
**Stroke Patient and ED Stroke
Therapy Assessments:
What Does Every Emergency
Physician Need to Know About
the NIHSS & Other Stroke
Scales?**

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**Emergency Medicine
Associates**

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Disclosures

- All past advisory board or speakers' bureau activities have expired within the past year

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Sessions Objectives

- Review stroke scales
- Discuss the NIH stroke scale (NIHSS)
- Discuss NIHSS and prognosis
- Discuss implications of NIHSS score and TPA usage

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Stroke Scales

- NIH Stroke Scale
- Scandanavian Stroke Scale
- Katz Index of ADL
- Kenny Self-Care Evaluation
- Hemispheric Stroke Scale
- Barthel Index
- Orgogozo Scale
- Canadian Stroke Scale
- The Activity Index
- Canadian Neurological Scale
- Toronto Stroke Scale
- Mathew Stroke Scale

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Stroke Scales

- Used for stroke assessment
- Initial use for clinical trials
- Many different types:
 - Global Outcome Scales
 - Physical Deficit Scales
 - Activities of Daily Life Scales

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Global Outcome Scales

- Global ranking on one or more broad scales
- Poor reproducibility and sensitivity
- Rankin scale (modified Rankin scale)

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Modified Rankin Scale

Level	Description
0	No symptoms
1	No significant disability, despite symptoms; able to perform all usual duties and activities
2	Slight disability; unable to perform all previous activities but able to look after own affairs without assistance
3	Moderate disability; requires some help, but able to walk without assistance
4	Moderately severe disability; unable to walk without assistance and unable to attend to own bodily needs without assistance
5	Severe disability; bedridden, incontinent, and requires constant nursing care and attention
6	Dead

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Stroke Scales

- Global Outcome Scales
 - Rankin Scale
- Physical Deficit Scales
- Activities of Daily Life Scales

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Physical Deficit Scales

- Stroke related deficits based on neurologic examination
- NIH Stroke Scale (NIHSS)
- 15 point assessment based on 3 previously used scales
- Designed for non-neurologist
- Good reliability

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NIH Stroke Scale (NIHSS)

1a. Level of consciousness 0: Alert 1: Drowsy 2: Stuporous 3: Comatose 1b. Level of consciousness questions (ask age and month) 0: Answers both correctly 1: Answers 1 correctly 2: Both incorrect 1c. Level of consciousness commands (close your eyes, make a fist) 0: Obeys both correctly 1: Obeys 1 correctly 2: Both incorrect 2. Best gaze 0: Normal 1: Partial gaze palsy 2: Forced deviation 3. Visual fields 0: No visual loss 1: Partial hemianopia 2: Complete hemianopia 3: Bilateral hemianopia 4. Facial paresis 0: Normal movement 1: Minor paresis 2: Partial paresis 3: Complete palsy	5a. Best motor (repeat for each arm and each leg) 0: No drift 1: Drift 2: Some effort versus gravity 3: No effort versus gravity 4: No movement 5b. Limb ataxia (scored only if present) 0: Absent 1: Present in 1 limb 2: Present in 2 limbs 10. Sensory (pinprick) 0: Normal 1: Partial loss 2: Decrease 11. Best language 0: No aphasia 1: Mild to moderate aphasia 2: Severe aphasia 3: Mute 12. Dysarthria 0: Normal articulation 1: Mild to moderate dysarthria 2: Unintelligible or worse 3: Unscorable 13. Neglect/attention 0: No neglect 1: Partial neglect 2: Complete neglect Total NIH-SS (0 to 42)
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Severity of Stroke

NIHSS score	Stroke Severity
0-1	normal, near-normal
1-4	minor stroke
5-15	moderate stroke
15-20	moderately severe stroke
>20	severe stroke

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Stroke Scales

- Global Outcome Scales
 - Rankin Scale
- Physical Deficit Scales
 - NIH Stroke Scale (NIHSS)
- Activities of Daily Life Scales

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Activities of Daily Life Scales

- Measures functions useful for daily living
- More useful for studies of rehabilitation
- Impractical in setting of acute stroke
- The Barthel Index

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The Barthel Index

- 10 weighted measures
- Feeding, bathing, grooming, dressing, bowel control, bladder control, toileting, chair/bed transfer, ambulation, and stair climbing
- Max score = 100 (10 pts for each area)

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NIHSS in ED Stroke Patients

- Correlates with volume of CT measured infarction
- Correlates with day 7 CT scans
- Strong predictors of overall prognosis

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NIHSS and Px

<u>NIH Stroke scale</u>	<u>1 yr Favorable Outcome</u>
<10	60-70%
>20	4-16%

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NIHSS Ease of Use?

- Great for data collectors, cumbersome for clinicians: ~8 minutes to do
- ED Acute Stroke presentations:
 - Head CT: 100%
 - Neurology consultation: majority
 - NIHSS performance: 1.2%
- Modified NIHSS, 3 Point Stroke Scale, others

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NIHSS & TPA Use

- Score correlates with IC bleed risk

<u>NIH Stroke scale</u>	<u>Symptomatic ICH</u>
0-1	2%
1-4	3%
5-15	5%
15-20	4%
>20	17%

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Other Scales

- Modified Rankin Scale
- Barthel Index
 - Predicts discharge placement & independent community living
- Outcome measure for stroke therapies
- NNT analysis for TPA use

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Conclusions

- Many different scales for stroke assessment
- NIHSS assesses severity of stroke and prognosis
- NIHSS correlates with TPA IC bleed risk
- Use of TPA in severe strokes merits caution

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Questions?

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