

Italian Health Economics Association (AIES)
23rd Annual Conference
National Healthcare Systems and universal coverage:
are they still feasible?
Lessons learned and challenges ahead after 70 years of the British NHS
and 40 years of the Italian NHS
Napoli, 27-29 September 2018

Authors:

Elena Pizzo*- Senior Research Associate, Department of Applied Health Research, University College London (Role: Presenter)

Maureen Dumba, Imaging Department, Imperial College Healthcare NHS Trust, Charing Cross Hospital, Fulham Palace Road, London W6 8RF, UK

Kyriakos Lobotesis, Imaging Department, Imperial College Healthcare NHS Trust, Charing Cross Hospital, Fulham Palace Road, London W6 8RF, UK

Corresponding author: Dr Elena Pizzo, Senior Research Associate. Email:

e.pizzo@ucl.ac.uk Department of Applied Health Research, UCL, 1-19 Torrington Place, London, WC1E7HB Tel. +442031083250

Topic of paper: Health Technology Assessment, Population health management

Presentation format: oral session

Abstract Title: Cost-utility analysis of endovascular thrombectomy between 6 and 24 hours in acute ischemic stroke

Background: Stroke is a global health issue and continues to be a leading cause of morbidity and mortality worldwide, including complex disabilities (Feigen et al, 2013, Adamson 2004). In recent years, mechanical thrombectomy has been proven to be safe and effective in the management of ischaemic stroke within 6 hours of symptom onset (NICE, 2016). Recently published evidence (Ganesalingam, Pizzo et al., 2015) has shown it is also cost-effective. There was limited information on the safety and efficacy of thrombectomy performed beyond 6 hours, but two prospective randomised controlled trials - DAWN and DEFUSE 3 - (Nogueira, 2018; Albers, 2018) have recently demonstrated that endovascular thrombectomy performed 6 to 16 hours (DEFUSE 3 trial) and 6 to 24 hours (DAWN trial) after stroke onset resulted in better functional outcomes at 90 days than standard medical therapy alone. Previous economic evaluations of thrombectomy has been undertaken in the UK (Ganesalingam et al., 2015) based on the assumption that the intervention was performed within 6 hours, but there is awareness that this may not occur.

Objectives: Aim of this study was to model the cost-utility of mechanical thrombectomy in the hyperacute management of stroke with symptom onset between 6 and 24 hours in the UK, based on the results of these two recently published randomised control trials.

Methodology: A cost-utility analysis of mechanical thrombectomy compared to medical treatment was performed using a Markov model that estimates expected costs and outcomes in 20 year time horizon, adopting the UK National Health Service (NHS) and personal social services (PSS) perspective. The model was populated using available evidence and data from published sources. We present the results of 3 models using the effectiveness results of the DEFUSE 3 and DAWN trial. Effectiveness is measures in quality-adjusted life years QALYs. Costs were calculated in 2017 UK£, inflated where necessary. Both costs and outcomes incurring after the first year were discounted at an annual rate of 3.5%. Extensive sensitivity analysis has been performed to control for uncertainty in the parameter values used. A probabilistic sensitivity analysis is run to explore impact of uncertainty on the findings.

Results: Mechanical thrombectomy performed between 6 and 24 hours from acute stroke is still cost-effective. Over 20 year period the incremental cost per (QALY) of mechanical thrombectomy was \$1,564 (£1,219) when performed after 12 hours from onset, \$5,253 (£4,096) after 16 hours and \$3,712 (£2,894) after 24 hours. The probabilistic sensitivity analysis demonstrated that thrombectomy had a 99.9% probability of being cost-effective at the minimum willingness to pay for a QALY commonly used in UK.

The results of this study demonstrate that performing mechanical thrombectomy up to 24 hours from acute ischemic stroke symptom onset is still cost-effective, suggesting that this intervention could be implemented by the NHS on the basis of improvement in quality of life as well as economics grounds.

The study doesn't take into account the costs for society of the disability following the stroke. Generally these costs represent a huge burden for caregivers and society in terms of rehabilitation and productivity losses that, if taken into account, would provide even better results.

