Supplemental Methods

The aim of this retrospective study was to analyze the triage concept of performing thrombectomy at external hospitals (EXT) and to compare it to the Drip and Ship (DS) concept. To this day, four stroke networks have published data on EXT: Heidelberg University Hospital in Heidelberg/Germany, Mount Sinai Health Systems in New York/USA, University Hospital of Hamburg-Eppendorf in Hamburg/Germany and the Hokkaido University in Sapporo/Japan. These four stroke networks have formed the EndoVascular thrombEctomy in Referring and External STroke centers (EVEREST) collaboration. Each stroke networks was asked to provide their published data on EXT for a pooled analysis.

The Department of Neurosurgery at Icahn School of Medicine at Mount Sinai in New York City provides thrombectomy service at the comprehensive stroke center (CSC) of the Mount Sinai Health System and at thrombectomy-capable stroke centers (TSCs) in the metropolitan area of New York City. They use a car or public transportation for transferring their neurointerventionalists. For this pooled analysis, they provided pseudonymized data of 228 patients treated between 2016 and 2018 from a prospective observational study comparing MS, DS, and EXT in New York City.[1] Inclusion criterion of their study was thrombectomy at a CSC or TSCs in New York City. Exclusion criteria were baseline mRS>2, an inpatient status at time of stroke onset, fluctuating exams leading to delayed decision-making for thrombectomy, or transfer from hospitals outside of a 20-mile radius.

The Department of Neuroradiology at Heidelberg University provides thrombectomy service at the CSC of the Heidelberg University Hospital, Germany, and at TSCs in the surrounding region with a travel time up to one hour. They use a car or a taxi for transferring their neurointerventionalists. They provided data of two studies. One of them was a retrospective study comparing DS and EXT with 126 patients treated between 2012 and 2016.[2] In the EXT group, inclusion criterion was admission to a TSC (distance of about 100 km between TSC and CSC) for thrombectomy due to anterior circulation stroke was the

inclusion criterion. In the DS group, inclusion criterion was transfer from a primary stroke center to the CSC (distance of at least 70 km) for thrombectomy due to anterior circulation stroke.

Moreover, Heidelberg University Hospital also provided data of a prospective observational study comparing MS, DS, and EXT, which they conducted with the University Hospital Hamburg-Eppendorf. In this bi-center study, 440 patients treated in 2018 were analyzed.[3,4] Inclusion criteria were thrombectomy due to intracranial or extracranial arterial occlusion, age>18, and life expectancy of at least 3 months. Exclusion criteria were pre-existing neurological or psychiatric disease, vascular disease preventing, or impeding thrombectomy.

The Department of Neuroradiology at the University of Hamburg-Eppendorf provides thrombectomy service at the CSC in Hamburg/Germany and at TSCs around Hamburg with a travel time of about one hour. They use a taxi for transferring their neurointerventionalists. They provided data of a retrospective study comparing DS and EXT (n=74).[5] Inclusion criterion was admission to a TSC with large vessel occlusion with the intention to perform thrombectomy either at a TSC or CSC. Exclusion criterion was relevant infarct growth.

The Department of Neurosurgery at Hokkaido University provides thrombectomy service at two CSCs in Sapporo, Japan and at TSCs in the region around Sapporo with a travel time up to one hour. They use a car or a taxi for transferring their neurointerventionalists. Hokkaido University published a retrospective study on 122 patients in the EXT triage concept at six TSCs.[6] However, three TSCs left the stroke network in the meanwhile. Therefore, only data of the three remaining TSCs (n=67) could be included in the present pooled analysis. For this pooled analysis, Hokkaido University provided additional data of another 66 EXT patients treated after publication of that study until December 2019. Hence, in total 133 patients (all EXT) were included from the Hokkaido stroke network.

The geography of the participating stroke networks is presented in the Supplemental Figures I-IV. Further details can be found in the original papers.

References

1 Morey JR, Oxley TJ, Wei D, et al. Mobile Interventional Stroke Team Model Improves Early Outcomes in Large Vessel Occlusion Stroke: The NYC MIST Trial. Stroke 2020;51:3495–503. doi:10.1161/STROKEAHA.120.030248

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3 Seker F, Fiehler J, Möhlenbruch MA, et al. Time Metrics to Endovascular Thrombectomy in 3 Triage Concepts: A Prospective, Observational Study (NEUROSQUAD). Stroke 2020;51:335–7. doi:10.1161/STROKEAHA.119.027050

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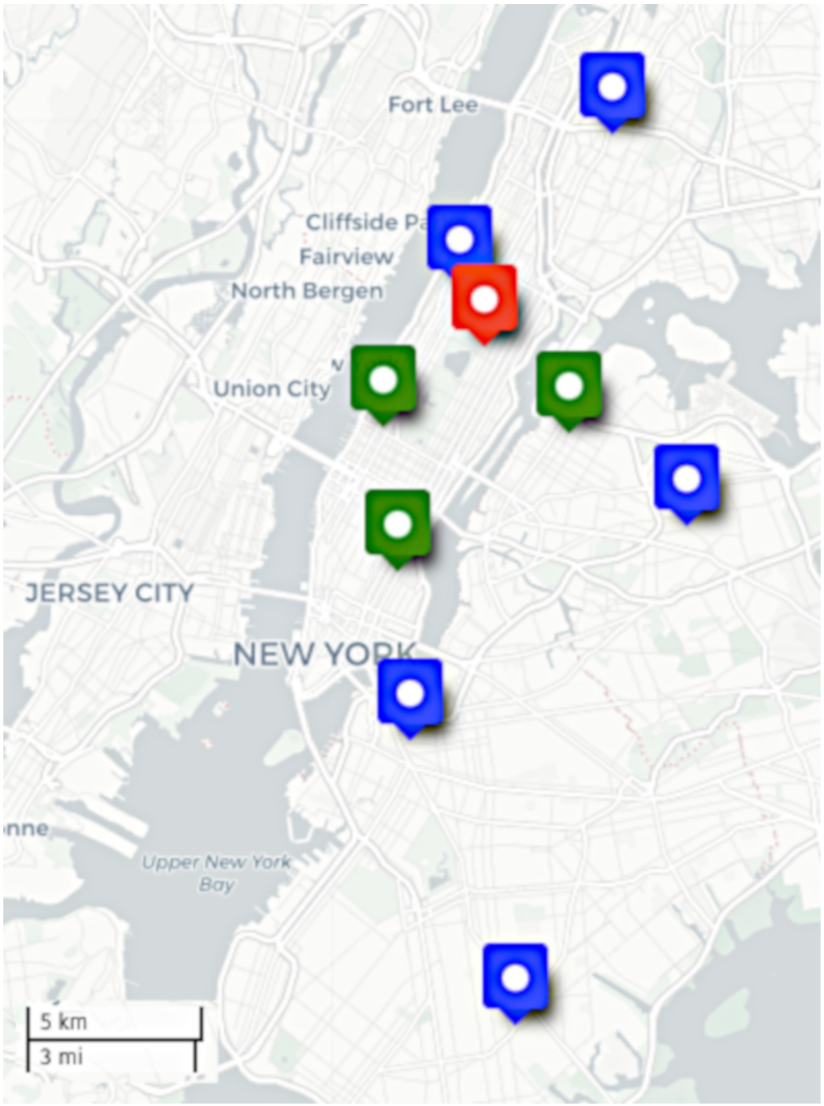
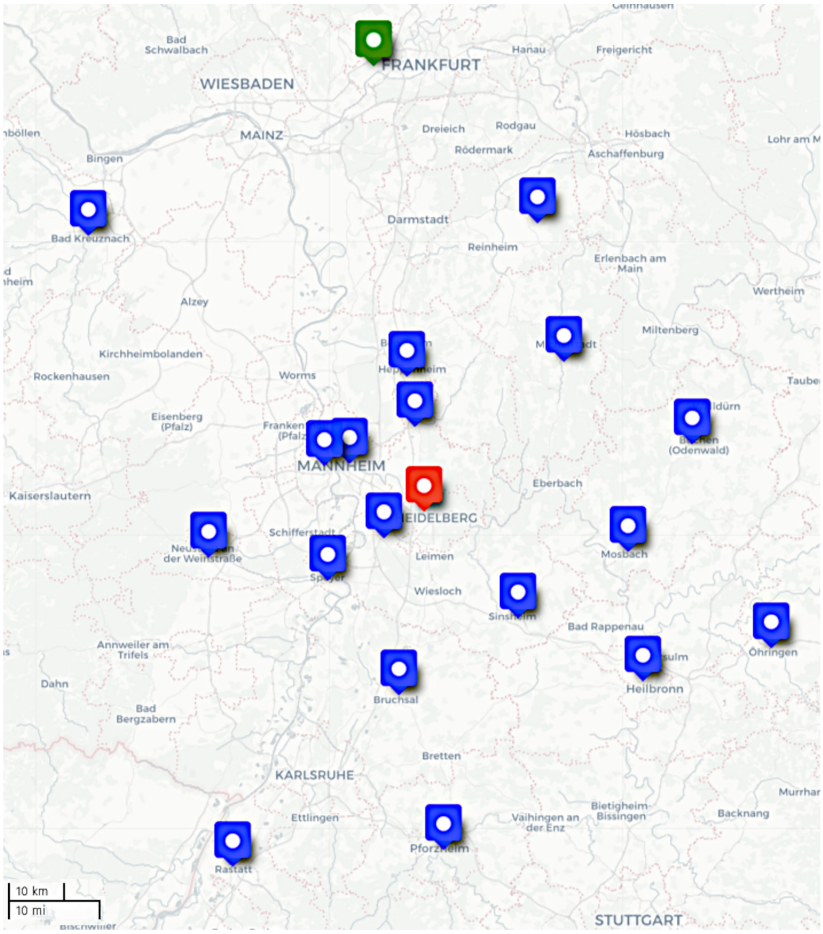
5 Brekenfeld C, Goebell E, Schmidt H, et al. 'Drip-and-drive': shipping the neurointerventionalist to provide mechanical thrombectomy in primary stroke centers. J NeuroInterventional Surg 2018;10:932–6. doi:10.1136/neurintsurg-2017-013634

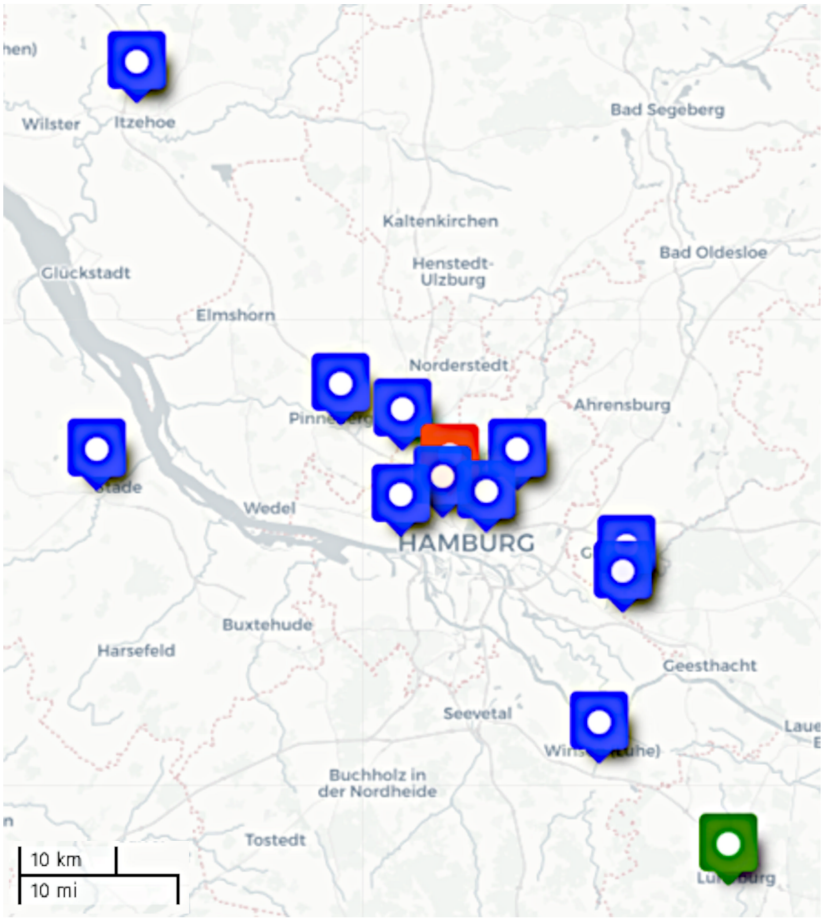
6 Osanai T, Ito Y, Ushikoshi S, et al. Efficacy of 'drive and retrieve' as a cooperative method for prompt endovascular treatment for acute ischemic stroke. J NeuroInterventional Surg 2019;11:757–61. doi:10.1136/neurintsurg-2018-014296



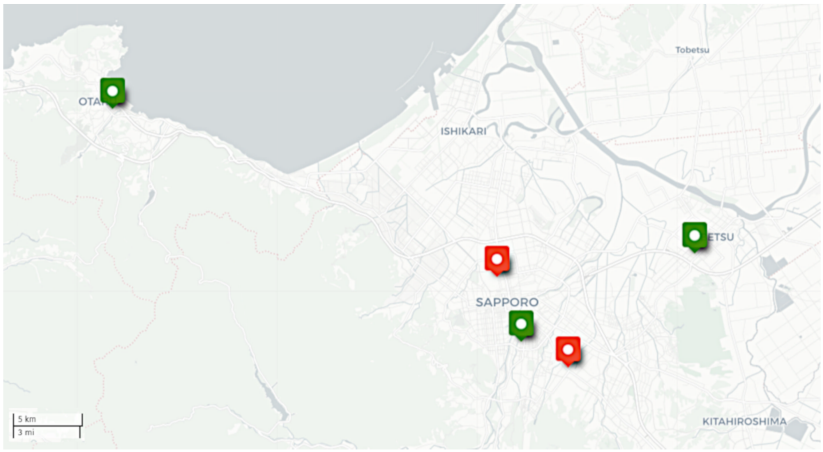
Supplemental Figure I. Stroke network of Mount Sinai Health System in New York City, USA. Red marker indicates comprehensive stroke center. Blue markers indicate referring primary stroke centers. Green markers indicate external stroke centers.



Supplemental Figure II. Stroke network of the Heidelberg University in Heidelberg, Germany. Red marker indicates comprehensive stroke center. Blue markers indicate referring primary stroke centers. Green markers indicate external stroke centers.



Supplemental Figure III. Stroke network of the University of Hamburg-Eppendorf in Hamburg, Germany. Red marker indicates comprehensive stroke center. Blue markers indicate referring primary stroke centers. Green markers indicate external stroke centers.



Supplemental Figure IV. Stroke network of the Hokkaido University in Sapporo, Japan. Red markers indicate comprehensive stroke centers. Green markers indicate external stroke centers.