

# POST TPA NEURO VITAL SIGNS, A NEW APPROACH WITH THE HELP OF AN OLD FRIEND

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## DISCLOSURES

I WORK FOR HOUSTON METHODIST HOSPITAL: NO CONFLICTS



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DNV, JCAHO and AHA Guidelines of post tPA:

Vital Signs and Neuro checks:

Q15 min for 2 hours

Q30 min for 6 hours

Q1 hour for 16 hours

Specific Neuro Exam not specified. Whatever is used, must be used consistently.

Inconsistency among hospitals

NIHSS, GCS, Laterality of extremities, mNIHSS

Providers using NIHSS must be certified

Patients often admitted to non-neuro units

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Our Goal:

Maintain patient safety

New Scale will Identify changes in patient condition

Reduce time spent on each assessment  
(NIHSS can take 10+min)

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What we did:

Discussion with stroke neurologists and nurse practitioners to determine the testable items that would best show change in neuro status at the earliest phases. Used these in creating the Houston Methodist Stroke Change Scale (HMSCS)

HMSCS consists of elements from the NIHSS since the reliability and inter-rater variability has been long established on this scale.

IRB approved retrospective study to determine correlation between a change in patient conditions as identified in both the NIHSS and the HMSCS

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## LOC

- 0 = Alert; keenly responsive
- 1 = Not alert but arousable by minor stimulation
- 2 = Not alert, requires repeated stimulation, obtunded
- 3 = Unresponsive, responds only with reflex motor or autonomic effects, flaccid



## LOC Commands (“make a fist, open your fist; close your eyes, open your eyes”)

- 0 = performs both tasks correctly
- 1 = performs one task correctly
- 2 = performs neither task correctly



## Gaze

- 0 = Normal
- 1 = partial gaze palsy
- 2 = total gaze palsy



## Left Arm Motor

- 0 = No Drift
- 1 = Drift before 10 seconds
- 2 = Falls before 10 seconds
- 3 = No effort against gravity
- 4 = No movement

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## Right Arm Motor

- 0 = No Drift
- 1 = Drift before 10 seconds
- 2 = Falls before 10 seconds
- 3 = No effort against gravity
- 4 = No movement



## Left Leg Motor

- 0 = No Drift
- 1 = Drift before 5 seconds
- 2 = Falls before 5 seconds
- 3 = No effort against gravity
- 4 = No movement



## Right Leg Motor

- 0 = No Drift
- 1 = Drift before 5 seconds
- 2 = Falls before 5 seconds
- 3 = No effort against gravity
- 4 = No movement



## Speech ("MAMA, TIP-TOP, FIFTY FIFTY, THANKS, HUCKLEBERRY, BASEBALL PLAYER")

- 0 = Normal
- 1 = Mild to moderate slurring of speech
- 2 = Severe slurring of speech or Mute
- UN = Intubated or other physical barrier

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### Retrospective study

- All tPA patients from June 1, 2016 through December 31, 2016
- 24 hours of NIHSS were reviewed from EPIC on each patient.
- HMSCS was calculated from documented NIHSS
- Scales were compared if the NIHSS had a change of  $\geq 2$  points



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75 patient charts met criteria to be evaluated

30 cases had a NIHSS change, 26 also had a change in the HMSCS.

- The 4 cases had no deterioration in condition, and were conducted at shift change with different assessors.
- 13 patients were determined to have change in patient condition (cerebral edema, hemorrhagic transformation)

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### Conclusions:

Found to be safe for patients with no extra testing in comparison to what is currently being done.

Strong correlation between exams:

100% Correlation between NIHSS and HMSCS on patients with neurological deterioration

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### Conclusions

Decrease time spent in assessment and documentation.

NIHSS takes 8-10 min to perform fully

mNIHSS takes 5-7 min to perform fully (more items with higher inter rater variability)

HMSCS take 2-3 min to perform fully

NIHSS verses HMSCS

Save 5 min on each of the 36 time points

180 min of time given back to the staff for patient care

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Keep In Mind:

This exam is not meant to be a full exam. The change should spur the nurse into further action (more in-depth neurological exam, notification of physician, etc.).

The NIHSS does not go away. Still needs to be performed prior to tPA administration. Our system is also electing to do the NIHSS at handoff of a patient for shift change or transfer to a different unit. NIHSS at Discharge

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Limitations of our work at a single institution:

Small Sample size:

- 75 patients reviewed
- 30 with a change of 2 points at anytime
- 13 with follow-up CT/MRI due to change in condition
- 4 with swelling
- 2 ICH
- All others had no changes in scan or other issues, (NIH/MSCS elevated post thrombectomy)

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Future efforts:

IRB approval to retrospectively study up to 250 patients to see if the strong correlation continues

? Study the work with non-NIHSS certified nurses

? Expand to other centers for comparison

