

APPENDIX I: Stroke Scales

For patients who experience a neurologic event post-implant, the modified Rankin Scale (MRS) and/or National Institutes of Health Stroke Scale (NIHSS) must be administered and the resultant scores recorded at the time of the event and at follow-up visits as part of the patient's routine care.

Modified Rankin Scale (MRS)

The MRS is a scale commonly used for measuring the degree of disability or dependence in the daily activities of individuals who have experienced a stroke. The MRS is administered at the time of the event and at follow-up visits after the event. The assessment requires approximately 5 minutes to complete. The scale runs from 0-6, running from perfect health without symptoms to death:

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

Only clinical staff trained to administer the test may do so. Training may be obtained at the following website: <http://www.rankinscale.org/>.

National Institutes of Health Stroke Scale (NIHSS)

The NIHSS is a systematic assessment tool that provides a quantitative measure of stroke-related neurologic deficit and is administered at the time of the event and at follow-up visits after the event. The scale was originally designed as a research tool to measure baseline data on patients in acute stroke clinical trials. However, the NIHSS is now widely used as a clinical assessment tool to evaluate acuity of stroke patients, determine appropriate treatment, and predict patient outcome.

The NIHSS is valid for predicting lesion size and can serve as a measure of stroke severity. The scale has been shown to be a predictor of both short and long term outcome of stroke patients. Additionally, the stroke scale serves as a data collection tool for planning patient care and provides a common language for information exchanges among healthcare providers.

The scale is designed to be a simple, valid, and reliable tool that can be administered at the bedside consistently by trained physicians, nurses or therapists and is used to

evaluate the effect of acute cerebral infarction on the levels of consciousness, language, neglect, visual-field loss, extraocular movement, motor strength, ataxia, dysarthria, and sensory loss. The NIHSS is an 11-item neurologic examination stroke scale; each item scores a specific ability between a 0 and 4. For each item, a score of 0 typically indicates normal function in that specific ability, while a higher score is indicative of some level of impairment. The individual scores from each item are summed in order to calculate a patient's total NIHSS score. The maximum possible score is 42, with the minimum score being a 0.

Stroke ¹	Stroke Severity
0	No Stroke Symptoms
1-4	Minor Stroke
5-15	Moderate Stroke
16-20	Moderate to Severe Stroke
21-42	Severe Stroke

¹ <http://emedicine.medscape.com/article/2172609-overview>

The single patient assessment requires less than 10 minutes to complete. Throughout the assessment, it is important that the examiner does not coach or help with the assigned task. The examiner may demonstrate the commands to patients that are unable to comprehend verbal instructions; however, the score should reflect the patient's own ability. It is acceptable for the examiner to physically help the patient get into position to begin the test, but the examiner must not provide further assistance while the patient is attempting to complete the task. For each item, the examiner should score the patient's first effort, and repeated attempts should not affect the patient's score. An exception to this rule is the language assessment (Item 9) in which the patient's best effort should be scored (refer to NIHSS form in this Appendix). Some of the items contain "Default Coma Scores", these scores are automatically assigned to patients that scored a 3 in item 1a.

Only clinical staff trained to administer the test may do so. Training may be obtained on-line at several websites (e.g., <https://learn.heart.org/nihss.aspx>). Alternatively, the NIH Stroke Scale Training DVD (version 2.0) may be obtained via the National Institute of Neurologic Disorders and Stroke at <https://catalog.ninds.nih.gov/ninds/product/NIH-Stroke-Scale-Training-DVD-version-2-0-/NDS-511>.

Additional NIHSS resources are located on the NIH website at: <http://stroke.nih.gov/resources/index.htm>.

Forms for both the MRS and NIHSS are included in this Appendix.