

## Overuse of Imaging

### Overuse of Imaging for the Evaluation of Children with Post-Traumatic Headache

#### Description

The percentage of children, ages 2 through 17 years old, with post-traumatic headache who were evaluated in the emergency department (ED) within 24 hours after an injury, and imaging of the head [computed tomography (CT) or magnetic resonance imaging (MRI)] was obtained in the absence of documented neurologic signs or symptoms that suggest intracranial hemorrhage or basilar skull fracture. A lower percentage indicates better performance, as reflected by use of imaging only when indicated.

#### Calculation

This measure of imaging overuse requires administrative and medical record data and is calculated as a percentage as follows:

The number of children with post-traumatic headache for whom imaging of the head (CT or MRI) was obtained in the absence of documented neurologic signs or symptoms that suggest intracranial hemorrhage or basilar skull fracture divided by the number of eligible children with post-traumatic headache for whom imaging of the head (CT or MRI) was obtained (numerator divided by denominator times 100%).

#### Eligible Population

Determination of the eligible population for this measure requires administrative and medical record data.

<b>Ages</b>	Children 2 years or older on January 1 of the measurement year but younger than 18 years on December 31 of the measurement year
<b>Enrollment</b>	Continuous insurance-plan enrollment during both the measurement year and the year prior to the measurement year
<b>Event/Diagnosis</b>	Imaging studies of the head [ <i>based on Uniform Billing (UB-92) Revenue codes, Current Procedural Terminology (CPT) codes or International Classification of Diseases, 9<sup>th</sup> Revision, Clinical Modification* (ICD-9-CM) codes for head CT or MRI listed in Table IMG1</i> ] obtained for the evaluation of post-traumatic headache ( <i>based on ICD-9-CM codes listed in Table IMG2 and clinical documentation</i> ), in association with an ED visit ( <i>based on UB92 Revenue codes and CPT codes listed in Table IMG3</i> ) within 24 hours of injury ( <i>based on clinical documentation</i> ).

\*ICD-9-CM to ICD-10-CM code conversions are presented in the Tables where appropriate.

## Specification

**Denominator** The number of children, ages 2 through 17 years old, with post-traumatic headache who were evaluated in the ED within 24 hours after an injury, and imaging of the head was obtained in the absence of suspected child abuse or neglect (*based on ICD-9-CM codes listed in Table IMG4 or clinical documentation*) or a condition that could otherwise warrant neuroimaging (*based on ICD-9-CM codes listed in Table IMG5 or clinical documentation*).

**Numerator** The number of children eligible for the denominator for whom imaging of the head (CT or MRI) was obtained in the absence of documented neurologic signs or symptoms that suggest intracranial hemorrhage (*based on clinical documentation*) or basilar skull fracture (*based on clinical documentation*).

### Exclusions

---

- Children younger than 2 years of age or older than 17 years of age at the time of the ED evaluation of post-traumatic headache
- **Denominator Exclusions**
  - Exclusions based on ICD-9-CM codes captured in administrative claims data:
    - Suspected abuse/neglect
      - Based on relevant ICD-9-CM codes (Table 4) associated with health care received on the day of or within 7 days prior to neuroimaging
    - Medical history that could otherwise warrant neuroimaging
      - Based on ICD-9-CM codes (Table 5) associated with health care received on the day of or within the 365 days before the imaging was obtained
  - Exclusions based on clinical documentation:
    - Suspected abuse/neglect noted during the ED visit during which neuroimaging was obtained
    - Medical history noted during the ED visit during which neuroimaging was obtained that could otherwise warrant imaging (e.g., neoplasm and blood disorder, hydrocephalus and CNS anomalies, tuberous sclerosis, dwarfism, hemangioma, phlebitis/thrombophlebitis, intracranial hemorrhage, occlusion of cerebral arteries, moyamoya disease, congenital heart disease, anticoagulation)
    - No clinical documentation of headache as a symptom in cases where inclusion was based only on an ICD-9-CM code for concussion (8500)

- No clinical documentation of trauma history in cases where inclusion was based only on an ICD-9-CM code for headache (7840)
- Time of the injury was not documented in the medical record
- Time of the injury was documented to be greater than 24 hours prior to the time of the ED visit
- **Numerator Exclusions (All are based on clinical documentation)**
  - Severe mechanism of injury (e.g., penetrating trauma, fall from more than 5 feet, pedestrian struck by vehicle)
  - History of seizure or convulsions associated with trauma
  - History of loss of consciousness associated with trauma
  - Repeated vomiting
  - Documented basilar skull fracture
  - Suspected basilar skull fracture based on the following examination findings:
    - “Raccoon eyes” (bruising around the eyes/black eyes), Battle’s sign (bruising behind one or both ears), hemotympanum (blood behind one or both ear drums)
  - Absence of documented neurologic examination
  - Abnormal neurologic examination or signs or symptoms of intracranial hemorrhage or increased intracranial pressure:
    - Decreased alertness or confusion, including comments such as “not acting like himself” per parent report
    - Altered mental status or Glasgow Coma Scale Score <14
    - Papilledema
    - Diplopia
    - Abnormal face or eye movements
    - Asymmetric face or extremity muscle movements
    - Altered sensation
    - Dizziness
    - Gait disturbance
    - Lack of coordination

Example chart review data abstraction tool provided at the end of this document.

**Table IMG1: Codes to Identify Neuroimaging in Administrative Claims with ICD-10-CM Code Conversion**

Imaging Modality	Code Type	Codes
Head CT	Revenue (UB-92)	350, 351, 352, 353, 354, 355, 356, 357, 358, 359
	CPT	70450, 70460, 70470, 70480,
	ICD-9-CM**	87.03
Brain MRI	Revenue (UB-92)	610, 611, 612, 613, 614, 615, 616, 617, 618, 619
	CPT	70551, 70552, 70553
	ICD-9-CM***	88.91

\*\*ICD-10-CM Code for Head CT: B02000Z, B0200ZZ, B02010Z, B0201ZZ, B020Y0Z, B020YZZ, B020ZZZ

\*\*\*ICD-10CM Code for Head MRI: B030Y0Z, B030YZZ, B030ZZZ

**Table IMG2: ICD-9-CM Codes to Identify Population with Post-Traumatic Headache with ICD-10-CM Code Conversion**

Post-Traumatic Headache ICD-9-CM Code Description	ICD-9-CM Code	ICD-10-CM Code	ICD-10-CM Code Description
Post-traumatic headache	33920	G44309	Post-traumatic headache, unspecified, not intractable
Post-traumatic headache	33921	G44319	Acute post-traumatic headache, not intractable
Acute pain due to trauma	33811	G8911	Acute pain due to trauma
Headache	7840	R51	Headache
Concussion with no loss of consciousness	8500	S060X0A	Concussion without loss of consciousness, initial encounter

**Table IMG3: Codes to Identify Emergency Department Visits**

UB92 Revenue Codes	Between 450 and 459
	In 516, 526, 981
CPT Codes	Between 99281 and 99285
	99288

**Table IMG 4: ICD-9-CM Codes to Identify Child Abuse or Neglect with ICD-10-CM Code Conversion**

Child Abuse or Neglect ICD-9-CM Code Description	ICD-9-CM Code	ICD-10-CM Code	ICD-10-CM Code Description
Child abuse and neglect	9955	T7402XA	Child neglect or abandonment, confirmed, initial encounter
Child abuse and neglect	9955	T744XXA	Shaken infant syndrome, initial encounter
Child abuse and neglect	9955	T7612XA	Child physical abuse, suspected, initial encounter
Child abuse and neglect	9955	T7622XA	Child sexual abuse, suspected, initial encounter
Child abuse and neglect	9955	T7422XA	Child sexual abuse, confirmed, initial encounter
Child abuse and neglect	9955	T7402XA	Child neglect or abandonment, confirmed, initial encounter
Child abuse and neglect	9955	T7492XA	Unspecified child maltreatment, confirmed, initial encounter
Child abuse and neglect	9955	T7492XA	Unspecified child maltreatment, confirmed, initial encounter
Child abuse and neglect	9955	T7692XA	Unspecified child maltreatment, suspected, initial encounter
Child abuse and neglect	9955	T7412XA	Child physical abuse, confirmed, initial encounter
Child abuse and neglect	9955	T7602XA	Child neglect or abandonment, suspected, initial encounter
Child abuse and neglect	9955	T7692XA	Unspecified child maltreatment, suspected, initial encounter
Observation and evaluation for – abuse and neglect	V7181	Z0472	Encounter for exam and observation following alleged child physical abuse

**Table IMG5: ICD-9-CM Codes to Identify Other Conditions that Potentially Warrant Imaging for Evaluation of Post-Traumatic Headache with ICD-10-CM Code Conversion**

Other Conditions ICD-9-CM Code Description	ICD-9-CM Code	ICD-10-CM Code	ICD-10-CM Code Description
Malignant neoplasm of brain	1915	C715	Malignant neoplasm of cerebral ventricle
Malignant neoplasm of brain	1911	C711	Malignant neoplasm of frontal lobe
Malignant neoplasm of brain	1914	C714	Malignant neoplasm of occipital lobe
Malignant neoplasm of brain	1919	C719	Malignant neoplasm of brain, unspecified
Malignant neoplasm of brain	1913	C713	Malignant neoplasm of parietal lobe
Malignant neoplasm of brain	1918	C718	Malignant neoplasm of overlapping sites of brain
Malignant neoplasm of brain	1917	C717	Malignant neoplasm of brain stem
Malignant neoplasm of brain	1912	C712	Malignant neoplasm of temporal lobe
Malignant neoplasm of brain	1910	C710	Malignant neoplasm of cerebrum, except lobes and ventricles
Malignant neoplasm of brain	1916	C716	Malignant neoplasm of cerebellum
Malignant neoplasm of pituitary gland	1943	C752	Malignant neoplasm of craniopharyngeal duct
Malignant neoplasm of pituitary gland	1943	C751	Malignant neoplasm of pituitary gland
Malignant neoplasm of pineal gland	1944	C753	Malignant neoplasm of pineal gland
Secondary malignant neoplasm of other sites - brain	1983	C7931	Secondary malignant neoplasm of brain
Benign neoplasm of brain	2250	D332	Benign neoplasm of brain, unspecified
Benign neoplasm of cranial nerves	2251	D333	Benign neoplasm of cranial nerves
Benign neoplasm of cerebral meninges	2252	D329	Benign neoplasm of meninges, unspecified
Benign neoplasm of cerebral meninges	2252	D320	Benign neoplasm of cerebral meninges
Neoplasm of uncertain behavior - pituitary	2370	D444	Neoplasm of uncertain behavior of craniopharyngeal duct
Neoplasm of uncertain behavior - pituitary	2370	D443	Neoplasm of uncertain behavior of pituitary gland
Neoplasm of uncertain behavior - pineal gland	2371	D445	Neoplasm of uncertain behavior of pineal gland

<b>Other Conditions ICD-9-CM Code Description</b>	<b>ICD-9-CM Code</b>	<b>ICD-10-CM Code</b>	<b>ICD-10-CM Code Description</b>
Neurofibromatosis	23779	Q8509	Other neurofibromatosis
Neurofibromatosis	23773	Q8503	Schwannomatosis
Neurofibromatosis	23772	Q8502	Neurofibromatosis, type 2
Neurofibromatosis	23771	Q8501	Neurofibromatosis, type 1
Neurofibromatosis	23770	Q8500	Neurofibromatosis, unspecified
Personal history of malignant neoplasm of brain	V1085	Z85841	Personal history of malignant neoplasm of brain
Sickle cell disease	28260	D571	Sickle-cell disease without crisis
Sickle cell disease	28260	D571	Sickle-cell disease without crisis
Pancytopenia	28419	D61818	Other pancytopenia
Pancytopenia	28412	D61811	Other drug-induced pancytopenia
Pancytopenia	28411	D61810	Antineoplastic chemotherapy induced pancytopenia
Coagulation defects	2869	D689	Coagulation defect, unspecified
Coagulation defects	2869	D688	Other specified coagulation defects
Coagulation defects	2867	D684	Acquired coagulation factor deficiency
Coagulation defects	2867	D6832	Hemorrhagic disord d/t extrinsic circulating anticoagulants
Coagulation defects	2866	D65	Disseminated intravascular coagulation
Coagulation defects	28659	D68318	Oth hemorrhagic disord d/t intrns circ anticoag,antib,inhib
Coagulation defects	28653	D68312	Antiphospholipid antibody with hemorrhagic disorder
Coagulation defects	28652	D68311	Acquired hemophilia
Coagulation defects	2864	D680	Von Willebrand's disease
Coagulation defects	2863	D682	Hereditary deficiency of other clotting factors
Coagulation defects	2862	D681	Hereditary factor XI deficiency
Coagulation defects	2861	D67	Hereditary factor IX deficiency
Coagulation defects	2860	D66	Hereditary factor VIII deficiency
Qualitative platelet defects	2871	D691	Qualitative platelet defects
Primary thrombocytopenia	28731	D693	Immune thrombocytopenic purpura
Primary thrombocytopenia	28730	D6949	Other primary thrombocytopenia
Primary thrombocytopenia	28733	D6942	Congenital and hereditary thrombocytopenia purpura
Primary thrombocytopenia	28732	D6941	Evans syndrome
Primary thrombocytopenia	28731	D693	Immune thrombocytopenic purpura
Primary thrombocytopenia	28739	D693	Immune thrombocytopenic purpura
Primary thrombocytopenia	28730	D6949	Other primary thrombocytopenia
Primary thrombocytopenia	28739	D6949	Other primary thrombocytopenia
Primary thrombocytopenia	28739	D693	Immune thrombocytopenic purpura
Primary thrombocytopenia	28739	D6949	Other primary thrombocytopenia
2ndary thrombocytopenia	28749	D6959	Other secondary thrombocytopenia
2ndary thrombocytopenia	28741	D6951	Posttransfusion purpura
Thrombocytopenia, unspecified	2875	D696	Thrombocytopenia, unspecified
Other specified hemorrhagic conditions	2878	D698	Other specified hemorrhagic conditions
Unspecified hemorrhage conditions	2879	D699	Hemorrhagic condition, unspecified

<b>Other Conditions ICD-9-CM Code Description</b>	<b>ICD-9-CM Code</b>	<b>ICD-10-CM Code</b>	<b>ICD-10-CM Code Description</b>
Primary hypercoagulable state	28981	D6861	Antiphospholipid syndrome
Primary hypercoagulable state	28981	D6862	Lupus anticoagulant syndrome
Primary hypercoagulable state	28981	D6852	Prothrombin gene mutation
Primary hypercoagulable state	28981	D6859	Other primary thrombophilia
Primary hypercoagulable state	28981	D6851	Activated protein C resistance
2ndary hypercoagulable state	28982	D6869	Other thrombophilia
Long-term (current) use of anticoagulants	V5861	Z7901	Long term (current) use of anticoagulants
Long-term (current) use of antiplatelets/ antithrombotics	V5863	Z7902	Long term (current) use of antithrombotics/antiplatelets
Obstructive hydrocephalus	3314	G911	Obstructive hydrocephalus
Congenital hydrocephalus	7423	Q031	Atresia of foramina of Magendie and Luschka
Congenital hydrocephalus	7423	Q038	Other congenital hydrocephalus
Congenital hydrocephalus	7423	Q030	Malformations of aqueduct of Sylvius
Spina bifida with hydrocephalus	74103	Q052	Lumbar spina bifida with hydrocephalus
Spina bifida with hydrocephalus	74102	Q051	Thoracic spina bifida with hydrocephalus
Spina bifida with hydrocephalus	74101	Q050	Cervical spina bifida with hydrocephalus
Spina bifida with hydrocephalus	74100	Q0703	Arnold-Chiari syndrome with spina bifida and hydrocephalus
Spina bifida with hydrocephalus	74100	Q054	Unspecified spina bifida with hydrocephalus
Spina bifida with hydrocephalus	74100	Q0702	Arnold-Chiari syndrome with hydrocephalus
Mechanical complication of CNS device, implant, graft	9962	T85192A	Mech compl of implnt electrnc neurostim of spinal cord, init
Mechanical complication of CNS device, implant, graft	9962	T8509XA	Mech compl of ventricular intracranial shunt, init
Mechanical complication of CNS device, implant, graft	9962	T85199A	Mech compl of implnt electrnc stimult of nervous sys, init
Mechanical complication of CNS device, implant, graft	9962	T85190A	Mech compl of implanted electronic neurostim of brain, init
Infection and inflammatory reaction due to CNS device...	99663	T8579XA	Infect/inflm reaction due to oth int prosth dev/grft, init
Other complications of internal prosthetic device, implant...	99675	T8582XA	Fibrosis due to internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8589XA	Oth complication of internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8586XA	Thrombosis due to internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8585XA	Stenosis due to internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8583XA	Hemorrhage due to internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8584XA	Pain due to internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8581XA	Embolism due to internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8586XA	Thrombosis due to internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8589XA	Oth complication of internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8585XA	Stenosis due to internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8584XA	Pain due to internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8583XA	Hemorrhage due to internal prosth dev/grft, NEC, init
Other complications of internal prosthetic device, implant...	99675	T8582XA	Fibrosis due to internal prosth dev/grft, NEC, init

<b>Other Conditions ICD-9-CM Code Description</b>	<b>ICD-9-CM Code</b>	<b>ICD-10-CM Code</b>	<b>ICD-10-CM Code Description</b>
Other complications of internal prosthetic device, implant...	99675	T8581XA	Embolism due to internal prosth dev/grft, NEC, init
Presence of cerebrospinal fluid drainage device	V452	Z982	Presence of cerebrospinal fluid drainage device
Mucopolysaccharidosis (hydrocephalus and seizure)	2775	E763	Mucopolysaccharidosis, unspecified
Mucopolysaccharidosis (hydrocephalus and seizure)	2775	E761	Mucopolysaccharidosis, type II
Mucopolysaccharidosis (hydrocephalus and seizure)	2775	E7601	Hurler's syndrome
Mucopolysaccharidosis (hydrocephalus and seizure)	2775	E7629	Other mucopolysaccharidoses
Mucopolysaccharidosis (hydrocephalus and seizure)	2775	E7622	Sanfilippo mucopolysaccharidoses
Mucopolysaccharidosis (hydrocephalus and seizure)	2775	E7603	Scheie's syndrome
Mucopolysaccharidosis (hydrocephalus and seizure)	2775	E76219	Morquio mucopolysaccharidoses, unspecified
Encephalocele	7420	Q019	Encephalocele, unspecified
Absence part of brain, agenesis part of brain, agyria...	7422	Q041	Arhinencephaly
Absence part of brain, agenesis part of brain, agyria...	7422	Q042	Holoprosencephaly
Absence part of brain, agenesis part of brain, agyria...	7422	Q043	Other reduction deformities of brain
Congenital cerebral cyst, macrocephaly, etc	7424	Q045	Megalencephaly
Congenital cerebral cyst, macrocephaly, etc	7424	Q046	Congenital cerebral cysts
Congenital cerebral cyst, macrocephaly, etc	7424	Q048	Other specified congenital malformations of brain
Dwarfism, NOS	2594	E343	Short stature due to endocrine disorder
Achondroplastic dwarfism	7564	Q771	Thanatophoric short stature
Achondroplastic dwarfism	7564	Q778	Oth osteochndrdys w defct of growth of tublr bones and spine
Achondroplastic dwarfism	7564	Q784	Enchondromatosis
Achondroplastic dwarfism	7564	Q774	Achondroplasia
Spina bifida	7402	Q002	Iniiencephaly
Spina bifida	7401	Q001	Craniorachischisis
Spina bifida	7400	Q000	Anencephaly
Anomalies of skull face bones. Includes craniosynostosis	7560	Q750	Craniosynostosis
Anomalies of skull face bones. Includes craniosynostosis	7560	Q752	Hypertelorism
Anomalies of skull face bones. Includes craniosynostosis	7560	Q759	Congenital malformation of skull and face bones, unspecified
Tuberous sclerosis	7595	Q851	Tuberous sclerosis
Cerebral cysts	3480	G930	Cerebral cysts
Encephalopathy, NEC	34831	G9341	Metabolic encephalopathy
Encephalopathy, NEC	34839	I6783	Posterior reversible encephalopathy syndrome
Encephalopathy, NEC	34839	G9349	Other encephalopathy
CNS complications from surgically implanted device	3491	G9782	Oth postproc complications and disorders of nervous sys
CNS complications from surgically implanted device	3491	G9782	Oth postproc complications and disorders of nervous sys
CNS complications from surgically implanted device	3491	G9782	Oth postproc complications and disorders of nervous sys
Hemangioma of unspecified site (includes	22802	D1802	Hemangioma of intracranial structures



<b>Other Conditions ICD-9-CM Code Description</b>	<b>ICD-9-CM Code</b>	<b>ICD-10-CM Code</b>	<b>ICD-10-CM Code Description</b>
cavernous malformation			
Phlebitis/thrombophlebitis of intracranial venous sinuses	325	G08	Intracranial and intraspinal phlebitis and thrombophlebitis
Occlusion and stenosis of basilar artery	43301	I6322	Cerebral infrc due to unsp occls or stenosis of basilar art
Occlusion and stenosis of basilar artery	43300	I651	Occlusion and stenosis of basilar artery
Occlusion and stenosis of carotid artery	43310	I6529	Occlusion and stenosis of unspecified carotid artery
Occlusion and stenosis of vertebral artery	43320	I6509	Occlusion and stenosis of unspecified vertebral artery
Occlusion and stenosis of precerebral arteries – multiple and bilateral	43330	I658	Occlusion and stenosis of other precerebral arteries
Occlusion and stenosis of precerebral arteries – other specified	43380	I658	Occlusion and stenosis of other precerebral arteries
Occlusion and stenosis of precerebral arteries - unspecified	43390	I659	Occlusion and stenosis of unspecified precerebral artery
Occlusion of the cerebral arteries – cerebral thrombosis	43400	I6609	Occlusion and stenosis of unspecified middle cerebral artery
Occlusion of the cerebral arteries – cerebral thrombosis	43400	I6619	Occlusion and stenosis of unsp anterior cerebral artery
Occlusion of the cerebral arteries – cerebral thrombosis	43400	I6629	Occlusion and stenosis of unsp posterior cerebral artery
Occlusion of the cerebral arteries – cerebral thrombosis	43400	I6629	Occlusion and stenosis of unsp posterior cerebral artery
Occlusion of the cerebral arteries – cerebral thrombosis	43400	I6619	Occlusion and stenosis of unsp anterior cerebral artery
Occlusion of the cerebral arteries – cerebral thrombosis	43400	I6609	Occlusion and stenosis of unspecified middle cerebral artery
Occlusion of the cerebral arteries – cerebral thrombosis	43401	I6330	Cerebral infarction due to thombos unsp cerebral artery
Occlusion of the cerebral arteries – cerebral thrombosis	43400	I6609	Occlusion and stenosis of unspecified middle cerebral artery
Occlusion of the cerebral arteries – cerebral thrombosis	43400	I6619	Occlusion and stenosis of unsp anterior cerebral artery
Occlusion of the cerebral arteries – cerebral thrombosis	43400	I6629	Occlusion and stenosis of unsp posterior cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I6619	Occlusion and stenosis of unsp anterior cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I6609	Occlusion and stenosis of unspecified middle cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I669	Occlusion and stenosis of unspecified cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I6629	Occlusion and stenosis of unsp posterior cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43411	I6340	Cerebral infarction due to embolism of unsp cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I6619	Occlusion and stenosis of unsp anterior cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I6609	Occlusion and stenosis of unspecified middle cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I6629	Occlusion and stenosis of unsp posterior cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I669	Occlusion and stenosis of unspecified cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I6619	Occlusion and stenosis of unsp anterior cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I6629	Occlusion and stenosis of unsp posterior cerebral artery
Occlusion of the cerebral arteries – cerebral embolism	43410	I6609	Occlusion and stenosis of unspecified middle cerebral artery
Occlusion of the cerebral arteries – cerebral artery occlusion	43491	I6350	Cereb infrc due to unsp occls or stenosis of unsp cereb artery
Occlusion of the cerebral arteries – cerebral artery occlusion	43490	I669	Occlusion and stenosis of unspecified cerebral artery

<b>Other Conditions ICD-9-CM Code Description</b>	<b>ICD-9-CM Code</b>	<b>ICD-10-CM Code</b>	<b>ICD-10-CM Code Description</b>
Occlusion of the cerebral arteries – cerebral artery occlusion	43490	I669	Occlusion and stenosis of unspecified cerebral artery
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4359	I67848	Other cerebrovascular vasospasm and vasoconstriction
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4359	G459	Transient cerebral ischemic attack, unspecified
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4352	G458	Oth transient cerebral ischemic attacks and related synd
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4358	G458	Oth transient cerebral ischemic attacks and related synd
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4358	G451	Carotid artery syndrome (hemispheric)
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4351	G450	Vertebro-basilar artery syndrome
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4353	G450	Vertebro-basilar artery syndrome
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4350	G450	Vertebro-basilar artery syndrome
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4358	G458	Oth transient cerebral ischemic attacks and related synd
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4352	G458	Oth transient cerebral ischemic attacks and related synd
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4350	G450	Vertebro-basilar artery syndrome
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4351	G450	Vertebro-basilar artery syndrome
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4353	G450	Vertebro-basilar artery syndrome
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4350	G450	Vertebro-basilar artery syndrome
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4351	G450	Vertebro-basilar artery syndrome
Transient cerebral ischemia – basilar/vertebral artery syndrome, etc	4353	G450	Vertebro-basilar artery syndrome
Cerebral aneurysm, nonruptured	4373	I671	Cerebral aneurysm, nonruptured
Moyamoya disease	4375	I675	Moyamoya disease
Nonpyogenic thrombosis of intracranial venous sinus	4376	I676	Nonpyogenic thrombosis of intracranial venous system
Other congenital anomalies of circulatory system – coarctation of the aorta	74710	Q251	Coarctation of aorta
Other congenital anomalies of circulatory system – other anomalies of the aorta	74721	Q254	Other congenital malformations of aorta
Other congenital anomalies of circulatory system – other anomalies of the aorta	74720	Q254	Other congenital malformations of aorta
Other congenital anomalies of circulatory system – other anomalies of the aorta	74729	Q254	Other congenital malformations of aorta
Other congenital anomalies of circulatory system – other anomalies of the aorta	74722	Q253	Supravalvular aortic stenosis
Other congenital anomalies of circulatory system – other anomalies of the aorta	74722	Q252	Atresia of aorta
Other congenital anomalies of circulatory system – other anomalies of the aorta	74721	Q254	Other congenital malformations of aorta
Other congenital anomalies of circulatory system – other anomalies of the aorta	74729	Q254	Other congenital malformations of aorta
Other congenital anomalies of circulatory system – other anomalies of the aorta	74720	Q254	Other congenital malformations of aorta
Other congenital anomalies of circulatory system – other anomalies of the aorta	74729	Q254	Other congenital malformations of aorta
Other congenital anomalies of circulatory system – other anomalies of the aorta	74720	Q254	Other congenital malformations of aorta
Other congenital anomalies of circulatory system – other anomalies of the aorta	74721	Q254	Other congenital malformations of aorta
Other specified anomalies of circulatory system (includes arteriovenous malformation) – cerebrovascular	74781	Q283	Other malformations of cerebral vessels

<b>Other Conditions ICD-9-CM Code Description</b>	<b>ICD-9-CM Code</b>	<b>ICD-10-CM Code</b>	<b>ICD-10-CM Code Description</b>
Other specified anomalies of circulatory system (includes arteriovenous malformation) – cerebrovascular	74781	Q282	Arteriovenous malformation of cerebral vessels
Other specified anomalies of circulatory system (includes arteriovenous malformation)	74789	Q288	Oth congenital malformations of circulatory system
Other venous embolism/thrombosis unspecified site	7539	Q649	Congenital malformation of urinary system, unspecified
Other and unspecified intracranial hemorrhage	4329	I629	Nontraumatic intracranial hemorrhage, unspecified
Other and unspecified intracranial hemorrhage	4321	I6200	Nontraumatic subdural hemorrhage, unspecified
Other and unspecified intracranial hemorrhage	4320	I621	Nontraumatic extradural hemorrhage
Personal history of other certain diseases – TIA and cerebral infarction	V1250	Z8679	Personal history of other diseases of the circulatory system
Personal history of other certain diseases – TIA and cerebral infarction	V1250	Z8679	Personal history of other diseases of the circulatory system

## Chart Abstraction Tool

### Overuse of Imaging for the Evaluation of Children with Post-Traumatic Headache

1. Date and time of ED visit with imaging

\_\_\_/\_\_\_/\_\_\_ \_\_\_:\_\_\_

2a. Documentation of trauma

Yes No

2b. Time of trauma within 24 hours

Mark yes if "yesterday" is all that is mentioned, without note of the exact time.

Yes No → If "No" exclude from denominator and STOP.

2c. Was there documentation of a specific time of trauma?

Yes No

2d. Date and time of trauma

\_\_\_/\_\_\_/\_\_\_ \_\_\_:\_\_\_

3a. Was the case included based only on the presence of the ICD-9-CM code for headache (7840)?

Yes No

3b. If yes – Was there clinical documentation of trauma (per Item 2a)?

Yes No → If "No" exclude from denominator and STOP.

4a. Was the case included based only on the presence of the ICD-9-CM code for concussion (8500)?

Yes No

4b. If yes – Was there clinical documentation of headache as a symptom?

Yes No → If "No" exclude from denominator and STOP.

5. Was there documentation of suspected child abuse or neglect in the notes from the ED visit during which neuroimaging was obtained?

Yes No → If "Yes" exclude from denominator and STOP.

6. Was there documentation of history of a medical condition\* that could otherwise warrant imaging in the notes from the ED visit during which neuroimaging was obtained?

Yes No → If "Yes" exclude from denominator and STOP.

*\*Mark "Yes" for medical conditions such as neoplasm and blood disorder, hydrocephalus and CNS anomalies, tuberous sclerosis, dwarfism, hemangioma, phlebitis/thrombophlebitis, intracranial hemorrhage, occlusion of cerebral arteries, moyamoya disease, congenital heart disease, anticoagulation.*

Was there documentation of a severe mechanism of injury?

Mark "Yes" for mechanisms of injury such as penetrating trauma, fall from more than 5 feet, pedestrian struck by vehicle.

Yes  No → If "Yes" exclude from numerator.

Was there documentation of seizure or convulsion associated with trauma?

Yes  No → If "Yes" exclude from numerator.

Was there documentation of loss of consciousness associated with trauma?

Yes  No → If "Yes" exclude from numerator.

Was there documentation of repeated vomiting?

Yes  No → If "Yes" exclude from numerator.

Was there documentation of basilar skull fracture?

Yes  No → If "Yes" exclude from numerator.

Was there documentation of signs of basilar skull fracture?

Mark "Yes" if the following physical examination findings are documented: "Raccoon eyes" (bruising around the eyes/black eyes), Battle's sign (bruising behind one or both ears), hemotympanum (blood behind one or both ear drums).

Yes  No → If "Yes" exclude from numerator.

Was there documentation of a neurologic examination?

Yes  No → If "Yes" exclude from numerator.

Was there documentation of an abnormal neurologic examination, signs and symptoms of intracranial hemorrhage or increased intracranial pressure?

Mark "Yes" if any of the examination findings, signs or symptoms listed below were present in the clinical documentation.

Yes  No → If "Yes" exclude from numerator.

Decreased alertness, confusion, not acting like himself/herself?

Yes  No

Altered mental status

Yes  No

Glasgow Coma Scale Score <14

Yes  No

Papilledema

Yes  No

Diplopia

Yes  No

Abnormal face or eye movements

Yes  No

Asymmetric face or extremity muscle movements

Yes  No

Alerted sensation

Yes  No

Dizziness

Yes  No

Gait disturbance

Yes  No

Lack of coordination

Yes  No