Early Results from University of Rochester's "Code LVO" Pathway for Regional LVO Acute Ischemic Strokes

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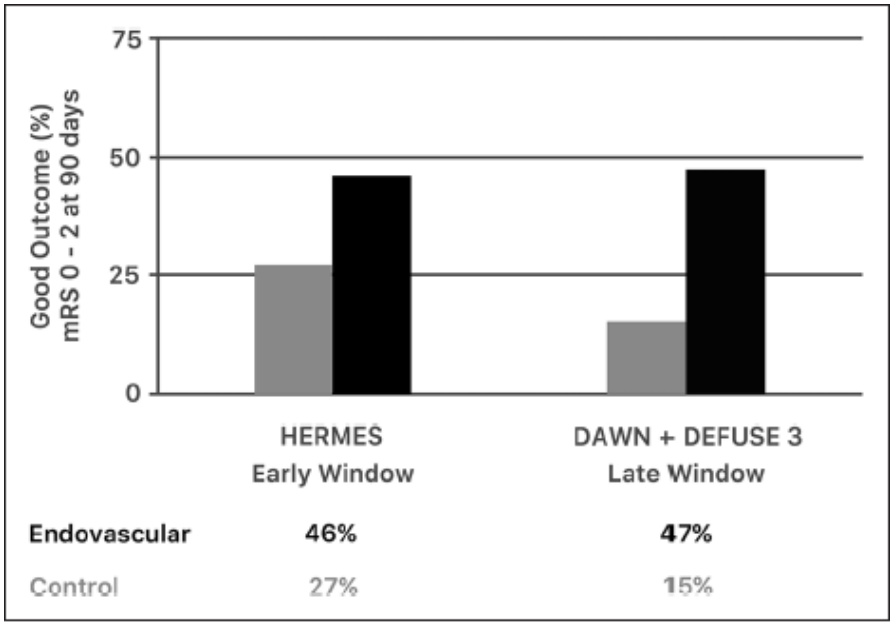
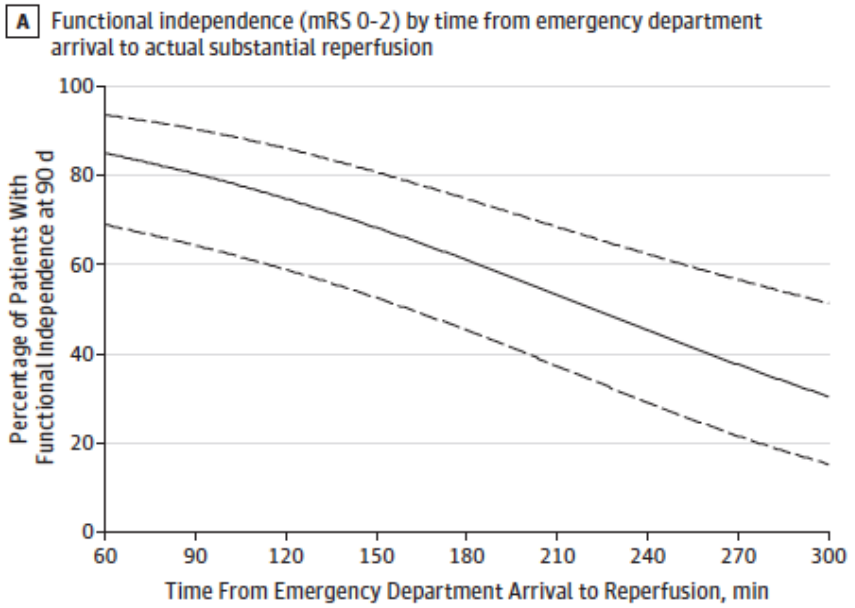
Stroke Treatment Alliance of Rochester STAR-NY

Disclosures

- We thank the NECC for their support for data collection and presentation

Mechanical Thrombectomy Efficacy





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Alberts, Stroke. 2018;49:768-771.
Saver, et al. JAMA. 2016;316(12):1279-1288

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Regional ELVO Data: 01/16 – 06/17

	MT +	MT -
N	9 (15%)	52 (85%)
DIDO (mean)	1:44	3:04
DIDO (median)	1:46	1:59
DTS (OSH ED) (mean)	4:27	n/a
DTS (OSH ED) (median)	4:08	n/a
Home/ Acute Rehab	7 (78%)	25 (48%)
NH/SNF/ CMO/ Deceased	2 (22%)	27 (52%)

Association of a Primary Stroke Center Protocol for Suspected Stroke by Large-Vessel Occlusion With Efficiency of Care and Patient Outcomes

Ryan A. McTaggart, MD; Shadi Yaghi, MD; Shawna M. Cutting, MD, MS; Morgan Hemendinger; Grayson L. Baird, PhD; Richard A. Haas, MD; Karen L. Furie, MD, MPH; Mahesh V. Jayaraman, MD

1. Notify the CSC on arrival
2. Perform computed tomographic angiography concurrently with non-contrast computed tomography of the brain and within 30 minutes of arrival
3. Share imaging data with the CSC using a cloud-based platform.

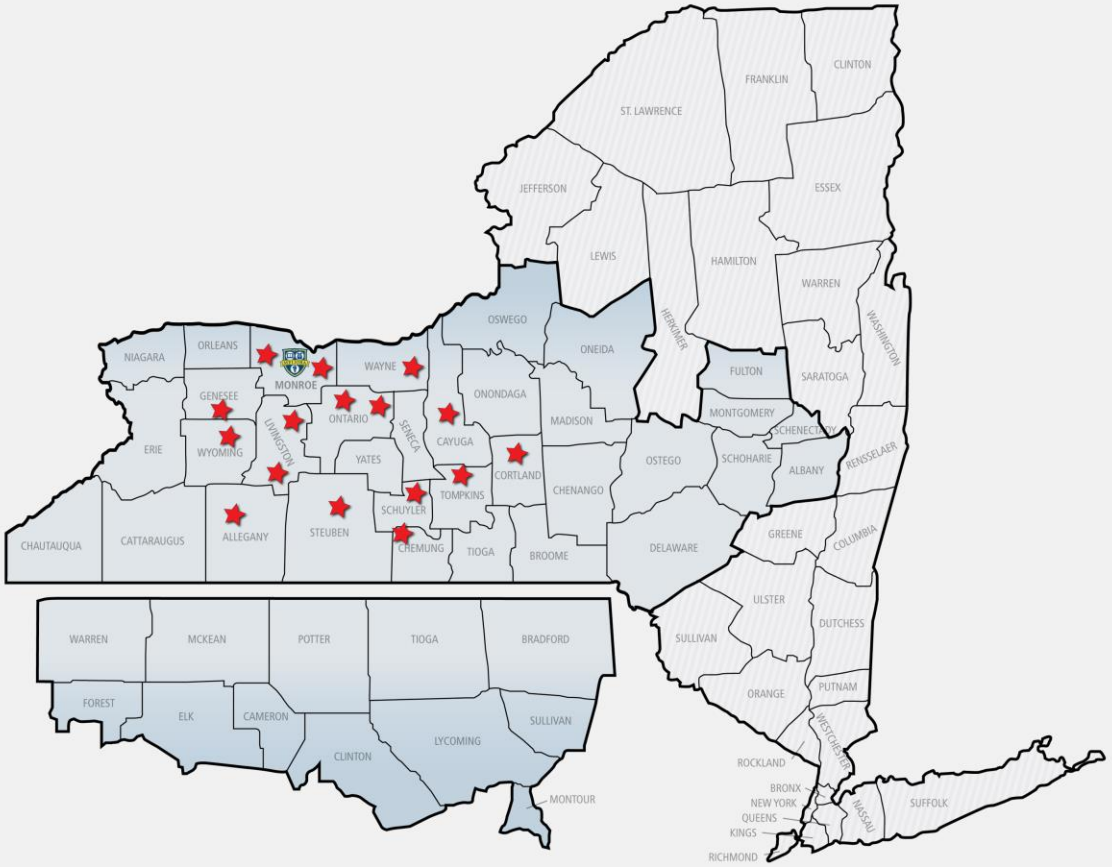
"When the protocol was fully executed, patients were twice as likely to have a favorable outcome (50% vs 25%, P < .04)."

Rhode Island (McTaggart, et al)

- 1212 sq miles
- ~1.05 million people

Rochester, NY Region

- Monroe County alone 1367 sq miles
- 14 more counties
- ~ 1.7 million people



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The URMC “Code LVO” Pathway

- 8/17 - 12/17: Process Engineering and internal vetting and stakeholder buy-in
- 1/18 - 4/18: External Vetting, internal and regional education
- 4/18: Go Live with first hospital
- 4/18-12/18: Review of pilot results, process improvements, continue regional buy-in and education, internal re-education and re-assurances

The “Code LVO” Pathway: Goals

- Identify all LVO-Strokes in our region that qualify for MT
- Allow stroke patients to remain in their local community hospital when transfer to a CSC is unlikely to be of benefit
- Median DIDO time < 60 minutes
- Median OSH door to CSC Skin Puncture time (DTS) < 120 minutes

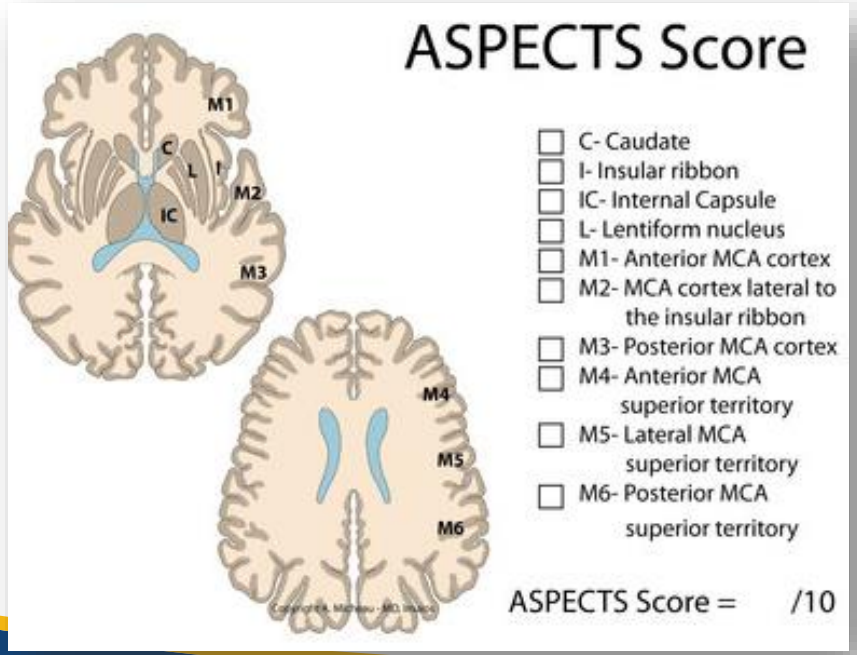
“Code LVO” Qualifying Criteria

NIHSS $\geq$ 6

ASPECTS $\geq$ 6

Anterior Circulation LVO (ICA or Proximal MCA, i.e. M1)

ASPECTS: Alberta Stroke Program Early CT Score



<u>Look at all Cuts</u>

CT cuts at level of Basal Ganglia

C/ IC/ L/ I

M1/ M2/ M3

CT Cuts > 1 cm rostral to Basal Ganglia:

M4/ M5/ M6

Lose 1 point for each area with EIC

Lancet 2000; **355:** 1670–74

http://www.aspectsinstroke.com/

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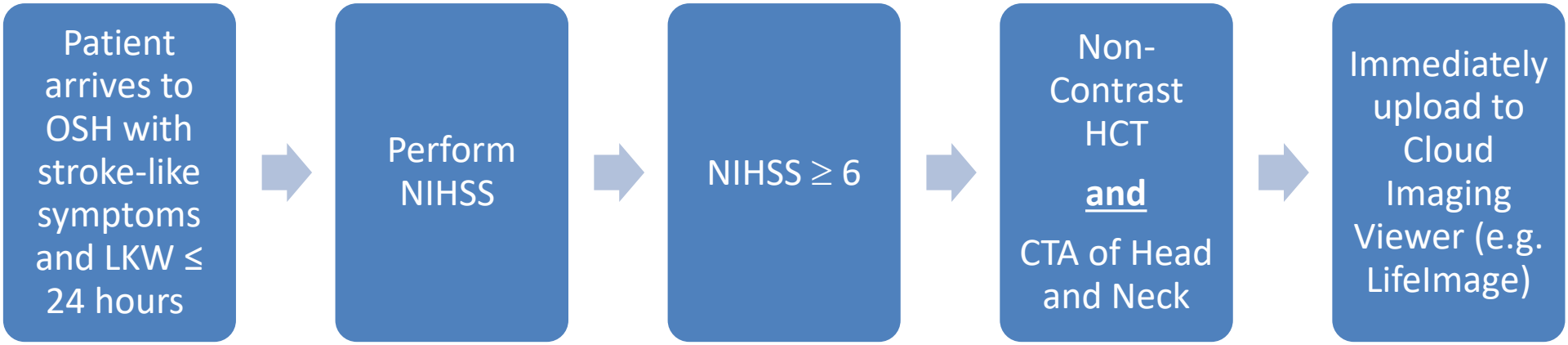
“Code LVO”: Identification



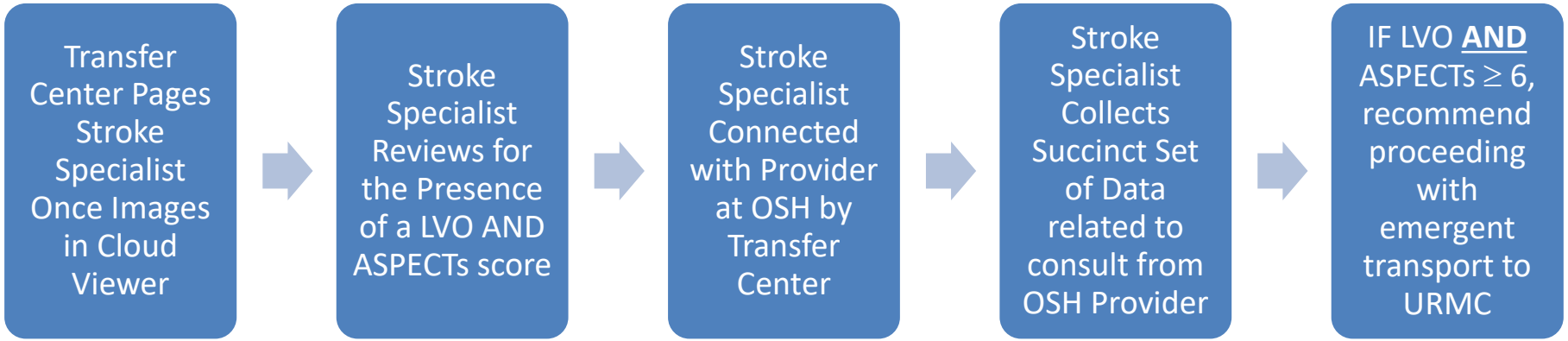
Code LVO: Parallel Processes

NIHSS ≥ 10

- Non-contrast HCT and CTA of Head and Neck on arrival -> Immediate Cloud Image Upload
- Call CSC Transfer Center and say "Code LVO at ____" and send facesheet*
- Auto-Launch Transport (HEMS vs Ground)
- Routine ED evaluation for IV tPA

*CSC reviews HCT and CTA for ASPECTS and LVO via Cloud Image viewer
For NIHSS 6-9, Hospitals asked to wait for radiology read before launch of transport

“Code LVO”: CSC Process



Succinct Data Collected

- NIHSS
- Method of Transport
- Anticoagulant Use + INR or Last Dose of Medication
- tPA yes/no
- LKWT
- Family contact name & phone number
- +/- Baseline Functional Status

CSC Process, Confirmed Transfer

- OSH RN -> URMC RN Report
- URMC sends “Code LVO” Page to
  - Mobilize the OR and NeuroICU
  - Provide notification to ED, Neurology, and NSGY of patient’s ETA

“Code LVO” Results 4/2018- 12/2018

Metric	Pre-Code LVO	Post-Code LVO	Absolute Diff
Hospital 1 Median DIDO	2:17	1:29	**-0:48**
Hospital 2 Median DIDO	2:07	1:43	**-0:24**
Hospital 3 Median DIDO	2:07	0:57	**-1:10**
Aggregate Median DIDO	2:10	1:20	**-0:50**
% DIDO < 60 minutes	1.1%	15.4%	**+14.3%**
Thrombectomy Attempt Rate	25.4%	53.9%	**+29.5%**
Mortality Rate	27.2%	16.7%	**-10.5%**

2018 “Code LVO” Results vs New York State

Metric	Code-LVO Hospitals	New York State	Difference
Median DIDO	1:20	2:10	**- 0:50**
% DIDO < 60 min	15.4%	3.7%	**+11.7%**

Acknowledgements

- Regional ED nurses and physicians
- Regional Stroke directors, providers and coordinators
- EMS and Critical care transport teams
- URMC Transfer center
- URMC ED and ICU teams
- URMC Cerebrovascular team
- URMC Radiology/ IR
- URMC OR teams and Anesthesiology

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“Code LVO” Team

- Sarah Gallagher, BS, RN, CCRN-K, SCRN, URMC Stroke Coordinator, FF Thompson Hospital
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- Curt Benesch, MD MPH, Medical Director, Comprehensive Stroke Center, Chief, Vascular Neurology, Professor of Neurology and Neurosurgery, University of Rochester

Measurable Objective(s)/ Outcome(s)

Primary Outcome

- MT performance rate in ELVO transfers, defined as attempted MT/ ELVO transfers

Select Secondary Outcomes

- DIDO time for ELVO transfers
  - Helipad vs none
  - Helicopter vs ground
- Auto-launch transport rate
- Transport Time
  - Helipad or none
- CSC door to puncture time
- OSH Door-to-skin puncture time
- CTA performance rate (NIHSS >/= 6)
- Discharge and 90 day mRS
- Describe barriers to full implementation of “Code LVO”