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Impact of Clinical Trial Enrolment on Thrombolysis Workflow in a Mobile Stroke Unit: Results from the AcT Trial

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Highlights

- The University of Alberta Hospital-based mobile stroke unit (MSU) enrolled patients in the Intravenous Tenecteplase Compared with Alteplase for Acute Ischemic Stroke (AcT) trial.
- All eligible patients were randomized to the study without MSU workflow issues.
- An MSU is a feasible site for clinical trials in the hyperacute phase**.**

Abstract

Background: The Edmonton-based mobile stroke unit (MSU), which transports patients to the University of Alberta Hospital (UAH), enrolled patients in the Intravenous Tenecteplase Compared with Alteplase for Acute Ischemic Stroke (AcT) trial. We examined the feasibility of trial enrolment in MSU, its impact on acute stroke workflow metrics, and functional outcomes at 90-120 days.

Methods: In this post-hoc analysis, patients were divided into three groups based on enrolment site (MSU (n=43), UAH (n=273), and non-UAH (n=1261)). All patients were enrolled with a deferred consent process. The primary outcome for this analysis was the feasibility of enrolment defined as the proportion of patients receiving intravenous thrombolysis (IVT) during the study period who were enrolled in the trial. Multiple linear and binary logistic regression was used to evaluate the adjusted effect of the study groups on acute stroke workflow metrics and functional outcomes at 90-120 days.

Results: 100% of eligible IVT-treated patients in the MSU during the study period were enrolled in the AcT trial. Covariate-adjusted linear regression showed shorter door-to-needle [17.2 (9.7-24.6) min] and CT-to-needle [10.7(4.2-17.1) min] times in the MSU compared to UAH and non-UAH sites. There was no difference in the proportion of patients with an excellent functional outcome (mRS 0-1) at 90-120 days or symptomatic ICH at 24 hours between groups.

Conclusions: Enrolment in the AcT trial from the MSU was feasible. MSU-enrolled patients demonstrated faster door-to-needle and CT-to-needle times resulting in earlier IVT administration, and similar rates of symptomatic intracerebral hemorrhage.

Keywords: mobile stroke unit, acute ischemic stroke, intravenous thrombolysis, tenecteplase

Introduction

Intravenous thrombolysis (IVT) is the first-line treatment for eligible patients with acute ischemic stroke within the first 4.5 hours of symptom onset.[1] IVT is typically delivered in the emergency department of a primary or comprehensive stroke center supervised by a neurologist. Rapid administration of IVT closer to symptom onset is associated with better short and long-term functional outcomes than delayed treatment.[2] The time-limiting step for IVT delivery is the need for a computed tomography (CT) scan before IVT and the availability of a trained

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multidisciplinary team. Mobile stroke units (MSUs) are specially designed ambulances equipped with a CT scanner and trained personnel that may include a physician, nurse, CT technologist, and paramedics. The MSU can assess a patient with acute stroke syndrome at the scene of the stroke, at a rendezvous point with another ambulance, or a community hospital without access to a CT scanner. The MSU hastens time to neurological assessment after symptom onset, provides dedicated access to a CT scanner, and allows for rapid administration of IVT.[3] Challenges exist in the recruitment of patients in clinical trials in the prehospital setting with respect to the consent process and clinical trial workflow.[4,5] Few clinical trials have enrolled patients in MSUs.[6]

The pivotal Intravenous Tenecteplase Compared with Alteplase for Acute Ischemic Stroke (AcT) trial was a multicenter, randomized controlled trial that demonstrated non-inferiority of tenecteplase (TNK) compared to alteplase within the first 4.5 hours from stroke onset.[7] The Edmonton-based MSU transports patients to the University of Alberta Hospital (UAH) and was involved in enrolling patients in the AcT trial.[8] We examined the feasibility, impact on workflow, and functional outcomes with MSU enrolment in the AcT trial.

Methods

The AcT Trial

This is a post-hoc analysis of the AcT trial; the protocol and main results have been previously published.[7,9] Briefly, the AcT trial was a Canadian, pragmatic, multicenter, parallel-group, open-label, registry-linked, randomized, controlled, non-inferiority study comparing the efficacy of TNK versus alteplase in eligible patients with acute ischemic stroke. In the AcT trial, patients were recruited in 1 MSU, 5 primary stroke centers, and 17 comprehensive stroke centers between November 2020 and January 2022. Eligibility for IVT and post-thrombolysis care was based on the Canadian Stroke Best Practices Guidelines.[1,10] Patients were randomized 1:1 to receive either TNK at a dose of 0.25 mg/kg according to weight brackets up to a maximum of 25 mg as bolus dose or alteplase 0.9 mg/kg up to a maximum of 90 mg (10% as bolus dose and the remaining 90% over 1 hour as an infusion). The primary outcome for the AcT trial was the proportion of patients with a modified Rankin score (mRS) of 0-1 at 90-120 days after randomization.

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Workflow of Edmonton Mobile Stroke Unit

The Edmonton MSU has been operational since February 2017 and services both urban and rural areas within a 250 km radius of the UAH in Alberta, Canada.[11] The MSU team consists of a stroke fellow, emergency department nurse, CT technologist, primary care paramedic, and advanced care paramedic. The MSU operates on weekdays between 8 am to 4 pm and is alerted by the Emergency Medical Services (EMS) dispatch or a critical care phone consultation service regarding patients with an acute stroke syndrome who are within 4.5 hours of symptom onset or last known well time. For calls within the city of Edmonton, both a regular ambulance and MSU are co-dispatched. For rural locations, the MSU and EMS ambulance meet at a rendezvous point approximately midway between the site of the initial assessment and the UAH. On arrival, if the patient is suspected to be an acute stroke eligible for thrombolysis, the patient is then transferred to the MSU for a CT scan. Once completed, the team reviews the case and CT scan with a telestroke physician. If eligible for IVT, alteplase or tenecteplase is delivered in the field and if required the infusion is continued as the patient is transported to the comprehensive stroke center for further evaluation and admission.

Workflow of Trial Enrolment

The UAH MSU was included as a site in the AcT trial and screened consecutive patients for trial enrolment between November 2020 and January 2022. Patients evaluated on the MSU, similar to other sites in the AcT trial, were enrolled using a deferred consent process in accordance with the Tri-Council Policy Statement – Ethical Conduct for Research involving human guidelines and the Helsinki Declaration.[12] The deferred consent process was designed to allow for rapid treatment of time-critical conditions for patients being enrolled in randomized clinical trials. The deferred consent process was approved at all sites in the AcT trial except for two centers in Quebec. Patients were screened for trial eligibility by stroke fellows who were on board the MSU. If the patient was deemed eligible for IVT, the stroke fellow randomized the patient with the help of a secure, real-time, web-based server that could be accessed via a web browser on a mobile phone. Randomization was also available through secure text messaging and automated telephone calls. The randomizing physician received instant information about the treatment allocation and dose. The study drug was stored on the MSU. The study coordinator would meet

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the patient and/or the family member(s) on arrival at the UAH site at the earliest feasible time to obtain written informed consent.

Study Outcome Measures

The primary outcome was the proportion of MSU administered IVT patients during the study period who were enrolled in the trial. Secondary outcomes were door-to-needle time (min), CT-to-needle time (min), the proportion of patients with symptomatic intracerebral hemorrhage (ICH) at 24 hours, and mRS 0-1 at 90-120 days.

Statistical Analyses

The study participants were divided into MSU-treated, UAH site, and non-UAH sites. Age was described as mean ± SD. Baseline NIHSS and workflow metrics were non-normally distributed and described as median with interquartile range (IQR). Sex, presence of intracranial occlusion, patients undergoing endovascular thrombectomy (EVT), symptomatic ICH, and patients with mRS of 0-1 and 0-2 at 90-120 days were expressed as proportions. Univariable analysis to compare proportions was performed with the Chi-Square test. To assess between-group differences in workflow measures (min) a linear regression was used. Logistic regression assessed between-group differences on 90-day mRS 0-1. Similarly, a binary logistic regression was used to assess between-group differences in patients achieving excellent outcomes (mRS 0-1), good outcomes (mRS 0-2), and deaths. The reference category was a non-UAH site. All regression analyses were adjusted for prespecified variables, including age (years), sex, baseline NIHSS, visible symptomatic arterial occlusion site, and IVT drug type (TNK or alteplase). Statistical significance was defined as a p-value <0.05. All analyses were conducted using STATA 18.0 BE (StataCorp LLC, Texas, USA).

Results

Of the 1577 patients (after excluding the 23 patients who did not consent) in the AcT trial, 43 (2.7%) were MSU-treated, 273 (17.3%) were treated at the UAH site, and 1261 (80%) were treated at non-UAH sites. 100% of eligible MSU patients during the data collection period of the AcT trial were enrolled. No issues were noted with randomization or internet connectivity during enrolment. There were no issues related to drug availability or drug administration on the MSU.

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The baseline characteristics of participants in the MSU-treated, UAH, and non-UAH groups are described in Table 1 and outcomes in Table 2.

On linear regression, door-to-needle-time (min) was lower in the MSU-treated group by 17.2 (95% Confidence Interval (CI) 9.7-24.6) min compared to the non-UAH sites (Supplementary Table 1). CT-to-needle time (min) was lower in the MSU-treated group compared to the non-UAH site by 10.7 (95% CI 4.2-17.1) min (Supplementary Table 2; Figure 1). CT-to-needle time was higher at the UAH site than the non-UAH sites by 3.1 (95%CI 0.4-5.9) min. There was no statistically significant interaction noted between study groups and IVT drug type.

Symptomatic ICH at 24 hours, odds of excellent outcome (mRS 0-1), odds of good outcome (mRS 0-2) showed no difference between the MSU-site and non-UAH site (Supplementary Table 3-4; Figure 2). A total of 241 (15.3%) died during the study period. The odds of death were increased in the UAH-treated group (aOR 1.57 (1.08-2.26)) (Supplementary Table 5) compared to non-UAH site.

Discussion

This post-hoc analysis of MSU-enrolled patients included in the AcT trial indicates that it is feasible to rapidly screen and enroll patients with acute ischemic stroke into clinical trials on an MSU without significantly disrupting thrombolysis workflow. During the study period, all stroke patients eligible for IVT evaluated by the MSU were enrolled in the trial. The MSU-enrolled participants had faster workflow metrics, such as CT-to-needle time (min) and door-to-needle time (min) allowing rapid delivery of reperfusion therapy after symptom onset. No difference was observed in functional outcome measures assessed at 90-120 days. No safety concerns were observed.

The prehospital stroke trial enrolment with an emergency medical systems ambulance is challenging due to the issues of consent, CT scanner availability, and randomization.[13,14] The Prehospital Acute Neurological Treatment and optimization of medical care in Stroke study (PHANTOM-S) conducted in Germany, and the Benefits of Stroke Treatment Delivered by an MSU Compared with standard management by Emergency Medical Services (BEST-MSU) trial

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conducted in the United States of America consistently demonstrated it is possible to enroll patients safely in the CT equipped MSU.[15,16] Both the BEST MSU trial and PHANTOM-S prospectively designated weeks of enrolment by MSU vs standard of care in a quasi-experimental fashion. These primary studies randomized patients to receive IVT either in MSU or in the closest stroke center and observed the efficacy of MSU in delivering acute care. In the comparison of TNK with alteplase for the early treatment of ischemic stroke in the Melbourne MSU (TASTE-A) trial the investigators were able to conduct an MSU-only trial.[6] The investigators randomized 104 patients 1:1 with the help of sealed, opaque envelopes that contained the treatment allocation, organized in sequential order as internet connectivity concerns were expected. The TASTE-A study was able to randomize all eligible patients. In the AcT study, patients were randomized in the MSU as a site along with the other stroke centers, thus allowing MSU participation in the acute stroke multicenter trial. In this analysis, we demonstrated the feasibility of randomizing patients in the MSU with the help of a web browser. rFVIIa for Acute hemorrhagic Stroke administered at the earliest Time (FASTEST) is another ongoing global study randomizing patients with acute spontaneous ICH in the first 2 hours of symptom onset to either receive rFVIIa or placebo.[17] The study is enrolling patients at 15 MSUs worldwide. Like the AcT trial, a deferral of consent is used at applicable sites. The randomization procedure involves the delivery of a fixed number of predetermined drug kits to each site which are sequentially numbered, blinded, and dispensed by the site pharmacy. Thus, the MSU will carry only one sequential kit at any given time. This is an example of the innovative ideas that can be successfully implemented in recruiting patients in the MSU environment. The deferral of the consent and presence of stroke fellow may have facilitated the enrolment process. In the absence of a physician in the MSU enrollment is still possible if a study stroke physician is available via telehealth and patient is being transferred to a study-site ED. It is also possible to enroll patients in implementation studies by time-based cluster randomization, where the intervention and control can be provided on certain days of week.

MSU allows for faster and earlier delivery of thrombolysis in eligible acute ischemic stroke patients. MSU has been associated with better utility-weighted disability outcomes derived from the mRS at 90 days.[18] Furthermore, it has also been demonstrated that IVT with TNK is associated with better early reperfusion than alteplase on the MSU.[6] In our analysis, CT-to-

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needle time and door-to-needle times were quicker than other sites. Faster CT-to-needle time could be MSU workflow related as the patient is not moved from the stretcher bed, and the MSU team can deliver dedicated care to one patient without simultaneity, which may be presented in ED care.[19] The AcT was conducted during the COVID-pandemic, it may have affected workflow metrics. In a study from Alberta, the first year of COVID-pandemic was associated with delays in CT-groin puncture, door-to-groin puncture and groin-puncture-to-reperfusion times compared to the pre-pandemic period. However, no delays were noted in the door-to-CT and door-to needle times during the first year of the pandemic.[20] Our results demonstrated that there was no significant difference between the site of enrolment and the proportion of patients that had an mRS of 0-1 at 90-120 days. Due to the small sample size, the results can only be considered exploratory.

With respect to measures of safety, the proportion of symptomatic ICH was not different between groups, and proportion of favorable outcomes (mRS 0-1 or mRS 0-2) was not different among groups (Table 2). Interestingly, the rates of visible occlusions were significantly lower in the MSU (45.2%) compared to UAH (64.6%) and non-UAH sites (68.2%) as well as the proportion of patients that received EVT: MSU 23.3%, UAH 26.4%, and non-UAH 33.6%. Recent evidence that TNK reduces perfusion lesion volume as compared to alteplase does not explain this group difference as the proportion of TNK use was similar among groups: MSU 51.2%, UAH 49.1%, and non-UAH 51.5%. In a recent meta-analysis, IVT resulted in successful reperfusion in 1 in 10 patients averting the need for EVT.[21] However sub-group analyses of time interval from stroke onset to IVT did not significantly change rates of successful reperfusion, and thus faster onset-to-needle times cannot adequately explain the proportional differences in visible occlusions and EVTs in our MSU group from existing data. As the MSU is treating earlier than patients included in the above analyses it is possible that ultra-early thrombolysis could have a higher recanalization rate in the setting of a threshold effect but that remains unproven. In this exploratory analysis there was increased death in UAH ED treated group compared to the non-UAH site and MSU site. Possible consideration are patients treated in MSU-site have stable hemodynamic parameters, in the current observation maybe younger, had a lower intracranial occlusion, mild-moderate severity of baseline neurological deficits as assessed by NIHSS (Table 1).

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Our study has limitations. First, this is a secondary analysis of the AcT trial and as such is underpowered to detect differences in patients' functional outcomes treated via the MSU in relation to other sites, though point estimates favor the MSU. Furthermore, the small sample size also limits the evaluation of workflow metrics beyond door-to-needle and CT-to-needle times. Unexplained lower proportions of visible occlusions and EVT may be confounding the lower rates of death observed in the MSU group. As MSU care expands globally, the feasibility of enrollment will enhance the inclusion of stroke patients in the pre-hospital space and ultra-early time period in trials of important stroke therapies.

Conclusion

Enrolment into the AcT trial from the MSU was feasible. MSU-enrolled patients demonstrated no difference in a favorable outcome but had faster door-to-needle and CT-to-needle times resulting in earlier IVT, similar rates of symptomatic intracerebral hemorrhage. Clinical trial enrollment in MSU will allow for the inclusion of patients in the hyperacute phase of stroke.

Statement of Authorship

GC and AP contributed equally as first authors. MK led conceptualization and creation of study design with assistance from GC and AP. AP and MK led statistical analysis with critical input from TTS and TJ. GC, AP, and MK prepared the first draft. BHB, TJ, AS, MA, RS, AB, LC, NS, AT, TTS, and BKM critically revised the final manuscript.

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Competing Interests Disclosure Statement

MA has received grants from CIHR and has participation on a data safety monitoring board or advisory board with Palmera Medical and Fluid Biomed. RS discloses salary support from Sunnybrook Research Institute, grants from CIHR, participation on an advisory board for Hoffman-La Roche (<$5000), and stock ownership in FollowMD Inc. BKM discloses grants from CIHR, consulting fees from Roche, Boehringer Ingelheim, Circle CVI and Biogen, honoraria from Roche and Boehringer Ingelheim, participation on an advisory board with

EMMA-CAN and INSTRUCT, and stock ownership in Circle CVI. LC discloses payments received from Servier and consulting fees from Ischaemavie RAPID, Circle NV, and Canadian Medical Protective Association. AS discloses honoraria from Bayer Daiichi, advisory board membership for Bayer, consulting fees from Bayer, Servier Canada, Daiichi Sanyko Compan, AstraZeneca, VarmX, and Takeda, and stock options in Ensho. TTS discloses consulting feeds from Circle NVI. All other authors have nothing to disclose.

References

1. Heran M, Lindsay P, Gubitz G, et al. Canadian Stroke Best Practice Recommendations: Acute Stroke Management, 7thEdition Practice Guidelines Update, 2022. *Canadian Journal of Neurological Sciences*. Published online January 19, 2022. doi:10.1017/cjn.2022.344
2. Ebinger M, Siegerink B, Kunz A, et al. Association Between Dispatch of Mobile Stroke Units and Functional Outcomes Among Patients With Acute Ischemic Stroke in Berlin. *JAMA*. 2021;325(5):454-466. doi:10.1001/JAMA.2020.26345
3. Mackey J, Yamal JM, Parker SA, et al. Golden Hour Treatment with tPA (Tissue-Type Plasminogen Activator) in the BEST-MSU Study. *Stroke*. 2023;54(2):415-425. doi:10.1161/STROKEAHA.122.039821
4. Broderick JP, Aziz YN, Adeoye OM, et al. Recruitment in Acute Stroke Trials: Challenges and Potential Solutions. *Stroke*. 2023;54(2):632-638. doi:10.1161/STROKEAHA.122.040071
5. Sandset EC, Walter S, Song L. The challenges of large-scale prehospital stroke trials. *Lancet Neurol*. 2022;21(11):948-949. doi:10.1016/S1474-4422(22)00356-8
6. Bivard A, Zhao H, Churilov L, et al. Comparison of tenecteplase with alteplase for the early treatment of ischaemic stroke in the Melbourne Mobile Stroke Unit (TASTE-A): a phase 2, randomised, open-label trial. *Lancet Neurol*. 2022;21(6):520-527. doi:10.1016/S1474-4422(22)00171-5
7. Menon BK, Buck BH, Singh N, et al. Intravenous tenecteplase compared with alteplase for acute ischaemic stroke in Canada (AcT): a pragmatic, multicentre, open-label, registry-linked, randomised, controlled, non-inferiority trial. *The Lancet*. 2022;400(10347):161-169. doi:10.1016/S0140-6736(22)01054-6

8. Kate MP, Jeerakathil T, Buck BH, et al. Pre-hospital triage of suspected acute stroke patients in a mobile stroke unit in the rural Alberta. *Sci Rep*. 2021;11(1):1-7. doi:10.1038/s41598-021-84441-0
9. Sajobi T, Singh N, Almekhlafi MA, et al. Alteplase Compared to Tenecteplase in patients with Acute Ischemic Stroke (AcT) Trial: Protocol for a Pragmatic Registry linked Randomized Clinical Trial. *Stroke: Vascular and Interventional Neurology*. Published online May 6, 2022. doi:10.1161/svin.121.000447
10. Gladstone DJ, Patrice Lindsay M, Douketis J, et al. Canadian Stroke Best Practice Recommendations: Secondary Prevention of Stroke Update 2020 - ADDENDUM. *Can J Neurol Sci*. 2023;50(3):481. doi:10.1017/cjn.2022.57
11. Shuaib A, Jeerakathil T. The mobile stroke unit and management of acute stroke in rural settings. *Cmaj*. 2018;190(28):E855-E858. doi:10.1503/cmaj.170999
12. Faris H, Dewar B, Fedyk M, et al. Protocol for Deferral of Consent in Acute Stroke Trials. *Neurology*. 2023;100(6):292-300. doi:10.1212/WNL.0000000000201533
13. Saver JL, Starkman S, Eckstein M, et al. Prehospital Use of Magnesium Sulfate as Neuroprotection in Acute Stroke. *New England Journal of Medicine*. 2015;372(6):528-536. doi:10.1056/nejmoa1408827
14. Bath PM, Scutt P, Anderson CS, et al. Prehospital transdermal glyceryl trinitrate in patients with ultra-acute presumed stroke (RIGHT-2): an ambulance-based, randomised, sham-controlled, blinded, phase 3 trial. *The Lancet*. 2019;393(10175):1009-1020. doi:10.1016/S0140-6736(19)30194-1
15. Ebinger M, Kunz A, Wendt M, et al. Effects of Golden Hour Thrombolysis: A Prehospital Acute Neurological Treatment and Optimization of Medical Care in Stroke (PHANTOM-S) Substudy. *JAMA Neurol*. 2015;72(1):25-30. doi:10.1001/JAMANEUROL.2014.3188
16. Grotta JC, Yamal JM, Parker SA, et al. Prospective, Multicenter, Controlled Trial of Mobile Stroke Units. *New England Journal of Medicine*. 2021;385(11):971-981. doi:10.1056/nejmoa2103879
17. Naidech AM, Grotta J, Elm J, et al. Recombinant factor VIIa for hemorrhagic stroke treatment at earliest possible time (FASTEST): Protocol for a phase III, double-blind, randomized, placebo-controlled trial. *International Journal of Stroke*. 2022;17(7):806-809. doi:10.1177/17474930211042700

18. Turc G, Hadziahmetovic M, Walter S, et al. Comparison of Mobile Stroke Unit With Usual Care for Acute Ischemic Stroke Management: A Systematic Review and Meta-analysis. *JAMA Neurol*. 2022;79(3):281-290. doi:10.1001/JAMANEUROL.2021.5321
19. Sarmiento RJ, Wagner A, Sheriff A, et al. Workflow and Short-Term Functional Outcomes in Simultaneous Acute Code Stroke Activation and Stroke Reperfusion Therapy. *NeuroSci*. 2024;5(3):291-300. doi:10.3390/neurosci5030023
20. Ganesh A, Stang JM, McAlister FA, et al. Changes in ischemic stroke presentations, management and outcomes during the first year of the COVID-19 pandemic in Alberta: a population study. *CMAJ*. 2022;194(12):E444-E455. doi:10.1503/CMAJ.211003
21. Tsivgoulis G, Katsanos AH, Schellinger PD, et al. Successful reperfusion with intravenous thrombolysis preceding mechanical thrombectomy in large-vessel occlusions. *Stroke*. 2018;49(1):232-235. doi:10.1161/STROKEAHA.117.019261/-/DC1

Table 1: Baseline characteristics in MSU-treated, UAH site and non-UAH site groups.

	MSU-Treated (n=43, 2.7%)	UAH Site (n=273,17.3%)	Non-UAH site (n=1261, 80%)	p
Mean Age±SD, years	69±14	72±14	72±14	0.3
Female Sex, n (%)	15(34.9)	131(48)	609(48.3)	0.2
Median (IQR) NIHSS	9 (6,13)	11(6, 17)	9 (6, 17)	0.5
Median Onset-to-CT time, min	87(60, 123) *	101 (77, 145)	103(71, 159)	0.1
Median Onset-to-needle time, min	100 (79, 139) *	129(102,184)	131(93,189)	0.01
Median Door-to-needle time, min	26 (22,30) *	40(31,54) **	36(28,49)	<0.0001
Median CT-to-needle time, min	13 (9,17) *	22(14,33) **	19(12,30)	<0.001
Visible Occlusion, n (%)	19 (45.2) *	175(64.6)	851(68.2)	0.005
Tenecteplase, n (%)	22(51.2)	134(49.1)	650(51.5)	0.7
Endovascular Thrombectomy, n (%)	10(23.3) *	72(26.4)	424(33.6)	0.03

MSU- Mobile stroke unit, UAH-University of Alberta Hospital, NIHSS-National Institute Health Stroke Scale, CT- Computed tomography, *p<0.05 in MSU compared to other groups, **p<0.05 in UAH compared to non-UAH

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Table 2: Outcomes in MSU-treated, UAH site and non-UAH site groups.

	MSU-Treated (n=43, 2.7%)	UAH Site (n=273,17.3%)	Non-UAH site (n=1261, 80%)	p
Endovascular Reperfusion, n (%)	5(50)	56(77.8)	331(78.1)	0.1
Symptomatic intracerebral hemorrhage, n (%)	1(2.3)	9(3.3)	41(3.3)	0.9
mRS 0-1, n (%)	22(51.2)	96(35.7)	444(35.4)	0.1
mRS 0-2, n (%)	31(72.1)	148(55)	698(55.6)	0.09
Death, n (%)	2(4.7) *	53(19.4)	186(14.8)	0.02

MSU- Mobile stroke unit, UAH-University of Alberta Hospital, mRS-modified Rankin scale, *$p<0.05$ in MSU compared to other groups

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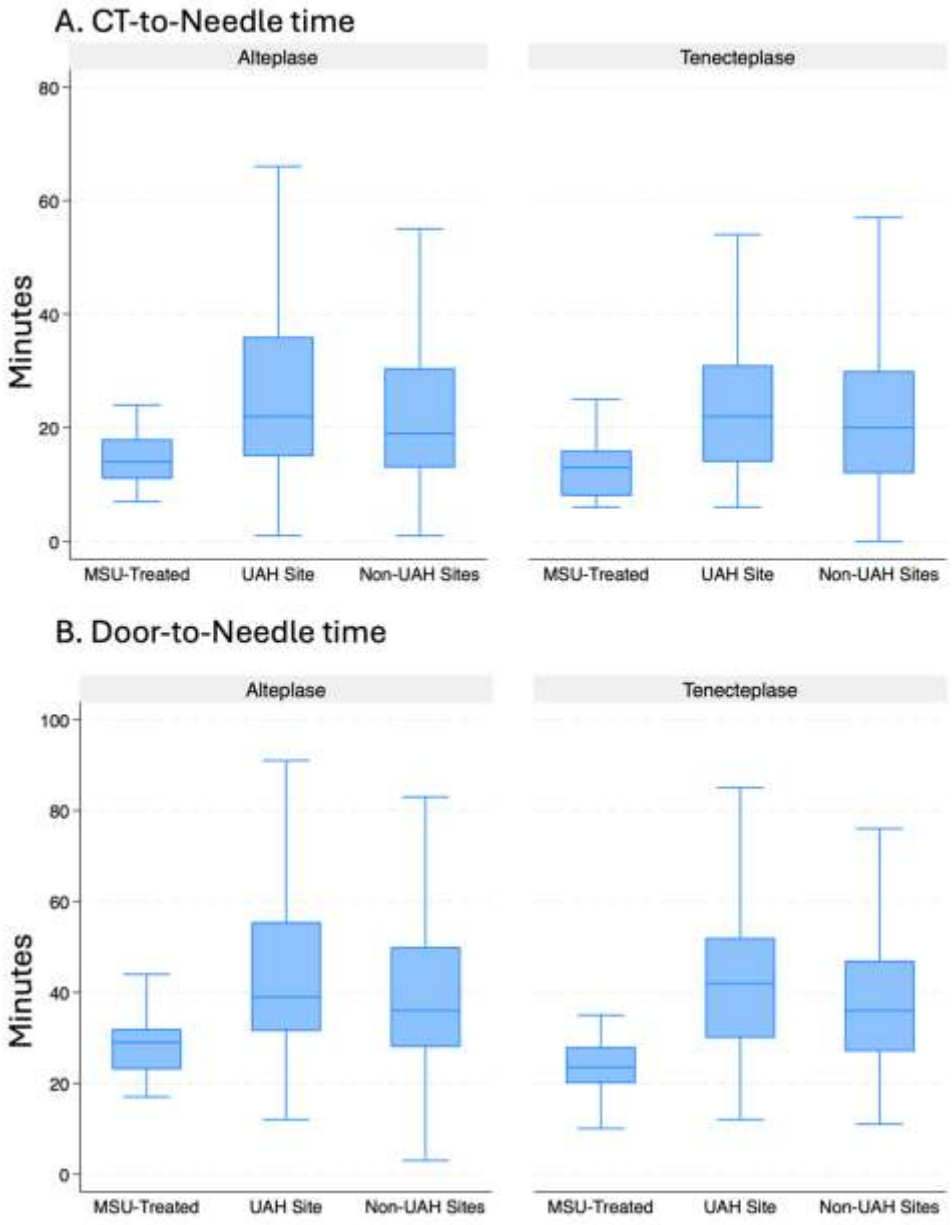

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359 Figure 1: Box plot A: CT-to-needle time (min) in different groups (MSU-treated, UAH site, non-
360 UAH site) and different intravenous thrombolysis groups (Alteplase, Tenecteplase); B: Door-to-
361 needle time (min) in different groups (MSU-treated, UAH site, non-UAH site) and in different
362 intravenous thrombolysis groups (Alteplase, Tenecteplase).

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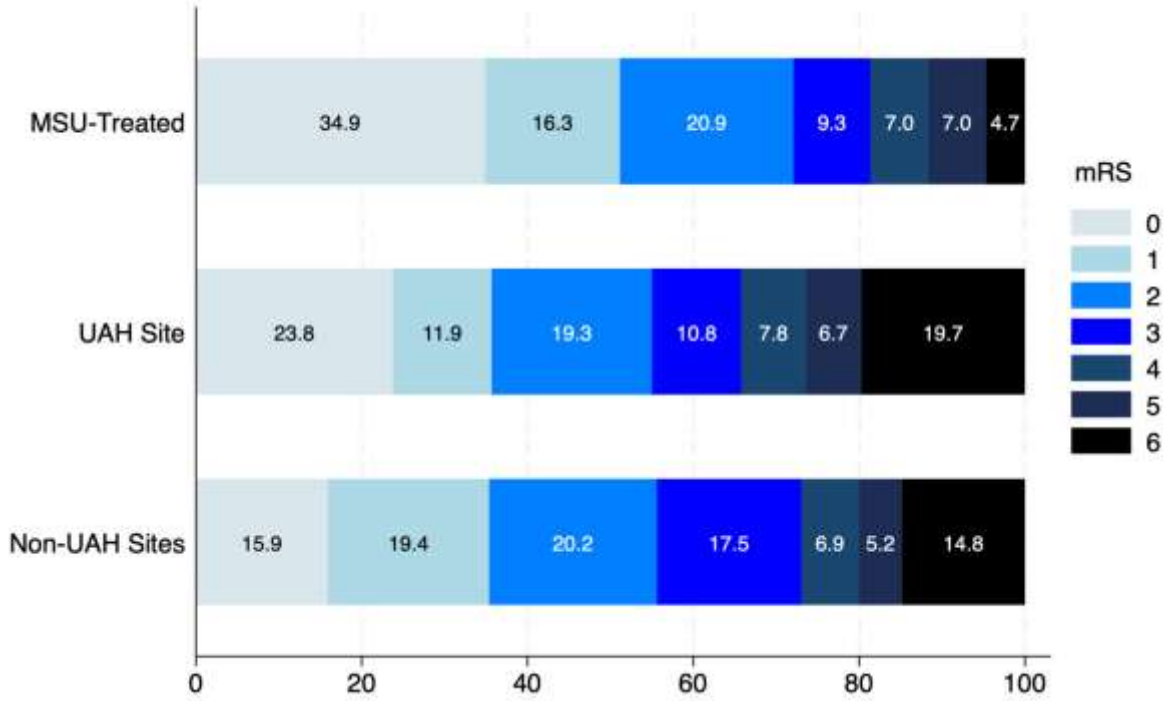

Figure 2: Distribution of the modified Rankin Scale scores at 90-120 days in MSU-treated, UAH site, non-UAH site.

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