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# Functional Outcomes of Patients Experiencing Pre-Hospital Thrombolysis in a Mobile Stroke Treatment Unit Compared With Conventional Care

The Lancet

1 Expert Comment

## TAKE-HOME MESSAGE

- The authors evaluated 305 patients treated in a mobile stroke treatment unit (STEMO) vs 353 treated conventionally (ambulance and in-hospital care) to compare 3-month functional outcomes after intravenous thrombolysis in the setting of acute ischemia. The primary outcome was the proportion of patients living at home without assistance before a stroke who had a modified Rankin Scale score of 1 or less. Adjusted odds ratio for the primary outcome for STEMO care compared with conventional care was not significant (aOR, 1.4;  $P = .052$ ); nor did intracranial hemorrhage and 7-day mortality differ significantly between the groups.
- Continued research is needed in larger studies to determine if a mobile treatment unit could improve patient outcomes for stroke.

## ♥ Cardiology

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Prehospital treatment of stroke, based on use of a specialized ambulance (originally termed “Mobile Stroke Unit”) that includes imaging, point-of-care laboratory, and telemedicine connection to the hospital was proposed in 2003,<sup>1</sup> first reported in 2010,<sup>2</sup> and followed by a randomized study in 2012.<sup>3</sup> Here, Kunz et al present interesting results of a recent registry study conducted in Berlin on 3-month outcomes of stroke patients receiving tissue plasminogen activator. Patients were included in the years from 2011 to 2015; thus, in part also participating in two earlier published studies, the PHANTOM-S study (May 1, 2011, to January 31, 2013)<sup>4</sup> and a further pilot study (February 5 to April 30, 2011).<sup>5</sup>

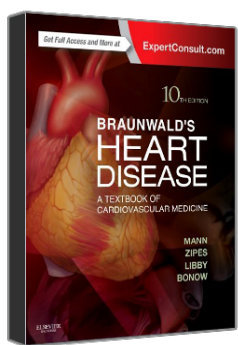
The authors compared 305 patients included in the mobile stroke unit arm with 353 included in the conventional arm. The results of this registry study failed to show a significantly improved 3-month outcome, as 161 (53%) in the intervention group versus 166 (47%) in the conventional care group had an mRS score of 1 or lower ( $P = .14$ ). However, both dichotomized secondary outcomes (mRS score 0–3 and mortality) were significantly more favorable in patients in the intervention cohort than in the conventional care group.

Together, this study not only corroborates the enormous time gain associated with use of this novel strategy but showed that it might improve clinical outcomes, consistent with the authors’ own earlier findings in the PHANTOM-S trial,<sup>6</sup> showing that patients who received intravenous thrombolysis within the first 60 minutes from stroke onset were more likely to be discharged to home from the hospital.

This study indicates the need for further research on this topic. Indeed, further multicenter randomized trials such as the BEST-MSU trial at Baylor may ultimately clarify the question regarding clinical efficacy of this concept.

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## Abstract

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## BACKGROUND

Specialised CT-equipped mobile stroke treatment units shorten time to intravenous thrombolysis in acute ischaemic stroke by starting treatment before hospital admission; however, direct effects of pre-hospital thrombolysis on clinical outcomes have not been shown. We aimed to compare 3-month functional outcomes after intravenous thrombolysis in patients with acute ischaemic who had received emergency mobile care or and conventional care.

## METHODS

In this observational registry study, patients with ischaemic stroke received intravenous thrombolysis (alteplase) either within a stroke emergency mobile (STEMO) vehicle (pre-hospital care covering 1·3 million inhabitants of Berlin) or within conventional care (normal ambulances and in-hospital care at the Charité Campus Benjamin Franklin in Berlin). Patient data on treatment, outcome, and demographics were documented in STEMO (pre-hospital) or conventional care (in-hospital) registries. The primary outcome was the proportion of patients who had lived at home without assistance before stroke and had a 3-month modified Rankin Scale (mRS) score of 1 or lower. Our multivariable logistic regression was adjusted for demographics, comorbidities, and stroke severity.

## FINDINGS

Between Feb 5, 2011, and March 5, 2015, 427 patients were treated within the STEMO vehicle and their data were entered into a pre-hospital registry. 505 patients received conventional care and their data were entered into an in-hospital thrombolysis registry. Of these, 305 patients in the STEMO group and 353 in the conventional care group met inclusion criteria and were included in the analysis. 161 (53%) patients in the STEMO group versus 166 (47%) in the conventional care group had an mRS score of 1 or lower ( $p=0\cdot14$ ). Compared with conventional care, adjusted odds ratios (ORs) for STEMO care for the primary outcome (OR 1·40, 95% CI 1·00–1·97;  $p=0\cdot052$ ) were not significant. Intracranial haemorrhage ( $p=0\cdot27$ ) and 7-day mortality ( $p=0\cdot23$ ) did not differ significantly between treatment groups.

## INTERPRETATION

We found no significant difference between the proportion of patients with a mRS score of 1 or lower receiving STEMO care compared with conventional care. However, our results suggest that pre-hospital start of intravenous thrombolysis might lead to improved functional outcome in patients. This evidence requires substantiation in future large-scale trials.

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## Additional Info

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Disclosure statements are available on the authors' profiles:

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