

# MOBILE STROKE UNITS

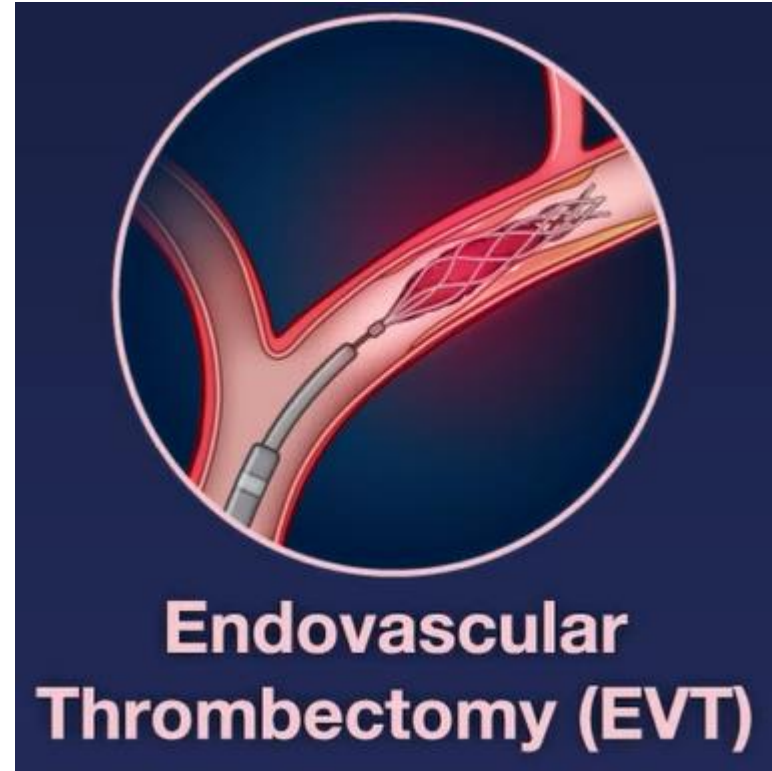
Where do we stand?



*Photo Courtesy of Northwestern Medicine*

Lindsay Vogel, MD, PhD student  
Datablitz 2021

# STANDARD CARE



*Grotta JC, et al. 2021*

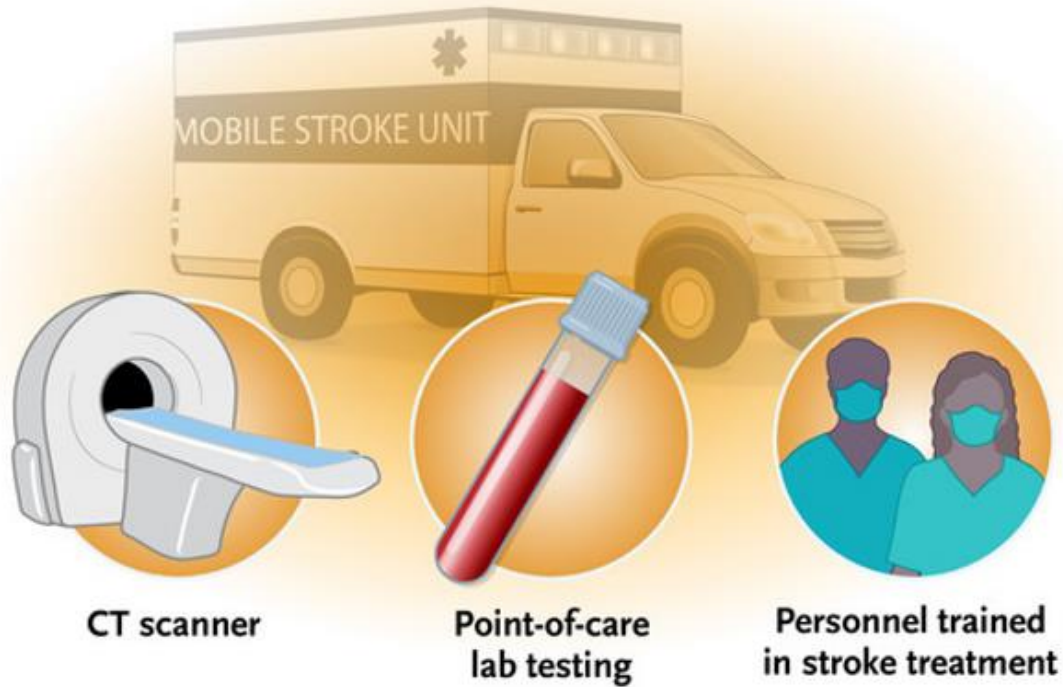
# STANDARD CARE



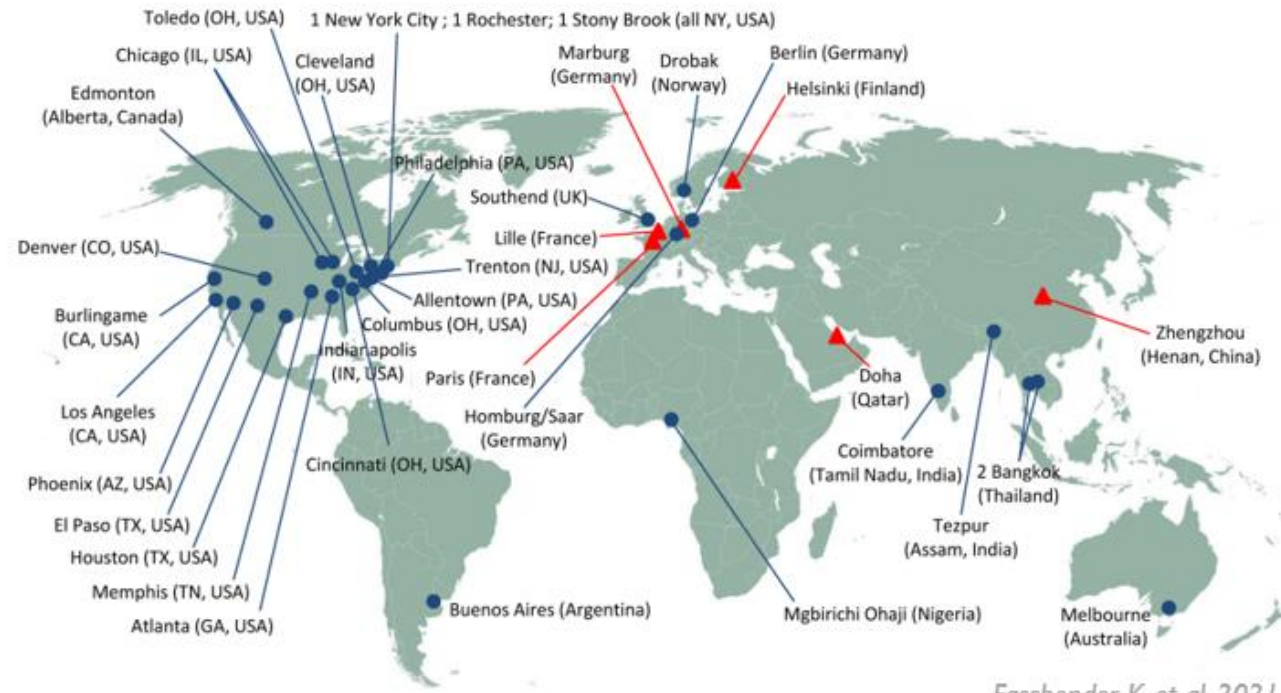
*Grotta JC, et al. 2021*

## Limits of thrombolysis :

- Limited number of eligible patients (+/- 10%)
  - Time from onset > 4H30
  - Unknown onset
  - Contraindications
- Time-sensitive efficacy



Grotta JC, et al. 2021



Fassbender K, et al. 2021

# *The* NEW ENGLAND JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

SEPTEMBER 9, 2021

VOL. 385 NO. 11

## Prospective, Multicenter, Controlled Trial of Mobile Stroke Units

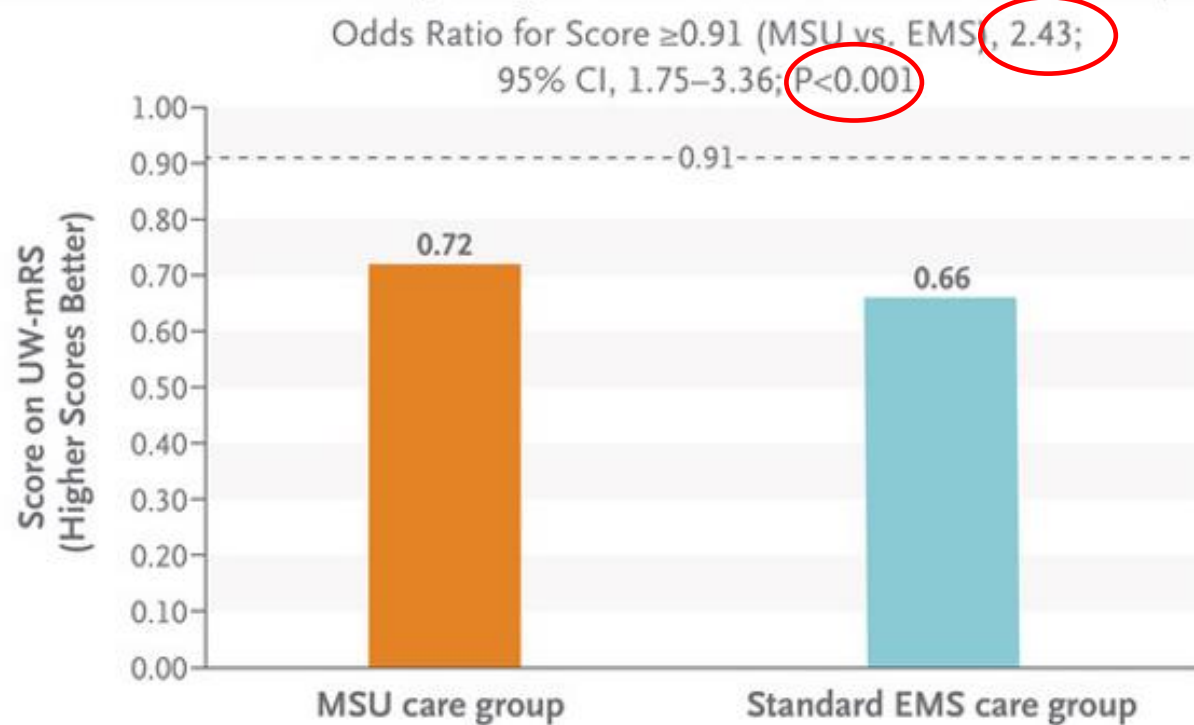
J.C. Grotta, J.-M. Yamal, S.A. Parker, S.S. Rajan, N.R. Gonzales, W.J. Jones, A.W. Alexandrov, B.B. Navi, M. Nour, I. Spokoiny, J. Mackey, D. Persse, A.P. Jacob, M. Wang, N. Singh, A.V. Alexandrov, M.E. Fink, J.L. Saver, J. English, N. Barazangi, P.L. Bratina, M. Gonzalez, B.D. Schimpf, K. Ackerson, C. Sherman, M. Lerario, S. Mir, J. Im, J.Z. Willey, D. Chiu, M. Eisshofer, J. Miller, D. Ornelas, J.P. Rhudy, K.M. Brown, B.M. Villareal, M. Gausche-Hill, N. Bosson, G. Gilbert, S.Q. Collins, K. Silnes, J. Volpi, V. Misra, J. McCarthy, T. Flanagan, C.P.V. Rao, J.S. Kass, L. Griffin, N. Rangel-Gutierrez, E. Lechuga, J. Stephenson, K. Phan, Y. Sanders, E.A. Noser, and R. Bowry

- Sites : Houston, Colorado, Memphis, New York, Los Angeles, Burlingame, Indianapolis
- Alternating weeks
- Population : patients eligible for t-PA



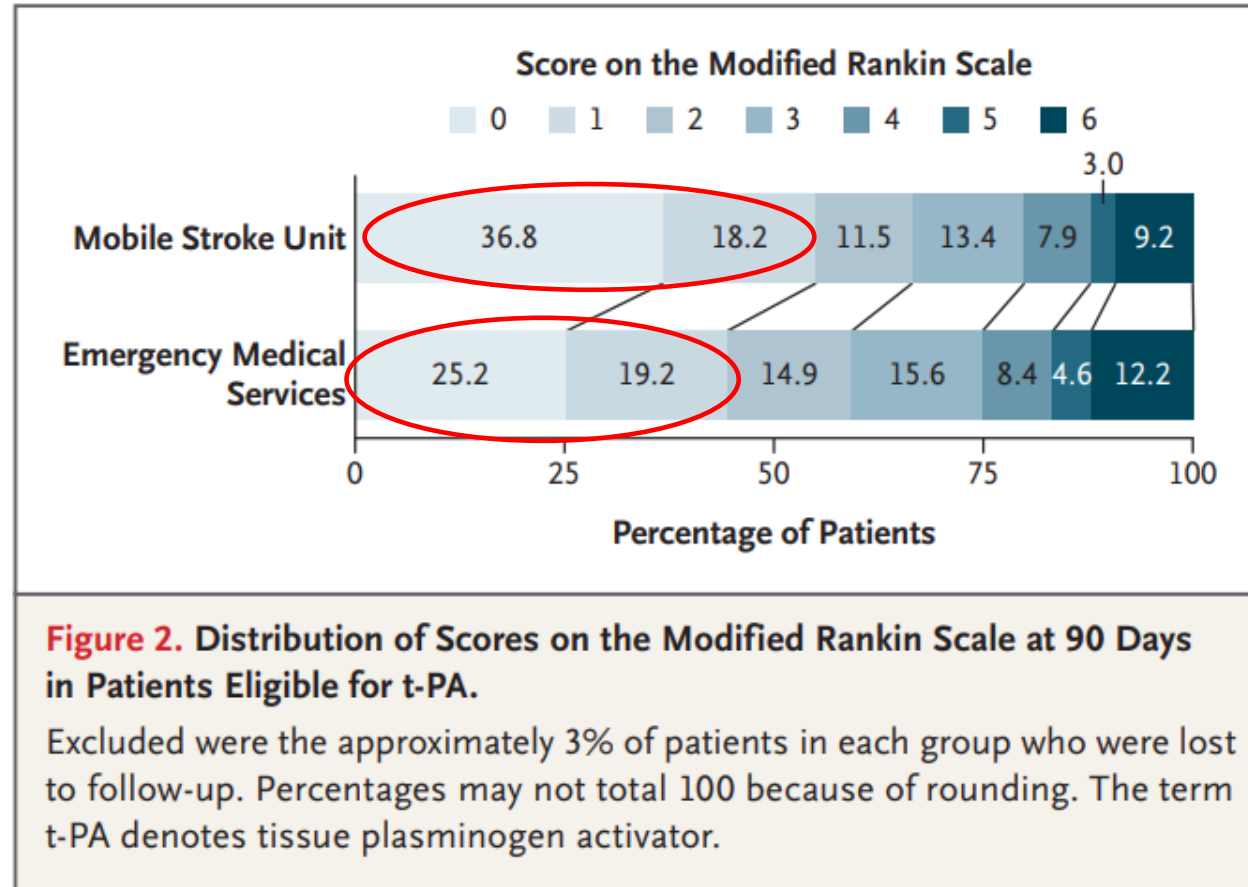
# PRIMARY OUTCOME

## Mean Score on the Utility-Weighted Modified Rankin Scale at 90 Days



Grotta JC, et al. 2021

# PRIMARY OUTCOME



Grotta JC, et al. 2021



**LIÈGE**  
université



## SECONDARY OUTCOME

**Table 3. Time Metrics in Patients Eligible for t-PA.\***

Interval	Mobile Stroke Unit	Emergency Medical Services
	<i>minutes</i>	
Median interval between the time that the patient was last known to be well and t-PA treatment (IQR)	72 (55–105)	108 (84–147)
Median time from 911 alert to t-PA treatment (IQR)	46 (39–55)	78 (66–93)
Median time from ED door to t-PA bolus (IQR)	—	40 (30–51)
Median interval between the time that the patient was last known to be well and the alerting of emergency medical services (IQR)	23 (8–52)	22 (11–60)
Median time from 911 alert to arrival of emergency medical services (IQR)	9 (6–13)	9 (6–13)
Median time from arrival of emergency medical services to ED arrival (IQR)	55 (47–62)	27 (21–33)
Median interval between the time that the patient was last known to be well and endovascular thrombectomy (IQR)	166 (131–202)	163 (134–209)
Median time from 911 alert to endovascular thrombectomy (IQR)	141 (116–171)	132 (114–160)
Median time from ED door to endovascular thrombectomy (IQR)	76 (53–105)	94 (72–124)

\* ED denotes emergency department.

Grotta JC, et al. 2021



## SECONDARY OUTCOME

**Table 1. (Continued.)**

Characteristic	Patients Eligible for t-PA†		All Enrolled Patients	
	Mobile Stroke Unit (N=617)	Emergency Medical Services (N=430)	Mobile Stroke Unit (N=886)	Emergency Medical Services (N=629)
Indianapolis	8 (1.3)	5 (1.2)	8 (0.9)	6 (1.0)
Received t-PA within 4.5 hr after stroke onset — no. (%)‡	599 (97.1)	342 (79.5)	644 (72.7)	365 (58.0)

Grotta JC, et al. 2021

---

## LIMITATIONS :

- **Non randomized** design
- **Differences in enrollment** between MSU and EMS group
- 3:2 imbalance in **group size** (617 patients in the MSU group versus 430 in the EMS group)
- Few patients were enrolled at the **non-Houston** sites

Research

JAMA | **Original Investigation**

## Association Between Dispatch of Mobile Stroke Units and Functional Outcomes Among Patients With Acute Ischemic Stroke in Berlin

Martin Ebinger, MD; Bob Siegerink, PhD; Alexander Kunz, MD; Matthias Wendt, MD; Joachim E. Weber, MD; Eugen Schwabauer, MD; Frederik Geisler, MD; Erik Freitag, MD; Julia Lange, MD; Janina Behrens, MD; Hebum Erdur, MD; Ramanan Ganeshan, MD; Thomas Liman, MD; Jan F. Scheitz, MD; Ludwig Schlemm, MD; Peter Harmel, MD; Katja Zieschang, MD; Irina Lorenz-Meyer, MSc; Ira Napierkowski, Dr rer nat; Carolin Waldschmidt, MD; Christian H. Nolte, MD; Ulrike Grittner, DrPhil; Edzard Wiener, MD; Georg Bohner, MD; Darius G. Nabavi, MD; Ingo Schmehl, MD; Axel Ekkernkamp, MD; Gerhard J. Jungehulsing, MD; Bruno-Marcel Mackert, MD; Andreas Hartmann, MD; Jessica L. Rohmann, MScPH; Matthias Endres, MD; Heinrich J. Audebert, MD; for the Berlin\_PRehospital Or Usual Delivery in stroke care (B\_PROUD) study group

---

## TAKE HOME MESSAGE :

**MSUs management of acute ischemic stroke in patients who were eligible to receive t-PA resulted in:**

- Less disability at 90 days
- Faster and more frequent t-PA treatment

**But MSUs are expensive and difficult to implement and maintain**

**Further research is needed to define:**

- their best placement
- their optimal integration into healthcare environment
- their long term medical benefit and cost-effectiveness

---

# THANK YOU FOR YOUR ATTENTION !

## REFERENCES :

- Grotta JC, Yamal J-M, Parker SA, et al. Prospective, multi-center, controlled trial of mobile stroke units. N Engl J Med 2021;385:971-81.
- Ebinger M, Siegerink B, Kunz A; Berlin\_PRehospital Or Usual Delivery in stroke care (B\_PROUD) study group. Association Between Dispatch of Mobile Stroke Units and Functional Outcomes Among Patients With Acute Ischemic Stroke in Berlin. JAMA. 2021 Feb 2;325(5):454-466.
- Lees KR. Does My District Need a Mobile Stroke Unit? N Engl J Med. 2021 Sep 9;385(11):1043-1044.
- Fassbender K, Merzou F, Lesmeister M, et al. J Neurol Neurosurg Psychiatry 2021; 92:815-822.