Carotid Endarterectomy Data Dictionary

Blue Cross Blue Shield of Michigan
Carotid Registry
Data Collection Definitions

Definitions updated 2.1.2022

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CEA Qualifying Case Criteria

Qualifying Procedures:

- Endarterectomy of the common carotid artery (CCA), internal carotid artery (ICA), carotid bifurcation and carotid bulb
- CEA that is converted to a CAS during the same OR time
    - Enter a CEA and CAS for this scenario

CEA procedures that do not qualify:

- Endarterectomy of the external carotid artery (ECA)
- A qualifying CEA that is converted to a carotid bypass during the same OR time
- CEA of the petrosal and intracranial regions of the internal carotid artery (ICA)
- Patch on anastomosis
- The procedure was aborted BEFORE the primary incision was made.

Physician

Data Abstraction Instructions:

Choose the attending physician from the drop down list, or create a physician identification if not already listed.

Selections:

Choose Physician

Required:
Yes

Fellow ID/Second Operator

Data Abstraction Instructions:

Use the drop down box to choose a physician. If not available in drop down, enter the fellow's or second operator's information to create a physician ID.

Selections:

- Enter value

Supporting Definitions:

This is an optional field if your site chooses to track it' fellows or second operators.

Required:
No

Procedure Date & Start Time

Data Abstraction Instructions:

Enter the date of the current procedure (mm/dd/yyyy) and enter the time the procedure was initiated. (Military time)

Selections:

- Enter date & time

Supporting Definitions:

The time the procedure started is defined as the incision time for open procedures. Indicate the time (hours:minutes) using military 24-hour clock, beginning at midnight (0000 hours).

Required:
Yes

Procedure End Date & Time

Data Abstraction Instructions:

Enter the date and time the procedure ends.

Selections:

- Enter Date & Time

Supporting Definitions:

End time for open surgical procedures is defined as the time when all instrument and sponge counts are completed; all dressings and drains are secured; and the physicians/surgeons have completed all procedure-related activities on the patient. Should the patient expire in the procedure area, indicate the time the patient was pronounced. Indicate the time (hours:minutes) using military 24-hour clock, beginning at midnight (0000 hours).

Required:
Yes

Status of Procedure

Data Abstraction Instructions:

Indicate status of the procedure using the following categories.
Elective = the procedure could be deferred without increased risk of compromised vascular outcome. This should include the planned or scheduled procedures.
Urgent = required operation within 72 hours, but > 12 hours of **admission.**
Emergent = required operation within 12 hours of **admission** to prevent limb loss.

Selections:

- Elective
- Urgent
- Emergent

Required:
Yes

Labs

Pre Procedure Creatinine

Data Abstraction Instructions:

Use the last value between 30 days prior to arrival and current procedure. If there is no value, mark not drawn.

Selections:

- Drawn
    - Enter value
- Not drawn

Supporting Definitions:

When multiple lab values are available pre-procedure, enter the value closest to the procedure start time. If a patient has multiple procedures within a hospitalization, the pre-procedure labs should be abstracted after the previous procedure; if no labs are drawn from the end of the previous procedure to the start of the current procedure, enter "Not drawn".

Required:
Yes
Suffix:
mg/dl
Minimum:
0.1
Maximum:
15
Soft Minimum:
0.3

Pre Procedure Hemoglobin (Hgb)

Data Abstraction Instructions:

Use the last value between 30 days prior to arrival and current procedure. If there is no value, mark not drawn

Selections:

- Drawn
    - Enter value
- Not drawn

Supporting Definitions:

When multiple lab values are available pre-procedure, enter the value closest to the procedure start time. If a patient has multiple procedures within a hospitalization, the pre-procedure labs should be abstracted after the previous procedure; if no labs are drawn from the end of the previous procedure to the start of the current procedure, enter "Not drawn".

Required:
Yes
Suffix:
g/dl
Minimum:
2
Maximum:
20
Soft Minimum:
5
Soft Maximum:
18

Pre Procedure BNP

Data Abstraction Instructions:

Indicate if a BNP value was obtained within the 30 days prior to the procedure. If more than one value exists, use the one closest to the procedure start time.

Selections:

Pre Procedure BNP

- Yes
  - Value_____pg/mL
- No

Required:
Yes

Pre Procedure Troponin

Data Abstraction Instructions:

Indicate if a Troponin I, Troponin T, Troponin I HS (High Sensitivity) or Troponin T HS value was obtained within the 30 days prior to the procedure. If more than one value exists, use the value closest to the procedure start time.

Selections:

Pre Procedure Troponin

- Yes
  - Pre procedure troponin I
    - Yes
      - Enter lab value _____
      - Pick unit of lab value from list
        - ng/dL
        - ng/mL
        - ng/L
        - pg/mL
    - No
  - Pre procedure troponin T
    - Yes
      - Enter lab value _____
      - Pick unit of lab value from list
        - ng/dL
        - ng/mL
        - ng/L
        - pg/mL
    - No
  - Pre procedure troponin I HS
    - Yes
      - Enter lab value _____
      - Pick unit of lab value from list
        - ng/dL
        - ng/mL
        - ng/L
        - pg/mL
    - No
  - Pre procedure troponin T HS
    - Yes
      - Enter lab value _____
      - Pick unit of lab value from list
        - ng/dL
        - ng/mL
        - ng/L
        - pg/mL
    - No
- Not Drawn

Supporting Definitions:

When multiple lab values are available pre-procedure, enter the value closest to the procedure start time. If a patient has multiple procedures within a hospitalization, the pre-procedure labs should be abstracted after the previous procedure; if no labs are drawn from the end of the previous procedure to the start of the current procedure, enter "Not drawn".

Required:
Yes
Suffix:
ng/dL, ng/mL, ng/L, pg/mL

Post Procedure Peak Creatinine

Data Abstraction Instructions:

Record the highest level recorded from time of procedure to next procedure or discharge, whichever occurs first.

Selections:

- Drawn
  - Enter value
- Not drawn

Supporting Definitions:

The next procedure is any procedure utilizing contrast, or any open surgical procedure. If the "next procedure" is a complication from the entered procedure, continue to abstract the peak creatinine beyond it.
If only one value is available post procedure through discharge, that value will be used for both the post procedure peak creatinine **and** the discharge value.

Required:
Yes
Suffix:
mg/dl
Minimum:
0.1
Maximum:
15
Soft Minimum:
0.3

Post Procedure Nadir Hemoglobin

Data Abstraction Instructions:

Record the lowest level recorded from time of procedure to next procedure, or discharge, whichever occurs first.

Selections:

- Drawn
  - Enter value
- Not drawn

Supporting Definitions:

The next procedure is any procedure utilizing contrast, or any open surgical procedure. If the "next procedure" is a complication from the entered procedure, continue to abstract the peak creatinine beyond it.
If only one value is available post procedure through discharge, that value will be used for both the post procedure nadir hemoglobin **and** the discharge value.

Required:
Yes
Suffix:
g/dl
Minimum:
2
Maximum:
20
Soft Minimum:
5

Soft Maximum:
18

Patient History

Significant Valve Disease

Data Abstraction Instructions:

Indicate whether the patient has had a previous surgical replacement and/or repair of a cardiac valve by any approach prior to arrival at this facility. This includes percutaneous valve procedures and valvuloplasty. Also indicate if patient has mitral valve regurgitation of at least grade 2 or greater, mitral valve area < 1.5 cm^2, aortic valve regurgitation of at least grade 2 or greater, or aortic valve area <= 1.0 cm^2.

Selections:

- Yes
  - MI/MR
  - MS
  - AI
  - AS
- No

Supporting Definitions:

This may include physician documentation of moderate or severe valve disease.

Required:
Yes

Mechanical Aortic or Mitral Valve

Data Abstraction Instructions:

Indicate if the patient has a history of open surgical or percutaneous valve replacement with a mechanical mitral or aortic valve. If the patient has received a biological (e.g. tissue) valve, had surgical valve repair (without valve replacement), or undergone percutaneous valve modification (including valvuloplasty, mitral annular remodeling, or mitral valve clipping/suturing), without mechanical valve replacement, code "No".

Selections:

- Yes
- No

Required:
Yes

Angina CCS Class III or IV within 6 Weeks

Data Abstraction Instructions:

Indicate if the patient experienced anginal symptoms equivalent to the Canadian Cardiovascular Society (CCS) Classification System Class III or IV within 6 weeks prior to the procedure.
CCS Class III or Class IV are defined as:
Class III = Marked limitation of ordinary activity; for example, angina occurs walking one or two blocks on the level or climbing one flight of stairs in normal conditions and at a normal pace.
Class IV = Inability to carry on any physical activity without discomfort - angina syndrome may be present at rest.

Selections:

- Yes
- No

Required:
Yes

Peripheral Arterial Disease (PAD)

Data Abstraction Instructions:

Indicate if the patient has a history of peripheral arterial disease prior to the current procedure. Peripheral arterial disease is characterized by any of the following:

- Claudication, either with exertion or at rest
- Amputation for arterial vascular insufficiency
- Vascular reconstruction, bypass surgery, or percutaneous intervention to the extremities
- Documented aortic aneurysm
- Positive noninvasive test (e.g., ankle brachial index less than 0.8)

Selections:

- Yes
- No

Required:
Yes

Home O2 Therapy

Data Abstraction Instructions:

Indicate if, prior to the current procedure, the patient has been receiving home oxygen therapy for treatment of chronic lung disease.

Selections:

- Yes
- No

Required:
Yes

Major surgery planned within next 8 weeks

Data Abstraction Instructions:

Indicate if the patient is receiving carotid revascularization in preparation for a major surgical procedure. Indicate "yes" only if the surgical procedure will take place within 8 weeks following the carotid revascularization.

Selections:

- Yes
    - Cardiac
    - Vascular
    - Other
- No

Required:
Yes

Previous Neck Radiation

Data Abstraction Instructions:

Indicate if the patient had previous X-Ray therapy to the neck prior to the current admission or prior to the current procedure.

Selections:

- Yes
- No

Required:
Yes

Prior Neck Surgery (other than CEA)

Data Abstraction Instructions:

Indicate if the patient had a previous extensive (i.e., radical) neck dissection (other than carotid endarterectomy (CEA) prior to the current admission or prior to the current procedure.

Selections:

- Yes
- No

Required:
Yes

Tracheostomy Present

Data Abstraction Instructions:

Indicate if the patient has an open tracheostomy, at the time of the current procedure.

Selections:

- Yes
- No

Required:
Yes

Previous Laryngeal Nerve Palsy

Data Abstraction Instructions:

Indicate if the patient has a history of laryngeal nerve palsy, defined as paralysis of the larynx caused by damage to the recurrent laryngeal nerve or its parent nerve, the vagus nerve, prior to the current procedure. Indicate the location of the laryngeal nerve palsy, either right or left.

Yes - Right = Laryngeal Nerve Palsy located on the right side of the neck.
Yes - Left =Laryngeal Nerve Palsy located on the left side of the neck.
No = No Laryngeal Nerve Palsy.

Selections:

- Yes
  - Right
  - Left
- No

Required:
Yes

Cardiac History

Two or More Major Coronary Arteries within Stenosis >= 70% (LAD, LCX, RCA)

Data Abstraction Instructions:

Indicate if the patient currently has two or more major coronary arteries stenosis great than or equal to 70% prior to the current procedure. Major Coronary Arteries are defined as Left Anterior Descending (LAD), Left Circumflex Artery (LCX) and Right Coronary Artery (RCA). This does not include collaterals. Indicate only if the patient currently has coronary arteries with stenosis. If the arteries were intervened upon or the patient had a CABG to repair the blocked arteries, it does not qualify.

Selections:

- Yes
- No

Required:
Yes

Left Main Coronary Artery Stenosis >= 50%

Data Abstraction Instructions:

Indicate if the patient currently has Left Main Coronary Artery stenosis greater than or equal to 50% prior to the current procedure. Indicate only if the patient currently has left main stenosis. If the artery was intervened upon or the patient had a CABG to repair the blocked artery, it does not qualify.

Selections:

- Yes
- No

Supporting Definitions:

Required:
Yes

MI within 6 weeks

Data Abstraction Instructions:

Indicate if the patient had a myocardial infraction (MI) within 6 weeks prior to the index procedure as evidenced by the following:

- Acute myocardial infarction (<=7 days) manifested as a rise and fall of cardiac biomarkers (preferable troponin) with at least one of the values above the range of normal for your laboratory [above the 99th percentile of the upper reference limit (URL)] together with evidence of myocardial ischemia with at least one of the following:
    - ischemic symptoms;
    - ECG changes indicative of new ischemia (new ST-T changes or new left bundle branch block),
    - Development of pathological Q waves in the ECG;
    - Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality.
    - Prior myocardial infarction (>7 days) manifested by:
        - A myocardial infarction meeting the criteria of an acute MI, as documented in the medical record, or
        - By either of the following:
            - Development of new pathological Q waves with or without symptoms.
            - Imaging evidence of a region of loss of viable myocardium that is thinned and fails to contract, in the absence of a non-ischemic cause.

Selections:

- Yes
- No

Required:
Yes

NYHA Functional Class III or IV within 6 Weeks

Data Abstraction Instructions:

Indicate if the patient's highest New York Heart Association (NYHA) cardiac functional class has been Class III or IV anytime within 6 weeks prior to the current procedure. Patients with NYHA Class III and Class IV have anginal or heart failure symptoms, at rest, and/or resulting in marked limitation of physical activity. Class III and Class IV are formally defined as:
Class III = Patient has cardiac disease resulting in marked limitation of physical activity. Patient is comfortable at rest. However, less than ordinary physical activity (e.g., walking one to two level blocks or climbing one flight of stairs) causes fatigue, palpitations, dyspnea, or anginal pain.
Class IV = Patient has dyspnea at rest that increases with any physical activity. Patient has cardiac disease resulting in inability to perform any physical activity without discomfort. Symptoms may be present even at rest. If any physical activity is undertaken, discomfort is increased.

Selections:

- Yes
- No

Supporting Definitions:

Enter No for patients without cardiac disease or patients with NYHA Class I or II.

Required:
Yes

Permanent Pacemaker or ICD

Data Abstraction Instructions:

Indicate if the patient has a permanent pacemaker or implantable cardioverter defibrillator (ICD) prior to admission or prior to the current procedure.

Selections:

- Yes
- No

Required:
Yes

Cardiac Stress Test (CEA)

Data Abstraction Instructions:

Indicate if a Cardiac Stress Test was performed within prior 6 months. If performed, indicate if the study was normal or abnormal.

Selections:

- Yes
    - Normal
    - Abnormal
- No

Required:
Yes

EKG (CEA)

Data Abstraction Instructions:

Indicate if an EKG was performed within prior 6 months. If performed, indicate if the study was normal or abnormal.

Selections:

- Yes
  - Normal
  - Abnormal
- No

Required:
Yes

Neurologic History and Risk Factors

Dementia or Alzheimer's Disease

Data Abstraction Instructions:

Indicate if the patient has a history of dementia or Alzheimer's Disease, with global deterioration of intellectual or cognitive function as indicated in the medical record.

Selections:

- Yes
- No

Required:
Yes

History of Seizure or Known Seizure Disorder

Data Abstraction Instructions:

Indicate if the patient has a history of a seizure disorder as indicated in the medical record, or characterized by at least two unprovoked seizures that occurred at different times (excluding febrile seizures) on admission or prior to the current procedure.

Selections:

- Yes
- No

Required:
Yes

Previous Carotid Intervention

Data Abstraction Instructions:

Indicate if the patient had a previous carotid endarterectomy or carotid artery angioplasty or carotid stent procedure. The event may have occurred either prior to this admission, or during this admission prior to the current procedure. If there was more than one procedure (i.e. more than one carotid artery stent procedure on the right carotid artery), code the most recent occurrence for each intervention.

Selections:

- Yes
  - If Yes, select **most recent** occurence for each:
- No

Required:
Yes

Previous Right CEA Timeframe

Data Abstraction Instructions:

Indicate the timeframe of the most recent carotid endarterectomy (CEA) for the right side, prior to the current procedure.

Selections:

- Yes
  - <=30 days
  - 31-180 days
  - >=181 days
- No

Required:

Yes

Previous Right CAS Timeframe

Data Abstraction Instructions:

Indicate the timeframe of the most recent carotid angioplasty and/or stent procedure for the right side, prior to the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

Previous Left CEA Timeframe

Data Abstraction Instructions:

Indicate the timeframe of the most recent carotid endarterectomy (CEA) for the left side, prior to the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

Previous Left CAS Timeframe

Data Abstraction Instructions:

Indicate the timeframe of the most recent carotid angioplasty and/or stent procedure for the left side, prior to the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

Neurologic Event(s) prior to procedure

Data Abstraction Instructions:

Indicate if the patient experienced a neurologic event at any time prior to the current procedure. Neurologic events are defined as TIA (transient ischemic attack), ischemic stroke, or intracranial hemorrhage/hemorrhagic stroke, and are further described as:

- Transient Ischemic Attacks (TIA) are characterized by the following: A focal neurologic abnormality of sudden onset and brief duration (i.e., lasting <24 hours) that reflects a dysfunction (presumed to be ischemic in origin) in the cerebral distribution of the affected artery. They are evidenced by neurological symptoms involving right or left retinal, right or left hemispheric, vertebrobasilar, and/or unknown territories.
  Ischemic Strokes are caused by a “blockage of a blood vessel” resulting in residual symptoms lasting greater than 24 hours, and leading to impaired functional outcomes. They are evidenced by loss of neurological function involving right or left retinal,

right or left hemispheric, vertebrobasilar, and/or unknown territories.
- Intracranial Hemorrhage or Hemorrhagic Strokes are caused by “bursting or leaking of blood vessels” in the brain and may lead to impaired functional outcomes. They are evidenced by intraparenchymal (e.g., hemorrhagic conversion of prior stroke) intracranial hemorrhage, subarachnoid intracranial hemorrhage, and/or subdural intracranial hemorrhage.

Symptoms of transient ischemic attack or ischemic stroke in specific territories can include the following:
1. Ischemia in the retinal territory can be manifested as:

- Transient monocular blindness (e.g., amaurosis fugax, defined as a transient episode of blindness or partial blindness, affecting one eye only).

2. Ischemia in the hemispheric territory supplied by the carotid artery can be manifested as:

- language impairment
- speech impairment or dysphasia
- hemi-neglect
- and/or, the symptoms noted in #4 (a through e) below

3. Ischemia in the vertebrobasilar territory can be manifested as:

- vertigo (spinning sensation)
- cranial nerve abnormalities (an example is dysconjugate gaze, in which eyes are no longer yoked together)
- “crossed” neurological symptoms, indicated by focal neurological deficits involving both sides of the body (example: sensory loss on the right and motor weakness on the left)
- and/or, the symptoms noted in #4 (a through e) below

4. Symptoms of ischemia that can be manifested in either the carotid hemispheric territory and/or Vertebrobasilar territory include:

- motor weakness
- sensory loss
- slurred speech ("dysarthria")
- visual field cut (more common in the vertebrobasilar territory)
- clumsiness or incoordination (more common in the vertebrobasilar territory)

Note: The specific territory of the prior event should be confirmed by a physician and prior imaging studies may be of assistance to confirm the territory involved.

Selections:

- Yes
  - If Yes, select **most recent** occurence for each:
- No

Required:
Yes

TIA - Right Retinal

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a Transient Ischemic Attack (TIA) involving the right retinal territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

TIA - Left Retinal

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a Transient Ischemic Attack (TIA) involving the left retinal territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

TIA - Right Hemispheric

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a Transient Ischemic Attack (TIA) involving the right hemispheric territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

TIA - Left Hemispheric

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a Transient Ischemic Attack (TIA) involving the left hemispheric territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

TIA - Vertebrobasilar

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a Transient Ischemic Attack (TIA) involving the vertebrobasilar territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

TIA - Unknown

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a Transient Ischemic Attack (TIA) involving an unknown territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

Ischemic Stroke - Right Retinal

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a completed ischemic stroke involving the right retinal territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

Ischemic Stroke - Left Retinal

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a completed ischemic stroke involving the left retinal territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

Ischemic Stroke - Right Hemispheric

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a completed ischemic stroke involving the right hemispheric territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days

- No

Required:
Yes

Ischemic Stroke - Left Hemispheric

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a completed ischemic stroke involving the left hemispheric territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

Ischemic Stroke - Vertebrobasilar

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a completed ischemic stroke involving the vertebrobasilar territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

Ischemic Stroke - Unknown

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a completed ischemic stroke involving an unknown territory. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
  - <= 30 days
  - 31-180 days
  - >= 181 days
- No

Required:
Yes

Intracranial Hemorrhage or Hemorrhagic Stroke - Intraparenchymal

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced an intraparenchymal (e.g. hemorrhagic conversion of prior stroke) intracranial hemorrhage. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
    - <= 30 days
    - 31-180 days
    - >= 181 days
- No

Required:
Yes

Intracranial Hemorrhage or Hemorrhagic Stroke - Subarachnoid

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a subarachnoid hemorrhage. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
    - <= 30 days
    - 31-180 days
    - >= 181 days
- No

Required:
Yes

Intracranial Hemorrhage or Hemorrhagic Stroke - Subdural

Data Abstraction Instructions:

Indicate the timeframe if the patient experienced a subdural hemorrhage. If there was more than one, code the most recent occurrence prior to admission or the current procedure.

Selections:

- Yes
    - <= 30 days
    - 31-180 days
    - >= 181 days
- No

Required:
Yes

Acute Evolving Stroke

Data Abstraction Instructions:

Indicate if the patient has experienced an acute evolving stroke with ischemia which is ongoing and progressing at the time of the procedure. Acute evolving stroke includes all of the following:

- Any sudden development of neurological deficits attributable to cerebral ischemia and/or infarction.
- Onset of symptoms occurring within prior three days and ongoing at time of procedure.
- The event is marked by progressively worsening symptoms.

Note: Possible symptoms include, but are not limited to the following: numbness or weakness of the face or body; difficulty speaking or understanding; blurred or decreased vision; dizziness; or loss of balance and coordination.

Selections:

- Yes
- No

Required:
Yes

Pre-Procedure Carotid Studies (w/in past 6 months)

Carotid Duplex Ultrasound (PRE)

Data Abstraction Instructions:

Indicate if a carotid duplex ultrasound was performed prior to the current procedure.

Selections:

- Yes
- If yes, enter the **most recent** values.
- No

Required:
Yes

Peak Systolic Velocity - Right (PRE)

Data Abstraction Instructions:

Indicate the patient's right peak systolic velocity (PSV) for the internal carotid artery (ICA) in centimeters per second (cm/sec). If the carotid duplex ultrasound report provides a proximal and distal PSV for the ICA. Enter the highest PSV for the ICA and then enter the corresponding EDV.

Selections:

- Documented
    - Enter value
- Not documented

Required:
Yes
Suffix:
cm/sec
Minimum:
0
Maximum:
999

Peak Systolic Velocity - Left (PRE)

Data Abstraction Instructions:

Indicate the patient's left peak systolic velocity (PSV) for the internal carotid artery (ICA) in centimeters per second (cm/sec). If the carotid duplex ultrasound report provides a proximal and distal PSV for the ICA. Enter the highest PSV for the ICA and then enter the corresponding EDV.

Selections:

- Documented
    - Enter value
- Not documented

Required:
Yes
Suffix:
cm/sec
Minimum:
0
Maximum:
999

End Diastolic Velocity - Right (PRE)

Data Abstraction Instructions:

Indicate the patient's right end diastolic velocity (EDV) for the internal carotid artery (ICA) in centimeters per second (cm/sec). Enter the EDV that correlates with the highest PSV for the ICA.

Selections:

- Documented
  - Enter value
- Not documented

Required:
Yes
Suffix:
cm/sec
Minimum:
0
Maximum:
700

End Diastolic Velocity - Left (PRE)

Data Abstraction Instructions:

Indicate the patient's left end diastolic velocity (EDV) for the internal carotid artery (ICA) in centimeters per second (cm/sec). Enter the EDV that correlates with the highest PSV for the ICA.

Selections:

- Documented
  - Enter value
- Not documented

Required:
Yes
Suffix:
cm/sec
Minimum:
0
Maximum:
700

ICA/CCA Ratio - Right (PRE)

Data Abstraction Instructions:

Indicate the ratio of the peak systolic velocity in the right internal carotid artery (ICA) to the peak systolic velocity in the distal right common carotid artery (CCA).

Selections:

- Documented
  - Enter value
- Not documented

Required:
Yes

ICA/CCA Ratio - Left (PRE)

Data Abstraction Instructions:

Indicate the ratio of the peak systolic velocity in the left internal carotid artery (ICA) to the peak systolic velocity in the distal left common carotid artery (CCA).

Selections:

- Documented

    - Enter value
- Not documented

Required:
Yes

MR Angiography Performed

Data Abstraction Instructions:

Indicate if a magnetic resonance (MR) angiogram was performed prior to the current procedure.

Selections:

- Yes
- If Yes, indicate the highest percent (%) stenosis for the artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.
- No

Required:
Yes

MRA CCA Highest % Stenosis - Right

Data Abstraction Instructions:

Indicate, for the MR Angiography, the highest percent (%) stenosis for the right common carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
    - Enter value
- Not documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

MRA CCA Highest % Stenosis - Left

Data Abstraction Instructions:

Indicate, for MR Angiography, the highest percent (%) stenosis for the left common carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
    - Enter value
- Not documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

MRA ICA Highest % Stenosis - Right

Data Abstraction Instructions:

Indicate, for MR Angiography, the highest percent (%) stenosis for the right internal carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
  - Enter value
- Not documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

MRA ICA Highest % Stenosis - Left

Data Abstraction Instructions:

Indicate, for MR Angiography, the highest percent (%) stenosis for the left internal carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
  - Enter value
- Not documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

CT Angiography Performed

Data Abstraction Instructions:

Indicate if a computed tomography (CT) angiogram was performed prior to the current procedure.

Selections:

- Yes
- No

Required:
Yes

CTA CCA Highest % Stenosis - Right

Data Abstraction Instructions:

Indicate, for CT Angiography, the highest percent (%) stenosis for the right common carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
  - Enter value
- Not documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

CTA CCA Highest % Stenosis - Left

Data Abstraction Instructions:

Indicate, for CT Angiography, the highest percent (%) stenosis for the left common carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
  - Enter value
- Not documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

CTA ICA Highest % Stenosis - Right

Data Abstraction Instructions:

Indicate, for CT Angiography, the highest percent (%) stenosis for the right internal carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
  - Enter value
- Not documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

CTA ICA Highest % Stenosis - Left

Data Abstraction Instructions:

Indicate, for CT Angiography, the highest percent (%) stenosis for the left internal carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
  - Enter value
- Not documented

Required:

Yes
Suffix:
%
Minimum:
0
Maximum:
100

Carotid Angiography Performed

Data Abstraction Instructions:

Indicate if a diagnostic carotid angiogram was performed prior to the current procedure.

Selections:

- Yes
- No

Required:
No

Carotid Angio CCA Highest % Stenosis - Right

Data Abstraction Instructions:

Indicate, for the Carotid Angiography, the highest percent (%) stenosis for the right common carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
    - Enter Value
- Not Documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

Carotid Angio CCA Highest % Stenosis - Left

Data Abstraction Instructions:

Indicate, for the Carotid Angiography, the highest percent (%) stenosis for the left common carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
    - Enter Value
- Not Documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

Carotid Angio ICA Highest % Stenosis - Right

Data Abstraction Instructions:

Indicate, for the Carotid Angiography, the highest percent (%) stenosis for the right internal carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
  - Enter Value
- Not Documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

Carotid Angio ICA Highest % Stenosis - Left

Data Abstraction Instructions:

Indicate, for the Carotid Angiography, the highest percent (%) stenosis for the left internal carotid artery. If the vessel is totally occluded, enter 100%. If no stenosis is present, enter 0%. If a range is given, enter the highest value.

Selections:

- Documented
  - Enter Value
- Not Documented

Required:
Yes
Suffix:
%
Minimum:
0
Maximum:
100

Procedure Details

Target Carotid Vessel

Data Abstraction Instructions:

Indicate whether the target vessel is the right or left carotid artery for the current procedure.

Selections:

- Right
- Left

Required:
Yes

Type of Carotid Procedure

Data Abstraction Instructions:

Indicate if the procedure was done conventionally or by eversion carotid endarterectomy.

Selections:

- Conventional
- Eversion

Supporting Definitions:

Carotid endarterectomy is conventionally undertaken by a longitudinal arteriotomy. Eversion carotid endarterectomy (CEA), employs a transverse arteriotomy and reimplantation of the carotid artery. This refers to the arteriotomy of the ICA or CCA, NOT the ECA.

Required:
Yes

ASA (American Society of Anesthesiologists) Class

Data Abstraction Instructions:

Enter the ASA class as documented by the anesthesia team.
Class 1 = normal/healthy
Class 2 = mild systemic disease
Class 3 = severe systematic disease
Class 4 = severe systematic disease that is a constant threat to life
Class 5 = moribund/not expected to survive without operation

Selections:

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5

Required:
Yes

Anesthesia (CEA)

Data Abstraction Instructions:

Indicate if the patient received general anesthesia, local anesthesia, or regional anesthesia during the current procedure. If more than one given, code the strongest form of anesthesia.
Ex: Local + Regional = Regional.

Selections:

- General
- Local
- Regional

Required:
Yes

Monitoring During Procedure

Data Abstraction Instructions:

Indicate the type of neurologic monitoring per anesthesia/surgical team during the carotid endarterectomy. I
Awake = Locoregional anesthesia is given (e.g., cervical plexus block or cervical epidural) that allows awake cerebral function monitoring.
Cerebral monitoring = If cerebral oximetry or SSEP was used to monitor the patient, enter Cerebral monitoring.
Cerebral oximetry = non-invasive, continuous monitoring devices used to monitor adequate cerebral oxygenation. Sensors are applied to the patient's forehead and attached to a monitor.
Somatosensory evoked potentials (SSEP) = monitor signals from sensory areas to the brain. Stimulating electrodes are placed on the ankle and wrist, and signals are sent to receiving electrodes placed on the scalp.
Stump pressure = an estimate of hemispheric blood flow by measuring pressure in the carotid stump distal to the clamp. Stump pressure is more often used to determine whether or not a shunt should be placed intraoperatively.
EEG = measurement of the spontaneous electrical activity of the brain. Electrodes are attached to the patient's scalp and connected to a monitor.
Other = a form of neurologic monitoring was used during the carotid endarterectomy that is not on the list.

Selections:

- Yes
    - Awake
    - Cerebral monitoring
    - Stump pressure
    - EEG
    - Other
- No

Required:
Yes

Antibiotics Pre Procedure

Data Abstraction Instructions:

Indicate if an antibiotic was given within one hour of incision (2 hours for Vancomycin).

Selections:

- Yes
- No

Required:
Yes

Skin Preparation

Data Abstraction Instructions:

Enter the skin prep used to prep the skin before the incision was made. Select all that apply.

Selections:

- Chlorhexidine
- Alcohol
- Iodine
- Chlorhexidine + Iodine
- Chlorhexidine + Alcohol

- Iodine + Alcohol

Supporting Definitions:

Include Ioban in the Iodine option.

Required:
Yes

Arteriotomy Patch Used

Data Abstraction Instructions:

Indicate if there was closure of the internal carotid arteriotomy with a patch during the carotid endarterectomy (CEA) procedure.

Selections:

- Yes
- No

Required:
Yes

Visible Thrombus Present

Data Abstraction Instructions:

Indicate if a thrombus (blood clot) was present on direct visual inspection intraoperatively during the carotid endarterectomy (CEA) procedure.

Selections:

- Yes
- No

Required:
Yes

Shunt Used

Data Abstraction Instructions:

Indicate if a shunt was used at the surgical site to maintain blood flow during the carotid endarterectomy (CEA) procedure.

Selections:

- Yes
- No

Required:
Yes

Completion Evaluation

Data Abstraction Instructions:

Indicate if any of the following studies were utlilzed during the procedure at completion to evaluate patency.

Selections:

- Yes
    - Doppler
    - Duplex
    - Angiogram
    - Flowprobe
- No

Supporting Definitions:

Only include studies done at completion.

Required:
Yes

Drain

Data Abstraction Instructions:

Indicate if a suction wound drain was placed during closure of the surgical incision.

Selections:

- Yes
- No

Required:
Yes

Surgical Procedure Terminated

Data Abstraction Instructions:

Indicate if the carotid endarterectomy procedure was terminated.

Selections:

- Yes
- No

Required:
Yes

Reasons for Surgical Termination

Data Abstraction Instructions:

Indicate the reasons the carotid endarterectomy procedure was terminated. Choose all that apply:

Selections:

- Hypotension
- Hypertension
- Cardiac instability
- Nerve compromise
- Difficulty with anesthesia
- Inability to implement shunting
- Excessive scar tissue
- Difficult dissection
- Excessive bleeding
- Carotid artery thrombosis
- ICA string sign/atresia
- Inability to access lesion due to anatomical reasons
- Other

Required:
Yes

Re-explore After Closure

Data Abstraction Instructions:

Indicate if a defect was detected, after closure, during the same operation, that resulted in reopening the incision for exploration.

Selections:

- Yes
- No

Required:
Yes

Procedure Indications and Anatomic Variables

Urgent Cardiac Surgery w/in 30 Days

Data Abstraction Instructions:

Indicate if the patient is having the carotid revascularization procedure because of the need for cardiac surgery within 30 days of the current procedure. Cardiac Surgery is defined as bypass, valve, ICD patches and transplant surgery.

Selections:

- Yes
- No

Required:
Yes

Concurrent with CABG

Data Abstraction Instructions:

Indicate if the CEA/CAS was performed in the same OR time as a CABG.

Selections:

- Yes
- No

Required:
Yes

Target Lesion Symptomatic w/in Past 6 Months

Data Abstraction Instructions:

Indicate if the patient has had neurologic symptoms in the past six months related to the target lesion. Conditions qualifying patients as symptomatic:

- Transient Ischemic Attack (TIA): distinct focal neurologic dysfunction persisting less than 24 hours;
- Non-disabling stroke: Modified Rankin Scale < 3 with symptoms for 24 hours or more;
- Transient monocular blindness: amaurosis fugax

Selections:

- Yes
- No

Required:
Yes

Syncope

Data Abstraction Instructions:

Indicate if the patient experienced syncope as an indication for the procedure. If you enter Yes for Syncope, then enter No for Target Lesion Symptomatic within Past 6 Months.

Selections:

- Yes
- No

Required:
Yes

Restenosis in Target Vessel After Prior CAS

Data Abstraction Instructions:

Note if the indication for the current procedure is restenosis in the target carotid artery which was previously treated with an angioplasty and/or stent. Carotid artery restenosis is defined as greater than 50% diameter stenosis at or adjacent to the site previously treated with balloon angioplasty or stent.

Selections:

- Yes
- No

Required:
Yes

Restenosis in Target Vessel After Prior CEA

Data Abstraction Instructions:

Note if the indication for the current procedure is restenosis in the target carotid artery which was previously treated with a carotid artery endarterectomy. Restenosis is defined as renarrowing within or adjacent to a prior endarterectomy site, evidenced by greater than 50% diameter stenosis.

Selections:

- Yes
- No

Required:
Yes

Contralateral Carotid Artery Occlusion

Data Abstraction Instructions:

Indicate if there is known 100% occlusion of the patient's contralateral carotid artery.

Selections:

- Yes
- No

Required:
Yes

Fibromuscular Dysplasia of Carotid Artery

Data Abstraction Instructions:

Indicate if the patient has a history of known fibromuscular dysplasia of the ipsilateral carotid artery prior to admission or prior to the current procedure.

Selections:

- Yes
- No

Required:
Yes

Spontaneous Carotid Artery Dissection

Data Abstraction Instructions:

Indicate if the patient has had a spontaneous carotid artery dissection prior to the current procedure.

Selections:

- Yes
- No

Required:
Yes

Pre-procedure Smoking Cessation

Data Abstraction Instructions:

Indicate if the patient received physician-delivered advice, a prescription for nicotine replacement, and/or a referral for smoking cessation services before admission to the hospital. These interventions would be implemented to prepare the patient for the current procedure. Select all that apply.

Selections:

- Yes
    - Physician delivered advice
        - Patient refused
    - Nicotine replacement therapy (NRT)
        - Patient refused
    - Referral to smoking counseling services
        - Patient refused
        - Local counseling service
        - Michigan Quitline
        - Other counseling service
- No

Supporting Definitions:

Yes = Enter Yes for Pre Procedure Smoking Cessation if Yes was entered for Current Smoker under Patient History ‘ Comorbidity, and one of the three steps was implemented before admission to the hospital.

Physician delivered advice = A surgeon, advanced practice personnel (PA, NP), or resident has a conversation with the patient and recommends the patient stop smoking. A recommendation to stop smoking offered by a nurse, respiratory therapist or student does not count as physician-delivered advice.

If there is documentation that the provider recommended smoking cessation and the patient refused, enter Physician delivered advice AND Patient refused. There must be adequate documentation to support this claim.

Nicotine replacement therapy (NRT) = The provider ordered NRT before admission to the hospital. NRT may include a nicotine patch, gum, lozenge, or other pharmacologic assistance (Varenicline or Bupropion).

If a patient refuses NRT, and there is provider documentation that NRT was offered and documentation that the patient refused, enter NRT AND Patient refused.

Referral to smoking counseling services = The provider documents they referred the patient to a smoking counseling service. Smoking counseling services may include a smoking counseling service, a smoking cessation program, a smoking cessation class, the Michigan Tobacco Quitline, or a national smoking cessation service. The provider must recommend a smoking counseling service to the patient. The standard message to stop smoking on the AVS or discharge summary template is not sufficient.

If a physician, mid-level provider, or resident does an assessment and then refers the patient to a respiratory therapist or a dedicated smoking cessation nurse to provide smoking cessation education, you can choose Referral to smoking counseling services.

If there is documentation that the provider recommended smoking counseling services and the patient refused, enter Referral to smoking counseling services, AND Patient refused. There must be adequate documentation to support this claim.

Patient Refused = The provider documented that the patient refused the corresponding intervention.

Local counseling service = The provider refers the patient to the hospital’s smoking counseling service or a community-based smoking counseling service. Enter Referral to smoking counseling services AND Local counseling service.

Michigan Quitline = The provider refers the patient to the Michigan Tobacco Quitline. Enter Referral to smoking counseling services AND Referral to Michigan Quitline.

Other counseling service = The provider refers the patient to a Federal or National smoking cessation service. Enter Referral to smoking counseling services AND Other counseling service.

No = Enter No for Smoking Cessation at Discharge if No was entered for Ever Smoked or current Smoker under Patient History / Comorbidity. Enter No if the patient is a current smoker; however, none of the three steps were implemented before admission to the hospital.

Required:
Yes

Outcomes

New Stroke

Data Abstraction Instructions:

Indicate if the patient experienced a new Stroke during or after the current procedure and before discharge. If yes, specify all new events and resolution status. If more than one event occurred in the same territory, code the earliest occurrence and code the latest time the deficit resolved

Selections:

- Yes
- No

Required:
Yes

New Right Hemispheric or Retinal Neurologic Event Occurred (Stroke)

Data Abstraction Instructions:

Indicate if a new right hemispheric or retinal stroke developed during or after the current procedure.

Selections:

- Yes
- No

Required:
Yes

New Right Hemispheric or Retinal Neurologic Event Resolved (Stroke)

Data Abstraction Instructions:

Indicate if the new right hemispheric or retinal stroke resolved prior to discharge.

Selections:

- Yes
- No

Required:
Yes

New Left Hemispheric or Retinal Neurologic Event Occurred (Stroke)

Data Abstraction Instructions:

Indicate if a new left hemispheric or retinal stroke developed during or after the current procedure.

Selections:

- Yes
- No

Required:
Yes

New Left Hemispheric or Retinal Neurologic Event Resolved (Stroke)

Data Abstraction Instructions:

Indicate if the new left hemispheric or retinal stroke resolved prior to discharge.

Selections:

- Yes
- No

Required:
Yes

New Vertebrobasilar Event Occurred (Stroke)

Data Abstraction Instructions:

Indicate if a new vertebrobasilar stroke developed during or after the current procedure.

Selections:

- Yes
- No

Required:
Yes

New Vertebrobasilar Event Resolved (Stroke)

Data Abstraction Instructions:

Indicate if the new vertebrobasilar stroke resolved prior to discharge.

Selections:

- Yes
- No

Required:
Yes

New Unknown Event Occurred (Stroke)

Data Abstraction Instructions:

Indicate if a new stroke developed in an unspecified or unknown location during or after the current procedure.

Selections:

- Yes
- No

Required:
Yes

New Unknown Event Resolved (Stroke)

Data Abstraction Instructions:

Indicate if the unknown stroke resolved prior to discharge.

Selections:

- Yes
    - Intraprocedure
    - Within 24 hours of procedure
    - > 24 hours post procedure through discharge

- No

Required:
Yes

New TIA

Data Abstraction Instructions:

Indicate if the patient experienced a new TIA during or after the current procedure and before discharge. If yes, specify the territory of the event and resolution status.

Selections:

- Yes
- No

Required:
Yes

New Right Hemispheric or Retinal Neurologic Event Occurred (TIA)

Data Abstraction Instructions:

Indicate if a new right hemispheric or retinal TIA developed during or after the current procedure.

Selections:

- Yes
- No

Required:
Yes

New Left Hemispheric or Retinal Neurologic Event Occurred (TIA)

Data Abstraction Instructions:

Indicate if a new left hemispheric or retinal TIA developed during or after the current procedure.

Selections:

- Yes
- No

Required:
Yes

New Vertebrobasilar Event Occurred (TIA)

Data Abstraction Instructions:

Indicate if a new vertebrobasilar TIA developed during or after the current procedure.

Selections:

- Yes
- No

Required:
Yes

New Unknown Event Occurred (TIA)

Data Abstraction Instructions:

Indicate if a new TIA developed in an unspecified or unknown location during or after the current procedure.

Selections:

- Yes
- No

Required:
Yes

Death

Data Abstraction Instructions:

Indicate if the patient died during or post procedure, prior to discharge.

- For purposes of this registry the start of the procedure is defined as the time the physician obtained vascular access/made surgical incision. Any adverse events that occur before (i.e. in the holding room) are not attributed to the procedure. The procedure is complete when the patient leaves the procedure room.

Selections:

- Yes
  - During procedure
  - Post procedure
- No

Required:
Yes

Cause of Death

Data Abstraction Instructions:

Indicate the cause of death.

Selections:

- Neurologic: Due to a new or progressive neurologic event.
- Cardiac: Due to a fatal arrhythmia, MI or heart failure.
- Pulmonary: Due to pulmonary complication.
- Vascular: Due to major blood loss or other vascular complication.
- Infection: Due to infection.
- Renal Failure: Due to renal failure.
- Other: Due to other cause.

Required:
Yes

CHF

Data Abstraction Instructions:

Indicate if the patient developed a new onset or acute reoccurrence/exacerbation of symptomatic heart failure or pulmonary edema after the procedure through discharge.

Selections:

- Yes
  - Enter date of first occurrence post procedure
- No

Supporting Definitions:

Pulmonary edema with requirement for monitoring or treatment in the ICU.

Required:
Yes

Cranial Nerve Injury

Data Abstraction Instructions:

Indicate if the patient experienced a new cranial nerve injury, involving glossopharyngeal, vagus, accessory, hypoglossal, and/or superior laryngeal nerves. The cranial nerve injury can be an mechanical injury caused by the procedure or caused by retraction. The cranial nerve injury can be transient or persistent.

VII (facial) = new facial droop or drooping of the corner of the mouth. Inability to keep fluids in thd mouth occurs with severe injuries.

IX (glossopharyngeus) = swallowing difficulty or problems with gag reflex unless other diagnosis confirmed. Recurrent aspiration or respiratory failure can occur with severe injuries.

X (vagus) = hoarseness and laryngoscopy is normal.

XII (hypoglossal) = any tongue deviation or tongue discoordination. Upper airway obstruction occurs with bilateral hypoglossal nerve injury.

Other = any other cranial nerve injury that is not in this list.

Reference: https://www.jvascsurg.org/action/showPdf?pii=S0741-5214%2897%2970258-1

Selections:

- Yes
  - VII
  - IX
  - X
  - XII
  - Other
- No

Required:
Yes

Dysrhythmia

Data Abstraction Instructions:

Indicate if the patient had a **new** rhythm disturbance post procedure that required treatment with medications or cardioversion.

Selections:

- Yes
  - Enter date of first occurrence post procedure
- No

Required:
Yes

Myocardial Injury

Data Abstraction Instructions:

Indicate if the patient suffered any type of myocardial injury post procedure, including a troponin leak, demand ischemia, NSTEMI or STEMI. If so, indicate the date of the first elevated troponin value as well as the peak troponin value.

Selections:

- Yes
  - Enter date of first occurence of Myocardial Injury post procedure dd/mm/yyyy
  - **Enter type of myocardial injury:**
    - Troponin leak

        - Demand ischemia
        - NSTEMI
        - STEMI
        - Not documented
- No

Supporting Definitions:

Utilize progress notes and consults to help in the determination of the type of myocardial injury. If no determination is made, select "Not documented".
If only a single abnormal troponin value was found in absence of other criteria for myocardial injury, then record as No.
Troponin: Troponin rise alone should be reported if there was a rise in cardiac biomarker values [preferably cardiac troponin (cTn)] with at least one value above the 99th percentile upper reference limit (URL) in absence of the qualifying criteria for myocardial infarction or sudden death as listed in the clinical MI definition below. This elevation may be classified as a troponin leak or demand ischemia.
Note, ""rise"" in troponin would imply that the troponin can be elevated at baseline (either pre-op or post-op baseline), but not rise above whatever the patient's baseline level is. The lack of rising troponin above the baseline number would indicate that there was no additional myocardial injury.
A myocardial infarction is evidenced by any of the following:

1. A rise and fall of cardiac biomarkers (preferably troponin) with at least one of the values in the abnormal range for that laboratory [typically above the 99th percentile of the upper reference limit (URL) for normal subjects] together with at least one of the following manifestations of myocardial ischemia:
2. Ischemic symptoms such as angina or acute shortness of breath.
3. ECG changes indicative of new ischemia (new ST-T changes, new left bundle branch block, or loss of R wave voltage).
4. Development of pathological Q waves in 2 or more contiguous leads in the ECG (or equivalent finding for true posterior MI.
5. Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality.
6. Documentation in the medical record of the diagnosis of acute myocardial infarction based on the cardiac biomarker pattern in the absence of any items enumerated in a-d due to conditions that may mask their appearance (e.g., peri-operative infarct when the patient cannot report ischemic symptoms; baseline left bundle branch block or ventricular pacing).
7. ECG changes associated with prior myocardial infarction can include the following (with or without prior symptoms):
    - Any Q wave in leads V2-V3 >= 0.02 seconds or QS complex in leads V2 and V3.
    - Q-wave >= 0.03 seconds and >= 0.1 mV deep or QS complex in leads I, II, aVL, aVF, or V4-V6 in any two leads of a contiguous lead grouping (I, aVL, V6; V4-V6; I, III, and aVF).
    - R-wave >= 0.04 seconds in V1-V2 and R/S >= 1 with a concordant positive T-wave in the absence of a conduction defect.
8. Imaging evidence of a region with new loss of viable myocardium at rest in the absence of a non-ischemic cause. This can manifest as:
9. Echocardiographic, CT, MR, ventriculographic or nuclear imaging evidence of left ventricular thinning or scarring and a failure to contact appropriately (i.e., hypokinesis, akinesis, or dyskinesis).
10. Fixed (non-reversible) perfusion defects on nuclear radioisotope imaging (e.g., MIBI, thallium).
11. Cardiac death with symptoms suggestive of myocardial ischemia and presumed new ischemic ECG changes or new LBBB, but death occurred before cardiac biomarkers were obtained, or before cardiac biomarker values would be increased.

Source:
Thygesen K, Alpert JS, White HD, et al. (Circulation 2007). Universal Definition of Myocardial Infarction. ESC/ACCF/AHA/WHF expert consensus document. *AHA Journals*, *140*(13), 2634-53. https://ahajournals.org/journal/circ

Required:
Yes

Peak post-operative troponin value

Data Abstraction Instructions:

Indicate the peak post-operative troponin value and type of troponin drawn within 30 days post procedure.

Selections:

Peak post-operative troponin

- Yes
    - troponin I
        - Yes
            - Enter lab value _____
            - Pick unit of lab value from list
                - ng/dL

            - ng/mL
            - ng/L
            - pg/mL
        - No
    - troponin T
        - Yes
            - Enter lab value _____
            - Pick unit of lab value from list
                - ng/dL
                - ng/mL
                - ng/L
                - pg/mL
        - No
    - troponin I HS
        - Yes
            - Enter lab value _____
            - Pick unit of lab value from list
                - ng/dL
                - ng/mL
                - ng/L
                - pg/mL
        - No
    - troponin T HS
        - Yes
            - Enter lab value _____
            - Pick unit of lab value from list
                - ng/dL
                - ng/mL
                - ng/L
                - pg/mL
        - No
- Not Drawn

Required:
Yes
Suffix:
ng/dL, ng/mL, ng/L, pg/mL

Persistent Hypotension

Data Abstraction Instructions:

Indicate if the patient experienced persistent hypotension for >24 hours post procedure requiring parenteral drug treatment. Hypotension is defined as a systolic blood pressure (SBP) <90 mm Hg or the need for IV vasopressors and/or atropine to maintain SBP>=90 mm Hg.

Selections:

- Yes
- No

Required:
Yes

Reperfusion Symptoms

Data Abstraction Instructions:

Indicate if the patient had an incidence of hyperperfusion syndrome. Clinical diagnosis should be made by knowledgeable provider, familiar with this syndrome.

Selections:

- Yes
    - Seizure

- Hemorrhage
- Non specific

- No

Supporting Definitions:

Seizures are associated with headache, or hemorrhage on CT/MRI.

Required:
Yes

Return to OR

Data Abstraction Instructions:

Indicate if the patient had to return to the Operating Room, post procedure, for an event related to the Carotid Endarterectomy. If yes, indicate reason(s).

Selections:

- Yes
  - Bleeding
  - Neurologic event
  - Technical defect requiring revision
- No

Supporting Definitions:

An example of Bleeding is when the patient is taken back to the OR for treatment of a neck hematoma.

Examples of Technical Defect Requiring Revision are:

- To fix a problem with the arteriotomy patch
- To add an arteriotomy patch
- The ends of the plaque lesion were not secured and are causing an obstruction

Required:
Yes

Was the LOS >2 days after CEA?

Data Abstraction Instructions:

Indicate if the length of stay (LOS) for the Elective CEA procedure was >2 days and the reason the patient was in the hospital >2 days. If Yes is entered, select all reasons that apply.
This field does not apply to urgent or emergent CEA procedures.
Hypertension = Indicate if the patient experienced hypertension for >24 hours post procedure requiring parenteral drug treatment. Hypertension is defined as a systolic blood pressure (SBP) > 160 mmHg and the need for IV antihypertensives, ACE inhibitors, calcium channel blockers, beta blockers, or diuretics to maintain a SBP <160 mmHg.

COPD = Indicate if the patient developed an exacerbation of COPD after procedure through discharge.

Urinary retention = Patient is unable to void (urinate) requiring catheterization within 24 hours postoperatively or >6 hours after the removal of a preoperatively placed Foley catheter.

Other = The reason the patient was in the hospital > 2 days is not on the list**.**

Selections:

- Yes
- - Hypertension
  - Lack of transportation
  - No caregiver/support at home
  - COPD
  - Urinary retention
  - Other

  No

Required:
Yes