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Subject: Computed Tomography (CT) Head/Brain

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Position Statement	Billing/Coding	Reimbursement	Program Exceptions	Definitions	Related Guidelines
Other	References	Updates			

DESCRIPTION:

Computed tomography (CT) is a radiology modality that provides clinical information in the detection, differentiation, and demarcation of disease. CT is a form of medical imaging that involves the exposure of patients to ionizing radiation. CT should only be performed under the supervision of a physician with training in radiation protection to optimize examination safety. Radiation exposure should be taken into account when considering the use of this technology. This guideline addresses the use of CT of the head/brain for evaluation, diagnosis and management of head/brain related conditions in the outpatient setting.

Summary and Analysis of Evidence: Computed tomography (CT) is a technology that produces cross-sectional images of the body using x-rays. CT is utilized extensively in imaging of the head. CT of the head is superior to magnetic resonance imaging (MRI) for the evaluation of osseous structures, acute intracranial hemorrhage, and the detection of calcification, which can be important for the identification of an abnormality or for refinement of a differential diagnosis. CT of the brain is sufficient and diagnostic in many clinical circumstances, such as in acute trauma, nontraumatic intracranial hemorrhage, evaluation of shunt malfunction, and selected postoperative follow-up. CT is less useful for certain conditions such as neoplastic, infectious, or inflammatory conditions affecting the cranial nerves, brain parenchyma, and meninges. In combination with the clinical history and physical examination findings, CT of the brain is a useful screening tool for indications such as acute mental status change, seizure, acute neurologic deficit, acute headache, and nonacute headache with neurologic findings. CT is useful as a screening modality for the presence of neoplasm and mass effect to which the addition of intravenous (IV) contrast may provide added sensitivity in selected circumstances (ASNR-ASNR-SPR, 2020).

POSITION STATEMENT:

Computed tomography (CT) of the head or brain **meets the definition of medical necessity** for the following:

Evaluation of headache

- Chronic headache with a change in character/pattern (e.g., more frequent, increased severity or duration)

- Cluster headaches or other trigeminal-autonomic cephalgias, (e.g., paroxysmal hemicrania, hemicrania continua, short-lasting unilateral neuralgiform headache attacks (SUNCT/SUNA) imaging is indicated once to eliminate secondary causes
- New acute headache, sudden onset:
    - With a personal or family history (brother, sister, parent, or child) of brain aneurysm or AVM (arteriovenous malformation)
    - < 48 hours of “worst headache in my life” or “thunderclap” headache
    - Prior history of stroke or intracranial bleed
    - Known coagulopathy or on anticoagulation
- New onset of headache with any of the following:
    - Acute, new, or fluctuating neurologic deficits, such as sensory deficits, limb weakness, speech difficulties, visual loss*, lack of coordination, or mental status changes or with signs of increased intracranial pressure (papilledema). * Not explained by underlying ocular diagnosis, glaucoma, or macular degeneration
    - History of cancer or significantly immunocompromised
    - Fever
    - Subacute head trauma
    - Age > 50
    - New severe unilateral headache with radiation to or from the neck, associated with suspicion of carotid or vertebral artery dissection
    - Related to activity or event (sexual activity, exertion, position) (new or progressively worsening)
    - Persistent or worsening during a course of physician-directed treatment.

Note: Neuroimaging warranted for atypical/complex migraine aura, but not for a typical migraine aura.

- Special considerations in the pediatric population with persistent headache
    - Occipital location
    - Age < 6 years
    - Symptoms, indicative of increased intracranial pressure, such as recurring headaches after waking with or without associated nausea/vomiting
    - Documented absence of family history of headache
    - Severe headache in a child with an underlying disease that predisposes to intracranial pathology (e.g., immune deficiency, sickle cell disease, neurofibromatosis, history of neoplasm, coagulopathy, hypertension, congenital heart disease).

Evaluation of neurologic symptoms or deficits

- Acute, new or fluctuating neurologic symptoms or deficits such as sensory deficits, limb weakness, speech difficulties, visual loss*, lack of coordination or mental status changes.

* Not explained by underlying ocular diagnosis, glaucoma, or macular degeneration.

Evaluation of known or suspected stroke or vascular disease

- Known or suspected stroke with any acute, new or fluctuating symptoms or deficits such as sensory deficits, limb weakness, speech difficulties, visual loss*, lack of coordination or mental status changes.

*Not explained by underlying ocular diagnosis, glaucoma, or macular degeneration

- Suspected stroke with first-degree family history of aneurysm (brother, sister, parent, or child) or known coagulopathy or on anticoagulation
- Symptoms of transient ischemic attack (TIA) (episodic neurologic symptoms such as sensory deficits, limb weakness, speech difficulties, visual loss, lack of coordination, or mental status changes)
- Suspected acute subarachnoid hemorrhage (SAH)
- Follow-up for known hemorrhage, hematoma, or vascular abnormalities
- Suspected central venous thrombosis
- Evaluation of neurological signs or symptoms in sickle cell disease.

Evaluation of known or suspected trauma

- Known or suspected trauma or injury to the head with documentation of one or more of the following acute, new or fluctuating:
    - Focal neurologic findings (e.g., ataxia, papilledema, visual field defects, nystagmus, gait disturbances)
    - Motor changes
    - Mental status changes
    - Amnesia
    - Vomiting
    - Seizures
    - Headache
    - Signs of increased intracranial pressure (e.g., headaches, seizures, nausea, vomiting, blurred vision)
- Known coagulopathy or on anticoagulation
- Known or suspected skull fracture by physical exam and/or prior imaging
- Repeat scan 24 hours post head trauma for anticoagulated members with suspected diagnosis of delayed subdural hematoma
- Post concussive syndrome if persistent or disabling symptoms and imaging has not been performed
- Subacute or chronic traumatic brain injury with new cognitive and/or neurologic deficit.

Evaluation of suspected brain tumor, mass, or metastasis

- Suspected brain tumor with any acute, new, or fluctuating neurologic symptoms or deficits such as sensory deficits, limb weakness, speech difficulties, visual loss*, lack of coordination or mental status changes

*Not explained by underlying ocular diagnosis, glaucoma, or macular degeneration

- Suspected brain metastasis or intracranial involvement in members with a history of cancer based on symptoms or examination findings (may include new or changing lymph nodes)
- Langerhans cell histiocytosis with visual, neurological, or endocrine abnormality; polyuria or polydipsia; suspected craniofacial bone lesions, aural discharge, or suspected hearing impairment/mastoid involvement.

Evaluation of known brain tumor, mass, or metastasis

- Follow-up of known malignant brain tumor
- Suspected recurrence with prior history of central nervous system (CNS) cancer (either primary or secondary) based on neurological symptoms or examination findings
- Member with history of CNS cancer (either primary or secondary) and a recent course of chemotherapy, radiation therapy (to the brain), or surgical treatment within the last two (2) years
- Follow-up of known non-malignant tumor/lesion if symptomatic, new/changing signs or symptoms or complicating factors
- Follow-up of known meningioma
- Bone tumor or abnormality of the skull
- Langerhans cell histiocytosis
    - To assess treatment response and surveillance of known brain/skull lesions.

For surveillance post-treatment

Evaluation of known or suspected seizure disorder

- New onset of seizures or newly identified change in seizure activity/pattern.

Evaluation of known or suspected inflammatory disease or infection (e.g., meningitis, or abscess)

- Suspected intracranial abscess or brain infection with acute altered mental status or positive lab findings or follow up assessment during or after treatment completed
- Meningitis with positive signs and symptoms (such as fever, headache, mental status changes, stiff neck) or positive lab findings
- Suspected encephalitis with headache and altered mental status or follow-up as clinically warranted
- Endocarditis with suspected septic emboli
- Central nervous system (CNS) involvement in members with known or suspected vasculitis or autoimmune disease with abnormal inflammatory markers or autoimmune antibodies
- Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up
- Immunocompromised member (e.g., transplant recipients, HIV, primary immunodeficiency syndromes, hematologic malignancies) with focal neurologic symptoms, headaches, behavioral, cognitive, or personality changes.

Evaluation of clinical assessment documenting cognitive impairment of unclear cause

- Change in mental status with a mental status score of either MMSE or MoCA of less than 26 or other similar mental status instruments*/formal neuropsychological testing showing at least mild cognitive impairment and a completed basic metabolic workup (such as thyroid function testing, liver function testing, complete blood count, electrolytes, and B12)

* Examples of other mental status instruments: Ottawa 3DY (O3DY), Brief Alzheimer's Screen (BAS), Blessed Dementia Scale (BDS), caregiver completed AD8 (cAD8), Brief Cognitive Rating Scale (BCRS), Clinical Dementia Rating (CDR).

MMSE-The Mini Mental State Examination (MMSE) is a tool that can be used to systematically and thoroughly assess mental status. It is an 11-question measure that tests five areas of cognitive function:

orientation, registration, attention and calculation, recall, and language. The MMSE has been the most commonly used measure of cognitive function in dementia research, but researchers have recognized that it is relatively insensitive and variable in mildly impaired individuals. The maximum score is 30. A score of 23 or lower is indicative of cognitive impairment. The MMSE takes only 5-10 minutes to administer and is therefore practical to use repeatedly and routinely.

MoCA-The Montreal Cognitive Assessment (MoCA) was designed as a rapid screening instrument for mild cognitive dysfunction. It assesses different cognitive domains: attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation. MoCA differs from the MMSE mainly by including tests of executive function and abstraction, and by putting less weight on orientation to time and place. Ten of the MMSE's 30 points are scored solely on the time-place orientation test, whereas the MoCA assigns it a maximum of six points. The MoCA also puts more weight on recall and attention-calculation performance, while de-emphasizing language skill. Time to administer the MoCA is approximately 10 minutes. The total possible score is 30 points; a score of 26 or above is considered normal.

Evaluation of movement disorders

- Acute onset of a movement disorder with concern for stroke or hemorrhage
- Evaluation of Parkinson's disease with atypical feature or other movement disorder (e.g., suspected Huntington disease, chorea, parkinsonian syndromes, hemiballismus, atypical dystonia) to exclude an underlying structural lesion.

Note: CT has limited utility in the chronic phases of disease. Imaging is not indicated in essential tremor or isolated focal dystonia (e.g., blepharospasm, cervical dystonia, laryngeal dystonia, oromandibular dystonia, writer's dystonia)

Evaluation of cranial nerve and visual abnormalities

- Anosmia (loss of smell) or dysosmia (documented by objective testing) that is persistent and of unknown origin
- Abnormal eye findings on physical or neurologic examination (e.g., papilledema, nystagmus, ocular nerve palsies, new onset anisocoria, visual field deficit)

Note: Not explained by underlying ocular diagnosis, glaucoma, or macular degeneration

- Binocular diplopia with concern for intracranial pathology
- Childhood strabismus with development delay or abnormal fundoscopic exam to rule out intracranial abnormalities
- Horner's syndrome with symptoms localizing the lesion to the central nervous system
- Evaluation of cranial neuropathy when thought to be due to tumor, stroke, or bony abnormalities of the skull base.

Evaluation of known or suspected congenital abnormality (e.g., craniosynostosis, neural tube defects)

- Known or suspected congenital abnormality with any acute, new, or fluctuating neurologic, motor, or mental status changes
- Evaluation of macrocephaly in an infant/child < 18 years of age with previously abnormal ultrasound (US), abnormal neurodevelopmental examination, signs of increased ICP or closed anterior fontanelle
- Microcephaly in an infant/child < 18 years of age
- Evaluation of the corticomedullary junction in achondroplasia
- Craniosynostosis and other head deformities

- Prior treatment or planned treatment for congenital abnormality.

Cerebral spinal fluid (CSF) abnormalities

- Evaluation of suspected hydrocephalus
- Known hydrocephalus
- Known or suspected normal pressure hydrocephalus (NPH)
    - With symptoms of gait difficulty, cognitive disturbance, and urinary incontinence
- Follow-up shunt evaluation with neurologic symptoms that suggest shunt malfunction
- Evaluation of known or suspected cerebrospinal fluid (CSF) leakage
- Cisternography for intermittent and complex CSF rhinorrhea/otorrhea. CSF fluid should always be confirmed with laboratory testing (Beta-2 transferrin assay)
- Suspected spontaneous intra-cranial hypotension with distinct postural headache (other symptoms include nausea, vomiting, dizziness, tinnitus, diplopia neck pain or imbalance).

Pre-operative/procedural evaluation for brain/skull surgery

- Pre-operative evaluation for a planned surgery or procedure.

Post-operative/procedural evaluation

- Follow-up study may be needed to evaluate a member's progress after treatment, procedure, intervention or surgery. Documentation requires a medical reason why additional imaging is needed for the type and area(s) requested for evaluation.

Other indications for brain CT

- Vertigo associated with any of the following:
    - Signs or symptoms suggestive of a CNS lesion (ataxia, visual loss, double vision, weakness or a change in sensation)
    - Progressive unilateral hearing loss
    - Risk factors for cerebrovascular disease with concern for stroke
    - After full neurologic examination and vestibular testing with concern for central vertigo (e.g., skew deviation, vertical nystagmus, head thrust test, video nystagmography (VNG)/ electronystagmography (ENG))
- Diagnosis of central sleep apnea on polysomnogram
    - Children > 1 year of age
    - Adults in the absence of heart failure, chronic opioid use, high altitude, or treatment emergent central sleep apnea and concern for a central neurological cause (e.g., Chiari malformation, tumor, infectious/inflammatory disease) or with an abnormal neurological exam
- Syncope with clinical concern for seizure or associated neurological signs or symptoms
- Cyclical vomiting syndrome or abdominal migraine with any localizing neurological symptoms
- Soft tissue mass of the head with nondiagnostic initial evaluation (ultrasound and/or radiograph)
- Psychological changes with neurological deficits on exam or after completion of a full neurological assessment that suggests a possible neurologic cause

- Global developmental delay or developmental delay with abnormal neurological examination in a child < 18 years of age
- Cerebral palsy if etiology has not been established in the neonatal period, there is change in the expected clinical or developmental profile or concern for progressive neurological disorder
- Unexplained event (brief resolved unexplained event (BRUE)) formerly apparent life-threatening event (ALTE) in infants < 1 year of age with concern for neurological cause based on history and exam
  Note: Imaging is not indicated in low-risk members
- Prior to lumbar puncture in members with suspected increased intracranial pressure or at risk for herniation.

BILLING/CODING INFORMATION:

CPT Coding:

70450	Computed tomography, head or brain; without contrast material
70460	Computerized axial tomography, head or brain; with contrast material(s)
70470	Computerized axial tomography, head or brain; without contrast material, followed by contrast material(s) and further sections
76380	Computed tomography, limited or localized follow-up study

REIMBURSEMENT INFORMATION:

Reimbursement for computed tomography (70450 – 70470, 76380) performed on the same anatomical area is limited to two (2) computed tomography (70450 – 70470, 76380) within a 6-month period. Computed tomography (70450 – 70470, 76380) in excess of two (2) computed tomography (70450 – 70470, 76380) within a 6-month period are subject to medical review of documentation to support medical necessity. Documentation should include radiology reason for study, radiology comparison study-date and time, radiology comparison study observation, radiology impression, and radiology study recommendation.

Reimbursement for computed tomography (70450 – 70470, 76380) for an oncologic condition undergoing active treatment or active treatment completed within the previous 12 months on the same anatomical area is limited to four (4) computed tomography (70450 – 70470, 76380) within a 12-month period. Computed tomography (70450 – 70470, 76380) for an oncologic condition in excess of four (4) computed tomography (70450 – 70470, 76380) within a 12-month period are subject to medical review of documentation to support medical necessity. Documentation should include radiology reason for study, radiology comparison study-date and time, radiology comparison study observation, radiology impression, and radiology study recommendation.

Re-imaging or additional imaging of the head or brain due to poor contrast enhanced exam or technically limited exam is the responsibility of the imaging provider.

LOINC Codes:

The following information may be required documentation to support medical necessity: physician history and physical, physician progress notes, plan of treatment and reason for computed tomography (CT scan) of the head and brain.

Documentation Table	LOINC Codes	LOINC Time Frame Modifier Code	LOINC Time Frame Modifier Codes Narrative
Physician history and physical	28626-0	18805-2	Include all data of the selected type that represents observations made six months or

			fewer before starting date of service for the claim
Attending physician progress note	18741-9	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Plan of treatment	18776-5	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology reason for study	18785-6	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology comparison study-date and time	18779-9	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology comparison study observation	18834-2	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology-study observation	18782-3	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Physician history and physical	28626-0	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Attending physician progress note	18741-9	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim

PROGRAM EXCEPTIONS:

Federal Employee Plan (FEP): Follow FEP guidelines.

Medicare Advantage products:

No Local Coverage Determination (LCD) were found at the time of the last guideline reviewed date.

The following National Coverage Determination (NCD) was reviewed on the last guideline reviewed date: Computed Tomography, (220.1) located at cms.gov.

If this Medical Coverage Guideline contains a step therapy requirement, in compliance with Florida law 627.42393, members or providers may request a step therapy protocol exemption to this requirement if based on medical necessity. The process for requesting a protocol exemption can be found at Coverage Protocol Exemption Request

DEFINITIONS:

Acute: having a short and relatively severe course.

Aneurysm: a sac formed by the dilatation of the wall of an artery, a vein, or the heart; it is filled with fluid or clotted blood, often forming a pulsating tumor.

Arteriovenous malformation: a congenital anomaly of the brain vasculature composed of arterial and venous channels with many interconnecting shunts without a capillary bed; clinical characteristics include hemorrhage, headache, and focal epileptic seizures.

Chiari: an inability to coordinate voluntary muscular movements that is symptomatic of some nervous disorders.

Chronic: persisting over a long period of time.

Congenital anomaly: congenital anomaly present at birth; it may be a malformation, disruption, deformation, or dysplasia.

Hydrocephalus: a condition marked by dilatation of the cerebral ventricles, most often occurring secondarily to obstruction of the cerebrospinal fluid pathways and accompanied by an accumulation of cerebrospinal fluid within the skull.

Meningitis: inflammation of the meninges, usually by either a bacterium (bacterial) or a virus (viral).

Nystagmus: an involuntary, rapid, rhythmic movement of the eyeball, which may be horizontal, vertical, rotatory, or mixed.

Papilledema: edema of the optic disk (papilla), most commonly due to increased intracranial pressure, malignant hypertension, or thrombosis of the central retinal vein.

Thunderclap headaches: a severe headache with sudden onset similar to a clap of thunder, with maximum intensity within 1 minute.

RELATED GUIDELINES:

Computed Tomographic Angiography (CTA) Heart, 04-70450-03

Computed Tomography (CT) Abdomen and Pelvis 04-70450-22

Computed Tomography (CT), Extremity (Upper & Lower) 04-70450-24

Computed Tomography (CT), of the Neck for Soft Tissue Evaluation 04-70450-20

Computed Tomography (CT), Spine (Cervical, Thoracic, Lumbar) 04-70450-23

Computed Tomography (CT), Temporal Bone/Mastoid & Maxillofacial 04-70450-19

Computed Tomography (CT), Thorax 04-70450-21

Computed Tomography to Detect Coronary Artery Calcification, 04-70450-02

Whole Body Computed Tomography (CT), 04-70450-25

OTHER:

Other name used to report computed tomography (CT):

CAT scanning
Computed tomography scanning
Computerized axial tomography

Pediatric Examinations

The use of CT in pediatric examinations requires assessment of the risks, benefits and use of the studies. The lowest possible radiation dose consistent with acceptable diagnostic image quality should be used in pediatric examinations. Radiation doses should be determined periodically based on a reasonable sample of pediatric examinations. Technical factors should be appropriate for the size and the age of the child and should be determined with consideration of parameters (e.g., characteristics of the imaging system, organs in the radiation field, lead shielding).

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COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 06/25/26.

GUIDELINE UPDATE INFORMATION:

09/15/09	New Medical Coverage Guideline.
01/01/10	Revised Florida Blue Radiology Management program exception section.
07/15/11	Scheduled review; revised position statement for trauma-deleted with symptoms of neurological deficits (e.g., one sided weakness, paralysis, loss of muscle control, increased muscle tone, loss of muscle tone, gait disturbance, lack of coordination, ataxia, speech impairments, facial numbness, vision deficits), deleted headache and replaced with acute onset of headache, deleted criteria for headache: increased frequency or severity (progressively) gets worse over days or weeks), headache with fever, nuchal rigidity (stiff neck), headache with mental status changes, headache with nausea and vomiting, unexplained by physical findings, headache with focal neurological signs (e.g., ataxia, papilledema, visual field defects, nystagmus, gait disturbances), added 76380, revised limitation to two (2) within a 6-month period and updated the references.
10/01/11	Revision; formatting changes.
05/15/12	Revised and expanded position statement for; trauma, headache, brain, cerebrovascular accident, aneurysm/arteriovenous malformation, inflammatory disease or infection, post-operative evaluation and other section. Deleted but is not limited to. Updated references.
08/15/13	Scheduled review; MCG subject changed to “Computed Tomography Head/Brain”. Added indication to headache section: headache with a change in character/pattern (e.g., more frequent, increased severity or duration) to headache section. Added “symptom or” to Evaluation of Neurologic Deficits heading (Evaluation of Neurological Symptoms or Deficit). Updated definitions, program exceptions and reference sections.
05/15/14	Added limitation statement for an oncologic condition; limited to four (4) computed tomography within a 12-month period.
02/15/15	Annual review; indications revised (skull fracture, headache, aneurysm/AVM, inflammatory disease or infection, congenital anomaly, seizure). Added pre-operative evaluation for brain/skull surgery and combination studies. Deleted evaluation of neurological symptoms or deficits. Updated references.
03/15/18	Revision; revised position statement. Added position statement for seizure disorder, neurologic symptoms or deficits, cognitive impairment, inflammatory disease or infection, normal pressure hydrocephalus, combination CT. Updated references.
11/15/19	Revised position statement for (seizure disorder, suspected trauma, headache, brain tumor, mass or metastasis, CVA, inflammatory disease or infection, congenital abnormality, other indications for brain CT, combination studies). Updated references.
04/15/20	Review/revision. Revise and expand criteria for: trauma, headache, brain (tumor, mass or metastasis), cerebrovascular accident (CVA)/stroke, inflammatory disease or infection, hydrocephalus, other indications for brain CT). Expanded criteria for congenital abnormality and combination studies.
03/15/21	Review/revision. Added indication and criteria for: cognitive impairment, movement disorder, cranial nerve and visual abnormalities, cerebral spinal fluid abnormalities, pre-operative/procedural evaluation for brain/skull surgery. Revised and expanded criteria for: headache, stroke, vascular disease, trauma, brain (tumor, mass, metastasis), inflammatory disease or infection, congenital abnormality, other indications for brain CT and combination studies. Revised post-operative/procedural evaluation. Added indication and criteria for: cognitive impairment, movement disorder, cranial nerve and visual abnormalities, cerebral spinal fluid abnormalities, pre-operative/procedural evaluation for brain/skull surgery. Updated references.
07/01/22	Revision to Program Exceptions section.
09/30/23	Review: position statements and references updated.
07/15/24	Review; no change in position statement.
07/15/25	Review; no change in position statement.
07/15/26	Review; no change in position statement.