant**		
Net monetary benefit (NMB)	**€119,744 (threshold €30,000/QALY)[11]**		

Figure 2. Cost-effectiveness plane (Probabilistic Sensitivity Analysis)



CONCLUSION

Stent-retriever thrombectomy after IV t-PA resulted in a dominant alternative (less costly, more effective) versus IV t-PA alone for the treatment of acute ischemic stroke from the Spanish National Health System perspective.

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