

**SUPPLEMENTAL MATERIAL to****A Strategy for Reliable Identification of Ischemic Stroke, Thrombolytics, and Thrombectomy in Large Administrative Databases**

**Table I. ICD-CM, ICD-PCS, CPT, and MS-DRG used for identification of stroke patients and procedures**

**Table II. Most frequent non-designated MS-DRG codes among patients identified by ICD-9-CM or ICD-10-CM only**

**Table III. Most frequent ICD-9-CM or ICD-10-CM codes among patients identified by MS-DRG only**

**Table I. ICD-CM, ICD-PCS, CPT, and MS-DRG used for identification of stroke patients and procedures**

<b>Ischemic Stroke Patient Identification</b>	
<b>ICD-9-CM Codes</b>	
433.xx, excluding 433.10	Occlusion and stenosis of precerebral arteries, excluding occlusion and stenosis of carotid artery without mention of cerebral infarction
434.xx	Occlusion of cerebral arteries
436	Acute but ill-defined cerebrovascular disease
<b>ICD-10-CM Code</b>	
I63	Cerebral infarction
<b>MS-DRG Codes</b>	
061	Ischemic stroke, precerebral occlusion, or transient ischemia with thrombolytic agent with MCC
062	Ischemic stroke, precerebral occlusion, or transient ischemia with thrombolytic agent with CC
063	Ischemic stroke, precerebral occlusion, or transient ischemia with thrombolytic agent without CC/MCC
<b>Additional MS-DRG codes used, if present in combination with an above ICD-9-CM or ICD-10-CM code for ischemic stroke</b>	
064	Intracranial hemorrhage or cerebral infarction with MCC
065	Intracranial hemorrhage or cerebral infarction with CC or tPA in 24 hours
066	Intracranial hemorrhage or cerebral infarction without CC/MCC
023	Craniotomy w major device implant or acute complex central nervous system principal diagnosis w MCC
024	Craniotomy w major device implant or acute complex central nervous system principal diagnosis w/o MCC
<b>Thrombolytic Identification</b>	
<b>ICD-9-PCS Code</b>	
9910	Injection or infusion of thrombolytic agent
<b>ICD-9-CM Code</b>	
V4588	Status post administration of tPA in a different facility within the last 24 hours prior to admission to current facility
<b>ICD-10-PCS Code</b>	
3E03317	Introduction of other thrombolytic into peripheral vein, percutaneous approach
<b>ICD-10-CM Code</b>	

Z9282	Status post administration of tPA in a different facility within the last 24 hours prior to admission to current facility
<b>CPT Codes</b>	
37195	Thrombolysis, cerebral, by intravenous infusion
37201	Transcatheter therapy, infusion for thrombolysis other than coronary
37202	Transcatheter therapy, other than thrombolysis, chemotherapy, or embolization
<b>MS-DRG Codes</b>	
061	Ischemic stroke, precerebral occlusion, or transient ischemia with thrombolytic agent with MCC
062	Ischemic stroke, precerebral occlusion, or transient ischemia with thrombolytic agent with CC
063	Ischemic stroke, precerebral occlusion, or transient ischemia with thrombolytic agent without CC/MCC
065, if present in combination with a corresponding ICD-9 or ICD-10 code indicating alteplase receipt	Intracranial hemorrhage or cerebral infarction with CC or TPA in 24 hours
<b>EVT Identification</b>	
<b>ICD-9-PCS Codes</b>	
3974	Endovascular removal of obstruction from head and neck vessel(s)
1753	Percutaneous atherectomy of extracranial vessel(s)
1754	Percutaneous atherectomy of intracranial vessel(s)
<b>ICD-10-PCS Codes</b>	
03CG3ZZ	Extirpation of matter from intracranial artery, percutaneous approach
03CH3ZZ	Extirpation of matter from right common carotid artery, percutaneous approach
03CJ3ZZ	Extirpation of matter from left common carotid artery, percutaneous approach
03CK3ZZ	Extirpation of matter from right internal carotid artery, percutaneous approach
03CL3ZZ	Extirpation of matter from left internal carotid artery, percutaneous approach
03CM3ZZ	Extirpation of matter from right external carotid artery, percutaneous approach
03CN3ZZ	Extirpation of matter from left external carotid artery, percutaneous approach
03CP3ZZ	Extirpation of matter from left vertebral artery, percutaneous approach
03CQ3ZZ	Extirpation of matter from left vertebral artery, percutaneous approach

MS-DRG Codes	
023	Craniotomy w major device implant or acute complex central nervous system principal diagnosis w MCC
024	Craniotomy w major device implant or acute complex central nervous system principal diagnosis w/o MCC

**Legend:** ICD-CM: International Classification of Disease, Clinical Modification; ICD-PCS: ICD Procedural Coding System; CPT: Current Procedural Terminology; MS-DRG: Medicare Severity-Diagnosis-Related Group; MCC: major complication or comorbidity; CC: complication or comorbidity; tPA: tissue plasminogen activator; EVT: endovascular thrombectomy

**Table II. Most frequent non-designated MS-DRG codes among patients identified by ICD-9-CM or ICD-10-CM only**

MS-DRG	Frequency	
038	2,208	Extracranial procedures w CC
068	1,872	Nonspecific CVA & precerebral occlusion w/o infarct w/o MCC
039	1,797	Extracranial procedures w/o CC/MCC
037	1,431	Extracranial procedures w MCC
041	1,367	Periph/cranial nerve & other nerv syst proc w CC or periph neurostim
004	1,341	Tracheostomy with mv >96 hours or PDX except face, mouth and neck without major O.R. procedure
040	1,334	Periph/cranial nerve & other nerv syst proc w MCC
981	1,112	Extensive O.R. procedure unrelated to principal diagnosis w MCC

**Legend:** MS-DRG: Medicare Severity-Diagnosis-Related Group; ICD-CM: International Classification of Disease, Clinical Modification; CC: complication or comorbidity; CVA: cerebrovascular attack; MCC: major complication or comorbidity; O.R.: operating room

**Table III. Most frequent ICD-9-CM or ICD-10-CM codes among patients identified by MS-DRG only**

Primary Diagnosis Code	Frequency	
G459	57	Transient ischemic attack
G458	6	Subclavian steal syndrome
I651	2	Occlusion and stenosis of basilar artery
I6601	2	Occlusion and stenosis of right middle cerebral artery
I6602	2	Occlusion and stenosis of left middle cerebral artery
I6782	2	Reversible cerebral vasoconstriction syndrome
I6501	1	Occlusion and stenosis of right vertebral artery
I67841	1	Reversible cerebrovascular vasoconstriction syndrome

**Legend:** ICD-CM: International Classification of Disease, Clinical Modification; MS-DRG: Medicare Severity-Diagnosis-Related Group

**Table IV. ICD-9 and ICD-10 PCS codes used to identify craniotomy, craniectomy, or ventriculostomy among patients with MS-DRG 023 and 024**

<b>Procedure</b>	<b>Type of Code</b>	<b>Code</b>
Craniotomy or craniectomy	ICD-9 CM PCS	01.24 01.25 01.31 01.39 01.53 01.59
	ICD-10-CM PCS	00J00ZZ 00W00JZ 00W00KZ 0N800ZZ 0N803ZZ 0N804ZZ 0NC10ZZ 0NC13ZZ 0NC14ZZ 0NC30ZZ 0NC33ZZ 0NC34ZZ 0NC40ZZ 0NC43ZZ 0NC44ZZ 0NC50ZZ 0NC53ZZ 0NC54ZZ 0NC60ZZ 0NC63ZZ 0NC64ZZ 0NC70ZZ 0NC73ZZ 0NC74ZZ 0NH00MZ 0NH03MZ 0NH04MZ 0NP000Z 0NP004Z 0NP005Z 0NP007Z 0NP007Z 0NP00KZ 0NP00SZ 0NP030Z

		0NP034Z 0NP037Z 0NP03KZ 0NP03SZ 0NP040Z 0NP044Z 0NP047Z 0NP04KZ 0NP04SZ 0NP0X4Z 0NP0XSZ 0NW000Z 0NW004Z 0NW005Z 0NW007Z 0NW00JZ 0NW00KZ 0NW00MZ 0NW00SZ 0NW030Z 0NW034Z 0NW035Z 0NW037Z 0NW03JZ 0NW03KZ 0NW03MZ 0NW03SZ 0NW040Z 0NW044Z 0NW045Z 0NW047Z 0NW04JZ 0NW04KZ 0NW04MZ 0NW04SZ 0W9100Z 0W010ZZ 0W9130Z 0W913ZZ 0W9140Z 0W914ZZ 0WC10ZZ 0WC13ZZ 0WC14ZZ 0WH10YZ 0WH13YZ
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		0WH14YZ 0WJ10ZZ 0WP100Z 0WP101Z 0WP10JZ 0WP10YZ 0WP130Z 0WP131Z 0WP13JZ 0WP13YZ 0WP140Z 0WP141Z 0WP14JZ 0WP14HZ 0WW00Z 0WW101Z 0WW103Z 0WW10JZ 0WW10YZ 0WW130Z 0WW131Z 0WW133Z 0WW13JZ 0WW13YZ 0WW140Z 0WW141Z 0WW143Z 0WW14JZ 0WW14YZ 0N500ZZ 0N503ZZ 0N504ZZ 0NB00ZZ 0NB03ZZ 0NB04ZZ 0NT10ZZ 0NT30ZZ 0NT40ZZ 0NT50ZZ 0NT60ZZ 0NT70ZZ 009100Z 00910ZZ 00C10ZZ 00C13ZZ 00C14ZZ
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		009000Z
		00900ZZ
		009030Z
		00903ZZ
		009040Z
		00904ZZ
		00C00ZZ
		00C03ZZ
		00C04ZZ
		00H003Z
		00H003Z
		00H00YZ
		00H032Z
		00H033Z
		00H03YZ
		00H042Z
		00H043Z
		00H04YZ
		00H602Z
		00H603Z
		00H60YZ
		00H632Z
		00H633Z
		00H63YZ
		00H642Z
		00H643Z
		00H64YZ
		00P000Z
		00P002Z
		00P003Z
		00P007Z
		00P00JZ
		00P00KZ
		00P00YZ
		00P030Z
		00P032Z
		00P033Z
		00P037Z
		00P03JZ
		00P03KZ
		00P03YZ
		00P040Z
		00P042Z
		00P043Z
		00P047Z
		00P04JZ

		00P04KZ
		00P04YZ
		00P600Z
		00P602Z
		00P603Z
		00P60YZ
		00P630Z
		00P632Z
		00P633Z
		00P63YZ
		00P640Z
		00P642Z
		00P643Z
		00P64YZ
		00P6X2Z
		00W000Z
		00W002Z
		00W003Z
		00W007Z
		00W00MZ
		00W00YZ
		00W030Z
		00W032Z
		00W033Z
		00W037Z
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		00W602Z
		00W603Z
		00W60MZ
		00W60YZ
		00W630Z
		00W632Z
		00W633Z
		00W63MZ

		00W63YZ 00W640Z 00W642Z 00W643Z 00W64MZ 00W64YZ 00B70ZZ 00B73ZZ 00B74ZZ 00500ZZ 00503ZZ 00504ZZ 00B00ZZ 00B03ZZ 00B04ZZ
Ventriculostomy	ICD-9-CM PCS	V45.2 02.2 02.21 02.22
	ICD-10-CM PCS	Z982 009600Z 009630Z 009640Z 001607B 00160JB 00160KB 001637B 00163JB 00163KB 001647B 00164JB 00164KB 009130Z 00913ZZ 009140Z 00914ZZ 009230Z 00923ZZ 009240Z 00924ZZ 009430Z 00943ZZ 009440Z 00944ZZ 009530Z 009540Z

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