Effective for dates of service on or after April 1, 2013, refer to: https://www.bcbsal.org/providers/policies/careCore.cfm

Name of Policy:
Computed Tomography and Computed Tomographic Angiography of the Head and Neck

Policy #: 275  Latest Review Date: February 2013
Category: Radiology  Policy Grade: A

Background/Definitions:
As a general rule, benefits are payable under Blue Cross and Blue Shield of Alabama health plans only in cases of medical necessity and only if services or supplies are not investigational, provided the customer group contracts have such coverage.

Medical Necessity means that health care services (e.g., procedures, treatments, supplies, devices, equipment, facilities or drugs) that a physician, exercising prudent clinical judgment, would provide to a patient for the purpose of preventing, evaluating, diagnosing or treating an illness, injury or disease or its symptoms, and that are:

1. In accordance with generally accepted standards of medical practice; and
2. Clinically appropriate in terms of type, frequency, extent, site and duration and considered effective for the patient’s illness, injury or disease; and
3. Not primarily for the convenience of the patient, physician or other health care provider; and
4. Not more costly than an alternative service or sequence of services at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of that patient’s illness, injury or disease.
**Description of Procedure or Service:**

Computerized axial tomography (CAT) or computed tomography (CT) uses a highly collimated x-ray beam that passes through the patient and is differentially absorbed by tissue. The photons are detected and imaged, and contrast is dependent on the differential absorption of the photons by the tissue being studied. On axial CT, each revolution of the gantry around the patient produces one data set or slice. In other CT technology, the x-ray tube rotates continually (i.e., helical CT), allowing a continuous volume of transaxial data to be acquired rapidly and yielding slices at a rate of more than one slice per second at a thickness of 1mm or less. Gating refers to the use of programs to time data acquisition with organ movements, such as the heart or lungs. Per the American College of Radiology (ACR), the definition of CT angiography (CTA) is a CT examination that is primarily performed for assessment of the heart, arteries, or veins of the body. It requires at a minimum a thin section helical (spiral) CT acquisition coupled with a power injection of intravenous iodinated contrast medium. Three dimensional rendering and multiplanar reformations are important components of many CTA examinations.

**Policy:**

**Effective for dates of service on or after April 1, 2013, refer to:**
https://www.bcbsal.org/providers/policies/careCore.cfm

**Effective for dates of service on or after July 1, 2006 through March 31, 2013:**
Computed tomography of the head or brain meets Blue Cross and Blue Shield of Alabama’s medical criteria for coverage for the following conditions:
- Stroke
- Transient ischemia attack (TIA)
- Suspected subarachnoid hemorrhage (SAH)
- Headache
- Seizure
- Central nervous system (CNS) infection or abscess (effective September 1, 2010)
- Follow-up evaluation of AVM
- Hydrocephalus
- Trauma
- Brain tumor (effective September 1, 2010)

Computed tomography of the head or brain meets Blue Cross and Blue Shield of Alabama’s medical criteria for coverage following conditions:
- Suspected neonatal hemorrhage
- Follow-up evaluation of intracranial abscess
- Follow-up evaluation of primary brain tumor
- Central nervous system evaluation for brain metastases
- Follow-up evaluation of post-intracranial procedure, e.g. craniotomy, craniectomy
- Follow-up evaluation post CNS shunt placement
- Suspected CNS involvement with systemic disease, including but not limited to:
  - Systemic lupus
o Erythematous
o Vasculitis
o HIV
o Sarcoidosis
- Macrocephaly
- Microcephaly
- Craniosynostosis
- Suspected subdural hematoma (SDH)

**Effective for dates of service February 1, 2007 through March 31, 2013:**
- Central Nervous System (CNS) infection or abscess
- Follow-up evaluation of intracranial infection or abscess

**Effective for dates of service September 1, 2007 through March 31, 2013:**
- Arnold Chiari Malformation
- Dandy Walker Cyst
- Fibrous Dysplasia
- Encephalocele
- Astrocytoma
- Medulloblastoma
- Cephalohematoma
- Hemangioblastoma
- Ependymoma
- Glioma
- Glioblastoma Multiforme

**Computed tomography of the maxillofacial area or neck meets** Blue Cross and Blue Shield of Alabama’s medical criteria for coverage for the following conditions:
- **Complicated** acute sinusitis with progression of symptoms even with medical management
- Recurrent acute sinusitis (3 or more episodes within 1 year) (effective September 1, 2010)
- Chronic sinusitis (rhinosinusitis) (symptoms lasting 8 weeks or longer of varying intensity) (effective September 1, 2010)
- Suspected sinus or nasopharyngeal tumor (effective September 1, 2010)
- Submandibular or salivary gland mass or pathology
- Mucocele or nasal polyp
- Head or neck cancer
- Trauma
- Cough, work up of chronic (cough lasting more than 3 weeks)
- Parotid mass
- Suspected head and neck abscess
- Neck mass after equivocal ultrasound
- Airway obstruction by neck mass
- Suspected parathyroid tumor or pathology
• Thyroid nodule, goiter or mass
• Suspected recurrent medullary thyroid carcinoma
• Suspected submandibular duct stone
• Suspected laryngeal fracture
• Facial, orbital or head trauma
• Suspected sinus malignancy
• Evaluation of vocal cord paralysis or hoarseness
• Lymphoma

**Computed tomography of the orbit, sella or posterior fossa, outer, or middle ear meets** Blue Cross and Blue Shield of Alabama medical criteria for coverage the following conditions

• Head or neck cancer
• Suspected orbital tumor or other pathology
• Suspected unilateral proptosis, orbital, periorbital mass or tumor
• Unusual presentation of Bell’s Palsy
• Suspected temporal bone, mastoid or ear disease, including but not limited to:
  
  o Mastoiditis
  o Cholesteatoma
  o Evaluation of cochlear implants
  o Conductive hearing loss
  o Nystagmus
  o Acoustic neuroma
  o Sensorineural hearing loss
  o Cerebellar pontine angle tumor
• Trauma
• Extraocular myopathy

**Effective for dates of service February 1, 2007 through March 31, 2013:**

• Suspected submandibular duct stone or other salivary gland pathology
• Suspected unilateral proptosis, orbital, or periorbital mass or other pathology
• Optic neuritis or suspected optic neuritis
• Unusual presentation of Bell’s Palsy
• Mucocele or nasal polyp
• Suspected temporal bone, mastoid or ear disease including but not limited to:
  
  o Evaluation of tinnitus
  o Evaluation of vertigo
  o Evaluation of congenital anomaly of the ear
  o Evaluation of severe infections of the ear

**Effective for dates of service July 27, 2007 through March 31, 2013:**

**Computed tomography of the orbit, sella or posterior fossa, outer, or middle ear meets** Blue Cross and Blue Shield of Alabama medical criteria for coverage the following conditions

• Cochlear implant evaluation
• Congenital hearing loss
Effective for dates of service September 1, 2007 through March 31, 2013:
- Visual field loss
- Congenital anomaly of the orbit
- Otosclerosis
- Suspected pituitary disease

Computed tomography for perfusion imaging does not meet Blue Cross and Blue Shield of Alabama’s medical criteria for coverage when used for the evaluation of patients with acute stroke or for triaging stroke patients for thrombolytic therapy and is considered investigational. Please refer to Blue Cross and Blue Shield of Alabama’s medical policy #204, Computed Tomography Perfusion Imaging, for additional information.

**Computed Tomography Angiogram (CTA), Carotid**
Computed tomographic angiography for pre-operative study for carotid endarterectomy or angioplasty meets Blue Cross and Blue Shield of Alabama’s medical criteria for coverage for the following conditions:
- Symptomatic and asymptomatic carotid stenosis
- Suspected anterior circulation ischemia

**Computed tomographic angiography of head and neck meets** Blue Cross and Blue Shield of Alabama’s medical criteria for coverage for the following disorders:
- Cavernous hemangioma
- Arterial and venous aneurysm
- Traumatic injuries to arteries and veins
- Arterial dissection and intramural hematoma
- Arterial and venous thromboembolism
- Non-atherosclerotic, noninflammatory vasculopathy
  - Congenital vascular anomalies
  - Anatomic variants
  - Vascular interventions (percutaneous and surgical)
  - Vasculitis and collagen vascular diseases
  - Vascular infection
  - Vertebro-basilar insufficiency
  - Carotid body tumor
  - Preoperative evaluation of neck mass
  - TIA by history with clinical changes

Individual case consideration will be given to patients with conditions not described above. Clinical notes will be required for review.

*Blue Cross and Blue Shield of Alabama does not approve or deny procedures, services, testing, or equipment for our members. Our decisions concern coverage only. The decision of whether or not to have a certain test, treatment or procedure is one made between the physician and his/her patient. Blue Cross and Blue Shield of Alabama administers benefits based on the members' contract and corporate medical policies. Physicians should always exercise their best
medical judgment in providing the care they feel is most appropriate for their patients. Needed care should not be delayed or refused because of a coverage determination.

**Key Points:**

**Stroke or TIA**

Computed tomography (CT) scanning is the preferred method for imaging hyperacute stroke. It is widely available, can be performed on patients who have a pacemaker or are on a ventilator, and can be performed quickly on confused, delirious patients. Interpretation in the hyperacute stroke setting is fairly straightforward without the need for specialists. The American Heart Association and American Stroke Association have also published Guidelines for the Early Management of Patients with Ischemic Stroke. These two associations state that CT remains the most widely used neuroimaging technique for the evaluation of patients with suspected acute ischemic stroke.

Conventional magnetic resonance imaging (MRI) shows essentially the same parenchymal changes as seen on CT scanning, but with a greater degree of sensitivity and specificity. MRI is becoming the primary noninvasive modality for stroke imaging. MRI lacks the exposure to ionizing radiation. The disadvantage of higher cost and of availability is increasing. Many acute care centers continue to lack access to an on-site 24 hour MRI. Some absolute and relative contraindications to MRI, in addition to availability, are cardiac pacemakers and certain metallic implanted substances. Claustrophobia is more common in MRI than CT.

Patients presenting with focal neurological deficits should be evaluated for the possibility of stroke. Therapy must be started within three hours of acute ischemic stroke symptom onset. A baseline CT scan must be performed before therapy initiation. Contrast enhancement of CT scans seldom improves detection of acute stroke, but it may distinguish ischemic lesions from some types of neoplasms. Small hemorrhages may not be detected by CT scanning during the first few hours but may not have clinical importance. Hemorrhages become more evident with time, appearing on repeat scans hours to weeks after infarction.

Strokes are distinguished from TIAs arbitrarily, as ischemia-induced neurologic deficits persisting for less than 24 hours. Nearly all TIAs resolve more rapidly, and a deficit that persists for more than one or two hours is likely to be associated with permanent brain damage, often demonstrable by CT or MRI, despite clinical recovery. The important distinction between a TIA and a stroke is whether the ischemia has caused brain infarction or selective ischemic necrosis.

**Subarachnoid Hemorrhage (SAH)**

The classic symptom of a subarachnoid hemorrhage is a very rapidly developing, severe headache, typically called the “worst headache of my life”. Sentinel headaches are frequently severe and may be accompanied by nausea or vomiting and may cause meningeal irritation. Some patients may experience elevated body temperature. Nearly one half of patients whose intracranial pressure exceeds cerebral mean arterial pressure have alteration of mental status and coma. Acute subarachnoid hemorrhage that causes meningeal irritation may also lead to the development of nuchal rigidity and photophobia. Preretinal hemorrhages may also be discovered on ophthalmic exam. Patients should be sent for an emergency CT scan. CT scans performed
within 24 hours of onset usually reveal an area of high signal attenuation consistent with hemorrhage. CT scans without contrast have 90% sensitivity. If CT is not available, the patient should be transferred to a facility where CT is available. If the CT scan is normal but the suspicion of subarachnoid hemorrhage still exists, a lumbar puncture is usually diagnostic with a constant number of red blood cells in each tube. Cerebral angiography is the definitive study to identify the source of subarachnoid hemorrhage.

**Headache**

A CT scan of the head is useful for detecting accumulation of blood such as subdural hematomas and subarachnoid hemorrhages. It is moderately useful in detecting brain tumors and strokes not due to hemorrhage. MRI can detect subdural and epidural hematomas, herpes simplex infection of the brain, strokes, tumors, and arterial aneurysms. Lumbar puncture may be required in some instances if the CT scan is normal.

A doctor should be consulted when the headache is severe (the worst ever), different than usual headaches, starts suddenly during exertion, aggravated by exertion, coughing, bending or sexual activity, associated with nausea and vomiting, associated with stiff neck, fever, dizziness, blurred vision, slurred speech, unsteady gait, weakness or unusual sensations of the arm or leg, excessive drowsiness or confusion, associated with seizures, associated with recent head trauma or fall, not responding to treatment and is getting worse, disabling and interfering with work and quality of life, and requires more than the recommended dose of over-the-counter analgesics for relief.

**Seizure**

The American College of Emergency Physicians (ACEP) has published policy statements and clinical policies regarding the evaluation and management of adult patients presenting to the emergency department with seizures. The indications and timing of head CT scans in patients with a first-time seizure are controversial. A multidisciplinary collaboration between emergency medicine, neurology and neuroradiology using evidence-based clinical policy on neuroimaging of patients with a first-time seizure was published in 1996. Determination of neuroimaging was categorized into emergent, urgent and routine. The recommendation was that a head CT scan be performed in the emergency department whenever an acute intracranial process is suspected. Others have stated that neuroimaging should be performed because of discovery of an epileptogenic lesion can have effects on the patient and treatment of new-onset seizures. MRI improves diagnostic accuracy. In some instances electroencephalogram (EEG) should be performed within 24 hours of the seizure. Others have recommended that EEG should not be performed until at least two or more seizures have occurred.

There are a number of potential causes for acute symptomatic seizures. Metabolic derangements may precipitate seizure activity such as hypo or hypernatremia, hypo or hyperglycemia, hyperosmolality, hypocalcemia, respiratory alkalosis. Seizures may be drug induced. Illnesses such as eclampsia, hypertensive encephalopathy, liver failure, renal failure, sickle cell disease may result in seizures. Other neurologic conditions may instigate seizures, such as meningitis, encephalitis, acute head trauma, stroke, brain abscess or tumor.
Head Trauma
The major goals of the evaluation of the head injured patient are to diagnose the type of brain injury, to determine if the patient is deteriorating neurologically, and to decide what type of immediate medical or surgical intervention is required. Minor head injury with brief loss of consciousness is generally considered an indication for CT scanning and a period of close observation. The National Collaborating Center for Acute Care has developed guidelines regarding head injury. The statements regarding the use of CT scanning are that the current primary investigation of choice for the detection of acute clinically important brain injuries is CT imaging of the head. For safety, logistic and resource reasons, MRI is not currently indicated as the primary investigation for clinically important brain injury in patients who have sustained a head injury. It is recognized that additional information of importance to the patient’s prognosis can sometimes be detected by just a MRI. Patients with the following risk factors should have a CT requested provided they have experienced some loss of consciousness or amnesia since the injury: age greater than or equal to 65 years, coagulopathy, dangerous mechanism of injury, or a lower threshold for height of falls should be used when dealing with infants and young children (i.e., less than five years). The best evidence on selecting patients with head injury for imaging exists for adults and children and infants have a lower risk of brain and cervical spine injury than adults, validated adult rules on imaging of the head and cervical spine may be safely used in children and infants.

CNS Infection, Follow-up of Intracranial Abscess
In patients with suspected bacterial meningitis, there are patients that should undergo CT scanning prior to LP. Those patients include those who are immunocompromised, have a history of CNS disease, new onset of seizure, papilledema and abnormal level of consciousness, and focal neurologic deficit. Brain and CNS abscesses originate in or extend from extracerebral locations and produce symptoms and findings similar to those of other space-occupying lesions, such as brain tumors. Brain abscesses, often progress more rapidly than tumors and more frequently affects meningeal structures. Clinical manifestations may be minimal or absent. Most have a normal body temperature and fewer than one third show a peripheral white cell count greater than 11,000. Neck stiffness is rare in the absence of increased intracranial pressure. Otherwise, many features are similar to those of any expanding intracranial mass. Headache of recent onset is the most common symptom, along with disturbed consciousness, fever, nuchal rigidity, nausea, vomiting, seizures visual disturbances, hemiparesis and sepsis. LP examination is not useful in diagnosis because the findings range from normal to those of purulent meningitis. Computed tomography and MRI are useful for diagnosis of brain abscesses and for monitoring response to therapy.

Follow-up of Primary Brain Tumor, CNS Evaluation for Brain Metastases
Generalized symptoms that typically resemble increased intracranial pressure that often accompany cerebral tumors include headaches, lethargy, personality change, nausea, and vomiting. Lateradlizing symptoms that may reflect the location of the tumor include hemiparesis, hemisensory deficits, aphasia, visual field impairment, and seizures. MRI is far superior to CT scans and should be used in all patients suspected of having an intracranial tumor. When MRI suggests a primary brain tumor, there is no need for an extensive systemic search for a possible source of metastasis. Brain metastases are more common than primary brain tumors, but occur in patients with known cancer, typically with active systemic disease. Positive emission
tomography (PET) has been evaluated as a means of identifying brain metastases. PET studies in small number of patients have been associated with low sensitivity and specificity rates in the detection of brain metastases. Whole body PET is more useful in locating the primary lesion and sites of extracranial metastases in a patient with documented brain metastases.

**AVM**
Angiography remains the definitive test to identify the AVM and delineate its size, gross morphology, feeding arteries, and draining veins. If a hemorrhage has occurred, there may be evidence on unenhanced CT scanning of bleeding in an unusual location for primary intracerebral hemorrhage or a ruptured aneurysm. Contrast-enhanced CT scans may demonstrate marked enhancement of the feeding arteries and draining veins. MRI can also establish the diagnosis.

**Post Craniotomy**
Complete excision is the goal for a primary brain tumor. Surgical excision can often be accomplished for primary extra-axial tumors, such as meningiomas and acoustic neuromas.

**Post CNS Shunt Placement**
CT can assess the size of ventricles and other structures. MRI can evaluate for Chiari malformation or cerebellar or periaqueductal tumors. After shunt insertion, confirmation of correct positioning is obtained with plain x-ray. EEG is used if seizure occurs.

**CNS Involvement with Systemic Disease**
Symptoms demonstrated in neuropsychiatric manifestations in systemic lupus erythematosus (SLE) would be evaluated as necessary. The same would apply for HIV and sarcoidosis. These include evaluations of headache, meningitis, seizures, etc.

**Hydrocephalus, Macrocephaly, Microcephaly, Craniosynostosis**
CT can assess the size of ventricles and other structures. MRI can evaluate for Chiari malformation or cerebellar or periaqueductal tumors. Ultrasound through the anterior fontanel in infants is useful for possible development of progressive hydrocephalus. Hydrocephalus is diagnosed through clinical neurological evaluation and by using cranial imaging techniques such as ultrasonography, CT, MRI, or pressure monitoring. For craniosynostosis, skull x-ray with anterior-posterior, lateral and Water views. Prematurely fused sutures are identified by the absence of sutures and associated ridging of the suture line. Cranial CT scan with 3-dimensional reconstruction is not required for most infants and is sometimes obtained when surgery is being considered.

**Subdural hematoma (SDH)**
CT scan needs to be performed on an emergent basis when an acute SDH is suspected and should be obtained immediately after stabilizing the patient. On a contrast-enhanced CT scan, the chronic SDH membrane will enhance to varying degrees, depending on numerous factors. MRI is less useful in diagnosing an acute SDH. MRI may be helpful in imaging chronic SDH when CT images are difficult to interpret. MRI can be useful to evaluate associated parenchymal brain injury.
Arnold Chiari Malformation, Dandy Walker Cyst
Imaging for posterior fossa malformations is best done with MRI, especially images. The now routine inclusion of these inclusions of these images in any MRI study of the head has led to the discovery of a number of asymptomatic Chiari I malformations and asymptomatic cases of syringomyelia. (Goetz: Textbook of Clinical Neurology, 3rd ed.)

Encephalocele
Imaging using both MRI and CT scanning with bone windows is important for the evaluation of encephaloceles to outline their content and anatomical relationships for treatment planning. (Goetz: Textbook of Clinical Neurology, 3rd ed.)

Glioma, Astrocytoma, Medulloblastoma, Ependymoma
Low-grade gliomas are often seen as diffusely hypodense or isodense lesions with some flattening of the cortical gyral areas on CT or significant changes on T2-weighted images on MRI. There is correspondingly less edema formation. Often, low-grade tumors do not enhance or there may be very small areas of enhancement that become more evident on triple-dose gadolinium injection. Patients should be followed closely during the first years after diagnosis to establish the biological behavior of the tumor. To facilitate comparison, radiological scanning should be performed in a standardized manner using exclusively MRI or CT. The differential diagnoses of ependymomas include other CNS tumors such as medulloblastoma and low-grade glioma. Gadolinium MRI should be done prior to surgery to evaluate the entire neuroaxis. Although CT scans are more readily available and may reveal evidence of hydrocephalus, all patients should undergo MRI with gadolinium. Occasionally, subarachnoid seeding is evident on initial imaging. CT or MRI scans usually demonstrate a hypodense mass with variable heterogeneous enhancement. Once the diagnosis has been established, patients should receive craniospinal MRI with gadolinium enhancement to study the entire neuroaxis for tumor dissemination. This also allows examination of the resection bed without worry about postoperative enhancement caused by the surgery. MRI evaluation may be superior to CSF evaluation to detect dissemination. If MRI of the spine is contraindicated, myelography can be performed with cytological evaluation of CSF at least two weeks after surgery. (Goetz: Textbook of Clinical Neurology, 3rd ed.)

Head or Neck Abscess
Computed tomography and MRI are useful for diagnosis of brain abscesses and for monitoring response to therapy. Lateral neck radiography and mandible series x-rays along with chest radiography may be the first line of imaging. CT scans with contrast are the gold standard in evaluation of deep neck infections. MRI is not the initial modality of choice because of the increased time and expense involved in obtaining an MRI result. However, when obtained, MRI scans can give excellent soft tissue resolution to help localize the region of involvement. Ultrasounds do not reveal anatomic details but can help distinguish between phlegmon and abscess. Arteriography may be helpful when carotid, jugular, or innominate involvement is suggested.

Head or Neck Cancer
When cancer is highly suspected and before definitive surgical intervention, computed tomography scanning from the base of skull to the clavicles, preferable with the spiral technique, and a chest radiograph should be obtained. MRI provides added information in evaluating soft
tissue involvement especially in the base of the tongue, parapharyngeal spaces, and for sinus tumors. MRI can distinguish between soft tissue masses and retained secretions, whereas CT is more helpful in assessing bone invasion. PET scanning is a potential adjunct, but its precise role remains to be defined.

**Neck Mass or Node**
CT scanning of the neck has become a very helpful tool in diagnostically difficult cases. It can distinguish cystic from solid lesions, define the origin and full extent of deep, ill-defined masses, and when used with contrast can delineate vascularity or blood flow. CT should be obtained to detect an unknown primary lesion and to help with staging purposes. Lucent changes within nodes, size larger than 1.5cm, and loss of sharpness of nodal borders are often signs of metastatic carcinoma. Unsatisfactory aspirates should be repeated, and negative aspirates should be followed up with a repeat examination and fine needle aspiration biopsy (FNAB) a month later.

**Obstructive Thyroid Nodule and Goiter**
Fine-needle aspiration of thyroid masses has become the standard of care, replacing ultrasonography and radionuclide scanning in the assessment of thyroid nodules, although ultrasound may be performed to determine if the mass is cystic or to guide FNAB for small nodules. If there are significant obstructive signs, CT or MRI can determine size and obstruction. The presence of pressure symptoms requires evaluation for substernal extension of the thyroid gland, which is best performed by CT or MRI. If neither is available, radiography can reveal tracheal deviation, and pulmonary function tests can document inspiratory impairment.

**Nasopharyngeal Tumor**
Preferred examinations include the following: clinical examination of the neck, fiberoptic examination, CT scanning of the nasopharynx and neck, and MRI of the nasopharynx and neck. The role of CT is well established. CT remains the most common modality for tumor mapping and nodal staging, because access to MRI remains limited. MRI is superior to CT in demonstrating the extent of soft tissue tumors.

**Parathyroid Tumor**
Renal impairment, volume depletion, and anti-calciuretic agents, such as thiazide diuretic and parathyroid hormone are clinically relevant factors that can reduce renal calcium excretion and provoke hypercalcemia. If a parathyroid tumor causing excretion of excess parathyroid hormone is the cause of hypercalcemia then surgical parathyroidectomy is the only definitive treatment for hyperparathyroidism. Non-invasive studies may be required for localization such as ultrasonography, CT and MRI.

**Recurrent Medullary Thyroid Carcinoma**
A palpable tumor is the most common physical finding in the patient with medullary thyroid carcinoma (MTC). The tumor is usually firm and located in the middle or upper lobes of the gland. The tumor is a tumor of the calcitonin-producing cells of the thyroid gland. The ultimate effect is a decrease in blood calcium levels with an increased production of calcitonin. Ultrasonography cannot distinguish benign from malignant nodules. Radioiodine imaging can determine the functional status of a node. CT and MRI can be used to evaluate the soft-tissue
extension of large or suspicious masses in to the neck, trachea, and esophagus and to assess cervical lymph node metastases.

Submandibular Duct Stone
The radiological evaluation includes plain radiography, ultrasound, conventional sialography and CT. Large, well-calcified stones can usually be recognized on a plain radiographic study. Smaller or faintly calcified stones are more likely to be detected using CT. The majority of sialoliths occurs in the submandibular gland or its duct and are a common cause of acute and chronic infections.

Laryngeal Fracture
CT scanning is the imaging modality of choice to assess laryngeal anatomy. CT scanning can help detect laryngeal fractures in a patient with no clinical signs or symptoms. In patients with minor injuries and minimal symptoms (e.g., edema, ecchymosis, small hematomas), a CT scan is unlikely to provide new information that would alter treatment. Similarly, a patient with airway compromise and clinically obvious fractures requires aggressive surgical treatment regardless of CT findings.

Facial or Orbital Trauma
CT is replacing plain films in the evaluation of orbital trauma because of higher sensitivity and better definition of the injuries. When CT is not available or there is low suspicion without ocular symptoms plain films can be used. Orbital blow-out fractures may require CT scanning to evaluate the floor and medial wall of the orbit. CT scanning may not be needed in the emergent setting if the patient has no ocular injury or entrapment. However, in patients with a decrease in visual acuity, this test is helpful in diagnosing direct optic nerve involvement in the fracture and the presence of retroocular edema or hematoma, which can stretch the optic nerve. The indications for CT include detection of suspected fractures and preoperative planning.

Orbital Tumor
Space-occupying lesions that increase orbital volume may result in proptosis of the globe and may adversely affect visual and extraocular muscle function. CT scan can produce detailed axial and coronal views of soft tissue and bony structures. Image windows from 1.0-3.0 mm in thickness allow for detailed evaluation of orbital masses. Contrast-enhanced images may be obtained and can help identify inflammatory processes, vascular tumors, and engorged vessels. Calcified lesions are discernible without the addition of contrast.

Extraocular Myopathy
Orbital ultrasound can quickly confirm if patient has thickened muscles. CT or MRI may not always be necessary for diagnosis but MRI in most instances is the imaging technique of choice.

Bell’s Palsy
MRI is the imaging method of choice. In patients with unilateral facial palsy a detailed history should be taken and thorough clinical examination carried out. Should no recovery take place within the expected period of time further radiological investigations such as CT or MRI should be performed?
Sinusitis
The American Academy of Pediatrics has issued clinical guidelines for management of sinusitis. Imaging studies are not necessary to confirm a diagnosis of clinical sinusitis in children less than 6 years of age. The need for radiographs as a confirmatory test of acute sinusitis in children older than 6 years with persistent symptoms and for all children (regardless of age) with severe symptoms is controversial. CT scans of the paranasal sinuses should be reserved for patients in whom surgery is being considered as a management strategy. CT scans are indicated in children who present with complications of acute bacterial sinus infections that are not responsive to medical management. Plain sinus x-rays and other imagings are usually not necessary in making the diagnosis of acute sinusitis. In patients who have not responded to three weeks of continuous antibiotic therapy consider limited coronal CT scan of sinuses and/or referral to ear, nose, and throat provider.

Sinus Malignancy
CT scanning of the paranasal sinuses with contrast is particularly important in the initial assessment of sinus malignancies because of the superior capability of the CT scan to demonstrate bony involvement. MRI is also very useful in determining the extent of sinus disease. MRI can differentiate between inspissated secretions and tumor, not always possible with CT. MRI can also evaluate subtle soft tissue changes.

Temporal, Mastoid and Ear
CT is an excellent technique for demonstrating even small abnormalities of the thin and complex bony structures of the middle ear. It is the modality of choice for study of conductive hearing loss. Established indications for CT encompass complex conditions such as the acute and chronic otomastoiditis, post-operative ear in chronic otomastoiditis, or in the localization of prosthetic devices, and the assessment of congenital or vascular anomalies. The extent of bone erosion associated with cholesteatoma is demonstrated by high resolution CT. Fistulization through the tegmen tympani or the posterior wall of temporal bone is usually detectable by CT, the actual involvement of meninges and veins are better assessed by MRI. Other conditions in this category that have not previously been diagnosed but suspected would include but not limited to: ear infections, nystagmus, tinnitus, and vertigo.

Mucocele or Polyp
Plain film examination of the sinuses may be used to identify the density location. On CT, virtually all mucoceles appear as an expansile, non-enhancing sinus mass. On MRI, a mucocele will have varying signal intensities. When MR contrast agents are given the sinus mucous will enhance at the periphery of the non-enhancing secretions.

Vocal Cord Paralysis
Causes of vocal cord paralysis are varied and the majority classes as either toxic or idiopathic. Many times sectional may not be able to identify a lesion. With multidetector CT, this has allowed more definitive analysis of the larynx for determining the presence of ipsilateral vocal cord paralysis. Evaluation may include laryngoscopy, bronchoscopy and esophagoscopy as well as a neurological exam. Enhanced CT of the head, neck and chest, a thyroid gland scan and an upper GI series may also be indicated.
Cochlear Implant Evaluation
Cummings’ textbook of Otolaryngology: Head and Neck Surgery states that for medical and surgical evaluation for cochlear implant patients high resolution computed tomography (HRCT) is the gold standard for implantation. HRCT assists with ear selection and the evaluation of inner ear morphology, patency of the cochlea, position of the facial nerve, location of large mastoid emissary veins, size of the facial recess, thickness of the parietal bone, and height of the jugular bulb. The American Academy of Otolaryngology-Head and Neck Surgery also cite that under radiologic evaluation that computed tomography or magnetic resonance imaging scans may be taken to evaluate the inner ear.

Congenital Hearing Loss
Robson discussed the role of high resolution CT and MRI in contributing to the establishment of the etiology of congenital hearing impairment. The author states that these methods along with genetic testing can significantly improve treatment for certain kinds of hearing loss.

Preoperative Study for Endarterectomy/Angioplasty Planned
Carotid computerized tomography angiography (CTA) represents a reliable means of estimating the degree of stenosis of both extracranial and intracranial vessels. By using available multisection CT scanner, extracranial carotid stenosis can be diagnosed to a degree of accuracy equal to or exceeding catheter-based angiography. Overall accuracy for carotid CTA exceeds 95%.

Cough
In patients with cough, the starting point is the medical history and physical examination. Per the “ACCP Evidence-Based conical Practice Guidelines for Diagnosis and Management of Cough”, patients with chronic cough, uncommon causes should be considered when cough persists after evaluation for common causes (receiving an angiotensin-converting enzyme inhibitor, smoker, asthma, GERD, respiratory tract infection, etc.) and when the diagnostic evaluation suggests that an uncommon cause, pulmonary or extrapulmonary may be contributing. Until uncommon causes that potentially may be contributing to the patient’s cough have been ruled out, the diagnosis of unexplained cough should note be made. When a cough persists after consideration of the most common diseases; a chest CT should be performed and possibly a bronchoscopic evaluation.

Lymphoma
NCCN criteria for workup and follow-up of Hodgkin Disease/Lymphoma and Non-Hodgkin’s Lymphoma have listed CT of the neck if radiation therapy is planned. Chest/abdominal/pelvic CT with contrast of diagnostic quality are also among the recommended imaging workups. Restaging with PET-CT as integrated or a PET with a diagnostic CT is recommended.

Cavernous Hemangioma
A CT scan detects an oval or round shaped, sharply margined, homogenous lesion. Uptake of contrast medium by this tumefaction is highly variable and has limited diagnostic value. Computerized tomography should not be solely relied upon since it does not allow one to make a definitive diagnosis. A well-defined, oval to round, typically intraconal mass is seen with minimal enhancement. With large, long-standing lesions, molding of bone and internal
calcification may occur. On MRI the lesion is isointense on T1 and hyperintense on T2 with respect to muscle. Signal voids represent calcific phleboliths. Enhancement with gadolinium is moderate.

**CT Angiography**

CT angiography is a proven and useful procedure for the detection and characterization of vascular diseases and of vascular anatomy relevant to the treatment of extravascular disorders. CT angiography may be used as the primary modality for detecting disease or as an adjunctive tool for better characterizing known disease or assessing changes in disease state over time. CT angiography should be performed only for a valid medical reason and with the minimum radiation exposure that provides the image quality necessary for adequate diagnostic information. (ACR Practice Guideline for the Performance and Interpretation of CT Angiography)

The number of Computer Tomography (CT) scanners continues to increase as well as the usage of those scanners. It is estimated that more than 62 million CT scans per year are currently done in the United States, including at least 4 million children.

Conventional radiography doses of radiation are much smaller than CT; an abdominal CT delivers about 50 times more radiation to the stomach than conventional x-ray. Data has been gathered on the correlating radiation exposure and subsequent cancer rates from the Japanese survivors of atomic bombs, it is estimated by Brenner and Hall that 1.5% to 2.0% of cancers in the U.S. could be attributable to CT radiation. One study is now underway to gather direct data on CT-associated cancer with results not being available for some years. Per the December 6, 2007, Journal Watch, a recent survey suggested that many physician are unaware of radiation doses and potential risks associated with CT. (Radiology 2004; 231:393)

**Key Words:**

Computed tomography, CT, computerized tomography, computerized axial tomography, CAT, computed tomographic angiography, CTA

**Approved by Governing Bodies:**

Not applicable

**Benefit Application:**

Coverage is subject to member’s specific benefits. Group specific policy will supersede this policy when applicable.

ITS: Home Policy provisions apply
BellSouth/AT&T contracts: No special consideration
FEP contracts: Special benefit consideration may apply. Refer to member’s benefit plan.
Wal-Mart: Special benefit consideration may apply. Refer to member’s benefit plan.
Pre-certification requirements: Effective for dates of service on or after November 1, 2007, required when ordered by a provider in a Blue Cross and Blue Shield of Alabama’s Preferred or Participating Network for a patient covered by Blue Cross and Blue Shield of Alabama who will receive outpatient imaging services(s) from a Preferred Medical Doctor (PMD) or Preferred Radiology Participating (PRP) provider for dates of service on or after November 1, 2006.

Exceptions to the Alabama PMD and PRP pre-certification requirement: NASCO, Wal-Mart, Blue Advantage, Flowers Foods, Inc., FEP.

In addition to the above Blue Cross and Blue Shield of Alabama PMD/PRP Network requirement, some self-insured national account groups may require pre-certification for all MRIs effective for dates of service on or after January 1, 2009. Please confirm during your benefit verification process if a pre-certification is required.

Reviews to verify accuracy of pre-certification information will be conducted.

Pre-determination requirements: Not required. May be done as a courtesy to physicians and members not included in the circumstances described in the above Pre-certification requirements.

Coding:
CPT Codes:

- **70450** Computed tomography, head or brain; without contrast material
- **70460** Computed tomography, head or brain; with contrast material(s)
- **70470** Computed tomography, head or brain; without contrast material, followed by contrast material(s) and further sections
- **70480** Computed tomography, orbit, sella, or posterior fossa or outer, middle, or inner ear; without contrast material
- **70481** Computed tomography, orbit, sella or posterior fossa or outer, middle or inner ear; with contrast material(s)
- **70482** Computed tomography, orbit, sella or posterior fossa or outer, middle, or inner ear; without contrast material, followed by contrast material(s) and further sections
- **70486** Computed tomography, maxillofacial area; without contrast material
- **70487** Computed tomography, maxillofacial area; with contrast material(s)
- **70488** Computed tomography, maxillofacial area; without contrast material, followed by contrast material(s) and further sections
- **70490** Computed tomography, soft tissue neck; without contrast material
- **70491** Computed tomography, soft tissue neck; with contrast material(s)
- **70492** Computed tomography, soft tissue neck; without contrast material, followed by contrast material(s) and further sections
- **70496** Computed tomographic angiography, head, with contrast material(s), including noncontrast images, if performed, and image postprocessing
- **70498** Computed tomographic angiography, neck, with contrast material(s), including noncontrast images, if performed, and image postprocessing
- **76380** Computed tomography, limited or localized follow-up study
References:
12. Cincinnati Children’s Hospital Medical Center. Evidence based clinical practice guideline for medical management of first unprovoked seizure in children 2 to 18 years of age, Cincinnati Children’s Hospital Medical Center, July 2002.

Policy History:
Medical Policy Group, March 2006
Medical Policy Group, May 2006
Medical Policy Administration Committee, June 2006
Available for comment, May 30-July 13, 2006
Medical Policy Group, January 2007
Medical Policy Administration Committee, January 2007
Available for comment January 12-February 25, 2007
Medical Policy Group, September 2007
Medical Policy Administration Committee, October 2007
Available for comment October 23-December 6, 2007
Medical Policy Group, December 2007
Medical Policy Group, December 2008
Medical Policy Group, February 2009
Medical Policy Administration Committee, March 2009
Available for comment February 24-April 9, 2009
Medical Policy Group, July 2009
Medical Policy Administration Committee, August 2009
Available for comment August 10-September 23, 2009
Medical Policy Group, August 2010: Added coverage indications
Medical Policy Administration Committee, September 2010
Available for comment September 4-October 18, 2010
Medical Policy Group, February 2013: Updated policy with link to CareCore National medical policies effective April 1, 2013
Medical Policy Administration Committee, March 2013
Available for comment February 15 through March 31, 2013
Medical Policy Group, November 2013: Updated link to CareCore National
This medical policy is not an authorization, certification, explanation of benefits, or a contract. Eligibility and benefits are determined on a case-by-case basis according to the terms of the member’s plan in effect as of the date services are rendered. All medical policies are based on (i) research of current medical literature and (ii) review of common medical practices in the treatment and diagnosis of disease as of the date hereof. Physicians and other providers are solely responsible for all aspects of medical care and treatment, including the type, quality, and levels of care and treatment.

This policy is intended to be used for adjudication of claims (including pre-admission certification, pre-determinations, and pre-procedure review) in Blue Cross and Blue Shield’s administration of plan contracts.