

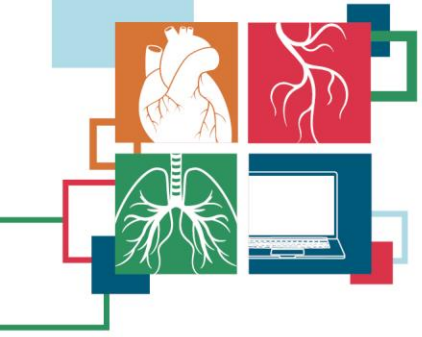
ADVANCES IN QUALITY & OUTCOMES: A Data Managers Meeting

SEPTEMBER 26-29, 2023 ■ VIRTUAL



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Adult Cardiac v4.20

Postop Event Scenarios: Stroke

Kim Meraglio MHA, MSN, CVRN-BC



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Disclosures

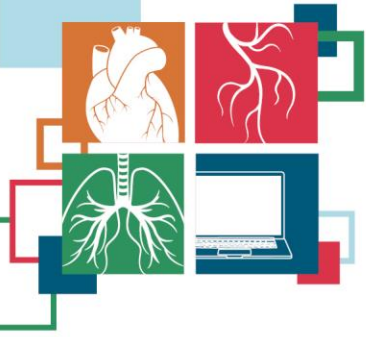
- None



Line Up

- Postop Stroke and STS Metrics
- Risk Model Variables & Postop Stroke
- Case scenarios and questions
- Q & A





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Heart and Vascular Institute



St. Elizabeth Youngstown Hospital Youngstown, Ohio



Lucas Henn, MD



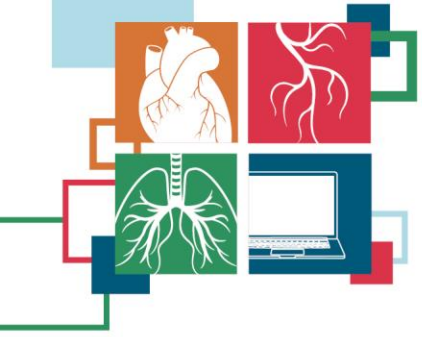
Jeremy Jubach, DO



Stephanie Cerrone, DO



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Post-op Stroke: STS Outcomes Metrics and Risk Adjustment



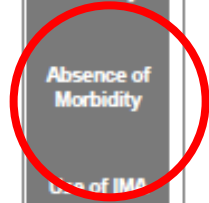
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Composite Quality Rating (Star Rating)

- For ALL risk models
- Part of the Absence of Morbidity Domain
 - Percentage of patients [risk-adjusted] who did not experience any major morbidity. These are: 1) reoperation for any cardiac reason (NQF definition); 2) renal failure; 3) DSWI; 4) prolonged ventilation/intubation; 5) **CVA**.
 - STS Public Reporting metric

The Society of Thoracic Surgeons		STS CABG Composite Quality Rating						
		Participant: [REDACTED]						
		STS Period Ending Dec 2022						
Domain	Rating	Participant		STS				
		Score	95% CI	Score	Min - Max	10th	50th	90th
Overall	★★	97.29%	(96.40-98.02)	96.76%	(91.15-99.03)	95.24%	96.93%	98.04%
Absence of Mortality	★★	97.64%	(96.44-98.56)	97.41%	(91.94-99.29)	96.05%	97.58%	98.54%
Absence of Morbidity	★★	90.67%	(88.22-92.86)	89.93%	(76.58-96.42)	85.82%	90.32%	93.51%
Use of IMA	★★	99.85%						
Medications	★★★	98.84%						

Absence of Morbidity	Jan 2020 - Dec 2022	466	Any Morbidity	46
			Cerebrovascular Accident only	3 6.5 %
			Deep Sternal Infection / Mediastinitis Only	1 2.2 %
			Multiple Morbidities	8 17.4 %
			Prolonged Ventilation Only	18 39.1 %
			Renal Failure Only	6 13 %
			Reoperation Only	10 21.7 %



NQF - Endorsed

- CABG Outcomes Measures
 - Stroke/Cerebrovascular

Domain	Participant					STS				
	Elig Proc	Est OR	95% CI	Percentile	Observ Rate	Est OR	Min-Max	10th	50th	90th
Deep Sternal Infection / Mediastinitis	466	0.81	(0.28-2.32)	65.80%	0.21%	1.00	(0.34-4.86)	1.77	0.91	0.65
Post-Op Renal Insufficiency (Failure)	456	0.99	(0.58-1.67)	50.50%	2.19%	1.00	(0.32-3.96)	1.53	0.99	0.65
Surgical Re-exploration	466	1.11	(0.69-1.78)	34.40%	2.58%	1.00	(0.33-2.74)	1.49	0.98	0.70
Stroke/Cerebrovascular	466	1.00	(0.60-1.65)	46.40%	1.50%	1.00	(0.40-2.00)	1.29	0.98	0.78
Prolonged Intubation (Ventilation)	466	0.77	(0.53-1.12)	71.90%	5.58%	1.00	(0.27-6.90)	1.83	0.98	0.56

STS Risk Model Variables

- Impact Postop Stroke Risk-adjustment

Additional Resources - Updated June 30, 2020

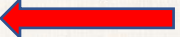
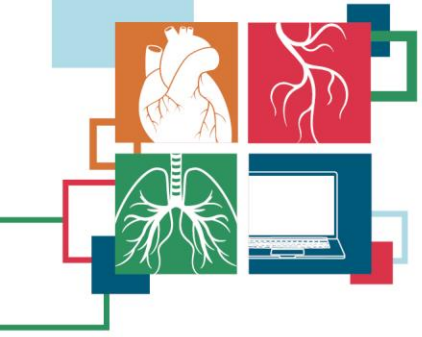
- [Data Specifications v4.20.2](#)
- [Software Specifications v4.20.2](#)
- [Itemized Changes from v4.20.1 to v4.20.2](#)
- [Change Summary v4.20.2](#)
- [Itemized Changes v4.20.2](#)
- [Procedure Identification Chart \(ProclD\) - Updated March 2022](#)
- [Risk Model Variable Chart](#) 
- [Risk Model Endpoint Chart - Updated February 2021](#)
- [Congenital Diagnoses and Procedure List](#)
- [Case Inclusion Guide](#)
- [NQF Endorsed Measures - Updated August 2021](#)

Table 13 STS Risk Model Variables – 2017 Models v 4.20.2

CABG	Operative Mortality	Stroke	Renal Failure	Prolonged Ventilation	Deep Vein Thrombosis
B. Demographics					
Age (70)	x	x	x	x	
Gender (75)	x	x	x	x	
RaceBlack (160)	x	x	x	x	
RaceAsian (165)		x	x	x	
Ethnicity (185)		x	x	x	
RaceNativeAm (170)			x	x	
RacNativePacific (175)			x	x	
C. Hospitalization					
SurgDt (310)			x	x	
PayorPrim (291)	x	x	x	x	
PayorSecond (293)	x	x	x	x	
D. Risk Factors					
WeightKg (335)	x	x	x	x	
HeightCm (330)	x	x	x	x	
Diabetes (360)	x	x	x	x	
Diabetes (365)	x	x	x	x	





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Post-op Events: Stroke Scenarios

- Test Your Knowledge



Data Collection Form (DCF)

P. Postoperative Events

(If Expired in OR = No↓)

The Society of Thoracic Surgeons
Adult Cardiac Surgery Database
Data Collection Form Version 4.20.2

Neurologic, Central

Postoperative Stroke: ++ Yes No

CNStrokP (6810)

Encephalopathy: Yes No

CNEnceph (6821)

Neurologic, Peripheral

Lower Extremity Paralysis >24 Hours: Yes No

CNParal (6825)

Paresis >24 hours: Yes No

CNParesis (6829)

Recurrent Laryngeal Nerve Injury: Yes No

RecLarynNrvInj (6833)



Scenario #1

- CABG on 7/2. Nurses noted neuro impairment on 7/4 at 1515. Patient unable to lift R arm, unable to get out of bed, R sided facial droop, slurred speech.
- CT head - negative. Neuro consult on 7/5 documented “Lacunar cerebrovascular event”. Repeat CT on 7/6 also negative. Neurology assessment notes on 7/6 document significant improvement in right hemiparesis. "No facial asymmetry or dysarthria and ability to generate fairly good strength in right upper and lower extremity today".
- On 7/7 neurology - "Patient with Lacunar cerebrovascular event with good recovery with nearly full strength in upper and lower extremity with resolution of the right hemiparesis. No significant deficit noted on imaging.
- **FAQ sent in** - *Since both CT scans were negative and patient symptoms eventually resolved (in >24 hours), instead of coding this a post op Stroke (or TIA), can I code it a "Post op neuro-paralysis"?*



Scenario #1 Questions

- How would you code **Seq. 6829 Post-Op-Neuro-Paresis >24 hours** and **Seq. 6810 Post-Op-Neuro-Stroke Perm?**

<p><u>Neurologic, Central</u></p> <p>Postoperative Stroke: ++ <input type="checkbox"/> Yes <input type="checkbox"/> No CNStrokP (6810)</p> <p>Encephalopathy: <input type="checkbox"/> Yes <input type="checkbox"/> No CNEnceph (6821)</p>
<p><u>Neurologic, Peripheral</u></p> <p>Lower Extremity Paralysis >24 Hours: Yes <input type="checkbox"/> No CNParal (6825)</p> <p>Paresis >24 hours: <input type="checkbox"/> Yes <input type="checkbox"/> No CNParesis (6829)</p> <p>Recurrent Laryngeal Nerve Injury: <input type="checkbox"/> Yes <input type="checkbox"/> No RecLarynNrvInj (6833)</p>



Scenario #1 Answers

- Code NO to **Seq. 6829 Post-Op-Neuro-Paresis >24 hours**

Rationale: The intent of this field is to capture paresis lasting > 24 hours related to spinal cord ischemia and not to stroke. Paresis is a condition typified by a weakness of voluntary movement, or by partial loss of voluntary movement or by impaired movement.

- Code YES to **Seq. 6810 Post-Op-Neuro-Stroke Perm**

Rationale: The patient had symptoms that lasted >24 hours despite the negative scans. **Definition from TM:** Indicate whether the patient has a postoperative stroke (i.e., any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that was confirmed on imaging or did not resolve within 24 hours. The Neurologist is the final arbitrator when there are differences in opinion as to if a stroke occurred.

- *In this scenario – symptoms, although resolving, did not resolve completely within 24 hours. CT scans negative. Neurologist documented a lacunar cerebral vascular event.*



Scenario #2

- From an FAQ sent in: Would this be considered a post operative stroke with it being "suspected"?
- Patient had stroke-like symptoms (left sided weakness) after surgery. Head CT was negative and no further imaging was done. Neurology charted both "clinically small infarct" and "small acute ischemic infarct, suspected." It is not clear when the symptoms fully resolved but were shown to be "improving" days after. I requested clarification from neurology whether this was a stroke or not, and this is what I received,

“Clinically, based on symptoms, neuro suspected small infarct given his left sided weakness. CT of the head is often negative when infarct is small as lower resolution scan, and we held off on MRI brain (higher resolution scan) as it wouldn't change our management/avoided unnecessary imaging and costs. From neurology's standpoint I think our notes reflect info above: we suspect he had a small acute ischemic stroke based on clinical exam. ”



Scenario #2 Question

- How would you code **Seq. 6810 Post-Op-Neuro-Stroke Perm?**

<p><u>Neurologic, Central</u> Postoperative Stroke: ++ <input type="checkbox"/> Yes <input type="checkbox"/> No CNStrokP (6810) Encephalopathy: <input type="checkbox"/> Yes <input type="checkbox"/> No CNEnceph (6821)</p>
<p><u>Neurologic, Peripheral</u> Lower Extremity Paralysis >24 Hours: Yes <input type="checkbox"/> No CNParal (6825) Paresis >24 hours: <input type="checkbox"/> Yes <input type="checkbox"/> No CNParesis (6829) Recurrent Laryngeal Nerve Injury: <input type="checkbox"/> Yes <input type="checkbox"/> No RecLarynNrvInj (6833)</p>



Scenario #2 Answer

- Code YES to **Seq. 6810 Post-Op-Neuro-Stroke Perm**
- Rationale: The patient had remaining but improving neurological deficits > 24 hours. Per the TM, indicate whether the patient has a postoperative stroke (i.e., any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that was confirmed on imaging **or** did not resolve within 24 hours. The Neurologist is the final arbitrator when there are differences in opinion as to if a stroke occurred.
- *In this scenario, the symptoms “shown to be improving days after”. The symptoms lasted greater than 24 hours. An MRI may have been more definitive, but not ordered since it would not have changed the management of the patient. Neurology charted “small infarct” (final arbitrator).*



Scenario #3

- CABG 2/22/23. Facial droop and dysarthria noted POD #2. Facial Droop and speech problems lasted > 24 hr.
- CT Scan on 2/24 negative. Neuro consult concern for embolic infarct. Neuro consult – “patient stated that he noted lip numbness and dysarthria post CABG”. MRI on 2/25 was positive for embolic infarcts.
- The surgeon sent a picture of the driver’s license from 1/2023 that appears to show the left facial droop (6 weeks prior to surgery in our EMR). The patient has said the droop is pre-existing. However, H&P, consults, event note, and nursing documentation do not support this. No mention of any neuro deficit found in the PCP notes from June and December prior to surgery or post op office visit. The postop CTS office visit doesn’t mention any neuro deficits 3/6, 3/20 visits says, “no residual neuro symptoms of difficulty speaking/facial droop”. The operating surgeon wants review - states this is not a stroke.



Scenario #3 Question

- How would you code **Seq. 6810 Post-Op-Neuro-Stroke Perm?**

<p><u>Neurologic, Central</u></p> <p>Postoperative Stroke: ++ <input type="checkbox"/> Yes <input type="checkbox"/> No CNStrokP (6810)</p> <p>Encephalopathy: <input type="checkbox"/> Yes <input type="checkbox"/> No CNEnceph (6821)</p>
<p><u>Neurologic, Peripheral</u></p> <p>Lower Extremity Paralysis >24 Hours: Yes <input type="checkbox"/> No CNParal (6825)</p> <p>Paresis >24 hours: <input type="checkbox"/> Yes <input type="checkbox"/> No CNParesis (6829)</p> <p>Recurrent Laryngeal Nerve Injury: <input type="checkbox"/> Yes <input type="checkbox"/> No RecLarynNrvInj (6833)</p>



Scenario #3 Answer

- Code YES to **Seq. 6810 Post-Op-Neuro-Stroke Perm**
- Rationale: There is MRI evidence postop for embolic infarcts. No preop brain imaging. Both criteria are met for postop stroke – neuro deficit > 24 hours and imaging evidence of stroke. Per the TM, indicate whether the patient has a postoperative stroke (i.e., any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that was confirmed on imaging **or** did not resolve within 24 hours. The Neurologist is the final arbitrator when there are differences in opinion as to if a stroke occurred.



Scenario #4

- Patient had anoxic brain injury post cardiac surgery after suffering a cardiac arrest event. This resulted in the patient being in vegetative state.
- (FAQ sent in) Do I code YES to Seq. 6825 lower extremity paralysis > 24 hours and Seq. 6829 paresis > 24 hours?



Scenario #4 Question

<u>Neurologic, Central</u> Postoperative Stroke: ++ <input type="checkbox"/> Yes <input type="checkbox"/> No CNStrokP (6810) Encephalopathy: <input type="checkbox"/> Yes <input type="checkbox"/> No CNEnceph (6821)
<u>Neurologic, Peripheral</u> Lower Extremity Paralysis >24 Hours: Yes <input type="checkbox"/> No CNParal (6825) Paresis >24 hours: <input type="checkbox"/> Yes <input type="checkbox"/> No CNParesis (6829) Recurrent Laryngeal Nerve Injury: <input type="checkbox"/> Yes <input type="checkbox"/> No RecLarynNrvInj (6833)

- How will you code the following:

Postop Events: Seq. 6810 Post-Op-Neuro-Stroke Perm

Postop Events: Seq. 6829 Post-Op-Neuro-Paresis >24 hours

Postop Events: Seq. 6821 Post-Op-Neuro-Encephalopathy

Postop Events: Seq. 6825 Post-Op-Neuro-Lower Extremity Paralysis > 24 hours



Scenario #4 Answer

- Seq. **6821 Post-Op-Neuro-Encephalopathy** – YES. The remainder will be NO.
- Rationale: Encephalopathy is a term for any diffuse disease of the brain that alters brain function or structure. The hallmark of encephalopathy is an altered mental state. Blood tests, spinal fluid examination, imaging studies, electroencephalograms, and similar diagnostic studies may be used to differentiate the various causes of encephalopathy.
- In this scenario, the patient was oxygen deprived (anoxia) causing loss of consciousness, which is listed among the symptoms for encephalopathy in the TM.
- Paralysis and paresis are related to impairments caused by spinal cord ischemia.
- Stroke occurs when the blood supply to part of the brain is suddenly interrupted (clot or plaque) or when a blood vessel in the brain bursts, spilling blood into the spaces surrounding brain cells.
- Per the TM, Central events are caused by embolic or hemorrhagic events. Neurological deficits such as confusion, delirium and/or encephalopathic (anoxic or metabolic) events are **not** to be coded in Seq. 6810 CNStrokP.
- See TM Seq6821 Update from November 2021 for similar scenario.



Scenario #5

- Cardiac surgery on 1/17/23. Noted post op 1/17 seizure-like activity and L sided hemiparesis. CT of the head performed twice without diagnostic irregularity. Unable to complete MRI because patient had pacemaker. On 1/20/23 still with left side weakness but able to move toes and fingers.
- Neurology notes “likely” embolic right hemisphere event.
- 1/25/23 on date of discharge noted--Post operative likely embolic right hemispheric event- Left sided weakness has mostly resolved but deconditioned.
- (FAQ) Please confirm this is a post op stroke--even though no positive scanning.



Scenario #5 Question

- How will you code Postop Events: **Seq. 6810 Post-Op-Neuro-Stroke Perm?**

<p><u>Neurologic, Central</u> Postoperative Stroke: ++ <input type="checkbox"/> Yes <input type="checkbox"/> No CNStrokP (6810) Encephalopathy: <input type="checkbox"/> Yes <input type="checkbox"/> No CNEnceph (6821)</p>
<p><u>Neurologic, Peripheral</u> Lower Extremity Paralysis >24 Hours: Yes <input type="checkbox"/> No CNParal (6825) Paresis >24 hours: <input type="checkbox"/> Yes <input type="checkbox"/> No CNParesis (6829) Recurrent Laryngeal Nerve Injury: <input type="checkbox"/> Yes <input type="checkbox"/> No RecLarynNrvInj (6833)</p>



Scenario #5 Answer

- Code YES to **Seq. 6810 Post-Op-Neuro-Stroke Perm**
- Rationale: This is a stroke per the TM data definition. *The symptoms did not resolve within 24 hours of onset.* The intent is to capture whether the patient has a postoperative stroke (i.e. any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that was confirmed on imaging **or** did not resolve within 24 hours.



Scenario #6

- Patient had a mechanical AVR on 6/22/23. On POD #2 while transferring to the chair at the bedside, the patient developed right sided weakness and slumped in the chair.
- Symptoms resolved within 8 hours and patient was back to baseline.
- An MRI performed revealed an acute, small left parietal infarct and this was confirmed by the Neurologist.



Scenario #6 Question

- How will you code Postop Events: **Seq. 6810 Post-Op-Neuro-Stroke Perm?**

<p><u>Neurologic, Central</u></p> <p>Postoperative Stroke: ++ <input type="checkbox"/> Yes <input type="checkbox"/> No CNStrokP (6810)</p> <p>Encephalopathy: <input type="checkbox"/> Yes <input type="checkbox"/> No CNEnceph (6821)</p>
<p><u>Neurologic, Peripheral</u></p> <p>Lower Extremity Paralysis >24 Hours: Yes <input type="checkbox"/> No CNParal (6825)</p> <p>Paresis >24 hours: <input type="checkbox"/> Yes <input type="checkbox"/> No CNParesis (6829)</p> <p>Recurrent Laryngeal Nerve Injury: <input type="checkbox"/> Yes <input type="checkbox"/> No ReclarynNrvInj (6833)</p>



Scenario #6 Answer

- Code YES to **Seq. 6810 Post-Op-Neuro-Stroke Perm?**
- Rationale: The patient had diagnostic confirmation of stroke by MRI even though the symptoms lasted less than 24 hours. Per the TM, the intent is to capture whether the patient has a postoperative stroke (i.e. any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that was confirmed on imaging **or** did not resolve within 24 hours.
- Also, per the TM, Updated September 2021: Patient with abrupt onset neurological deficit had an MRI which was positive for acute CVA. The symptoms resolved within 24 hours. How is this coded? Patient had an MRI that was positive for a post-op stroke. In this scenario, code YES to post-op CVA.



Scenario #7

- Patient walking to the wheelchair at 2:30pm on the day of discharge following his aortic dissection repair and developed a sudden onset of slurred speech with facial droop. Stroke alert called and discharge was cancelled.
- Patient went for a CT of the brain that resulted with no abnormalities.
- Neurology was consulted the same day and documented suspected stroke in the EMR. The next morning the symptoms were gone, and he was back to baseline. Neurology noted TIA (transient ischemic attack) as the final diagnosis and signed off. Patient was discharged on antiplatelet & statin therapy.



Scenario #7 Question

- How will you code Postop Events: **Seq. 6810 Post-Op-Neuro-Stroke Perm?**

<p><u>Neurologic, Central</u> Postoperative Stroke: ++ <input type="checkbox"/> Yes <input type="checkbox"/> No CNStrokP (6810) Encephalopathy: <input type="checkbox"/> Yes <input type="checkbox"/> No CNEnceph (6821)</p> <hr/> <p><u>Neurologic, Peripheral</u> Lower Extremity Paralysis >24 Hours: Yes <input type="checkbox"/> No CNParal (6825) Paresis >24 hours: <input type="checkbox"/> Yes <input type="checkbox"/> No CNParesis (6829) Recurrent Laryngeal Nerve Injury: <input type="checkbox"/> Yes <input type="checkbox"/> No RecLarynNrvInj (6833)</p>



Scenario #7 Answer

- Code NO to Seq. 6810 **Post-Op-Neuro-Stroke Perm**
- Rationale: Patient does not meet the criteria for Stroke – the symptoms were less than 24 hours, and the imaging was negative. The intent is to capture whether the patient has a postoperative stroke (i.e., any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that was confirmed on imaging **or** did not resolve within 24 hours.
- Neurology confirmed diagnosis of TIA (transient ischemic attacks)
- TIA's are not captured in Seq. 6810



Quick Tip: Is it a stroke?

Ask Yourself

- Is there an infarct positive image from CT scans or MRI?

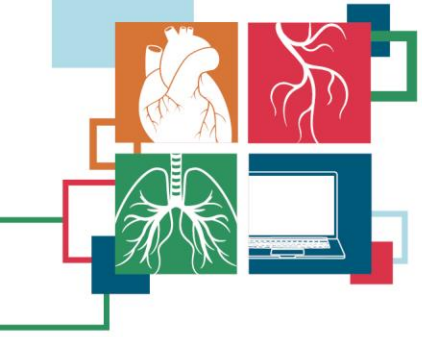
-OR-

- Are there signs/symptoms of stroke lasting greater than 24 hours?

Finally

- Did the Neurologist document a stroke? The Neurologist is the final arbitrator when there is conflicting evidence in the EMR.





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Stay tuned for Q & A

Thank You!



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