

**Supplementary Table 3.** One hundred surgeries that had the highest number of strokes

Procedure name	ICD-9 code	No. of stroke	Procedure frequency	Incidence of stroke (%)
Percutaneous transluminal coronary angioplasty	0066	761	165,698	0.46
Other excision or destruction of lesion or tissue of brain	0159	468	14,476	3.23
Hemodialysis	3995	454	115,663	0.39
Endarterectomy; other vessels of head and neck	3812	433	27,172	1.59
Open and other replacement of aortic valve with tissue graft	3521	416	15,928	2.61
Incision of cerebral meninges	0131	357	10,929	3.27
Clipping of aneurysm	3951	294	2,856	10.29
Interruption of the vena cava	387	288	22,439	1.28
Open reduction of fracture with internal fixation; femur	7935	275	51,207	0.54
Endovascular (total) embolization or occlusion of head and neck vessels	3972	252	4,174	6.4
Partial hip replacement	8152	250	36,879	0.68
(Aorto)coronary bypass of three coronary arteries	3613	238	13,380	1.78
(Aorto)coronary bypass of two coronary arteries	3612	216	14,793	1.46
Open and other replacement of aortic valve	3522	205	8,633	2.37
Excision of lesion or tissue of cerebral meninges	0151	193	4,549	4.24
Thoracentesis	3491	175	45,733	0.38
Total knee replacement	8154	173	191,443	0.09
Endovascular removal of obstruction from head and neck vessel(s)	3974	171	926	18.47
Angioplasty of other non-coronary vessel(s)	3950	157	32,919	0.48
Implant of pulsation balloon	3761	151	6,913	2.18
Other incision of brain	0139	138	2,628	5.25
(Aorto)coronary bypass of four or more coronary arteries	3614	134	6,942	1.93
Other partial resection of small intestine	4562	121	19,867	0.61
Laparoscopic cholecystectomy	5123	117	141,814	0.08
Open and other right hemicolectomy	4573	117	20,075	0.58
Closed reduction of fracture with internal fixation; femur	7915	114	22,214	0.51
Total hip replacement	8151	111	98,769	0.11
Percutaneous angioplasty of extracranial vessel(s)	0061	110	4,312	2.55
Other craniotomy	124	104	3,030	3.43
Resection of vessel with replacement; thoracic vessels	3845	98	1,499	6.54
Open and other replacement of mitral valve with tissue graft	3523	95	2,783	3.41
Percutaneous abdominal drainage	5491	93	46,708	0.2
Endovascular embolization or occlusion of vessel(s) of head or neck using bare coils	3975	91	1,166	7.8
Open and other sigmoidectomy	4576	90	18,441	0.49
(Aorto)coronary bypass of one coronary artery	3611	79	6,108	1.29
Open heart valvuloplasty of mitral valve without replacement	3512	79	4,597	1.72
Other exploration and decompression of spinal canal	0309	77	37,627	0.2
Other endovascular procedures on other vessels	3979	76	6,577	1.16
Arteriovenostomy for renal dialysis	3927	70	11,559	0.61
Single internal mammary-coronary artery bypass	3615	69	5,282	1.31
Other amputation below knee	8415	66	8,776	0.75
Open and other replacement of mitral valve	3524	64	2,639	2.43

Supplementary Table 3. Continued

Procedure name	ICD-9 code	No. of stroke	Procedure frequency	Incidence of stroke (%)
Excision or destruction of other lesion or tissue of heart, endovascular approach	3734	62	20,145	0.31
Extracranial-intracranial vascular bypass	3928	60	434	13.82
Ventricular shunt to abdominal cavity and organs	234	59	4,201	1.4
Cholecystectomy	5122	57	17,557	0.32
Other (peripheral) vascular shunt or bypass	3929	57	12,302	0.46
Open and other left hemicolectomy	4575	56	6,733	0.83
Lumbar and lumbosacral fusion of the anterior column, posterior technique	8108	53	31,922	0.17
Amputation above knee	8417	53	5,021	1.06
Insertion of intercostal catheter for drainage	3404	52	16,069	0.32
Other lysis of peritoneal adhesions	5459	48	18,711	0.26
Other craniectomy	0125	46	1,008	4.56
Other cervical fusion of the anterior column, anterior technique	8102	45	41,651	0.11
Nephroureterectomy	5551	45	16,516	0.27
Endovascular implantation of graft in thoracic aorta	3973	45	1,216	3.7
Open reduction of fracture with internal fixation; tibia and fibula	7936	42	41,571	0.1
Resection of vessel with replacement; aorta, abdominal	3844	42	2,570	1.63
Low cervical cesarean section	741	41	516,134	0.01
Percutaneous nephrostomy without fragmentation	5503	41	9,998	0.41
Internal fixation of bone without fracture reduction; femur	7855	40	10,171	0.39
Incision of vessel; lower limb arteries	3808	39	1,783	2.19
Endovascular implantation of other graft in abdominal aorta	3971	37	8,414	0.44
Other lobectomy of lung	3249	37	6,539	0.57
Biopsy of lymphatic structure	4011	36	10,455	0.34
Other revision of vascular procedure	3949	35	6,309	0.55
Replacement of ventricular shunt	0242	35	3,278	1.07
Extracorporeal membrane oxygenation	3965	34	389	8.74
Other transurethral prostatectomy	6029	33	25,617	0.13
Annuloplasty	3533	32	1,465	2.18
Thoracoscopic excision of lesion or tissue of lung	3220	31	8,401	0.37
Pericardiotomy	3712	31	3,094	1
Other transplant of liver	5059	31	2,095	1.48
Incision of vessel; upper limb vessels	3803	31	942	3.29
Heart transplantation	3751	31	882	3.51
Open heart valvuloplasty of aortic valve without replacement	3511	31	735	4.22
Percutaneous angioplasty of intracranial vessel(s)	0062	31	359	8.64
Partial excision of pituitary gland, transsphenoidal approach	0762	30	3,337	0.9
Amputation of toe	8411	29	15,130	0.19
Lumbar and lumbosacral fusion of the posterior column, posterior technique	8107	29	14,067	0.21
Other transurethral excision or destruction of lesion or tissue of bladder	5749	28	10,151	0.28
Exploratory laparotomy	5411	28	4,374	0.64
Aorta-iliac-femoral bypass	3925	28	2,399	1.17
Excision or destruction of other lesion or tissue of heart, open approach	3733	28	1,529	1.83
Other and unspecified total abdominal hysterectomy	6849	27	69,139	0.04

**Supplementary Table 3.** Continued

Procedure name	ICD-9 code	No. of stroke	Procedure frequency	Incidence of stroke (%)
Insertion of implantable heart assist system	3766	27	474	5.7
Partial excision of pituitary gland, transfrontal approach	0761	25	246	10.16
Laparoscopic right hemicolectomy	1733	24	10,009	0.24
Other repair of aneurysm	3952	24	1,581	1.52
Lumbar and lumbosacral fusion of the anterior column, anterior technique	8106	23	18,861	0.12
Total splenectomy	415	23	4,123	0.56
Percutaneous balloon valvuloplasty	3596	23	1,095	2.1
Lobectomy of brain	0153	23	585	3.93
Ventricular shunt to extracranial site NEC	239	23	407	5.65
Laparoscopic appendectomy	4701	22	92,255	0.02
Revision of hip replacement, both acetabular and femoral components	0070	21	7,814	0.27
Other myectomy	8345	21	5,416	0.39
Revision of arteriovenous shunt for renal dialysis	3942	21	4,469	0.47
Other cervical fusion of the posterior column, posterior technique	8103	20	5,539	0.36
Amputation through foot	8412	20	4,686	0.43

ICD-9, International Classification of Diseases, 9th revision; NEC, not otherwise specified.