

SUPPLEMENTAL MATERIAL

Table S1. The demographics and preoperative characteristics of the derivation population (NSQIP 2011-2013) and univariable logistic regression evaluating thirty-day stroke, death or myocardial infarction.

Variable	Definition	Total Pop. (n = 10,766)	No Stroke, Death, or MI (n = 10,339)	Stroke, Death, or MI (n = 427)	OR	95% CI	P-value
Age (years)	18-70	44.7	44.8	40.3	Ref.	--	--
	71-80	37.3	37.3	35.1	1.05	0.84 - 1.31	0.69
	>80	18.1	17.8	24.6	1.54	1.20 - 1.97	0.001*
Sex	Male	60.9	60.9	61.8	Ref.	--	--
	Female	39.1	39.2	38.2	0.96	0.79 - 1.17	0.68
Race or Ethnicity	White	86.6	86.6	86.2	Ref.	--	--
	African-American	4.4	4.5	3.8	0.84	0.51 - 1.40	0.51
	Hispanic	2.4	2.4	2.3	0.99	0.52 - 1.88	0.97
	Asian	1.9	1.9	3.3	1.75	1.01 - 3.04	0.05
	Unknown	4.7	4.7	4.5	0.96	0.60 - 1.54	0.86
Preoperative Functional Status	Independent	96.5	96.7	93.0	Ref.	--	--
	Dependent	3.3	3.2	7.0	2.30	1.56 - 3.39	<0.001*
	Missing	0.2	0.2	0.00	--	--	--
Smoking		26.6	26.5	27.6	1.06	0.85 - 1.31	0.61
Hypertension		85.2	85.1	88.3	1.32	0.98 -	0.07

						1.79	
COPD		10.0	9.9	13.1	1.38	1.03 - 1.84	0.03*
CHF		1.4	1.3	3.8	2.88	1.70 - 4.87	<0.001*
Dyspnea		13.9	13.8	15.2	1.12	0.85 - 1.47	0.42
Diabetes Mellitus	None	71.1	71.4	62.1	Ref.	--	--
	Non-Insulin	18.2	18.0	22.0	1.41	1.10 - 1.79	0.006*
	Insulin	10.8	10.5	15.9	1.74	1.32 - 2.29	<0.001*
Bleeding Disorder		20.8	20.6	24.6	1.26	1.00 - 1.58	0.05
Body Habitus	Normal Weight	28.3	28.2	30.2	Ref.	--	--
	Overweight	38.2	38.2	38.4	0.94	0.74 - 1.19	0.60
	Class I Obesity	21.6	21.6	21.1	0.91	0.69 - 1.20	0.51
	Class II/III Obesity	11.0	11.1	9.1	0.77	0.53 - 1.11	0.16
	Missing	0.9	0.9	1.2	1.29	0.51 - 3.22	0.59
Weight Loss		0.5	0.4	1.2	2.65	1.05 - 6.71	0.04*
Preoperative Sodium (mEq/L)	>135	86.1	86.0	88.1	Ref.	--	--
	≤135	10.1	10.2	9.1	0.88	0.63 - 1.23	0.45
	Missing	3.8	3.8	2.8	0.72	0.40 - 1.29	0.27
Preoperative	≥40	86.2	86.4	81.7	Ref.	--	--

GFR (mL/min/1.73 m²)	<40	10.6	10.3	16.4	1.66	1.29 - 2.18	<0.001*
	Missing	3.2	3.3	1.9	0.60	0.30 - 1.23	0.16
Preoperative White Blood Cell Count (cells/μL)	4,000– 12,000	90.1	90.0	91.8	Ref.	--	--
	>12,000	3.7	3.8	3.0	0.79	0.45 - 1.39	0.42
	<4,000	1.8	1.8	0.7	0.39	0.12 - 1.21	0.10
	Missing	4.4	4.4	4.5	0.99	0.62 - 1.58	0.96
Preoperative Hematocrit (%)	>36	73.8	74.1	64.6	Ref.	--	--
	\leq 36	23.0	22.7	32.3	1.64	1.33 - 2.02	<0.001*
	Missing	3.2	3.2	3.0	1.09	0.62 - 1.92	0.76
Preoperative Platelet Count (platelets/μL)	\geq 150,000	85.2	85.3	84.1	Ref.	--	--
	<150,000	10.3	10.3	11.7	1.16	0.85 - 1.56	0.35
	Missing	4.5	4.5	4.2	0.96	0.59 - 1.55	0.86
Preoperative PTT (seconds)	<50	56.7	56.6	60.0	Ref.	--	--
	50-80	3.7	3.6	5.2	1.35	0.86 - 2.10	0.20
	>80	1.3	1.3	1.6	1.17	0.54 - 2.52	0.69
	Missing	38.3	38.5	33.3	0.82	0.66 - 1.01	0.06
Preoperative INR	>1.4	71.5	71.3	75.4	Ref.	--	--
	\leq 1.4	3.5	3.5	4.2	1.15	0.70 -	0.57

						1.86	
	Missing	25.0	25.2	20.4	0.76	0.60 - 0.97	0.03*
Steroid Usage		3.1	3.1	3.8	1.24	0.74 - 2.06	0.42
Symptomatic Status	Asymptomatic	56.9	57.3	46.6	Ref.	--	--
	Amaurosis Fugax	7.1	7.2	5.2	0.88	0.56 - 1.38	0.58
	TIA	15.7	15.6	19.2	1.51	1.16 - 1.97	0.002*
	Stroke	18.4	18.1	27.4	1.87	1.48 - 2.36	<0.001*
	Missing	1.9	1.9	1.6	1.05	0.49 - 2.27	0.90
Preoperative Modified Rankin Scale Score	0-1	7.6	7.6	5.9	Ref.	--	--
	2-5	7.8	7.8	15.2	2.66	1.66 - 4.26	<0.001*
	Not Recorded	3.0	3.1	6.3	2.76	1.59 - 4.84	<0.001*
	Presentation Other Than Stroke	81.9	81.6	72.6	1.15	0.76 - 1.74	0.50
High-Risk Physiology	No	93.3	93.6	85.5	Ref.	--	--
	Yes	4.9	4.6	11.5	2.74	2.01 - 3.74	<0.001*
	Missing	1.9	1.8	3.0	1.82	1.03 - 3.23	0.04*
High-Risk Anatomy	No	86.3	86.5	79.9	Ref.	--	--
	Yes	11.9	11.6	17.6	1.64	1.27 - 2.12	<0.001*

	Missing	1.9	1.9	2.6	1.51	0.82 - 2.80	0.19
Preoperative Antiplatelet Agents	No	11.2	11.2	10.1	Ref.	--	--
	Yes	88.2	88.2	88.1	1.11	0.81 - 1.53	0.52
	Missing	0.6	0.6	1.9	3.78	1.70 - 8.42	0.001*
Preoperative Statin	No	19.8	19.9	19.2	Ref.	--	--
	Yes	79.6	79.6	79.9	1.04	0.81 - 1.33	0.77
	Missing	0.6	0.5	0.9	1.82	0.65 - 5.15	0.26
Preoperative Beta-Blocker	No	43.5	43.7	38.9	Ref.	--	--
	Yes	55.6	55.4	60.7	1.23	1.01 - 1.50	0.04*
	Missing	0.9	0.9	0.5	0.57	0.14 - 2.34	0.44
Ipsilateral Carotid Artery Stenosis	Mild/Moderate (<80%)	29.5	29.5	29.0	Ref.	--	--
	Severe (80-99%) or Occlusion	68.8	68.8	68.6	1.01	0.82 - 1.26	0.90
	Not Obtained	1.8	1.7	2.3	1.38	0.71 - 2.68	0.34
Contralateral Carotid Artery Stenosis	Mild (<50%)	49.9	50.2	42.4	Ref.	--	--
	Moderate (50-79%)	27.2	27.2	29.3	1.28	1.01 - 1.61	0.04*
	Severe (80-99%) or Occlusion	10.5	10.4	14.5	1.66	1.23 - 2.23	0.001*
	Not Obtained	12.4	12.3	13.8	1.33	0.98 - 1.79	0.07

Admission Type	Home	93.3	93.6	86.2	Ref.	--	--
	Transfer	6.7	6.4	13.8	2.33	1.75 - 3.10	<0.001*
Emergent Operation		2.5	2.4	5.4	2.37	1.53 - 3.67	<0.001*
ASA Class	I-II	7.4	7.5	4.7	Ref.	--	--
	III	76.0	76.4	65.6	1.38	0.87 - 2.18	0.17
	IV-V	16.5	16.0	29.5	2.97	1.84 - 4.79	<0.001*
	Missing	0.1	0.1	0.2	6.48	0.75 - 56.4	0.09
Revision Endarterectomy		0.8	0.8	1.2	1.48	0.60 - 3.68	0.40

All data are presented as percentages.

*Statistically significant difference by univariable logistic regression.

ASA: American Society of Anesthesiologists; AST: aspartase transferase; CEA: carotid endarterectomy; CHF: congestive heart failure; COPD: chronic obstructive pulmonary disease; GFR: glomerular filtration rate; INR: international normalized ratio; IU: international units; MAC: monitored anesthesia care; MI: myocardial infarction; PTT: partial thromboplastin time.

Glomerular filtration rate was calculated using the modified diet in renal disease study.

Severity of ipsilateral and contralateral carotid stenosis is recorded only when defined by Doppler ultrasound or angiogram.

Modified Rankin Scale score is only recorded among patients whose presentation was a stroke.

A hospital transfer includes from another acute care facility, from the emergency department, or from a nursing home.

An emergent operation is defined using physician documentation, and includes procedures performed within twelve hours of hospital admission.

Missing data for laboratory values includes patients in whom such testing was not obtained preoperatively.

Table S2. Multivariable regression evaluating the predictors of stroke, death, or myocardial infarction in the derivation population, stratified by symptomatic status.

Variable	Definition	Symptomatic (n=4,441)			Asymptomatic (n=6,120)		
		OR	95% CI	P-value	OR	95% CI	P-value
Age (years)	18-70	Ref.	--	--	--	--	--
	71-80	0.81	0.57-1.14	0.23	--	--	--
	>80	1.47	1.03-2.09	0.04*	--	--	--
Race or Ethnicity	White	Ref.	--	--	--	--	--
	African-American	0.86	0.45-1.67	0.66	--	--	--
	Hispanic	0.43	0.15-1.21	0.11	--	--	--
	Asian	2.00	0.98-4.06	0.06	--	--	--
	Unknown	0.74	0.39-1.40	0.35			
Preoperative Functional Status	Independent	Ref.	--	--	--	--	--
	Dependent	1.45	0.89-2.36	0.13	--	--	--
Hypertension		1.67	1.07-2.62	0.03*	--	--	--
CHF		1.36	0.58-3.17	0.48	1.08	0.43–2.76	0.86
COPD		--	--	--	1.40	0.93–2.12	0.11
Dyspnea		0.82	0.53-1.28	0.39	--	--	--
Diabetes Mellitus	None	Ref.	--	--	Ref.	--	--
	Insulin	1.38	0.96-1.98	0.08	1.26	0.87-1.81	0.22
	Non-Insulin	1.25	0.80-1.94	0.32	1.60	1.07-2.40	0.02*
Bleeding Disorder		--	--	--	1.15	0.80–1.64	0.46
Body Habitus	Normal Weight	Ref.	--	--	--	--	--
	Overweight	0.85	0.60-1.20	0.36	--	--	--

	Class I Obesity	0.93	0.62-1.39	0.72	--	--	--
	Class II/III Obesity	0.61	0.34-1.09	0.10	--	--	--
	Missing	0.91	0.33-2.51	0.85	--	--	--
Weight Loss		1.49	0.46-4.80	0.50	--	--	--
Preoperative GFR (mL/min/1.73 m²)	≥40	Ref.	--	--	Ref.	--	--
	<40	1.14	0.73-1.87	0.55	1.51	1.04-2.20	0.03*
	Missing	0.84	0.23-2.99	0.78	0.69	0.25-1.93	0.48
Preoperative Serum Albumin (g/dL)	≥3.5	--	--	--	Ref.	--	--
	<3.5	--	--	--	1.38	0.81–2.35	0.24
	Missing	--	--	--	0.90	0.55–1.49	0.70
Preoperative Hematocrit (%)	>36	Ref.	--	--	--	--	--
	≤36	1.64	1.20-2.24	0.002*	--	--	--
	Missing	1.39	0.39-4.91	0.61	--	--	--
Preoperative PTT (seconds)	<50	--	--	--	Ref.	--	--
	50-80	--	--	--	1.49	0.60–3.89	0.39
	>80	--	--	--	0.63	0.07–5.27	0.67
	Missing	--	--	--	0.80	0.59–1.12	0.19
Preoperative AST (IU/L)	≤40	--	--	--	Ref.	--	--
	>40	--	--	--	1.87	0.93–3.78	0.08
	Missing	--	--	--	1.23	0.75–2.03	0.41
Preoperative Modified Rankin Score	0-1	Ref.	--	--	--	--	--
	2-5	2.06	1.25-3.40	0.004*	--	--	--
	Not Recorded	2.38	1.32-4.29	0.004*	--	--	--
	Presentation	1.33	0.84-2.09	0.22	--	--	--

	other than Stroke						
High-Risk Physiology		2.34	1.44-3.79	0.001*	1.14	0.63–2.09	0.66
	Missing	6.86	2.26-20.79	0.001*	0.26	0.04–1.61	0.15
High-Risk Anatomy		1.24	0.84-1.83	0.28	1.35	0.88-2.08	0.17
	Missing	0.36	0.10-1.32	0.12	2.16	0.56–8.41	0.27
Preoperative Statin		--	--	--	1.17	0.79–1.75	0.44
Preoperative Beta-Blocker		--	--	--	1.29	0.94-1.77	0.12
Contralateral Stenosis	Mild (<50%)	Ref.	--	--	Ref.	--	--
	Moderate (50-79%)	1.26	0.90-1.76	0.18	1.28	0.90–1.80	0.17
	Severe (80-99%) or Occlusion	1.41	0.91-2.20	0.13	1.40	0.87–2.24	0.16
	Not Obtained	1.28	0.80-2.06	0.30	1.64	1.08–2.49	0.02*
Admission Type	Home	Ref.	--	--	Ref.	--	--
	Transfer	1.70	1.17-2.47	0.006*	2.51	1.33-4.76	0.005*
	Missing	0.13	0.02-0.96	0.05	--	--	--
Emergent Operation		1.57	0.95-2.59	0.08	--	--	--
ASA Class	I-II	Ref.	--	--	Ref.	--	--
	III	0.80	0.42-1.52	0.49	1.38	0.69-2.74	0.36
	IV-V	1.23	0.62-2.44	0.55	2.32	1.11–4.87	0.03*
	Missing	4.53	0.38-53.9	0.23	--	--	--
Revision Endarterectomy		--	--	--	1.37	0.46–4.05	0.57

C-Statistic		0.73	0.68
Hosmer-Lemeshow Test		0.48	0.73

*Statistically significant difference.

ASA: American Society of Anesthesiologists; CHF: congestive heart failure; CI: Confidence Interval; GFR: glomerular filtration rate; PTT: partial thromboplastin time.

Table S3. Prediction of the NSQIP CEA Scale in the validation population among asymptomatic patients on antiplatelet agents and statin preoperatively (n=3,340).

Outcome	Cumulative Incidence	C	OR	95% CI	P-value	HL
Stroke, Death, or Myocardial Infarction	3.0% (95% CI: 2.4-3.6%)	0.65	1.15	1.10-1.19	<0.001*	0.08
Stroke or Death	1.8% (95% CI: 1.3-2.9%)	0.66	1.15	1.09-1.21	<0.001*	0.02
Death	0.6% (95% CI: 0.3-0.9%)	0.75	1.23	1.13-1.33	<0.001*	0.06
Stroke	1.3% (95% CI: 0.9-1.9%)	0.62	1.10	1.04-1.18	<0.001*	0.25
Myocardial Infarction	1.7% (95% CI: 1.4-1.9%)	0.64	1.14	1.08-1.20	<0.001*	0.13
Cranial Nerve Deficit	3.5%: (95% CI: 2.9-4.2%)	0.55	1.04	1.00-1.09	0.07	0.94
Any Complication	8.2% (95% CI: 7.2-9.1%)	0.64	1.14	1.11-1.17	<0.001*	0.63
Extended Hospital Stay	14.1% (95% CI: 12.9-15.3%)	0.65	1.14	1.11-1.17	<0.001*	0.44
Non-Routine Discharge	2.4%: (95% CI: 1.9-2.9%)	0.72	1.20	1.15-1.26	<0.001*	0.07
Unplanned Readmission	4.7%: (95% CI: 4.0-5.5%)	0.69	1.17	1.13-1.21	<0.001*	0.08

CEA: carotid endarterectomy; CI: confidence interval; HL: Hosmer-Lemeshow Test; NSQIP: National Surgical Quality Improvement Program; OR: odds ratio.

*Statistically significant differences by logistic regression.