## URBAN STROKE SYSTEMS: GO LOCAL, GO FAST

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# PRESENTER DISCLOSURE INFORMATION

FINANCIAL DISCLOSURE:

No relevant financial relationship exists

# OPTIMAL CARE

- Stroke identified in prehospital setting
- Nearest primary stroke center alerted
- Immediate rapid assessment including CT/ CT Angio/ CT perfusion
- Identify LVO
- tPA rapidly where appropriate
- Images travel by cloud reviewed in comprehensive center
- Patient with LVO rapidly transferred direct to angio suite arrives with tPA still hanging with a critical care ambulance

#### THE SYSTEM

- Fire Based
- Paramedic on an Engine company
- Ambulance may only be a basic provider
- 3<sup>rd</sup> service
- · Paramedic ambulance
- Critical Care Ambulance separate from 911 system requested urgently when primary center suspects LVO or big stroke

#### THE EMS CALL

What about the next call?

- Length of call approximately I hour
- 5-10 minute response time
- 20 minutes assessment and care
- Vital Signs/cardiac monitor
- Fingerstick Blood Glucose Intravenous Line
- Airway management if necessary
- 10 minute transport time
- 10 minutes handoff
- 10 minutes restock
- 10 minutes to back in service in area
- Time elapsed from call 85 minutes

- Length of call 75 minutes
- 5-10 minute response time
- 25 minutes assessment and care
- Vital Signs/cardiac monitor
- Fingerstick Blood Glucose
- Intravenous Line
- Airway management if necessary
- 20 minute transport time
- 10 minutes handoff
- 10 minutes restock
- 20 minutes until back in service in area
- Time elapsed from call 100 minutes

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## ORIGINAL COMMUNICATION

Clinical prediction of large vessel occlusion in anterior circulation stroke: mission impossible?

Mirjam R. Heldner<sup>1</sup> · Kety Hsich<sup>2</sup> · Anne Broeg-Morvay<sup>1</sup> · Pasquale Mordasini<sup>2</sup> · Monika Bühlmann<sup>1</sup> · Simon Jung<sup>1,2</sup> · Marcel Arnold<sup>1</sup> · Heinrich P. Mattle<sup>1</sup> · Jan Gralla<sup>2</sup> · Urs Fischer<sup>1</sup> At the intersection of the sensit

At the intersection of the sensitivity and specificity curves, the best total NIHSS score cut-off to find LVO in all 9% of all LVOs NPV 72.4 %, and ACC 79.3 %) (Fig. S2 in the online material).

had NIH ≤4

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MORE MISSES	Score/Cutoff	n (%)	False-Negative Rate-1-Sensitivity, % (95% CI)	False-Positive Rate=1-Specificity, % (95% CB	Accuracy, % (95% CB
	NHSS score, ≥14 <sup>t</sup>	278 (28)	39 (34-44)	12 (9-14)	79 (77-82)
	MHSS score, ≥114771	356 (35)	27 (22-32)	17 (14-20)	79 (77-82)
inical Scales Do Not Reliably Ide	MHSS score, ≥10°2	388 (39)	24 (19-28)	20 (17-23)	78 (76–81)
	nenso scare, 210-	300 (30)	24 (19-20)	20 (17-20)	10 (10-01)
Stroke Patients With Large-A	MHSS score, ≥9 (0-3 h) or ≥7 (3-6 h) <sup>120</sup>	452 (45)	19 (15-23)	28 (24-31)	75 (73–78)
laume Turc, PhD*: Benjamin Maïer, MD*: Olivier N:	MHSS score, ≥6°	556 (55)	13 (9-16)	40 (36-43)	69 (66-72)
	MHSS score, ≥5	606 (60)	10 (7-13)	46 (42-50)	66 (63-69)
hilde Isabel, MD; Marie Tisserand, PhD; Igor Raynor	MHSS score, ≥4	669 (67)	7 (4-9)	54 (50-57)	62 (59-65)
alvet, PhD; Jean-Claude Baron, ScD; Jean-Louis Ma	RACE score, >5*	320 (32)	33 (28-38)	15 (12-17)	79 (77-82)
	3I-SS score, ≥4 <sup>a</sup>	133 (13)	70 (65-75)	5 (4-7)	74 (71-76)
	mNHSS° score, ≥7*	407 (41)	23 (19-28)	23 (20-26)	77 (74-80)
	aMHSS score, ≥117	779 (78)	5 (3-8)	69 (66-73)	52 (49-55)
	OoH-NIHSS soons, ≥1 <sup>11</sup> ; CPSS score, ≥1 <sup>12</sup>	832 (83)	4 (2-6)	76 (73-80)	47 (44-50)
	sNHSS-1 <sup>16</sup> score, ≥2"	347 (35)	34 (29-39)	19 (16-22)	76 (73-79)
	sNHSS-5" score, >4"	372 (37)	28 (23-33)	20 (17-23)	77 (75-80)
	sNHSS-8 <sup>14</sup> score, ≥6*	405 (40)	23 (18-27)	22 (19-25)	78 (75-80)
	CPSSS score, ≥2 <sup>14</sup>	324 (32)	35 (30-40)	16 (13-19)	78 (75-80)
	MPSS <sup>rs</sup> score, ≥3*	511 (51)	16 (12-20)	35 (31-38)	71 (69-74)
	rNHSS: profile A, B, C, D, or E (vs profile F)	535 (53)	17 (13-21)	39 (35-42)	68 (66-71)
	ROSIER™ score, ≥4*	421 (42)	21 (17-26)	24 (21-27)	77 (74-79)
(Stroke, 2016;47:1466-1472, DOI: 10.1161/STF	Scale; CPSSS, Cincinnati Preho: MHSS, National Institute of Healt MHSS, retrospective MHSS; RD0 "As no published cutoff was a of sensitivity and specificity in ou	n Stroke Scale; OoH-P SIER, Recognition of S vailable for these sco	IHSS, out of hospital MHSS; troke in the Emergency Roo	RACE, Rapid Arterial Occlum; and sNIHSS, shortened v	sion Evaluation Sc ersions of the NIF

#### MORE NUMBERS

- How good is the assessment?
- Cincinnati Prehospital Stroke Scale
- Testing Sensitivity 88% in anterior strokes only
- Actual NYC Sensitivity 62.4%
- Maybe the LAMS (Los Angeles Motor Score) is better?
  - LAMS ≥ 4 = NIH 10
- Totally miss posterior circulation

## THE RISK

- In each minute, 1.9 million neurons, 14 billion synapses, and 12 km (7.5 miles) of myelinated fibers are destroyed.
- 10 minutes of additional travel is equal to 19 million neurons
- tPA doesn't stop the clock for LVO, but it can help
- Improves overall rate of recanalization
- 25% patients recanalize prior to endovascular care
- Additional time to endovascular for subset of patients (only 10%) of total is increased but still in window for benefit <7.3 hours per most recent metaanalysis

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Т				

- Primary center keeps all those cases not eligible for endovascular
- Comprehensive center not overwhelmed
- 911 Ambulances more available for the next 911
- Rapid care and assessment for all
- More patients get tPA
- More patients get endovascular