HCHS/SOL Question by Question Instructions
Stroke Abstraction Form Version 1 (STR1)
Question by Question Instructions – 07/12/2022

General Instructions

The HCHS/SOL Stroke Abstraction Form (STR) is completed for each HCHS/SOL stroke-related hospitalization, out of hospital stroke-related death and nonfatal outpatient stroke event that is considered eligible per the HCHS/SOL Event Eligibility Form (EEF). The abstractor should be familiar with the document titled "General Instructions for Completing Paper Forms" prior to completing this form. Staff ID number and date the abstraction was completed as well as event ID Number and event date should be completed in the form header section.

The Stroke Abstraction Form captures the specific reasons for stroke-related hospitalizations and the use of various procedures and diagnostic evaluations.

The purpose of the question-by-question instructions is to make sure all HCHS/SOL medical record abstractors are collecting information in the same way. The more specific information one has about each item on the form--and the more one knows regarding where to find the "answers" as well as how to record them--the more uniform and useful the HCHS/SOL data will be. Although one may have ample experience in medical record abstraction and medical terminology, these instructions provide definitions that will help ensure that everyone is using the same "tools" to describe an event.

For each item on the form, the instructions will tell you where in the medical record, and in what order, to look for the required information. When consulting several sections of the medical record, you may find that they provide different or even contradictory information. It is, therefore, very important to consult all listed sections of the medical record for a given item on the form. Ideally, the information needed to complete an item on the form will be found in one or more of the medical record sections listed. However, other parts of the medical record may need to be searched for an answer. If the information needed is still unable to be found, mark "No" for items in which "Unknown" is not an available option.

If an item on the form is unable to be completed because of missing or contradictory information in the medical record, the Principal Investigator (P.I.) or physician consultant should be contacted for advice.

Emergency Department (ED) Visits and Transfers: Separate admissions (e.g., b/c of transfers) are abstracted on separate Stroke Abstraction forms, even though both abstractions can be scanned into a single HCHS/SOL investigation at the judgment of the Events staff. Since an ER visit alone is not an actual admission, there is no need to do two separate abstractions in a situation where a participant has an ED visit at one hospital but is then admitted at a different hospital. In such a situation, the records of the ED visit should be abstracted as part of the admission at the second hospitalization.

Multiple Care Locations: In general, there are three different options to make sure everything is abstracted when care is received in two locations:

(a) Two entirely separate investigations, each with its own abstraction form. (Use this method

for two events separated by 24 hours, though the Events staff has the option of collapsing events into a single investigation if conditions are directly related and admissions are within 30-day span).

(b) One investigation with two or more abstraction forms. (Use for a single event involving two admissions linked by a transfer.)

(c) One investigation with one abstraction form, even though care was received in two locations. (Use for one event that involves multiple locations but only one actual admission, such as an ER visit at one hospital followed by an admission to a different hospital.)

Sections and Content of the Medical Record Used for Abstraction

You need to consult all of the following sections of the medical record, as appropriate, in order to gather adequate information to complete the form. If the entire chart is available, these sections should be reviewed first. It is a good idea to read through these sections (and others, if possible), before you begin recording information on the form, in order to familiarize yourself with the course of events that occurred from admission to discharge.

Although the instructions for each individual form item sometimes list the most likely sources for finding the information sought by that particular question, you can use documentation from anywhere in the chart if these sources do not provide the information you need. However, keep in mind questions related to the time of event.

The **Hospital Face sheet** provides participant demographic information as well as admission and discharge information (dates, treating physician(s), discharge diagnosis(es), and ICD-9 and 10-CM codes). It also contains charges for certain medications, and tests.

The **Emergency Department (ED) Record** and **Emergency Medical Technician (EMT) or Ambulance Report** describe symptoms, dates and times of symptoms, vital signs, initial treatment during transportation to the hospital, ED treatment, response, and disposition. In the ED there will be a triage note from the initial assessment of the patient, then notes from the nurse and a note from the physician. The triage note is particularly valuable for initial vital signs.

The **Admission History and Physical Exam** (H&P) is a detailed description of symptoms leading to an admission, the condition of participant on admission, current medication use, and past medical history. It also includes a physical exam, results of tests and procedures done in the ED or upon admission, provisional diagnosis(es), and the initial treatment plan. Hospital visits of patients who stay in the hospital for < 24 hours may be designated as **observation care** which is considered outpatient care even though it may be overnight in the hospital. For these stays, you may only see a "short stay" note which is the admission note and discharge note combined.

The **Discharge Summary** summarizes the entire hospitalization, including admission and discharge dates, treating physician(s), the admission H&P, hospital course, treatments and procedures, and discharge disposition. If the hospitalization is prolonged or if residents or attending physicians rotate while a participant is admitted, there may also be an **interim summary** (which would not include the hospital course section). When there is an interim summary the discharge summary is still expected to be completed.

The **Death Summary** may replace or augment the discharge summary in the event of a participant's death. It may contain, or be attached to, autopsy information or an autopsy report.

The **Consults section** contains typed or handwritten notes made by specialists (e.g., infectious disease, cardiology, neurology) consulted while the participant was hospitalized. Handwritten consults may also be found in the physician progress notes section.

Laboratory Results. This section will contain chemistries including cardiac enzyme levels.

ECG Reports. In chronological order, the first, second, third and last ECG reports from the hospitalization are of interest.

The **Radiology (or diagnostic tests) section** contains reports of chest x-rays, echocardiograms, CTs, angiograms, cardiac catheterizations, VQ scans, thalium stress tests and other imaging procedures.

The **Operative section** contains operative and pathology reports and may contain autopsy reports. **Outpatient Records,** if available, may be used if they can provide more information about the event in question. If within a week of the ED or hospital visit, outpatient records may help to confirm recent signs and symptoms of specific conditions.

Rules on hierarchy and use of qualitative reports:

The underlying purpose of these rules is to capture information rather than to miss it, as long as the information appears accurate.

If there are conflicting sources of information, take information in this priority: the neurologist (any type of note), the attending physician (any type of note) the resident, ED physician, and nurse. However, if there is disagreement regarding diagnosis between physicians, the subspecialist for that diagnosis takes superiority. For example, for a pulmonary issue, the pulmonologist is considered more correct, but for a neurological issue, the neurologist should be more correct than the non- neurologist.

Rules for Physical Exam and Symptoms:

In general, the goal is to capture any presence of an abnormal exam finding. For signs and symptoms, any documented description of an abnormal finding by any physician is sufficient unless stated otherwise in the QXQ at the time of event. In the case where an exam finding is specifically requested for any one point in time and there is disagreement about the presence of that physical finding at that specific time point (e.g., at the time of the event), take information in this priority: the neurologist (any type of note), the attending physician (any type of note) the resident, ED physician, and nurse. If there is disagreement between subspecialists, the subspecialist for that diagnosis takes superiority. Time of event is meant to include approximately 24 hours after time of arrival or event onset if it happened after arrival.

For Stroke abstraction, a neurologist's exam and findings will take precedence over any other physician's findings if the neurological examination was completed within the first 24 hours of arrival or of an in-hospital event.

If the examination by the neurologist takes place more than 24 hours after arrival or of an in-hospital event, record the findings of the ED physician on arrival or of the first physician to examine the patient after the in-hospital event.

Please avoid using the following secondary sources to gather information, unless primary sources are incomplete or unavailable: physician orders, nurse's or multidisciplinary notes, vital sign logs, or physician progress notes, unless there is **no other way** to reconstruct the event.

Rules for Vital Signs at Time of Admission:

Use the first in time for admissions and the last in time for discharge (not necessarily the H&P) to complete Section B - Presenting Signs and Symptoms.

Rules for Diagnostic Tests: Qualitative vs Quantitative reports:

Generally, a physician's qualitative data takes precedence over quantitative (technician's) data. If there is a discrepancy between data in the qualitative description and data in the conclusion, use data in the qualitative section (i.e. go with text not test). If reviewing an actual report, the physician's qualitative interpretation takes precedence over the quantitative test result or any other physician's comments pertaining to the original interpretation. History and physical notes rank higher than emergency room notes.

General Information About Certain Procedures:

Procedures: The indicated procedures or treatments may lead to stroke in or out of the hospital. The first four procedures are invasive tests that could lead to clot formation or dislodgement of plaque, both of which may result in stroke. If the neurologic symptoms had multiple onsets, answer in relation to the most important onset.

Be aware that the same logic applies to treatment with anticoagulants such as Heparin and Warfarin (Coumadin). These are anticoagulant medications which may lead to a hemorrhagic complication, such as cerebral (brain) hemorrhage. Anticoagulants may be used to treat something other than the acute neurologic syndrome that this form is evaluating. The same logic applies to treatment with thrombolytic agents. When in doubt answering any questions on the form pertaining to anticoagulant treatment, contact the Neurologist Consultant.

Synonyms and definitions of procedures and medications/agents:

Cardiac catheterization. Catheter is placed in the heart chambers or coronary arteries for visualization. Also called coronary angiogram, coronary angiography. PTCA or PCI = "Yes"

Open heart surgery. Includes coronary artery bypass grafts (CAB or CABG), valve replacements or commisurotomy (mitral or aortic), repair of septal defect (ASD, patent foramen ovale).

Cerebral angiography. Also called cerebral angiogram, carotid angiography/angiogram, or 4 vessel angio. If only the carotids are visualized, this may be referred to as a 2 vessel angio. Also include vertebrobasilar angiograms. Answer **"Yes**" to angio's performed for the purpose of some intervention. (e.g...aneurysm clipping/coiling/repair).

Carotid endarterectomy. Surgical revascularization in the **neck** of a carotid artery obstruction.

Therapy with Heparin or Warfarin. This is "full dose" therapy, and does not include subcutaneous (SQ) Heparin, Lovenox, or a single dose.Associated drug names: Apixaban, Dabigatran, Eliquis, Pradaxa, Rivaroxaban, Xarelto.

Therapy with thrombolytic agents. Intravenous or intracardiac lysing (clot dissolving) agents used in the early stages of acute MI: TPA (tissue plasminogen activator, streptokinase, urokinase, APSAC (anisoylated plasminogen streptokinase activator complex), Alteplase. Other similar products which enter the market after the date of writing should be included. tPA for acute ischemic stroke should not be recorded, because it did not precede the stroke. (It may cause subsequent hemorrhagic stroke, but we focus on the first event).

Definitions of Terms

Some questions have responses of ”Yes,” “No,” and “Not Recorded.” If nothing is written down that definitely answers the question, “Not Recorded” should be chosen. Be sure to follow the correct skip patterns, i.e.: follow form logic! The following table lists terms you may encounter in the medical record that, when in doubt, should be recorded on the form as “Yes,” “No,” or “NR (Not Recorded - Unknown).” Obviously, the entire content of the event should be considered as well.

Yes	No	Unknown
Present	Not present	Rule out (R/O)
		Cannot Rule Out
Likely	Low probability	Suggestive
Apparent	Unlikely	Equivocal
Consistent with		Suspicious
Compatible with		Questionable
Definite		Possible
Probable		Uncertain
Highly suspicious		Reportedly
Presumed		Perhaps
Borderline		Could be
Thought to be		Might be
Minimal		May be
Representing		May represent
Mild or trace		
Scant		

The table below contains time-of-day and length-of-time terms that you may encounter in the medical record and how they should be interpreted and/or recorded on the form. (Use 12-hour clock, not 24-hour clock).

If the medical record says this…	You record this…
[If no time is listed]	12:00p.m.
Middle of the night	1:00 a.m.
Early morning	6:00 a.m.
Morning	8:00 a.m.
Late morning	10:00 a.m.
Mid-day or noon	12:00 p.m.
Early afternoon	2:00 p.m.
Afternoon or mid-afternoon	3:00 p.m.
Late afternoon	4:00 p.m.
Early evening	7:00 p.m.
Late evening	11:00 p.m.
Midnight	12:00 a.m.
Several days	>3 days
A few days	≥ 2 but < 4 days
Several hours	≥ 4 but < 6 hours
A few hours	≥ 2 but < 4 hours

To record other time frames, use the following guidelines:

≥ 3 days	Several days
≥ 1 day and < 3 days	Few days
≥ 4 hours and < 6 hours	Several hours
≥ 2 hours and < 4 hours	Few hours
2 hours	Short time ago

"X days postoperative": the first postoperative day is the calendar day after the surgery

For timing purposes, when a patient was out of the hospital but not discharged (e.g., weekend pass), events will be considered in-hospital (an extension of the hospitalization).

It is appropriate to use information from the NIH scale to record neurological deficits. NIH scale takes precedence over contradicting information. (see APPENDIX I for the NIH scale.)

Whenever you have questions about the medical information recorded in the hospital record, consult with your surveillance director/MD consultant.

Other specific definitions are included in the instructions for each item on the individual abstraction form.

Stroke and TIA: Synonyms and Descriptions

Stroke refers to damage of brain tissue caused either by blockage of a blood vessel ("ischemic stroke," the most common kind of stroke) or bursting of a blood vessel ("hemorrhagic stroke," the most lethal kind of stroke). Stroke causes permanent injury to the brain. Symptomatic recovery depends on the location and extent of injury and may be complete or end in death. Symptoms typically affect just one side of the body and can include weakness, loss of sensation, loss of vision, loss of language function or other cognitive deficits. Synonyms for stroke include cerebrovascular accident, or cerebral vascular accident and when these terms are used by themselves the presumption is often ischemic stroke depending on context. A synonym for ischemic stroke is cerebral infarction.

Ischemic strokes are often categorized according to presumed cause, including cardiac embolism (cardioembolic), large artery atherosclerosis (e.g. carotid stenosis or intracranial stenosis due to cholesterol plaques), lacunar infarction (often called "small vessel stroke") or cerebral infarct without an identified cause after evaluation (cryptogenic stroke or embolic stroke of unknown source (ESUS).

Ischemic stroke often develops some bleeding within the territory of infarction, often called "hemorrhagic transformation." Large ischemic strokes almost always have some minor bleeding. This bleeding is usually asymptomatic but when the amount of bleeding is large it can make the patient's exam worse. These cases are still classified as ischemic stroke, not hemorrhagic stroke.

Hemorrhagic stroke has two subtypes, intracerebral hemorrhage (ICH), which is bleeding within the brain tissue and subarachnoid hemorrhage (SAH), which is bleeding in the subarachnoid space on the surface of the brain. SAH is most commonly caused by rupture of a berry-like outpouching in a cerebral vessel called an aneurysm. "Intracranial hemorrhage" is a term often used in place of intracerebral hemorrhage but technically refers to bleeding anywhere inside the skull and is more appropriately used for head trauma, not stroke.

For the purpose of HCHS/SOL classification of stroke, a stroke involves rapid onset of neurologic deficit, headache not secondary to brain trauma (closed head injury), tumor, infection (e.g., encephalitis or meningitis), or other non-vascular cause. Clinical evidence or suspicion of embolic stroke secondary to subacute bacterial endocarditis (SBE) is counted as stroke. Classification of stroke requires either clinically relevant lesion on brain imaging∗, or duration of symptoms greater than 24 hours, or death within 24 hours of symptoms.

Transient Ischemic Attack (TIA) refers to transient stroke symptoms caused by blockage of a blood vessel that reopens quickly enough so that no damage to brain tissue occurs. Typically, symptoms last just a few minutes, rarely more than one hour. It can include one or more episodes of [acute] focal neurologic deficit, lasting more than 30 seconds, with complete resolution of a focal neurologic deficit within 24 hours. To be a TIA it must have no clinically relevant lesion on brain imaging (or brain imaging not done) and must NOT have chronic

jerking, conjugate eye deviation, prolonged focal seizure with spread, scintillating scotoma, headache with nausea and vomiting, or immediately precede head trauma. The correct diagnosis of TIA is difficult; transient neurological symptoms mimicking stroke have many causes including migraine, seizure, nerve compression, low blood pressure and inner ear disorders. Some symptoms such as transient dizziness or numbness and tingling are so common that they are not diagnosed as TIA even though blockage in a blood vessel could be a cause. TIA is not a benign diagnosis even though symptoms resolve quickly. A true TIA carries as much or more risk of future stroke as an ischemic stroke and leads to hospitalization in many centers.

SPECIFIC ITEMS

The 'Completion Date' (the date of abstraction) and 'Staff ID' are entered as the first two fields on the form (0a. and 0b.). 'Event ID' (the 0c. field) is the Subject ID plus the two-digit Abstraction Year under "Form Group" followed by the two-digit Occurrence number under "Occurrence" on the CDART Data Management System (DMS)'s Form Grid screen. It should be carefully checked for accuracy when entered into the DMS. 'Event Date' (the 0d. field) is the date of the hospital admission. Event ID and event date should also be used to assist the abstractor in confirming the medical record being abstracted matches the Events Eligibility (or EEF) form. ***Please check these two forms when beginning an abstraction into the Stroke Abstraction (STR) form.***

ITEM BY ITEM INSTRUCTIONS

ADMINISTRATIVE INFORMATION

Item 0a. Completion Date: Enter the date as mm/dd/yyyy that the abstraction was completed.

Item 0b. Staff ID: Enter the personal abstractor number assigned to YOU.

Item 0c. Event ID: Enter the corresponding Event ID in the 12-digit space provided.

Item 0d. Event Date: Enter the hospital admission date as mm/dd/yyyy.

SECTION A: GENERAL INFORMATION

Item 1. Record the Date of Arrival to the Hospital (mm/dd/yyyy) This should be on the Triage or E.R. report, nurse's notes or possibly the Face Sheet as the "date of arrival." If the date of arrival is not available, record as missing. Look for validation that the date of arrival is correct on the E.R. notes, Face Sheet or additional documentation especially on handwritten notes.

Be aware that the arrival date is often different (e.g., the following day) from the admission date.

- *Sources: E.R. notes, Hospital Face Sheet, nurses or physicians' notes, etc.*

<u>Item 1a.</u> Time of Arrival: Record the earliest available time of arrival at the facility in 24-hour clock format (ex: 07:00, 12:30 etc.)

- *Sources: Hospital Face Sheet, E.D. Report, ECG Tracing, Lab Collected Times.*

<u>Item 2</u>. What was the Primary Admitting Diagnosis Code? Enter the primary admitting diagnosis code. This is the ICD code assigned to the main reason for the hospital admission or ED visit. However, once admitted, tests are done and treatment is provided, the original diagnosis may change or be ruled out. It may be the same as the primary discharge diagnosis code, but not always. ED visits that do not result in admissions will only have discharge codes, since the patient was not admitted. Be sure to list the admitting diagnosis code from the hospital face sheet. If there is no face sheet or formal ICD coding summary then you may see an assigned ICD code on the ED report, H&P or other sources listed below. Note: DO NOT ASSIGN an ICD code to the admitting diagnosis, if there is no ICD code assigned already, enter as missing. Do NOT use the codes listed on the second (2nd) page of the HCHS/SOL Medical Records Documents Shipping Cover Form. This is not a formal hospital record document.

- *Sources: Hospital Face Sheet, ED report, H & P, hospital transfer documents, physicians' notes.*

<u>Item 3.</u> Record the Date of Discharge from the hospital or Death (in mm/dd/yyyy), if death occurred during the hospitalization. This should be on the admission History and Physical and the Discharge Summary; (e.g., "date of discharge."). If the date is not available or this is an ED visit only, and no death occurred and/or was recorded, record as missing. Look for validation that the date of discharge is correct on the H & P, especially on handwritten notes in which the discharge date is not automatically filled in. Discharge date may also be on the hospital face sheet. If the participant was transferred to a rehabilitation center, chronic care facility or chronic care in the same hospital, the discharge date is the date of transfer. If the patient died, then record the date of death.

NOTE: If a patient is DOA (dead on arrival), an ER death (no matter what the circumstances or how long the patient was in the ER), or hospitalized with no vital signs and dies within 24 hours of admission, s/he is treated as an ***out-of-hospital death***.

Be aware that the discharge date may be different (e.g., the following day) from the ER date.

- *Sources: Hospital Face Sheet, Discharge or Death Summary or autopsy report.*

<u>Item 4.</u> What was the Primary Discharge Diagnosis Code? This is the ICD code assigned to the main reason determined for the admission, usually found on the ICD coding summary page for every hospital admission. In the absence of an ICD coding summary page, refer to the discharge report. The admission diagnosis and discharge diagnosis may not be the same. The primary discharge diagnosis will be conclusive, based on all testing and treatment per admission or ED visit. Be sure to list the discharge diagnosis code from the hospital face sheet. Occasionally, if there is not a face sheet or formal ICD coding summary then you may use an assigned ICD code if there is one on the Discharge Summary or other sources listed below. If there is no actual ICD code present, do not code diagnoses yourself, instead enter as missing. Do NOT use the codes listed on the second (2nd) page of the HCHS/SOL Medical Records Documents Shipping Cover Form. This is not a formal hospital record document.

- *Sources: ICD summary page, Hospital Face sheet, Discharge Summary, ED report,*

hospital transfer documents, physicians' notes.

Item 5. Mode of arrival from home/scene for neurological event or if neurological event occurred in hospital. Record Unknown (9), EMS (1), Private transport/taxi/walk-in (2), Transfer from another hospital (3), Mobile stroke Unit (4). If the information is not specified in the documentation provided as to whether the participant arrived at the hospital by EMS, private transportation, taxi or was a 'walk-in', was transferred from another hospital or arrived by a mobile stroke unit (an ambulance that has a CT scanner and within which a nurse can administer tPA on the way to the hospital). Currently only a few such units exist – only in large cities

- *Sources: Hospital Face sheet, ED report, hospital transfer documents, physicians' notes. nurses' notes, Discharge Summary.*

Item 6. Was the participant transferred from this hospital to another? Record No (0), Yes (1) or Unknown (9) if the information is not specified in the documentation provided. "Another hospital" means an acute-care facility to which the participant had been admitted.

If you answer "Yes" to this question, complete another HCHS/SOL STR form for the other hospitalization if the participant was admitted to the other hospital for a stroke event or suffered such an event while in the other hospital (refer to b. under Multiple Care Locations in General Instructions at the top of this document).

- *Sources: EMT/ambulance report, ED record, Discharge or Death summary, H&P, hospital transfer documents, physician's and/or nurses' notes.*

Item 7. Was a DNR/DNI or Withdrawal of Care order present during this hospitalization? Record No (0), Yes (1) or Unknown (9) if the information is not specified in the documentation provided.

- *Sources: ED record, H&P, Hospital face sheet, physician's and/or nurses' notes.*

SECTION B: MEDICAL HISTORY

Item 8. Were there new neurologic signs/symptoms present upon this admission? Record No (0), Yes (1) or Unknown (9).

The purpose of this question is to identify new signs/symptoms that began upon admission to this hospital. Refer to neurological signs/symptoms described below. Symptoms starting in the ED or EMS (in the ambulance) are considered as in-hospital onset. In the case of a clinically silent acute stroke seen on brain imaging but displaying NO signs or symptoms, answer this question as No. Answer the Q 46 CT and Q 47 MRI questions based on the in-hospital imaging.

Signs are physical exam findings observed by a physician. Symptoms are complaints expressed by the patient or relayed by the patient's family or friends.

Neurologic signs include: coma, paralysis, Babinski reflex, weakness, facial drooping, difficulty speaking or understanding, arm drift, seizures (convulsions,), change in level of consciousness

(LOC), etc.

Neurological symptoms include: weakness, numbness, tingling, visual disturbance, speech abnormality, difficulty swallowing, difficulty hearing, dizziness, vertigo, gait difficulty, incoordination, severe headache, seizures (convulsion), or change in level of consciousness.

For our purpose, we are interested in new or acute findings (that is, if a patient is presenting for evaluation of neurologic symptoms that have not been previously evaluated). Thus, for instance, a diabetic with long standing peripheral neuropathy who has had tingling in his feet for years would not have the same significance as someone who suddenly developed numbness on one side of his body.

If you are uncertain, consult the neurologist consultant. If in doubt about whether the finding is new, answer "Yes" and continue on.

Item 9. Did the participant's stroke or TIA occur during this hospitalization? Record No/NR (0) or Yes (1). If no/NR, skip to Item 10. In the case of a clinically silent stroke seen on brain imaging but displaying NO signs or symptoms, answer this question as No and enter a notelog.

Item 10. Did the event occur in the setting of a procedure within the last 30 days or during this hospitalization? Record No/NR (0) or Yes (1). If No/NR, skip to Item 11. Interpret "in the setting of a procedure" as during or after a recent pre-hospital or in-hospital procedure.

Item 10a. If Yes, what procedure? For EACH box 1-6, Record No/NR (0) or Yes (1) for each procedure listed. If "Other" (6) is chosen, please specify what other procedure applies and record in the comment field provided at item 6a.

- *Sources: Diagnostic Procedure Reports, Operative Reports*

Items 11. Date/time of onset of current neurologic symptoms:

Item 11a. Date Known? Record No (0) or Yes (1) if the date of onset of current neurological symptoms is known. If No (0), skip to Item 12.

Item 11b. Date: If yes, fill in boxes with month, day, and year in mm/dd/yyyy format. Treat month, day, year as separate items, *e.g.*, fill in year even if month and day are not given. If there are multiple new symptoms, indicate the beginning of the first of the new symptoms. Within reason, fill in a date. For example, if it says "two weeks ago," subtract 14 days from the admit date. If asymptomatic at bedtime, but awakened with symptoms, use the date of the day the symptoms were evident.

Item 11c. Time Known? Record No (0) or Yes (1) if the time of onset of current neurological symptoms is known. If No (0), skip to Item 12. If there are competing times of onset recorded, use hierarchy to decide the time.

Item 11d. Record the time, if known, in 24-hour clock format (ex: 07:00, 12:30 etc.)

Item 12. When was the patient last known to be free of deficits?

Record No (0) or Yes (1). If No, skip to item 13. A neurological deficit refers to abnormal function of a body area. This altered function is due to a problem with the normal function of the brain, spinal cord, muscles, or nerves. Examples include weakness or the inability to speak.

Item 12a. Date Known? Record No (0) or Yes (1) if the date the patient was last known to be free of deficits is known. If No (0), skip to Item 13. If patient went to bed well and woke up neurologically impaired, use the went-to-bed date as the last free of deficits date.

Item 12b. **Date:** Record the date (mm/dd/yyyy), if known.

Item 12c. Time Known? Record No (0) or Yes (1) if the time the patient was last known to be free of deficits is known. If No (0), skip to Item 13. Record the same time as the onset of neurological symptoms, if the onset occurred while patient was awake.

Item 12d. Time: Record the time the patient was last known to be free of deficits if known, in 24 hr. format (ex: 07:00, 12:30 etc.)

Item 13. Was there a history of previous stroke? Record No (0), Yes (1) or Unknown (9). If No or Unknown, skip to Item 14.

This refers to events preceding the present acute illness and hospitalization. Synonyms for "stroke" may include some of the following: cortical infarction, intracranial hemorrhage, cerebral thrombosis, cerebral artery occlusion, cerebral infarction, subarachnoid hemorrhage, apoplexy, cerebrovascular accident (CVA), intracerebral hemorrhage.

Answer "Yes" if one or more of the sources listed above makes explicit mention of previous "stroke" or states: a history of "probable stroke", a history "consistent with stroke", a diagnosis of "CVA vs. TIA", [use of this term disappeared 3 decades ago]. Answer "No" if absence of stroke is explicitly mentioned, if stroke was "possible" or "questionable" only (this differs from the normal definitions of terms on page 6 of this QxQ), or if the patient had a stated "TIA" with no documented residual findings.

Accept the documentation of a "TIA" unless the syndrome lasted more than 24 hours or there is an infarct on imaging. "No previous cerebrovascular disease" = No. Record "Unknown", otherwise, or if the only information about old stroke is from a CT scan. If a physician states history of old stroke based on an MRI/CT scan of head, answer "Yes" to history of stroke. Do not say "Yes" on the basis of an MRI/CT scan report alone. This information is needed to distinguish first events from recurrent events in subsequent data analysis. (See APPENDIX A).

If there is good documentation of a patient's history, record "No", even if the absence of a stroke is not explicitly stated. Take information from the history of the neurologist, resident, attending physician, ER physician or nursing notes/EMS, in that order.

Note: When “stroke” is stated, assume it is ischemic unless hemorrhagic is specifically mentioned. Per Dr. Labovitz, most strokes are ischemic.

Item 13a. **Date Known?** Record No (0) or Yes (1). IF No, skip to Item 13c.

Item 13b. Date of most recent stroke: (mm/dd/yyyy). Enter the date for first event, the *most recent* one. If specific dates are not given, use information available to calculate date. For instance, if stroke occurred "eight years ago" subtract eight from the current year. If a range is given for date of stroke (e.g., 5-7 years) choose the smaller number (5 years) and subtract from the current year.

Item 13c. Type of stroke: Unknown (9) (If answer = 9, skip to item 14) or Ischemic (1) (If answer = 1, skip to item 14) or Intracranial Hemorrhage (2) (If answer = 2, skip to item 13c1) or Subarachnoid hemorrhage (3) (If answer = 3, skip to item 13c3). In general, ischemic strokes are usually sudden in onset, while symptoms for hemorrhage may be more progressive in nature (ie: an ICH may progress over 30 minutes or more). If only “stroke” is documented and no mention of hemorrhage is found, select Ischemic (1) for this question.

Item 13c1. If the patient had an ICH, was hematoma evacuation performed?

No (0), Yes (1), or (9) Unknown

Item 13c2. Did the patient receive an intra-hematoma tPA infusion?

No (0), Yes (1), or (9) Unknown (For any answer to 13c2, skip to item 14).

Item 13c3. If the patient had an SAH, was an aneurysm found?

No (0), Yes (1), or (9) Unknown

Item 13c4. Was aneurysm coiling performed? No (0), Yes (1), or (9) Unknown

Item 13c5. Was aneurysm clipping performed? No (0), Yes (1), or (9) Unknown

Item 14. Is there a history of previous TIA? Record: No (0), Yes (1) or Unknown (9). If No or Unknown, skip to Item 15.

This refers to events preceding this acute illness. If admitted for first TIA, record "No". If a TIA preceded the current event, record "Yes". Synonyms for "TIA" may include: acute cerebrovascular insufficiency, spasm of cerebral arteries, insufficiency of basilar, carotid, or vertebral arteries history of amaurosis fugax (transient monocular blindness) = “Yes” to TIA. (See APPENDIX A). Reported (by patient or family) but unevaluated TIAs should be answered "No". If there is good documentation of a patient’s history, the abstractor can answer ”No”, even if the absence of TIA is not explicitly stated. Take information from the history of the neurologist, resident, attending physician, ER physician or nursing notes/EMS, in that order. Accept a diagnosis of TIA unless there is an infarct on imaging or it lasted more than 24 hours. A couple of possibilities where we could record a history of TIA are: (if record states “hx. of TIA 3 yrs. ago” answer YES). The real interest in having this question, per the reviewers, is if there was a pattern of TIA which precedes the current stroke of interest. For ex: Someone comes in with a TIA yesterday and then comes in the next day with severe deficits. Item 14a. and b. below, clarifies this a lot.

Item 14ab. If recent TIA, Date Known? (mm/dd/yyyy).

Enter the date for first event and most recent. If the date is not known, skip to Item 15. If there was only one previous event, complete Item 14a. with the same date (*i.e.*, the first and most recent event were the same). If specific dates are not given, use information available to calculate date. For instance, if TIA occurred "eight years ago", subtract eight from the current year. If a range is given for date of stroke (e.g., 5-7 years) choose the smaller number (5 years) and subtract from the current year. The intention of this question is whether the TIA pattern is part of this event or not related to it.

Item 15. Does the participant have a history of coronary artery disease (CAD) ? Record: No (0), Yes (1) or Unknown (9).

Item 16. Does the participant have a history of peripheral vascular disease (PVD) ? Record: No (0), Yes (1) or Unknown (9).

Item 17. Does the participant have a history of carotid disease? Record: No (0), Yes (1) or Unknown (9).

Item 18. Does the participant have a history of end stage renal disease (ESRD)? Record: No (0), Yes (1) or Unknown (9).

Item 19. Does the patient have a history of diabetes (DM, DM1, DM2, IDDM NIDDM)? Record: No (0), Yes (1) or Unknown (9).

Item 20. Does the patient have a history of hypertension (HTN)? Record: No (0), Yes (1) or Unknown (9).

Item 21. Does the patient have a history of dyslipidemia or prior therapy for such? Record: No (0), Yes (1) or Unknown (9).

Item 22. Does the patient have a history of smoking? Record: No (0), Yes (1) or Unknown (9).

Item 23. Does the patient have a history of use of alcohol use disorder? Record: No (0), Yes (1) or Unknown (9).

Item 24. Does the patient have a history of illicit stimulant use within four weeks prior to this hospitalization? Record: No (0), Yes (1) or Unknown (9). If "no illicit drug use" is stated, assume that includes no illicit stimulant use and record 'No'.

Item 25. Are any of the following conditions documented as having been present prior to or

during this hospitalization? Record: No/NR (not recorded) (0) or Yes (1) for each of the items 25a. – 25k:

> a. myocardial infarction (1 month prior to or during hospitalization), b. intracardiac thrombus or intracardiac tumor, c. atrial fibrillation/atrial flutter, c.1 ≥ 24 hours of cardiac monitoring, d. left-sided atrial enlargement on echocardiogram, e. rheumatic heart disease, f. systemic embolus, g. hematologic abnormality (hypercoagulable state), h. hematologic abnormality (hemorrhagic), i., migraine headaches, j. left-sided bioprosthetic valve, k. left-sided mechanical valve

Item 25a. Recent Myocardial Infarction - Record No/NR or Yes - To check "Yes" here there must be a history of severe chest pain, diagnostic or evolving ECG, or positive isoenzyme CK-MB, or elevated troponin, either four weeks prior to or during this hospitalization. Strong evidence of MI, chest pain, an evolving or diagnostic ECG, and/or positive enzymes is needed. If there is an MI code, but no evidence of MI, this can be checked "No". Admitting diagnosis of "R/O MI" alone is not sufficient evidence.

Item 25b. Intracardiac Thrombus or Intracardiac Tumor - this refers to a blood clot seen within the heart. It may also be called "intraventricular thrombus" (or clot) or "ventricular aneurysm with clot", or "left atrial thrombus". Check to see if an echocardiogram, autopsy or cardiac CT was done. These should specify if intracardiac thrombus was present. Echocardiogram is the most frequently used clinical study to evaluate the heart for this problem. Rarely cardiac CT has been used for the same purpose. If an autopsy was performed, read the section that pertains specifically to the heart on gross examination. Coronary artery thrombosis or coronary thrombotic occlusion is not intracardiac thrombus. If a right atrial thrombus is noted, discuss with the neurologist consultant. Intracardiac tumor. This is also called atrial myxoma and should be reported on echocardiogram, cardiac CT, or autopsy, if present (see above).

Item 25c. Atrial Fibrillation/Atrial Flutter - has important implications for stroke, regardless of the "timing" issue (ie: before or after the stroke). Therefore, if any ECG shows atrial fibrillation/flutter, answer "Yes", even if the atrial fibrillation/flutter became apparent after the stroke occurred. The only exception would be if AF occurred as part of a terminal process, *i.e.*, minutes before death in a patient who previously had no record of cardiac arrhythmias. This may also be called paroxysmal atrial fibrillation. This does ***not*** include paroxysmal tachycardia, supraventricular tachycardia (SVT), sinus tachycardia, or paroxysmal atrial tachycardia (PAT). Check all ECGs interpretations for atrial fibrillation. It may be abbreviated as A.F., A.fib or At.fib. If present on any ECG, record "Yes".

Item 25c1. Did the pt. have at least 24 (or more) hours of continuous cardiac rhythm monitoring on telemetry, Holter monitor, or by pacemaker/AICD interrogation within four weeks or during this admission? For admit to ICU or a telemetry unit or stroke unit, assume 24 hours monitoring if patient stayed there that long. Stroke service or stroke floor admission doesn't count unless it also mentions telemetry. Record No/NR (Not Recorded) (0) or Yes (1).

Item 25d. Left-sided Atrial Enlargement on Echocardiogram – Record No/NR (Not Recorded) (0) or Yes (1).

Item 25e. Rheumatic Heart Disease - abbreviated RHD, R.Ht. dis; this includes rheumatic valvular disease of mitral, aortic, tricuspid or pulmonary valves.

Item 25f. Systemic Embolus. Systemic emboli are emboli to the systemic arterial circulation, *i.e.* limbs, brain, kidney. They are to be distinguished from pulmonary emboli, which affects the pulmonary circulation, *i.e.* lungs only. A renal embolus or a femoral artery embolus is a systemic embolus. Pulmonary embolus = No. Although a cerebral embolus is technically a systemic embolus, we are looking for evidence to support the diagnosis of cerebral embolism (the presence of other systemic emboli). However, if cerebral embolus is the only type of embolus documented by angiography, this is sufficient evidence to answer "Yes". The origin of a systemic embolus may be the heart. If a "paradoxical embolus" (a systemic embolus arising "paradoxically" from the systemic veins and travelling through a septal defect in the heart) is noted in the chart, check "Yes". Also, check "Yes" if a blood clot is documented blocking a blood vessel by angiography. Read any non-cerebral or non-pulmonary angiograms for documentation of embolus. "Rule out or possible embolus" should be coded as "No". "Consistent with" or "probable embolus" should be coded as "Yes". Thromboembolus = systemic embolus.

Item 25g. Hematologic Abnormality (Hypercoagulable State) – A hypercoagulable state is a condition in which there is an abnormally increased tendency toward blood clotting. An anti-phospholipid antibody panel test may be done to diagnosis this abnormality or look for this condition being stated in physician notes. Also called Pro-thrombotic state or look for the word hypercoagulable.

Item 25h. Hematologic Abnormality (Hemorrhagic) – This is important in patients with intracerebral hemorrhage so don't look for it in patients with ischemic stroke. It is based on elevated PT/PTT >45 or H on lab report, INR above 1.7, or platelets below 100,000. Use earliest labs. Anti-coagulation therapy may be documented. May see "Intracerebral stroke due to INR > 1.7. tPA delivery may be used. Also look for specific statements linking a hematologic lab abnormality to the stroke (MD consultation may be needed here). Watch for specific statements by physician about hemorrhagic disorders ie: thrombocytopenia, hemophilia etc.

The record may document that patient has a significantly elevated PT/PTT, a low platelet count or an altered INR. Someone may come in with a high INR, be given meds to lower it (in an attempt to reverse the event so the hemorrhage doesn't get worse) but nothing was stated that the hemorrhage was due to the high INR. This is an example of why the abnormal values are of interest. If there is a question about how the documentation should be abstracted here, contact the neurology trainer for consultation.

Item 25i. Migraine Headaches: A migraine is a type of headache that may have symptoms such as nausea, vomiting or sensitivity to light and sound and possibly a throbbing pain, classically felt only on one side of the head. Some patients suffer "complicated" migraines which can cause temporary neurological deficits such as loss of vision or weakness or language disturbances mimicking stroke.

Item 25j. Left-sided bioprosthetic valve: Two types of prosthetic valves are used for heart valve replacement surgery - mechanical or bioprosthetic. Bioprosthetic heart valves (BHVs) are constructed from porcine heart valves or bovine pericardium preserved with glutaraldehyde.

Item 25k. Left-sided mechanical valve: Mechanical heart valves are made from materials such as titanium and carbon. They usually consist of two leaflets and a metal ring surrounded by a ring of knitted fabric, which is sewn onto the heart in place of the original valve. The main advantage of mechanical valves is that they are very durable.

SECTION C: SIGNS AND SYMPTOMS

For the neurological exam and retrospective NIHSS, take information from any note that includes neurological assessment. If there is conflicting information, refer to the hierarchy on page 3. If two or more notes from providers are equal in the hierarchy conflict, confer with the stroke abstraction trainer.

Item 26. If the new neurological signs/symptoms resolved, how long did they last? (Refer to Item 11.). If new neurological signs/symptoms resolved, how long had S/S lasted before resolution? Resolution requires a statement that the patient is back to baseline or symptoms ***have resolved. Note: Improved*** is not synonymous with ***resolved.*** Chronic symptoms should not be considered here, nor deaths due to causes other than neurologic events. Record 1. Less than 24 hours; 2. Twenty-four to forty-eight hours; 3. Greater than 48 hours; (This assumes a permanent condition) 4. Unknown; 5. Not applicable. Use Not Applicable for patient who passes away before resolution of symptoms.

Item 27. Was an NIHSS recorded? NIHSS is the National Institutes of Health Stroke Scale which measures the severity of stroke symptoms. Record: No (0) or Yes (1). If No is recorded, skip to Item 27b. Please note, if an NIHSS score was not recorded because an assessment wasn't or couldn't be conducted because the patient was unconscious or comatose, use the second standardized table below from NINDS to complete the stroke scale items.

Item 27a. If yes, what was the score? Record the numerical value of the NIHSS score if present and skip to Item 28.

Item 27b. If no, complete the scores in items 27b1 – 27b13, either 0, 1, 2, (or 3 or 4 where offered). Save the form and click on the little arrows in the field 27b14, to calculate. If information desired is not found in the chart, record 0. If something is not mentioned, it is recorded as 0 on the retrospective NIHSS. Information is only being collected from explicit neuro exams. For example, any exam done close to the time of the event that includes an evaluation of limb strength or an appropriate statement about LOC is fine to include. If literally nothing is mentioned, then score a 0. The NIHSS does not distinguish between old and new deficits, so both should be counted, even if a deficit is known to be chronic.

DESCRIPTIONS FOR THE CATEGORIES ON THE NIHSS:

Item	Score	Description
LOC a	0	Alert, keenly responsive, alertness is separate from orientation. Pt can be alert (score 0) and disoriented (score LOCb 1 or 2 as appropriate)
	1	Not alert, arousable by minor stimulation
	2	Not alert, requires repeated or painful stimulation to attend
	3	Responds only with reflex motor or autonomic effects or totally unresponsive
LOC b	0	Oriented x 3
	1	Oriented X < 3
	2	Disoriented; if receptive deficit present and orientation not reported, code as disoriented
LOC c	0	Notation of "follows commands" and no receptive deficit noted
	1	Any intermediate description (intermittently follows commands, simple commands) with or without receptive deficit
	2	Notation of "does not follow commands" with or without receptive deficit
Best Gaze	0	Normal
	1	Partial gaze palsy, gaze abnormal in one or both eyes but forced deviation or total gaze paresis not present
	2	Forced deviation or total gaze paresis not overcome by oculocephalic maneuver
Visual Fields	0	No visual loss
	1	Partial hemianopia or quadrantanopia
	2	Complete hemianopia of one eye
	3	Bilateral hemianopia or homonymous hemianopia (blind including cortical blindness)
Facial Palsy	0	Normal symmetrical movement
	1	Minor paralysis (flattened NLF, asymmetry on smiling) (score 1 if "mild" in description)
	2	Partial paralysis (total or near-total paralysis of lower face) (score 2 if no qualifier or qualified as moderate or severe)
	3	Complete paralysis (absence of movement in upper and lower face)
Motor Arm	0	No drift, limb holds 90 degrees for full 10 seconds If legs unimpaired and arm only has pronator drift, score 0 MRC 4+ or 5
	1	Drift down before 10 seconds If a leg is diagnosed as weak and arm only has pronator drift, score 1 MRC 4 or "mild" weakness
	2	Some effort against gravity, cannot get to 45 or 90 degrees MRC 3
	3	No effort against gravity MRC 2
	4	No movement MRC 0 or 1

Motor Leg	0	No drift, holds limb 45 degrees for full 5 seconds MRC 4+ or 5
	1	Drift down before 5 seconds MRC 4 or “mild”
	2	Some effort against gravity MRC 3
	3	No effort against gravity limb falls MRC 2
	4	No movement MRC 0 or 1
Limb Ataxia	0	Absent
	1	Present in 1 limb, limb must be able to move to have ataxia
	2	Present in 2 limbs
Sensory	0	Normal; no sensory loss
	1	Mild to moderate sensory loss; patient feels pinprick is less sharp or is dull on the affected side
	2	Severe to total sensory loss; patient is not aware of being touched
Best Language	0	No aphasia, normal
	1	Mild to moderate aphasia; some obvious loss of fluency or comprehension, able to express some ideas; reduction of speech and/or comprehension, but makes conversation about materials possible Expressive deficit only, unless qualified as “severe” or “no speech but preserved comprehension”, etc., then score as 2
	2	Severe aphasia, all communication is through fragmentary expression; range of information exchanged in limited Expressive plus receptive deficit or receptive deficit only
	3	Mute, global aphasia; no usable speech or auditory comprehension
Dysarthria	0	Normal
	1	Mild to moderate; slurs at least some words and at worst can be understood with some difficulty (score 1 if qualified as mild or moderate or if no qualifier)
	2	Severe; speech is unintelligible in the absence of or out of proportion to any dysphasia, or is mute/anarthric (score 2 if qualified as severe)
Extinction and Inattention	0	No abnormality
	1	Visual, tactile, auditory, spatial or personal inattention or extinction to bilateral simultaneous stimulation in 1 of modalities
	2	Profound hemi- inattention or hemi- inattention to >1 modality

Scoring the NIHSS for a Patient in Coma

Item	Score
1a	3 (defines coma)
1b	2
1c	2
2	0, 1, or 2
3	0, 1, or 2
4	3
5a	4
5b	4
6a	4
6b	4
7	0
8	2
9	3
10	2
11	2
Total	35–39

A patient who scores 3 on item 1a (level of consciousness) is considered to be in a coma. A patient in coma should be stimulated by rubbing on the chest or by using a painful stimulus. A 3 is scored for item 1a only if the patient makes no movement (other than reflexive posturing) in response to the noxious stimulation. Patients who appear to be in coma and who score <3 must be tested on all scale items. (Excerpt from NINDS Manual of Procedures, "The NIH Stroke Scale," provided in the online-only Data Supplement).[1] Once the patient is clearly found to be in coma, the prespecified (and for some items arbitrary) values are used for each item. NIH indicates National Institutes of Health; NIHSS, National Institutes of Health Stroke Scale; and NINDS, National Institute of Neurological Disorders and Stroke.

Item 27b14. Total Score: Complete the scores for Items 1-13 then Save the form and click the circular arrows in the box on Item 14 to calculate the total score for the NIHSS.

Item 28. Was the participant asleep at the time of the event? Record: No (0), Yes (1) or Unknown (9). Look for documentation that the patient awakened with deficits. Also called "Wake-up strokes".

Item 29. Severe headache at onset of symptoms or on hospital admission? Record: No (0), Yes (1) or Unknown (9). Severe may be quantified by the use of a pain scale 0/10, or "worse h/a in life" or "thunderclap h/a". When they include a qualifier like mild, record NO, or when unqualified "pt. had a h/a" record NO. Any type of headache may precede a stroke but for the purpose of this question, ***severe*** headaches are the ones of most interest.

Item 30. Vomiting? Record No (0), Yes (1) or Unknown (9).

Item 31. Blurry Vision? Record: No (0), Yes (1) or Unknown (9). If a physician notes the patient had no visual disturbance or no visual changes, record "No" for this question.

Item 32. Diplopia? Record: No (0), Yes (1) or Unknown (9).

This means double vision, seeing "two" of something. Do not include blurred vision or a visual field cut (hemianopia). If the patient is alert, and double vision or diplopia are not specifically mentioned, record "No". If a physician notes the patient had no visual disturbance or no visual changes, record "No" for this question.

Item 33. Vertigo? Record No (0), Yes (1) or Unknown (9). If Yes, skip to item 35 – if vertigo is yes, dizziness should always be yes).

Vertigo is a sense of dizziness where the patient feels a spinning sensation like they are on a merry-go-round. This is different from a sense of light-headedness or a sensation of passing out. Answer "No" if patient is said to have syncope, pre-syncope or simply dizziness. A duration > 24 hours may be assumed if vertigo is experienced on consecutive days.

Item 34. Dizziness? Record: No (0), Yes (1) or Unknown (9). The statement "off balance" does not qualify as vertigo nor dizziness. The complaint of "off balance" refers to having problems with standing or walking.

Dizziness can mean whooziness, lightheadedness, sometimes they say vertigo (if they have vertigo they are also dizzy). So if vertigo is yes, dizziness should always be yes.

Unsteady gait, falling to left, ataxia other comments referring to gait are NOT dizziness.

Item 35. Seizure? Record No (0), Yes (1) or Unknown (9). If No or Unknown skip to Item 36.

Seizure disorder is a medical condition that can be characterized by episodes of uncontrolled

electric activity in the brain (seizure). Examples may be, convulsion, abnormal electrical activity of the brain causing jerking movements. Convulsions = Seizures. These may be described as generalized tonic clonic (abbreviated "GTCsz") or "partial complex" (PCS) with or without "secondary generalization" (2^{O} gen). For postictal paralysis (Todd's paralysis), answer the applicable weakness questions as present

Item 35a. Was this the first neurologic symptom? Record No (0), Yes (1) or Unknown (9).

SECTION D: NEUROLOGICAL EXAM (Skip to Q48 if retrospective NIHSS Q27b was completed)

The next series of questions is to determine the specific neurologic signs or symptoms of stroke. These symptoms may have occurred prior to hospitalization, and prompted the patient to seek medical care, or may have occurred while the patient was in the hospital for a different illness. If a symptom is present, additional questions may be asked regarding duration or affected body part (e.g., "affected side[s], arm, leg). See each instruction below. Include signs and symptoms not noted in initial exams that become evident in subsequent exams in physician progress notes.

Some questions, if answered "Yes", require that additional information must be specified.

Weakness is a very common stroke symptom and has many terms. Paresis is weakness with some movement still possible. Plegia and paralysis mean there is no movement. Hemiparesis and hemiplegia mean one side of the body. Palsy means weakness or paralysis of muscles served by a cranial nerve (eyes, face, throat, tongue).

Item 36. Level of consciousness: Record Normal (0), Abnormal (1), Unconscious (2) or Unknown (9).

This does not include altered states of cognition such as dementia, Alzheimer's disease, mental confusion, or persistent vegetative state. The question does not refer to the quality of conscious behavior but to the quantity of consciousness. The Glascow Coma Scale (GCS) may provide you with some level of consciousness but if you just find a number 8, you don't know what the actual level of consciousness is.

Category		Score
Eye opening	Spontaneous	4
	To speech	3
	To pain	2
	None	1
Verbal response	Oriented	5
	Confused	4
	Inappropriate	3
	Incomprehensible	2
	None	1
Motor response	Obeys commands	6
	Localizes	5
	Withdraws	4
	Flexion/decorticate	3
	Extension/decrebrate	2
	None	1
Total score		15

- GCS less than or equal to 8 is consistent with severe brain injury when applied to head injured population.

- GCS 9 to 12 consistent with moderate brain injury.

- GCS greater than or equal to 13 consistent with minor injury.

(Refer to Appendix C for further interpretation of GCS)

Item 37. Aphasia: Record: No (0), Yes (1) or Unknown (9).

Aphasia is caused by damage to the language centers in the brain and refers to a disturbance of language including either impairment in word production (Broca's aphasia) or impairment in comprehension (Wernicke's aphasia) or both (mixed or global aphasia). Aphasia is different from dysarthria, which is slurred speech caused by weakness and may be present along with aphasia. Aphasia is tested by tasks of naming, fluency, repetition, comprehension, reading, and writing. If paraphasic errors are noted (incorrect words), answer "Yes".

"Dysphasia" (a less severe form of aphasia) = yes

"Inability to speak" = yes

"Speech difficulty" alone is insufficient (= no).

Item 38. Hemianopsia? Record: No (0), Yes (1) or Unknown (9).

Hemianopsia (also hemianopia) is defined as the inability to see on one side of space despite normal eye function. For instance, a patient can't see to the right. This is different from being blind in the right eye. Other descriptions would include visual field cut, homonymous hemianopia (or hemianopia) (abbreviated HH). Absent corneal reflex, nystagmus, decreased extraocular muscle strength, gaze preference or deviation, abnormal pupils or "visual neglect" are recorded as "No". In some patients the visual field loss involves just one quadrant of space.

This would be recorded as “Yes.”

If it states visual fields (V.F.), are full or full to confrontation, record "No".

“Visual difficulty” is too general to score as “Yes” without elaboration or a diagnosis, therefore record “No”. If a physician notes the patient had no visual disturbance or no visual changes, record “No” for this question.

Item 39. Any abnormality of Cranial Nerves III, IV or VI? Record: No (0), Yes (1) or Unknown (9). If No or Unknown skip to Item 40.

An example of abnormality of Cranial Nerve III would be Cranial Nerve III Palsy which may be written: CNIII (3), 3rd Cranial Nerve. A synonym for palsy is weakness or paralysis or plegia. Did a doctor note an abnormality of III, IV or VI and if so, did they state a location of abnormality? Do not try to interpret this from signs and symptoms, a physician must specifically note the presence or absence of a Cranial Nerve III, IV or VI abnormality to record “Yes” or “No”. Someone may also simply document an abnormality of Cranial nerve IV or VI, etc. You may see “CNII-X12 intact” – meaning no abnormality. We want to answer Yes if a doctor stated “III”, “IV” or “VI”. Record “extraocular movements intact” or “emoi” as NO.

Item 39a. Location of abnormality? (Record: 1 = Left, 2 = Right, 3 = Both, or 9 = Not Recorded (NR).

Item 40. Horizontal Gaze Palsy (Conjugate Gaze Deviation)? Record: No (0), Yes (1), or Unknown (9). If no or Unknown, skip to Item 41. If a physician notes the patient had no visual disturbance or no visual changes, record “No” for this question.

Item 40a. Location of Gaze Deviation: Record 1 = Left, 2 = Right, 3 = Both, or 9 = Not Recorded (NR).

Item 41. Dysphagia? – Record: No (0), Yes (1) or Unknown (9).

Dysphagia means impairment in swallowing. It is not to be confused with dysphasia (with an “s”), which is occasionally used to mean mild ***aphasia***.

Item 42. Dysarthria? – Record: No (0), Yes (1) or Unknown (9).

Dysarthria refers to slurred speech that results from weakness of the muscles of the face and throat. This is different from aphasia (described in Item 37).

Item 43. Weakness (paresis)? Record: No (0), Yes (1), or Unknown (9). If No or Unknown, skip to Item 44.

Synonyms for weakness in this context are: paresis, paralysis, and plegia. These are used to describe the strength or lack of strength in the face or limbs.

Other common terms include: hemiparesis (weakness of the arm and the leg on one side) and monoparesis (weakness of either the UE = upper extremity or LE = lower extremity).

The description of weakness should be qualified by location: (R) = right, (L) = left, (B) = both, or (N) - None. If chart says "weak R side", assume body not face.

Symptoms should be acute in onset. Do not consider “generally weak” or “generalized weakness” here, only localized findings are of interest. Mention of "drift" or "pronator drift" = weakness.

If there is weakness (paresis), record the affected limb. "Arm" refers to any part of the extremity, including fingers or hand. Similarly "leg" includes any part of the lower extremity such as toes and/or foot.

43a. Face - Record: 1 = Left, 2 = Right, 3 = Both, 4 = None or 9 = Not Recorded (NR)

Frequently, facial weakness is described as a decrease or flattening of the nasolabial fold on the side of the weakness. Right facial weakness may be noted as CN VII, decreased on (R) or abbreviated as decreased NLF (nasolabial fold) on (R), and facial droop. Mention of ptosis is not adequate to record weakness on this item.

43b. Arm - Record: 1 = Left, 2 = Right, 3 = Both, 4 = None or 9 = Not Recorded (NR)

The symptoms should be acute in onset. Generally, the entire limb is involved, but sometimes the hand is more severely affected than the shoulder. "Drift" or "pronator drift of the arm" = weakness.

43c. Leg - Record: 1 = Left, 2 = Right, 3 = Both, 4 = None or 9 = Not Recorded (NR)

Generally, the entire limb is involved, often worse distally (toes) than proximally (hips). “Leg" includes any part of the lower extremity such as toes and/or foot. “Drift” of the leg = weakness.

Item 44. Sensory Deficit? Record: No (0), Yes (1) or Unknown (9). If No or Unknown, skip to Item 45.

Sensory deficit may be described as numbness, marked tingling, abnormal sensation, loss of taste, in combination or singly. Other synonyms include: hemianesthesia, paresthesia, and analgesia.

We are interested in acute, not chronic, unchanged sensations. All or part of the face or limb may be involved. Testing for sensory deficit by the physician can include pinprick, light touch, and vibration.

If there is a sensation deficit, record the affected limb. A physical finding of ”extinction” is a “No” response.

44a. Face - Record: 1 = Left, 2 = Right, 3 = Both, 4 = None or 9 = Not Recorded (NR)

44b. Arm - Record: 1 = Left, 2 = Right, 3 = Both, 4 = None or 9 = Not Recorded (NR)

44c. Leg - Record: 1 = Left, 2 = Right, 3 = Both, 4 = None or 9 = Not Recorded (NR)

Item 45. Visual Fields Abnormality: Record: No (0), Yes (1), or Unknown (9).

The Visual Fields Test is a subjective measure of central and peripheral vision, or “side vision” that can detect dysfunction in central and peripheral vision which may be caused by various medical conditions such as stroke and other neurological deficits. If a Visual Fields Test was done, document the results as directed above. Record Abnormal if patient is recorded as having hemianopia, hemianopsia, quadrantanopsia, or visual field cut. If a physician notes the patient had no visual disturbance or no visual changes, record “No” for this question.

Item 46. Ataxic Gait: Record: No (0), Yes (1) or Unknown (9).

This item is looking primarily for ataxic or staggering gait (acute changes) and is also referred to as ataxia. This would be described under the cerebellar or coordination portion of a neurologic exam. We are not interested in abnormalities in gait that are simply the result of leg(s) weakness (=No), nor are we interested in chronic gait problems (=No).

Include truncal ataxia as "Yes". Ataxia is impaired balance or coordination (i.e. it can mimic being drunk in that it can present as having slurred speech, stumbles, or falls etc.). Truncal ataxia is characterized by instability of the trunk and usually occurs during sitting.

Record "No" for patients with: Parkinson's Disease, shuffling gait, unsteady gait, foot drop and hemiparetic gait (ie: unsteady gait due to leg weakness, not incoordination). If gait is not tested, Record "Unknown".

Record "No" for "gait difficulty," "imbalance," "difficulty with ambulation," and "gait problem". All of them are too nonspecific to score as ataxia.

Item 47. Hemiataxia? Record: No (0), Yes (1) or Unknown (9).

Hemiataxia is failure of muscular coordination on one side of the body.

SECTION E: DIAGNOSTIC TESTS

Item 48. First Recorded Blood Pressure: Record the value of systolic and diastolic of first blood pressure in mmHg that is documented in the record. This includes a B/P from EMS if there is one.

Item 49. First glucose level: Record the first (or P.O.C.) glucose level in the ambulance or on arrival at the hospital. Testing the glucose level at point of care (P.O.C.) is a tool to enable immediate determination of glucose levels in hospitalized patients.

Item 50. Was a Lumbar Puncture (L.P.) Performed? Record No/NR (0), or Yes (1). If No, skip to Item 51.

Also called "spinal tap", "spinal" or "tap". Check the physician progress notes for a procedure note, as well as laboratory results, for a first non-traumatic LP after onset of symptoms. Use results of first LP, if all taps are traumatic. If a report is available, check "Yes"; if none, check "No", or "NR" if there is no evidence that a Lumbar Puncture was performed. (A traumatic tap is when the needle hits a blood vessel on route to spinal cord, causing bleeding into the subarachnoid space. The first tube might be bloody and the next more clear.

Item 50a. Lumbar Puncture Diagnosis: Record Normal (0), Abnormal (1) or Unknown (9).

Item 51. Was one or more CT scan/s of the head performed during this hospitalization? Record No (0), Yes, one CT (1), Yes, two or more CTs (2) or NR (9). If No or NR, skip to Item 52.

This would include ACTA, EMI, CT, CAT scans, but not brain scans of the nuclear imaging (radionuclide) type. If a CT angiogram provides a description of brain tissue, record the findings here when possible.

Item 51a. Date of first CT: If yes, complete date of first CT in mm/dd/yyyy format.

Item 51b. Was acute or subacute stroke diagnosed on the first CT? : Record No (0), Yes (1) or Unknown/NR (9) Note: If No or NR, skip to item 52.

Item 51c. If two or more were performed, date of last CT: Record in mm/dd/yyyy.

Item 51d. Was acute stroke or subacute stroke diagnosed on the last CT, or was ANY stroke identified on the last CT that was not previously identified on the first CT? (If two or more were performed) Record No (0), Yes (1) or Unknown/NR - Not Recorded (9).

Note: An acute stroke that is identified as such on both the first and last CTs gets a Yes for both. The questions should essentially be treated the same. In other words, each question should be looked at as "Is there an acute stroke identified on this CT?"

The last CT question should ***also*** be looked at as "Was a chronic stroke identified on this CT that was not seen on the first CT?"

Item 52. Was Magnetic Resonance Imaging (MRI), including the head, performed? Record No (0) Yes (1) or Unknown/NR – Not Recorded (9). If No or Unknown/NR, skip to Item 53.

It is important to note the interval between symptom onset and MRI. If this procedure was performed more than once use the report you judge to be most helpful to arrive at a diagnosis (*i.e.* look for the strongest evidence).

Item 52a. Was acute or subacute stroke diagnosed on the MRI?: Record No (0), Yes (1) or Unknown/NR - Not Recorded (9).

Item 52b. Was a Diffusion Weighted Imaging (DWI) study performed? Record No (0), Yes (1) or Unknown/NR (9). If No or Unknown/NR, skip to Item 53.

Diffusion weighted imaging (DWI) is an MRI sequence that identifies acute strokes, typically showing bright signal within two weeks of stroke onset but not later. A report that read indicated that a stroke was "bright on DWI" would imply but not guarantee that the stroke is acute. Chronic strokes are rarely bright on DWI. Other lesions may be bright on DWI. If there is wording in the Brain MRI report that discusses diffusion, assume that DWI was performed.

Item 52c. DWI Diagnosis: Record Normal (0), Abnormal (1) or Unknown/NR - Not Recorded (9). If DWI diagnosis is Abnormal, record Yes for Item 52a. MRI diagnosis, **but NOT VICE VERSA.** Synonyms for Normal on DWI are "no signs of hyperintensity", "no bright signal", and "no restricted diffusion". A bright light on DWI represents a lesion.

Item 53. Was Cerebrovascular Angiography performed? Record No (0), Yes (1), or – Unknown/NR - Not Recorded (9). If No or Unknown/NR, skip to Item 54.

Cerebral Angiography is a form of angiography which provides images of blood vessels in and around the brain, using a catheter, x-ray imaging guidance and an injection of contrast material (dye) to examine blood vessels, thereby allowing detection of abnormalities. If this procedure was performed more than once, use the first cerebral angiography report with abnormal findings. If cerebral angiography preceded symptom onset record "No" here. Cerebrovascular Angiography can be used in hemorrhagic as well as ischemic strokes.

Item 53a. Date: Record date of the first cerebrovascular angiography with abnormal findings in mm/dd/yyyy format.

Item 53b-h. CTA and MRA of the Head or Neck, Carotid Doppler, Transcranial Doppler and Catheter Angiogram? Record No (0), Yes (1), or NR - Not Recorded (9).

If done at any time and reported in the chart, indicate the test performed. If a procedure was performed more than once, use the date of the first report with abnormal findings. If MRI angiography or CTA of the neck were done and it provides information on the carotid arteries, record this here. If ultrasound and MRA/CTA provide measurements of carotid stenosis, pick the more informative test. If there is a disagreement in stenosis percentage among tests, choose your answer according to the following hierarchy: ultrasound (first), CTA (second, MRA (last). CTA and MRA may include imaging of the internal carotid arteries and vertebral arteries in the head, so a stenosis may be described on MRA or CTA that is not seen on carotid Dopplers. Note: the external vertebral arteries cannot be adequately visualized on a Carotid Doppler/Ultrasound to assess stenosis. If the Carotid Doppler does not mention the external vertebral arteries or only mentions 'antegrade flow', mark Not Recorded (NR) for 53k and 53l. Consult physician as needed.

Angiography diagnosis:

Do not count CT angiograms as "Yes" here.

Do not count MRI angiograms as "Yes" here, unless it is an invasive procedure.

Note: Unless a test report or physician notes records a normal (or unremarkable) result, record as abnormal. If "No other significant stenosis" is stated, then record No to stenosis in all of the arteries under the angiography section with the exception of mention of stenosis in a specific location. If a description uses tortuous – a common finding related to hypertension (ex: "tortuous basilar artery"), unless stenosis or narrowing is specifically stated, use (NR) "not recorded" as an answer here.

EXTRACRANIAL STUDIES

Item 53i-l.: Stenosis - Right Internal Carotid Artery (i), Left Internal Carotid Artery (j), Right Vertebral Artery (k), or Left Vertebral Artery (l): For each of the items, Record No (0), Yes (1) or NR – Not Recorded (9) if stenosis was present or not. Extracranial studies include CTA of neck, MRA of neck, carotid Doppler, and Catheter Angiogram.

INTRACRANIAL STUDIES

Item 53m-w: Stenosis – (m) Right Internal Carotid Artery, (n) Stenosis Left Internal Carotid Artery, (o) Stenosis Right Vertebral Artery, (p) Stenosis Left Vertebral Artery, (q) Stenosis Right Middle Cerebral Artery, (r) Stenosis Left Middle Cerebral Artery, (s) Stenosis Right Anterior Cerebral Artery, (t) Stenosis Left Anterior Cerebral Artery, (u) Stenosis Right Posterior Cerebral Artery, (v) Stenosis Left Posterior Cerebral Artery, or (w) Stenosis Basilar Artery: Record No (0), Yes (1) or NR (9) if stenosis was present or not.

Intracranial studies include CTA of head, MRA of head, Transcranial Doppler, and Catheter Angiogram. Note: in imaging reports, mention of "A1, M1, or P1 segments" correlates with anterior cerebral, middle cerebral and posterior cerebral arteries and the description of stenosis present in the segments can be used to record stenosis in these arteries.

If an intracranial study does not list specific arteries but notes a normal or unremarkable result, record "No" for stenosis on all the cerebral arteries. If a study calls out some intracranial arteries as having or not having stenosis but doesn't mention all the arteries, answer appropriately for stenosis on only those arteries mentioned and mark "9 (NR)" for the arteries that were not specifically listed.

A "vasoreactivity test" describes dilation of vessels in the brain and does not inform on the presence or absence of stenosis.

Item 54: Was a transthoracic echocardiography study performed? Record No/NR – Not Recorded (0) or Yes (1). If No/Unknown, skip to item 55.

Item 54a: If Yes to Item 54, enter the ejection fraction.

Item 55: Was a transesophageal echocardiography study performed?

Record No/NR – Not Recorded (0) or Yes (1). If No/NR, skip to item 56.

Item 55a: If Yes to Item 55, enter the ejection fraction.

NOTE: If both 54 and 55 are No or NR, skip to Item 57 in Section F – Laboratory Tests.

Item 56a-m: Record No (0), Yes (1) or NR (9) for the presence of each item on either type of echocardiogram. In general, a physician statement that a TTE or TEE result was normal is sufficient to record "No" for Items 56 a-m, with the following exceptions:

> **Item 56g: Dilated Ventricle:** Unless the left ventricle dilation status is specifically stated in the report, record "NR" for this item.
>
> **Item 56h: Ascending Aortic Arch Atheroma:** If not well visualized on TTE, assessment usually requires a TEE. Unless this item is specifically stated as present or absent, record "NR" for this item. Note: description of "atherosclerosis or atherosclerotic plaque(s) in the aortic arch" is synonymous with an ascending aortic arch atheroma.
>
> **Item 56h1:** If Yes to ascending aortic arch atheroma, choose Mild (1), Moderate (2),

Severe (3) or NR (9)

Mild: 1 mm

Moderate 2-3 mm

Severe >=4 mm or mobile component

Item 56j: Patent Foramen Ovale (PFO): A special test during echo (often called a bubble study) is required to discover a patent foramen ovale. Unless specifically stated as present or absent, record "NR" for this item. Note: presence or absence of an interatrial shunt, an intrapulmonary shunt, or "late bubbles" does not indicate the presence or absence of a patent foramen ovale.

Item 56k. Valve vegetations - Typically, vegetation presents as an oscillating mass attached to a valvular structure, with a motion independent to that of the valve. However, vegetations may also present as non-oscillating masses with atypical location.

SECTION F. LABORATORY TESTS

Please draw your attention to the specific notations under Items #61, 63 and 67 below regarding which set of lab values should be used for the stroke abstraction form per Dr. Labovitz.

Item 57. Sodium (mmol/L or mEq/L):

Item 58. Serum creatinine (mg/dL)

Item 59. BUN (mg/dL)

Item 60. Hemoglobin (g/dL)

Item 61. Hematocrit (%)

NOTE: For items #57-61 and #64 (platelet count) take the first lab values drawn after the acute onset stroke.

Item 62. INR

Note: INR can be higher than aPTT

Item 63. PTT – Partial Thromboplastin Time - PTT is used for monitoring therapy with heparin to achieve a therapeutic range of heparin. **Item 63a**. aPTT – Activated Partial Thromboplastin Time (more sensitive than PTT) . The aPTT is used to monitor the patient's response to heparin therapy and mainly looks at how both the intrinsic clotting pathway and the common final pathway are working.

Note: a normal aPTT is 20-30-40 (50-80 is target for someone on heparin).

NOTE: For items #62-63a the last lab values drawn before the acute onset stroke are preferred but if >24 hours before, take the first labs drawn after the stroke

Item 64. Platelet count – Platelets are cells that help the blood clot. A platelet count measures how many platelets you have in your blood.

Item 65. Total Cholesterol (mg/dL)

Item 66. LDL (mg/dL)

Item 67. HbA1c (%)

NOTE: For Items #65-67, take the first labs drawn for the hospital admission.

SECTION G: TREATMENT

Item 68. Thrombolytic treatment received for stroke? Record No (0), Yes (1) or Unknown (9) If No or Unknown, skip to Item 69.

Thrombolytics restore cerebral blood flow in some patients with acute ischemic stroke and may lead to improvement or resolution of neurologic deficits. It is the use of drugs to break up or dissolve blood clots. The most commonly used drug for thrombolytic therapy is "tissue Plasminogen Activator (tPA), a strong clot dissolving medicine given to some candidates during a stroke event. Thrombolytics do not include anti-coagulant medications (heparin, coumadin, etc.).

Therapy with thrombolytic agents - Intravenous or intracardiac lysing (clot dissolving) agents used in the early stages of acute ischemic stroke: tPA (tissue plasminogen activator), streptokinase, urokinase, APSAC (anisoylated plasminogen streptokinase activator complex), Alteplase (brand name tPA), or Tenecteplase (TNK). Other similar products which enter the market after the date of writing should be included. (It may cause subsequent hemorrhagic stroke, but we focus on the first event).

Item 68a. IF Yes to thrombolytic treatment for stroke, did patient suffer symptomatic ICH post tPA? Record No (0), Yes (1) or Unknown (9).

Item 69. Endovascular therapy (EVT) (thrombectomy) received for ischemic stroke? Record No (0), Yes (1) or Unknown (9). If No or Unknown, skip to Item 70.

Item 69a. If yes, did the participant suffer symptomatic intracranial hemorrhage (ICH) post EVT? Record No (0), Yes (1) or Unknown (9).

Item 70. Did the patient receive osmotic/hypertonic treatment? Record No (0), Yes (1) or Unknown (9).

Osmotic/hypertonic treatment - Hyperosmolar **therapy with mannitol or hypertonic saline** is a used for cerebral edema to decrease intracranial pressure in patients with very large strokes.

Item 71. Was decompressive hemicraniectomy performed? Record No (0), Yes (1) or Unknown (9).

Decompressive hemicraniectomy is a neurosurgical procedure by which a part of the skull is removed to manage a medically intractable rise in intracranial pressure from brain swelling due to stroke.

SECTION H: DISCHARGE

Item 72. Patient alive at Discharge? Record No (0) or Yes (1). If Yes, skip to Item 73.

Item 72a. If no, was there evidence in the medical record of an autopsy being performed? Record No (0), Yes (1) or NR – Not Recorded (9). If No or NR, skip to item 78.

Item 72a.1. If yes to autopsy performed, record **one choice from items 1-7 below then skip to Item 78.**

1 = recent bleeding of saccular aneurysm/subarachnoid hemorrhage 2 = hemorrhagic infarction of the brain, 3 = lacunar stroke, 4 = embolic stroke, 7 = other

Item 73. Able to ambulate independently before current hospitalization? Record No (0), Yes (1) or Unknown/NR (9). Assume "Yes" for this question for patients living independently in the community unless medical records clearly state that patient cannot walk. If patient is institutionalized or of unknown status (arrived comatose with no information available), select "No" or "NR" as appropriate.

Item 74. Able to ambulate independently at discharge? Record No (0), Yes (1) or Unknown/NR (9). Independent ambulation is walking by oneself, even with walker, cane, or crutch. Assume "Yes" for this question if there is no reason to think otherwise.

Item 75. Where was patient discharged to? 1 = Home, 2 = Acute Rehabilitation, 3 = Skilled Nursing Facility, 4 = Assisted Living, 5 = Hospice, or 6 = Other/Unknown.

"Home" in this context means any independent living situation.

Item 76. At the time of discharge, did the patient require more help from another person for everyday activities compared to status prior to event?

Record No (0), Yes (1) or Unknown/NR (9).

Item 77. Was a Modified Rankin Scale done at discharge? Record No (0), Yes (1) or Unknown/NR (9). If No or Unknown/NR, skip to Item 77b.

The Modified Rankin Scale (abbreviated mRS) is the most widely used outcome measure in stroke clinical trials. It is a 6 point scale for measuring the degree of disability in patients who have had a stroke.

Item 77a. If yes, what was the Modified Rankin Score: If a MRS was done, record the score in the box provided and skip to item 75.

Item 77b. If No or Not recorded in Item 74, at discharge what was the participant's status from the below choices?

Enter the number that best reflects the level of disability the patient was experiencing at the time of discharge:

(0) Back to Normal

(1) Exhibiting S/S related to stroke but otherwise without disability
(2) Able to ambulate independently with some disability
(3) Dependent on others for some ADLs, but able to walk
(4) Moderately severe disability
(5) Bedridden (requires 24/7 care)
(9) Unknown/NR

Rankin scale descriptions.

0 The patient has no residual symptoms.

1 The patient has no significant disability; able to carry out all pre-stroke activities.

2 The patient has slight disability; unable to carry out all pre-stroke activities but able to look after self without daily help.

3 The patient has moderate disability; requiring some external help but able to walk without the assistance of another individual.

4 The patient has moderately severe disability; unable to walk or attend to bodily functions without assistance of another individual.

5 The patient has severe disability; bedridden, incontinent, requires continuous care.

SECTION I MEDICATIONS

Item 78a-i. Prior to admission, did the participant receive any of the following medications? Record No/NR (0) or Yes (1).

a. Oral Anticoagulants

   Apixaban, Rivaroxaban, Dabigatran, Edoxaban

b. Beta Blockers
c. Calcium Channel Blockers
d. ACE Inhibitor or ARB
e. Scheduled aspirin (not PRN)
f. Heparin or Enoxaparin
g. Coumadin, warfarin, panwarfarin, dicumarol
h. Anti-platelet agents (non-aspirin)
i. Statin or other lipid-lowering medication

Item 79a-i. During hospitalization or at discharge, did the participant receive any of the following medications? Record No/NR (0) or Yes (1).

a. Oral Anticoagulants
   Apixaban, rivaroxaban, dabigatran, edoxaban

b. Beta Blockers
c. Calcium Channel Blockers
d. ACE Inhibitor or ARB
e. Scheduled aspirin (not PRN)
f. Heparin or Enoxaparin
g. Coumadin, warfarin, panwarfarin, dicumarol

h. Anti-platelet agents (non-aspirin)
i. Statin or other lipid-lowering medication

NOTE:

Medications prescribed to patients, whether prescriptions or OTC may contain medications that are needed for HCHS medical record abstractions. Example: A patient uses medication prescribed for migraine headaches named Butalbital (Nsaid)-ASA-Caffeine. If ASA is one of the medications of interest it should be listed in the appropriate section of the Stroke Abstraction Form, Item 78e and/or 79e.

If the patient only takes the medication on a PRN basis, it would **NOT** be documented as a YES in the Abstraction Form, Item 78e and/or 79e. If, however, the patient takes the medication on a daily basis, even though it is prescribed PRN, it would be counted in the Stroke Abstraction Form as YES, providing there is a specification regarding dosage in the question on the form, ex: 81 mg.

Upon Completion of the Form:

Review the form for completeness and accuracy and resolve any discrepancies/questions, consulting with your colleagues and/or HCHS/SOL neurologist consultant as needed. Enter and save the abstracted data into the CDART Data Management System (DMS) and create a diagnostic .pdf form appropriate to the requirements for documentation for the Stroke Endpoint Physician Summary Packet. Drag & drop the diagnostic .pdf into the end of the STR form within CDART, save and close the form.

APPENDIX A

GENERAL DEFINITIONS REGARDING STROKE

Definite Subarachnoid Hemorrhage (SAH)

Evidence in the patient's clinical record of sudden or rapid onset of neurologic symptoms lasting for more than 24 hours or leading to death, plus must meet the criteria specified under at least one of the four paragraphs below:

1. Meets criteria (a) and (b) below:
   a) Angiographic identification of a saccular aneurysm as the source of bleeding (*e.g.*, demonstration of a clot adjacent to aneurysm or reduced caliber of otherwise normal vessels), or

b) Blood (not traumatic) tap or xanthochromic spinal fluid, or

2. Demonstration by computerized tomography or magnetic resonance imaging of a blood clot in Fissure of Sylvius, between the frontal lobes, in basal cisterns, or within a ventricle, with no associated intraparaenchymal hematoma, or

3. Demonstration at surgery of a bleeding saccular aneurysm, or

1. Demonstration at autopsy of recent bleeding of a saccular aneurysm.
2. This definition excludes non-aneurysmal causes of subarachnoid hemorrhage which are still legitimate strokes.

Probable Subarachnoid Hemorrhage

Evidence in the patient's clinical record of sudden or rapid onset of neurologic symptoms lasting for more than 24 hours or leading to death, plus must meet either criteria (1.) or criteria (2.) and (3.) below:

1. a) Angiographic identification of a saccular aneurysm as the source of the bleeding (*e.g.*, demonstration of a clot adjacent to aneurysm or reduced caliber of otherwise normal vessels) and

b) Spinal tap was either not done or was traumatic, or missing or

2. One or more of the following symptoms or signs occurred within minutes or a few hours after onset:
   a) Severe headache at onset, or severe headache when first conscious after hospital admission;
   b) Depression of state of consciousness;
   c) Evidence of meningeal irritation;
   d) Retinal (subhyaloid) hemorrhages and

3. Bloody (not traumatic) tap or xanthochromic spinal fluid.

Definite Brain Hemorrhage

Evidence in the patient's clinical record of sudden or rapid onset of neurologic symptoms lasting for more than 24 hours or leading to death, plus must meet the criteria specified under at least one of the three paragraphs below:

1. Demonstration of definite intracerebral hematoma by computerized tomography, or magnetic resonance imaging *e.g.*, an area of increased density, such as seen with blood or

2. Demonstration at autopsy or surgery of intracerebral hemorrhage, or

Definite Brain Infarction, Thrombotic (TIB)

Evidence in the patient's clinical record of sudden or rapid onset of neurologic symptoms lasting for more than 24 hours or leading to death, plus must meet the criteria specified under at least one of the two paragraphs below:

1. Demonstration at autopsy of infarct in brain, or

2. Evidence in the patient's clinical record that meet criteria (a) and (b) below:

    a) One major or two minor neurological signs and symptoms that lasted at least 24 hours or until the patient died:

    Major
    Hemiparesis involving two or more body parts
    Homonymous hemianopia
    Aphasia

    Minor
    Diplopia
    Vertigo or gait disturbance
    Dysarthria or dysphagia or dysphonia
    Unilateral numbness involving two or more body parts and

    b) Computerized tomography or MRI shows "infarct" or an area of decreased density which may indicate edema or ischema, with no evidence of hemorrhage.

Probable Brain Infarction, Thrombotic

Evidence in the patient's clinical record of sudden or rapid onset of neurologic symptoms lasting for more than 24 hours or leading to death, plus must meet al criteria (1.), (2.), and (3.) below:

1. One major or two minor neurological signs or symptoms listed in Section 3.3.2.5 (a) above that lasted at least 24 hours or until the patient died, and
2. Demonstration of negative or nonspecific findings and no evidence of hemorrhage by computerized tomography or MRI performed in the first 48 hours after the onset of symptoms or signs, and

3. A spinal tap was either not done, or was a traumatic tap, or yielded clear, colorless spinal fluid.

Definite Brain Infarction, Non-carotid Embolic (EIB)

Evidence in the patient's clinical record of sudden or rapid onset of neurologic symptoms lasting for more than 24 hours or leading to death, plus must meet the criteria specified under at least one of the two paragraphs below:

1. Demonstration at autopsy of:

    a) An infarcted area (bland or hemorrhagic) in the brain, and

    b) A source of emboli in a vessel of any organ, or an embolus in the brain, and

2. Evidence in the patient's clinical record that meet criteria (a), (b), and (c) below:

    a) One major or two minor neurological signs and symptoms that lasted at least 24 hours or until the patient died:

        Major
        Hemiparesis involving two or more body parts
        Homonymous hemianopia
        Aphasia

        Minor
        Diplopia
        Vertigo or gait disturbance
        Dysarthria or dysphagia or dysphonia
        Unilateral numbness involving two or more body parts and

    b) Establishment of a likely source for cerebral embolus, *e.g.*:

        Valvular heart disease (including prosthetic heart valve)
        Atrial fibrillation or flutter
        Myocardial infarction
        Cardiac or arterial operation or procedure
        Cardiac myxoma
        Bacterial endocarditis and

    c) Computerized tomography or magnetic resonance imaging shows an area of decreased density which may indicate edema or ischemia, with no evidence of hemorrhage.

Probable Brain Infarction, Non-carotid Embolic

Evidence in the patient's clinical record of sudden or rapid onset of neurologic symptoms lasting for more than 24 hours or leading to death, plus must meet all criteria (1.), (2.), (3.), and (4.) below:

1. One major or two minor neurological signs or symptoms listed in Section 3.3.2.7 (a) above that lasted at least 24 hours or until the patient died and

2. An identifiable source for the cerebral embolus as specified in Section 3.3.2.7 (b), and

3. Demonstration of negative or nonspecific findings and no evidence of hemorrhage by computerized tomography or MRI performed in the first 48 hours after the onset of symptoms or signs, and

4. A spinal tap was either not done, or was a traumatic tap, or yielded clear, colorless spinal fluid.

Possible Stroke of Undetermined Type

Evidence in the patient's clinical record of sudden or rapid onset of at least one major or two minor signs and symptoms that lasted more than 24 hours or until the patient died:

Major
Hemiparesis involving two or more body parts
Homonymous hemianopia
Aphasia

Minor
Diplopia
Vertigo or gait disturbance
Dysarthria or dysphagia or dysphonia
Unilateral numbness involving two or more body parts
Severe headache at onset, or severe headache when first conscious after hospital admission
Depression of state of consciousness
Evidence of meningeal irritation
Retinal (subhyaloid) hemorrhages
Palsy of the iii cranial nerve and

Clinical history, signs, symptoms and findings from diagnostic tests and/or autopsy are not sufficient to meet the criteria for classifying the case as a "Definite" or "Probable" case of one of the four specific diagnostic categories of stroke.

Undocumented Fatal Stroke

Must meet the following criteria:

1. Does not meet criteria for definite, probable, or possible stroke noted above and
2. Underlying cause of death consistent with stroke (*i.e.*, ICD 9: 430 - 438), but death occurred without hospitalization or hospital chart cannot be located.

Exclusionary Conditions for Diagnostic Criteria for Stroke

Cases are not considered a stroke if there is evidence in the patient's clinical record that the neurologic symptoms were the result of any of the following:

1. Major head (brain) trauma; *e.g.*, epidural hematoma, subdural hematoma, skull fracture

2. Neoplasm; *e.g.*, primary or metastatic brain/CNS neoplasia (malignant or benign)

3. Coma due to metabolic disorders or disorders of fluid or electrolyte balance; *e.g.*, due to diabetes, hypoglycemia, epilepsy, hypovolemia, poisoning, drug overdose, uremia, or liver disease

4. Vasculitis involving the brain; *e.g.*, SLE, radiation, *etc*.

5. Peripheral neuropathy

6. Hematologic abnormalities (considered exclusionary if present prior to event under consideration); *e.g.*, thrombogenic conditions (*e.g.*, DIC) are exclusionary for thrombotic or non-carotid embolic strokes, hemorrhagic conditions (*e.g.* anticoagulant or thrombolytic therapy, thrombocytopenia) are exclusionary for brain hemorrhage or subarachnoid hemorrhage

7. CNS infection: brain abscess, granulomas, meningitis, encephalitis, or any specific infection involving the brain or meninges.

APPENDIX B

DETAILED INSTRUCTIONS FOR SECTION E: DIAGNOSTIC TESTS

Review the available data and enter the appropriate responses and/or results of specific tests and diagnoses requested for the specific Items in Section E. In addition, there are specific examples and instructions for each code on the following pages.

Some similarities exist for all procedure codes except autopsy. For instance, any "normal study" will be coded as 1 (except for a normal CT done within 24 hours of symptom onset). In addition, there may be possible responses for "nonstroke" pathology for a procedure. The first will include "exclusionary findings". These refer to specific diagnoses, whose presence would eliminate a possible stroke case from analysis. These include disease processes such as CNS tumor, infection, vasculitis and head trauma which may mimic stroke by producing focal neurologic signs and symptoms. These exclusions are described on the last page of the stroke

criteria and mentioned specifically under each procedure below. The second type of nonstroke pathology includes all other types of unrelated findings and should only be coded if none of the other categories apply. This category is considered "unrelated pathology".

49. L.P. (Lumbar Puncture)

1. Normal study. All of the following must be true, if the specified test was performed:
   spinal fluid is clear and colorless
   WBC < 10, at least 90% mononuclear unless traumatic, then expect 1 WBC:700 RBC
   protein normal
   glucose normal
   RBC should be < 100; unless traumatic; then must decrease between 1st and last tube.
   Clotted blood indicates traumatic tap as well.
   Other studies done, should be normal. This includes cultures, AFB, cryptoantigen, myelin basic protein, oligoclonal bands, protein electrophoresis.

2. Exclusionary criteria include:

   infection - increased WBC without evidence of old hemorrhage; (+) cultures; (+) AFB, (+) VDRL, or (+) crypto antigen
   Neoplasm - (+) cytology with or without increased protein

   Only use this response if it appears likely that stroke-like deficits were caused by this pathology. If in doubt, consult with MD.

3. Unrelated pathology includes:

   traumatic tap - grossly bloody or pinked tinged fluid that clears by final tube. Associated with proportionate increased WBC (1:700 CBC) and increased protein

4. Bloody, Nontraumatic; xanthochromia

53b-h. Angiography and Angiography Diagnosis:

1. Normal study - no abnormalities identified

2. Exclusionary pathology

   Neoplasm - may be described as tumor blush or displacement of vessels due to "avascular mass"

   Vasculitis - including moya moya

   Subdural hematoma

   Ruptured AVM

3. Unrelated pathology:

Unruptured aneurysm or AVM

Carotid artery stenosis/ulceration

Cerebral artery thrombosis/embolism

Vertebrobasilar artery disease - including stenosis/tortuousity

Generalized small vessel disease

Chronic white matter ischemic changes

4. Ruptured Aneurysm - this should be described in vicinity of recent hemorrhage or associated with clot.

5. Avascular mass without evidence ruptured aneurysm/AVM
6. Occlusion or Stenosis
7. Dissection
8. Venous Occlusion
9. Arteriovenous Malformation
10. Other

51. Computed Tomography (CT) and 51a. First CT diagnosis:

1. Check timing to determine when study was done in relation to symptom onset.

2. Exclusionary pathology includes:
tumor; evidence of trauma such as fractured bones, coup and contrecoup injuries, soft tissue swelling over area of hematoma; subdural hematoma, epidural hematoma, and abscess or granuloma.

3. Unrelated pathology or findings include:
old stroke
old surgery
unruptured aneurysm
generalized atrophy, encephalomalacia
description of old surgery
hydrocephalus
normal variants - cavum septum pellucidum, calcification of falx/tentorim
age appropriate atrophy
atrophy normal for age

5. Subarachnoid hemorrhage - blood seen in Fissure of Sylvius, between the frontal lobes, in basal cisterns or within a ventricle with no associated intraparenchymal hematoma

6. Intracerebral hematoma - blood clot within the brain parenchyma. Occasionally these occur within secondary rupture into the ventricle or subarachnoid space. "Hypertensive" or "spontaneous hemorrhage" would be included. Typical locations include basal ganglia, cerebellum, thalamus and pons. Traumatic = "No". Sometimes, subarachnoid hemorrhage and intracerebral hematoma (hemorrhage) are both present. You will have to

determine and record only the primary condition that led to the secondary condition. Consult if needed.

7. Ischemic infarction - these are described as areas of low density (attenuation) in a typical vascular distribution. If "possible" infarction, use your best judgment of the quality of evidence and radiologist's language. Hemorrhagic infarction should be recorded as "Infarction" if it is clear that infarction preceded the hemorrhage. If unclear, consult.

8. Hemorrhagic infarction. Can be defined as an ischemic infarct in which an area of bleeding exists within necrosing cerebral tissue. This definition includes small hemorrhages confined to minor ischemic areas in grey matter as well as much larger lesions involving cortical and deep hemispheric regions.

52. MRI - Magnetic Resonance Imaging: and 52a. MRI Diagnosis:

1. Normal study - must check timing to determine when study was done in relation to symptom onset.

2. Exclusionary pathology includes:

   tumor; evidence of trauma such as fractured bones, coup and contrecoup injuries, soft tissue swelling over area of hematoma; subdural hematoma, epidural hematoma, abscess or granuloma, and M.S. plaques..

3. Unrelated pathology or findings include:
   old stroke
   old surgery
   unruptured aneurysm
   generalized atrophy, encephalomalacia
   description of old surgery
   hydrocephalus
   normal variants - cavum septum pellucidum, calcification of falx/tentorim
   age appropriate atrophy
   atrophy normal for age

5. Subarachnoid hemorrhage - blood seen in Fissure of Sylvius, between the frontal lobes, in basal cisterns or within a ventricle with no associated intraparenchymal hematoma

6. Intracerebral hematoma - blood clot within the brain parenchyma. Occasionally these occur within secondary rupture into the ventricle or subarachnoid space. "Hypertensive" or "spontaneous hemorrhage" would be included. Typical locations include basal ganglia, cerebellum, thalamus and pons. Traumatic = "No". Sometimes, subarachnoid hemorrhage and intracerebral hematoma (hemorrhage) are both present. You will have to determine and record only the primary condition that led to the secondary condition. Consult if needed.

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8. Hemorrhagic Infarction: . Can be defined as an ischemic infarct in which an area of bleeding exists within necrosing cerebral tissue. This definition includes small hemorrhages confined to minor ischemic areas in grey matter as well as much larger lesions involving cortical and deep hemispheric regions.

53i.-w..STENOSIS: Fill in appropriate code for both right and left internal carotids. If more than one lesion, select most stenotic plaque within internal carotid. The following qualitative terms should be answered as follows:

Term	Answer
Slight/Mild/Minimal	0 - 49%
Moderate	50 - 69%
Subtotal/high grade/tight/significant	70 - 99%
Severe (occluded = 100%)	> or equal to 90%

To determine whether a study is normal or abnormal use the guidelines above and below. *If the range is smaller than 5% take the lower figure. If a range of stenosis overlaps two categories choose the one where most of the range falls.*

- If report indicates “normal” exam, assume category 1
- If report states “Less than 50% stenosis”, assume category 1
- If report states “60-79% stenosis”, assume category 2
- If report states “No plaque”, “no stenosis” assume category 1

APPENDIX C

GLASGOW COMA SCALE

Category		Score
Eye opening	Spontaneous	4
	To speech	3
	To pain	2
	None	1
Verbal response	Oriented	5
	Confused	4
	Inappropriate	3
	Incomprehensible	2
	None	1
Motor response	Obeys commands	6
	Localizes	5
	Withdraws	4
	Flexion/decorticate	3
	Extension/decrebrate	2
	None	1
Total score		15

Glascow Coma Scale (cont.)

Definitions and Terms

- ▪ Eye response: Eye opening in response to various levels of stimulus
- ▪ Verbal response: Verbal communication in terms of comprehensibility
- ▪ Motor response: Movement in response to various stimuli

Techniques

- ▪ Eye response (E)
  - —No eye opening = 1
  - —Eye opening in response to pain (ie, pressure on fingernail bed, mandible, supraorbital area, or sternum) = 2
  - —Eye opening to speech = 3
  - —Spontaneous eye opening = 4
- ▪ Verbal response (V)
  - —No verbal response = 1
  - —Incomprehensible sounds (ie, moaning) = 2
  - —Inappropriate words (ie, random sounds or speech) = 3
  - —Confused, coherent speech (ie, disorientation or confusion) = 4
  - —Oriented = 5
- ▪ Motor (M)
  - —No movements = 1
  - —Extension in response to painful stimuli (ie, decerebrate posturing) = 2
  - —Flexion in response to pain (ie, decorticate posturing) = 3
  - —Flexion withdrawal in response to pain (ie, withdrawal of body part in response to stimulus) = 4
  - —Localized movements in response to pain (ie, purposeful movements across midline toward painful stimulus) = 5
  - —Obeys commands = 6
- ▪ GCS less than or equal to 8 is consistent with severe brain injury when applied to head injured population.
- ▪ GCS 9 to 12 consistent with moderate brain injury.
- ▪ GCS greater than or equal to 13 consistent with minor injury.
- ▪ Modifiers are used in the presence of severe eye/facial swelling, spinal cord injury, or oral intubation to indicate that that portion of the exam cannot be performed (ie, 11T indicates a normal eye and motor exam in an intubated patient).

Glascow Coma Scale (cont.)

Clinical Pearls and Pitfalls

- ▪ Some examiners break the score down by individual components (ie, E4V5M6) to precisely specify the components of the exam.
- ▪ A variety of independent factors may interfere with the applicability of the GCS to traumatic brain injury because they act as confounders, such as intoxication, sepsis, and shock.

- ▪ Alternative scores have been developed for use in children of various ages.
- ▪ The GCS has been used successfully to predict outcome in a variety of settings

Suggested Reading

Wijdicks EF. Clinical scales for comatose patients: the Glasgow Coma Scale in historical context and the new FOUR score. *Rev Neurol Dis.* 2006;3:109–117. [PubMed: 17047576]

APPENDIX D

GLOSSARY

Acalculia: loss of ability to do math reckoning.

Adiadochokinesia: inability to perform rapidly alternating movements.

Agraphia: inability to write.

Alexia or Visual Aphasia: loss of ability to understand written word.

auditory: lack of comprehension of spoken word

jargon or paraphasia: words may be fluent but inappropriate

amnesic: loss of memory of special words with hesitant and fragmentary speech

nominal aphasia: (anomia, dysnomia) - loss of ability to name objects

semantic aphasia: loss of meaning of words

Amaurosis fugax: monocular (one eye) transient blindness.

Analgesia: loss of pain sensation.

Aneurysm: saccular dilation of blood vessel. If it ruptures, it causes SAH.

Anisocoria: inequality of the diameter of pupils.

Anosmia: loss of smell.

Anoxia: lack of oxygen which can cause tissue damage if prolonged.

Aphasia: inability to express thoughts properly through speech (expressive aphasia) or loss of verbal comprehension (receptive aphasia).

Apraxia: inability to perform certain movements (without loss of motor power, sensation or coordination); loss of learned behavior, *e.g.*, dressing (inability to dress oneself).

Astereognosis: loss of ability to recognize common objects by touching and handling them with eyes closed.

Ataxia: lack of coordination of limb movements.

Atrophy: loss of tissue.

Autotopagnosia: inability to recognize one's self or part of one's self.

AVM: arteriovenous malformation - abnormal collection of blood vessels - prone to cause hemorrhage. If large, may exert mass effect.

Babinski reflex: on plantar stimulation large toe extends upward on involved side.

Bolt: peripheral monitor used to measure ICP.

Brudzinski: flexion of leg when neck is flexed. This is a sign of meningeal irritation.

Bruit: blowing sound heard with a stethoscope above blood vessel; caused by turbulent blood flow. These may occur over an aneurysm or area of stenosis.

Bulbar palsy: involvement of brain stem.

Burr hole: hole drilled through skull.

CAD: coronary artery disease.

Carotid artery: arteries that supply front and middle portion of brain. These travel on either side of neck from clavicle bone to jaw.

Carotid endarterectomy: surgical removal of clot or plaque from carotid artery.

Clonus: spasm with rapidly alternating rigidity, relaxation. May be sustained (continuous) or non-sustained.

Coma: decreased level of consciousness to the point of unresponsiveness to external stimuli, unable to be aroused.

Computerized tomography: "CAT Scan" or CT. A radiographic procedure to visualize the brain.

Conjugate movement: describes normal appearance of how the eyes move together. Dysconjugate movement is seen in certain neurologic conditions or in a "lazy eye" where eyes don't move together.

Craniotomy: surgical procedure that involves entering the cranial cavity.

CSF: cerebrospinal fluid.

CVA: cerebrovascular accident (an old term for stroke).

Decerebrate: posturing response to stimuli with extension of upper and lower extremities; frequently seen in coma.

Decorticate: posturing response to stimuli with flexion of upper extremities and extension of lower extremities.

Diplopia: double vision.

Dizziness: sensation of unsteadiness with feeling of movement in head.

Dysarthria: difficult and defective speech due to impairment of the tongue or other muscles essential to speech causing slurred speech.

Dysconjugate gaze: see conjugate movement.

Dysdiadochokinesia: Inability to perform rapid alternating movements normally.

Dysesthesia: unpleasant cutaneous sensation (burn, tickle, etc.).

Dysmetria: Incoordination of attempted voluntary muscle movements.

Dysphagia: difficulty in swallowing.

Dysphasia: an uncommonly used term for aphasia

Dysphonia: difficulty with phonation.

Edema: swelling.

Embolism: this is a blood clot that forms in one part of the body and travels in the blood stream to another part of the body. A thrombosis of an artery may break off of the "parent" vessel (*i.e.*, carotid artery) and form an embolus that eventually lodges in a vessel of smaller size in an end organ (*i.e.*, brain).

EOM: extraocular muscles or movement.

Fasciculations: irregular, inconstant, isolated contractions of fiber bundles within a muscle.

Flaccid: describes muscle tone which is lax.

Frontal release signs: "primitive" reflexes that result from disinhibition of frontal lobe, includes snout, palmomental, suck, grasp reflexes.

Glabellar reflex: patient cannot refrain from blinking when tapped on forehead between their eyes.

Hematoma: collection of blood outside of a vessel.

Hemianopsia: see homonymous hemianopsia (below).

Hemiparesis: weakness involving half of the body.

Hemiplegia: paralysis involving half of the body.

Herniation: a process which occurs when there is swelling or mass effect from other processes (tumor, brain hemorrhage) that leads to loss of brain function and death over several hours.

Hoffman sign: finger reflex - contraction of thumb and/or fingers when distant phalanx of middle finger (hand prone and relaxed) forcibly flexed by examiner.

Holme's sign: excessive flexion rebound after muscle extension pressure released.

Homonomous hemianopsia: impairment of half of the field of vision (of both eyes) on the side of the lesion.

Hypoalgesia: decreased pain, diminished sensitivity to pain.

Hypoesthesia: decreased tactile sensation.

ICP: intracranial pressure.

ICP monitor: intracranial pressure monitor - may be a bolt or ventriculostomy.

IHD: ischemic heart disease.

Infarction: area of tissue (cell) death.

Ipsilateral: situation on or pertaining to same side.

Ischemia: lack of blood flow.

Kernig: inability to straighten leg when hip is flexed. This is a sign of meningeal irritation.

Locked in: lesion in basis portis that causes patient to be quadraparetic with intact cognition and eye movements only.

LP: lumbar puncture (spinal tap)

MAE: moves all extremities.

Mass effect: results from inability of the cranial cavity (area inside of skull) to expand. Thus any mass such as blood (hematoma), tumor, or swelling, exerts a mass effect or pressure on the brain itself.

Meninges: membranes covering brain, consists of three layers.

- dura: thick outer layer.
- pia: innermost layer - wrapped around brain
- arachnoid: middle membrane - vascular layer

Meningismus: patient exhibits signs of meningeal irritation such as stiff neck, Kernig or Brudzinski.

Myoclonus: clonic spasm of muscle or group of muscles.

Neglect syndrome: occurs in nondominant hemisphere events such as stroke. Affected patients will ignore their nondominant (usually left) side.

Nystagmus: oscillating or jerking movements of the eyes.

Occlusion: refers to complete blockage of an artery or vein.

Oriented X3: oriented to person, time, place.

Ox4: oriented to person, time, place; also includes situation.

Paraplegia: paralysis of legs and lower part of body - both in motion and sensation.

Paresis: weakness

Paresthesia: unpleasant cutaneous sensation, *i.e.*, numbness or tingling.

Parosmia: any disease or perversion of the sense of smell.

PERL: pupils equal, react to light.

PERRL(d+C)A: pupils equally round and reactive to light (direct and consensual) and to accommodation.

Plegia: paralysis

PM&R: physical medicine and rehab.

Post ictal: after an ictus or event, usually refers to period immediately following a seizure.

PRIND: partially reversible ischemic neurological deficit.

Proprioception: position sensation.

Ptosis: drooping of upper eyelid.

Quadriplegia: paralysis of all four limbs.

Reflexes:

Scale A	Scale B
N = normal reaction	2
1+ = slightly hyperactive	3
2+ = markedly increased non-sustained clonus	
3+ = one that shows sustained clonus	4
1- = reflex slightly decreased	
2- = reflex markedly decreased	1
3- = reflex absent except on reinforcement	
0 = reflex cannot be obtained at all	

RIND: reversible ischemic neurologic deficit (symptoms last > 24 hours). Not widely used anymore.

Romberg sign: patient unable to stand with feet placed close together and eyes closed.

SAH: subarachnoid hemorrhage, blood in space around the brain.

Scotoma: a blind or partially blind area in visual field.

Scotomata: optic nerve lesion producing impaired vision in one eye only.

SDH: subdural hematoma, blood clot outside of brain, but pressing against brain.

Seizure: convulsion; abnormal electrical activity of brain causing jerking movements.

Snout reflex: mouth puckers when chin tapped.

Spastic: muscles stiff, movements awkward (of the nature of or characterized by spasm).

Stenosis: narrowing of a blood vessel, frequently from atherosclerotic buildup.

Suck reflex: sucking occurs reflexively when something is placed in their mouth.

Syncope: faint, swoon.

Thrombosis: clot of blood that obstructs or blocks an artery or vein.

TIA: transient ischemic attack.

Tinnitus: ringing sound in ear.

Todd's paralysis: focal weakness or paralysis following a seizure, usually lasting minutes to days, but resolving. Mimic a stroke.

Tomography: see computerized tomography.

Trapezii: shoulder muscles.

Tremors: involuntary movements resulting in rhythmic movement of a joint.

Vasospasm: a complication of SAH where subarachnoid blood irritates blood vessels causing them to constrict. As a result, blood flow is decreased. This can lead to ischemic infarction (stroke).

Vegetative: loss of all cognitive function. Patient appears alert and awake, but does not interact with environment.

Vertebrobasilar arteries: arteries in back of neck that supply brain stem and back of brain vessel.

Vertigo: abnormal sense of spinning-type movement.

Ventricles: fluid (CSF) filled cavities within the brain.

Ventriculostomy: catheter inserted into ventricles with the brain to relieve and or monitor ICP.

Xanthochromia: yellowish colored spinal fluid.