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## Administrative Guideline

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## Head & Neck Imaging

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BY ACCEPTING THESE DOCUMENTS, I ACKNOWLEDGE ACCEPTANCE OF THE FOLLOWING TERMS AND CONDITIONS FOR ACCESS AND USE OF THE CLINICAL GUIDELINES:

AIM Specialty Health (AIM) has developed proprietary clinical appropriateness guidelines (together with any updates, referred to collectively as the “Guidelines”). The Guidelines are designed to evaluate and direct the appropriate utilization of high technology diagnostic imaging services. They are based on data from the peer-reviewed scientific literature, from criteria developed by specialty societies and from guidelines adopted by other health care organizations. Access to these Guidelines is being provided for informational purposes only. AIM is under no obligation to update its Guidelines. Therefore, these Guidelines may be out of date.

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The Guidelines do not constitute medical advice and/or medical care, and do not guarantee results or outcomes. The Guidelines are not a substitute for the experience and judgment of a physician or other health care professionals. Any clinician seeking to apply or consult the Guidelines is expected to use independent medical judgment in the context of individual clinical circumstances to determine any patient’s care or treatment. The Guidelines do not address coverage, benefit or other plan specific issues.

The Guidelines are provided “as is” without warranty of any kind, either expressed or implied. AIM disclaims all responsibility for any consequences or liability attributable or related to any use, non-use or interpretation of information contained in the Guidelines.
Use of AIM’s Diagnostic Imaging Guidelines:
AIM’s proprietary clinical appropriateness guidelines are designed to evaluate and direct the appropriate utilization of elective, high technology advanced imaging services. In the process, multiple functions are accomplished:

- To promote the most efficient and cost-effective use of evidence-based advanced imaging services
- To assist the practitioner as an educational tool
- To encourage standardization of medical practice patterns and reduce variation in clinical evaluation
- To curtail the performance of inappropriate, elective advanced imaging studies
- To reduce the performance of duplicate advanced imaging studies
- To advocate biosafety issues, including unnecessary radiation exposure (for CT and plain film radiography) and MRI safety concerns
- To enhance quality of healthcare for elective advanced imaging studies, using evidence-based medicine and outcomes research from numerous resources

AIM Guideline Development Process and Resources:
AIM reviews its proprietary clinical appropriateness guidelines on an ongoing basis, throughout the year based on the results of the research and development process and feedback from physicians and other providers. New Guidelines are also developed as needed.

Development of appropriate use criteria within AIM guidelines is based on objective medical evidence including assessment of potential benefits and harms. The resources considered during AIM guideline development can include but are not limited to:

- Professional Society Guidelines
- Professional Society Appropriate Use Criteria
- Agency for Healthcare Research and Quality (AHRQ) Comparative Effectiveness Guidelines
- Recommendations from the United States Preventive Services Task Force
- National Guideline Clearinghouse
- Centers for Medicare and Medicaid Services (CMS) * When variances occur, Medicare NCD and LCD determinations will be used instead of AIM guidelines for Medicare Advantage patients
- Initiatives sponsored by Specialty Licensing Boards, including but not limited to Choosing Wisely recommendations
- National Guideline Clearinghouse
- The latest scientific and clinical peer-reviewed literature

Guideline Review:
AIM’s proprietary guidelines for appropriate use of advanced imaging are reviewed routinely by:

- An External Expert Panel, consisting of physicians from multiple specialties and practice settings across the United States
- Health Plan Medical Directors
- Other clinical reviewers, under the governance of our clients’ state regulatory agencies
- Subject matter specialty physician experts and primary care physicians
Standard Anatomic Coverage for Multiple Simultaneous Imaging Requests

The major area of concern is contiguous body parts where clinical signs and symptoms may be coming from abnormalities involving either region or different modalities can be considered to evaluate the same anatomy for the same clinical problem. These are areas where ordering multiple tests before the results of any of the tests are known lead to inappropriate imaging.

General Considerations for Multiple Simultaneous Imaging Requests

Rapid breakthroughs in technology, with attendant rise of new imaging tests available to improve patient management, have created a dilemma for clinicians. Many factors in choosing the right test now come into play. One must consider basic data in the decision-making process. Considerations include the possible effect on patient management, the pretest probability that the patient is affected by a particular disease, the prevalence of the disease in the population, and the accuracy (sensitivity/specificity) of the test. When a screening approach is adopted, rather than targeting the particular test or anatomic site with the highest pretest probability of success, the possibility of one or more of the tests being superfluous and not contributing meaningfully to patient management increases to an unacceptable level.

For this reason, simultaneous ordering of multiple examinations may subject these examinations to more intensive levels of review than would be the case if these same tests were ordered sequentially. Depending on the clinical situation, one or more of the requested studies might not meet medical necessity criteria until the results of the lead study are known.

Common Indications for Multiple Simultaneous Imaging Requests

- The initial diagnosis/staging or follow-up of oncology patients
- Follow-up of patients who have had operative procedures on multiple anatomic sites
- Patients in whom the suspected anatomic abnormality might extend into multiple regions, such as diverticulitis or suspected syringomyelia

Common Inappropriate Multiple Simultaneous Imaging Requests

- Brain MRA ordered routinely with brain MRI without vascular indications
- Brain CT ordered simultaneously with sinus CT for headache
- Multiple levels of spine MRI’s or CT’s for diffuse back pain or radicular symptoms
- Cervical spine and shoulder MRI’s ordered simultaneously for shoulder pain
- Pelvic or hip MRI’s ordered simultaneously with lumbar spine MRI for hip pain
- Pelvic CT ordered routinely with abdominal CT for suspected upper quadrant disease processes
- CT Angiography (CTA) utilizes the data obtained from standard CT imaging. Request for a CT exam, in addition to CT Angiography of the same anatomic area AND during the same imaging session, is inappropriate
Imaging Considerations for all Exams

- Duplicative testing or repeat imaging of the same anatomic area with same or similar technology may be subject to high-level review and may not be medically necessary unless there is a persistent diagnostic problem or there has been a change in clinical status (e.g., deterioration) or there is a medical intervention which warrants interval reassessment.
- Request for re-imaging due to technically limited exams is the responsibility of the imaging providers.
- In general, follow-up exams should be performed only when there is a clinical change, with new signs or symptoms.
- AIM’s clinical guidelines do not supersede the enrollee’s health plan medical policy specific to a given exam for a given anatomic structure.

Imaging Considerations Specific to CT and CTA

- Advantages of CTA over MRA include higher sensitivity for detection of mural calcification; usually shorter scan time, which results in less motion, pulsation and turbulent flow artifact; avoidance of MRA in-plane flow as a cause of apparent exaggerated stenosis; more facile detection of surgical clips and stents.
- Disadvantages of CTA include radiation exposure and use of intravascular iodinated contrast material.
- Multi-detector row CT is preferred but not required in the performance of CTA, when compared with single detector CT.
- CTA studies are typically performed through acquisition of thin CT sections, during intravenous bolus infusion of iodinated contrast material.
- Contrast-enhancement for CT/CTA may be contraindicated in certain circumstances, such as a documented allergy to intravenous contrast material and renal insufficiency. Special consideration should also be given to patients with multiple myeloma.
- CT Angiography (CTA) utilizes imaging data from standard CT acquisitions. Request for a CT exam in addition to CT Angiography of the same anatomic area during the same imaging session is inappropriate.

Imaging Considerations Specific to MRI and MRA

Patient Compatibility Issues:

- Artifact due to patient motion may have a particularly significant impact on exam quality.
- Metallic implants present in spine and brain.
- Eye and brain for metallic foreign bodies.
- Breath hold requirements:
  - Some imaging sequences require breath holding and this may be difficult or impossible for some patients.
- Claustrophobic patients:
  - Patients with claustrophobia may need to be premedicated in order to tolerate the imaging procedure. Rarely patients with severe claustrophobia will not be suitable candidates for imaging.

Biosafety Issues:

- Ordering and imaging providers are responsible for considering biosafety issues prior to MRI/MRA examination, to ensure patient safety. Among the generally recognized contraindications to MRI/MRA exam performance are permanent pacemakers (some newer models are MRI/MRA compatible and others may be safe depending on sequences used; contact imaging facility for substantiation), implantable cardioverter-defibrillators (ICD), intracranial aneurysm surgical clips that are not compatible with MR imaging, as well as other devices considered unsafe in MRI scanners (including certain implanted materials in the patient as well as external equipment, such as portable oxygen tanks).
- Contrast utilization is at the discretion of the ordering and imaging providers.
Ordering Issues:

- The CPT code assignment for an MRI procedure is based on the anatomic area imaged. Requests for multiple MRI exams of the same anatomic area to address patient positional changes, additional sequences or equipment are not allowed. These variations or extra sequences are included within the original imaging request.

- There are rare circumstances when both CT and MRI exams should be ordered for the same clinical presentation. The specific rationale for each study must be delineated at the time of request.

- There are uncommon circumstances when both MRA and CTA should be ordered for the same clinical presentation. The specific rationale must be delineated at the time of request.

- Advantages of MRA, compared with CTA include avoidance of radiation exposure as well as intravascular administration of iodinated contrast material.

- Disadvantages of MRA, compared with CTA, include lower sensitivity for detection of mural calcification; usually longer scanning time, with potential for greater motion, pulsation and turbulent flow artifact; in-plane flow causing apparent exaggerated stenosis; greater difficulty in identifying surgical clips and stents.

Reference/Literature Review


Computed Tomography (CT) Head

CPT Codes

- 70450................. CT of head, without contrast
- 70460................. CT of head, with contrast
- 70470................. CT of head, without contrast, followed by re-imaging with contrast

Standard Anatomic Coverage

- From the skull base to vertex, covering the entire calvarium and intra-cranial contents
- Scan coverage may vary, depending on the specific clinical indication

Imaging Considerations

- MRI of the head is preferable to CT in most clinical scenarios, due to its superior contrast resolution and lack of beam-hardening artifact adjacent to the petrous bone (which may limit visualization in portions of the posterior fossa and brainstem on CT). Notable exceptions to the use of head MRI as the neuroimaging procedure of choice are: acute intra-cranial hemorrhage (parenchymal, subarachnoid; subdural; epidural); initial evaluation of recent craniocerebral trauma; osseous assessment of the calvarium, skull base and maxillofacial bones, including detection of calvarial and facial bone fractures; and evaluation of calcified intracranial lesions
- MRI is more sensitive for detection of shearing trauma to the brain and diffuse axonal injury. It is also the preferred technique for assessment of subacute and chronic intra-cranial hemorrhage
- CT of the head is an alternative exam in patients who cannot undergo MRI
- For CT imaging of the orbits, internal auditory canals (IACs) or temporal bones, see CPT codes 70480-70482
- According to Medicare’s correct coding edits, a CT of the head is not usually performed with a CT of the orbits. These studies are generally considered mutually exclusive procedures
- Imaging studies of the head and neck are inherently bilateral. Duplicate requests for bilateral studies to image the right and left side of the head are inappropriate
- Screening for metastatic disease in a patient with stage I non-small cell lung cancer (NSCLC) in the absence of neurologic symptoms is not indicated
- CT is not typically indicated for sudden hearing loss in the absence of other neurological findings

Common Diagnostic Indications For All Age Groups

The following diagnostic indications for head CT are accompanied by pre-test considerations as well as clinical supporting data and prerequisite information

Abnormalities detected on other imaging studies which require additional clarification to direct treatment

Acoustic neuroma (acoustic schwannoma, vestibular schwannoma)

Diagnosis
- See diagnosis of sensorineural hearing loss (SNHL)

Management
- When symptoms suggest recurrence or progression

Surveillance
- Post therapy: baseline and 12 months after surgery
- Conservative treatment or incomplete resection at 6, 18, 30, 42 months
Common Diagnostic Indications

Cerebrovascular accident (CVA or stroke) and transient ischemic attack (TIA)
- May present with a variety of signs and symptoms, including sudden onset of weakness, focal sensory loss or speech disorder
- Among patients being evaluated for CVA and possible thrombolytic therapy, unenhanced CT is often performed as the initial modality (within the initial 24 hours after symptom onset), to detect a possible hemorrhagic stroke or mass lesion

CNS findings / deficits – new onset or progressively worsening neurological abnormality
- Including but not limited to the following clinical symptoms and findings:
  - Anosmia (loss or impairment in sense of smell)
  - Ataxia (inability to coordinate voluntary muscular movements)
  - Bell’s palsy
  - Dysgeusia (dysfunction in sense of taste)
  - Facial numbness
  - Gait disorder
  - Hoarseness
  - Other movement disorders
  - Nystagmus (rapid, involuntary, oscillating ocular movements)
  - Paresis or paralysis
  - Other cranial nerve impairment

Note: Contrast-enhanced MRI, unless contraindicated, is generally recommended for evaluation of cranial nerve impairment

Congenital anomaly – not otherwise listed
- Including but not limited to the following conditions:
  - Dandy-Walker spectrum
  - Encephalocele
  - Holoprosencephaly
  - Macrocephaly
  - Microcephaly
  - Schizencephaly
  - Septo-optic dysplasia

Chiari Malformation (Arnold-Chiari Malformation)

Craniosynostosis

Dementia
- Initial evaluation, if MRI is contraindicated; OR
- Rapid progression, if MRI is contraindicated

Headache in adult – when any one of the following criteria is met
- Sudden onset and severe, including thunderclap or worst headache of life; OR
- Progressively worsening with increased frequency and severity over short timeframe and/or despite physician supervised appropriate therapy; OR
- With new focal neurologic signs, particularly papilledema, visual field defects and nuchal rigidity; OR
- New-onset headaches in a cancer or immunodeficient patient
Common Diagnostic Indications

Hemorrhage / hematoma
- Refers to non-traumatic, non-CVA and non-tumor-related intra-cranial bleed. Examples include hypertensive hemorrhage and hemorrhage secondary to anti-coagulation or bleeding diathesis
- CT is the preferred technique for evaluation of acute intra-cranial hemorrhage
- MRI is usually preferred for evaluation of subacute and chronic hemorrhage

Hydrocephalus (ventriculomegaly)
- MRI is often the preferred modality for initial evaluation of patients with hydrocephalus. For patients with an indwelling shunt, CT is usually adequate in the diagnostic follow-up of hydrocephalus

Increased intracranial pressure or herniation

Infectious or inflammatory process
- Including but not limited to the following:
  - Cerebral or cerebellar abscess
  - Encephalitis (including limbic encephalitis) 11,12
  - Meningitis
  - Neurocysticercosis
  - Opportunistic infection, particularly with immunosuppressed or other immunodeficient conditions
  - Subdural empyema

Mental status changes, with documented objective evidence from neurologic exam

Movement disorders
- Including Parkinson’s disease (particularly atypical cases with poor response to levodopa, in which there may be an underlying structural disorder producing parkinsonian features); Huntington’s disease; idiopathic sporadic cerebellar ataxia (olivopontocerebellar atrophy); and other conditions

Multiple sclerosis and other white-matter diseases, when MRI is contraindicated or not tolerated
- Initial diagnosis; OR
- Periodic scans to assess asymptomatic progression in multiple sclerosis during the course of disease; OR
- Tracking the progress of multiple sclerosis to establish a prognosis or evaluation of response to treatment; OR
- To evaluate changes in neurologic signs and symptoms

Neurocutaneous disorders
- Including but not limited to the following:
  - Neurofibromatosis
  - Sturge-Weber syndrome
  - Tuberous sclerosis
  - Von Hippel-Lindau disease (VHL)

Neuroendocrine abnormality suggestive of a pituitary lesion
- MRI is usually preferred over CT for evaluation of pituitary lesions
- Relevant laboratory and clinical abnormalities are required
Common Diagnostic Indications

Papilledema

Post-operative or post-procedure evaluation

Pre-operative or pre-procedure evaluation

Note: This indication is to be used for pre-operative evaluation of conditions not specifically referenced elsewhere in this guideline

Prior to lumbar puncture

Seizure disorder

- New onset; OR
- Increasing frequency; OR
- Increasing severity; OR
- Prior to the discontinuation of antiepileptic medications in a patient without prior MRI

Sensorineural hearing loss (SNHL) - Diagnosis

- Contraindication to MRI; AND
- Confirmed by audiogram or auditory brainstem reflex; AND
- Suggestive of a retrocochlear cause
  - Sudden onset
  - Asymmetric/unilateral

Syncope

- Syncope (complete loss of consciousness) and near syncope (partial loss of consciousness)
  When any of the following (a-c) applies:
  a. Seizure activity was witnessed or is highly suspected at the time of the syncope
  b. There is an abnormality on neurological examination
  c. The patient has at least one persistent neurological symptom

Tinnitus – Diagnosis

- Contraindication to MRI; AND
- After audiometry
- Suggestive of retrocochlear pathology
  - Unilateral/asymmetric
  - Sudden onset
  - Secondary neurological signs
- Suggestive of a vascular etiology
  - Pulsatile
Common Diagnostic Indications

Trauma to head
- CT is usually preferred for the initial evaluation of acute head trauma, due to the high sensitivity for hemorrhage and ability to display fractures
  - Particularly when associated with:
    - Calvarial fracture (as demonstrated on plain film radiography)
    - Change in mental status or amnesia
    - Focal neurological deficits
    - Loss of consciousness
    - Seizures
    - Signs of increased intracranial pressure
    - Nausea / vomiting
    - Worsening headaches
  - Suspected hemorrhage, or subdural or epidural hematoma

Tumor evaluation – benign and malignant
- Including but not limited to the following lesions:
  - Primary intra-cranial tumors
  - Metastatic disease

Unexplained mass lesion identified on prior imaging – surveillance, without pathologic tissue confirmation
- Examples include suspected arachnoid cyst or epidermoid cyst

Vascular abnormalities
- Including but not limited to:
  - Aneurysm
  - Arteriovenous malformation (AVM)
  - Cavernous malformation
  - Cerebral vein thrombosis
  - Dural arteriovenous fistula (DAVF)
  - Dural venous sinus thrombosis
  - Venous angioma

Note: Either CTA or MRA may be preferred

Ventricular shunt assessment

Vertigo and dizziness
- With recurrent or persistent symptoms and when evaluation for other etiologies has not been revealing
  - Abnormal audiogram or auditory brainstem response

Visual disturbance – such as visual field loss, diplopia and other alterations in vision that are unexplained by ophthalmologic exam and patient history
Common Diagnostic Indications

When the patient’s condition meets the head MRI guidelines, but MRI is either contraindicated or the patient is claustrophobic and cannot tolerate MRI examination

References

CT Angiography (CTA) Head: Cerebrovascular

CPT Codes
70496.................. Computed tomographic angiography, head, with contrast material(s), including noncontrast images, if performed, and image postprocessing

Standard Anatomic Coverage
- CTA may be performed to assess the major intra-cranial arteries of the anterior and posterior circulations (including the Circle of Willis) as well as the venous structures (major veins and dural venous sinuses)
- For specific clinical indications, exams may be tailored to the region of interest

Imaging Considerations
- CTA of the head is an alternative exam in patients who cannot undergo MRA
- During diagnostic interpretation, it is extremely useful to have images displayed on a workstation capable of multiplanar reformations and three-dimensional reconstructions

Common Diagnostic Indications
The following diagnostic indications for head CTA are accompanied by pre-test considerations as well as clinical supporting data and prerequisite information

Abnormalities detected on other imaging studies which require additional clarification to direct treatment

Aneurysm
- Including but not limited to:
  - Follow-up of known or suspected intra-cranial aneurysm, OR
  - Family history of intra-cranial aneurysm, OR
  - Associated hereditary disorders, such as autosomal dominant Polycystic Kidney Disease (10-20% occurrence of aneurysm), Ehlers Danlos syndrome type IV and Neurofibromatosis type

Arteriovenous malformation (AVM)

Congenital anomalies of the cerebral circulation

Dural arteriovenous fistula (DAVF)

Dissection

Endovascular neuro-interventional procedure for intra-cranial aneurysm, arteriovenous malformation (AVM) and dural arteriovenous fistula (DAVF): for post-treatment evaluation

Headache: sudden onset of worst headache of life; exertional headache; positional headache

Intra-cranial hemorrhage
- For identification of the source of hemorrhage
Common Diagnostic Indications

Intramural hematoma

Multiple sclerosis

- Evaluation of venous structures to assess for venous stenosis as a cause of multiple sclerosis, and referred to as chronic cerebrospinal venous insufficiency or CCSVI is considered not medically appropriate. MRV in preparation for either a neurosurgical or percutaneous procedure to treat multiple sclerosis is therefore considered not medically appropriate.

Post-operative or post-procedural evaluation

Pre-operative evaluation or pre-procedure evaluation

Note: This indication is to be used for pre-operative evaluation of conditions not specifically referenced elsewhere in this guideline

Pulsatile tinnitus, diagnosis

- Demonstrated on head CT or MRI

Stenosis or occlusion of carotid and cerebral arteries

- In patients with clinically suspected or known steno-occlusive disease
- In adult patients (atherosclerotic disease being a common etiology) and pediatric population (etiologies include Moyamoya or idiopathic progressive arteriopathy of childhood)
- Common clinical manifestations may include:
  - Confusion
  - Difficulty speaking or understanding speech
  - Dizziness
  - Gait Disturbance
  - Loss of Balance or Coordination
  - Loss of Consciousness
  - Numbness, weakness or paralysis of the face, arm or leg, on one side of the body
  - Sudden severe headache, that is unexplained
  - Visual disturbance, particularly in one eye
Common Diagnostic Indications

Stenosis or occlusion of vertebral and basilar arteries

- In patients with signs and symptoms of Vertebrobasilar Insufficiency (VBI) or Vertebral Basilar Ischemia
- Symptoms of VBI are usually temporary, due to diminished blood flow in the posterior circulation of the brain
- Common clinical manifestations may include:
  - Acute Sensorineural Hearing Loss
  - Ataxia
  - Diplopia
  - Dysarthria
  - Dysphagia
  - Facial Numbness and Paresthesias
  - Limb and Trunk Sensory Deficits
  - Loss of Taste Sensation
  - Motor Paresis
  - Nystagmus
  - Syncope
  - Vertigo
  - Visual Field Defects

Thromboembolic disease of major intra-cranial arterial and/or venous systems, including dural venous sinus thrombosis

Traumatic vascular injury

Vascular abnormalities associated with sickle cell disease in children

Vascular supply to tumors

Vasculitis

References

CPT Codes

70551.................. MRI Head, without contrast
70552.................. MRI Head, with contrast
70553.................. MRI Head, without contrast, followed by re-imaging with contrast

Standard Anatomic Coverage

- From skull base to vertex, covering the entire calvarium and intra-cranial contents, including the internal auditory canals
- Scan coverage may vary, depending on the specific clinical indication

Imaging Considerations

- MRI of the head is preferable to CT in most clinical scenarios, due to its superior contrast resolution and lack of beam-hardening artifact adjacent to the petrous bone (which may limit visualization in portions of the posterior fossa and brainstem on CT). Exceptions to the use of brain MRI as the neuroimaging procedure of choice and situations with preferred head imaging using CT include: osseous assessment of the calvarium, skull base and maxillofacial bones, including detection of calvarial and facial bone fractures; calcified lesions; initial evaluation of recent craniocerebral trauma; and acute intra-cranial hemorrhage (parenchymal; subarachnoid; subdural; epidural)
- MRI is more sensitive for detection of shearing trauma to the brain and diffuse axonal injury. It is also the preferred technique for assessment of subacute and chronic intra-cranial hemorrhage
- CT of the head is an alternative exam in patients who cannot undergo MRI
- Images of the pituitary gland, maxillary sinuses or internal auditory canals (IACs) are included within the single assigned CPT code for MRI imaging of the head and are not separately billable as multiple concurrent head MRI exams
- MRI studies of the head and neck are inherently bilateral. Duplicate imaging requests for these studies are inappropriate
- Screening for metastatic disease in a patient with stage I non-small cell lung cancer (NSCLC) in the absence of neurologic symptoms is not indicated

Common Diagnostic Indications

Abnormalities detected on other imaging studies which require additional clarification to direct treatment

Acoustic neuroma (acoustic schwannoma, vestibular schwannoma)

- Diagnosis
  - See diagnosis of sensorineural hearing loss (SNHL)
- Management
  - When symptoms suggest recurrence or progression
- Surveillance
  - Post therapy: baseline and 12 months after surgery
  - Conservative treatment or incomplete resection at 6, 18, 30, 42 months

Arnold Chiari I and II malformations
Common Diagnostic Indications

Cerebral palsy

Cerebrovascular accident (CVA or stroke) and transient ischemic attack (TIA)

- May present with a variety of signs and symptoms, including sudden onset of weakness, focal sensory loss or speech disorder

CNS finding / deficit – new onset or progressive neurological abnormalities

- Including but not limited to the following clinical symptoms and findings:
  - Anosmia (loss or impairment in sense of smell)
  - Ataxia (inability to coordinate voluntary muscular movements)
  - Bell’s palsy
  - Dysgeusia (dysfunction in sense of taste)
  - Facial numbness
  - Gait disorder
  - Hoarseness
  - Other movement disorders
  - Nystagmus (rapid, involuntary, oscillating ocular movements)
  - Paresis or paralysis
  - Any other cranial nerve impairment

Congenital anomaly

- Including but not limited to the following conditions:
  - Chiari malformations
  - Dandy-Walker spectrum
  - Encephalocele
  - Holoprosencephaly
  - Macrocephaly
  - Microcephaly
  - Schizencephaly
  - Septo-optic dysplasia

Dementia

- Initial evaluation, OR
- Rapid progression

Encephalopathy

Headache in adult – when any one of the following criteria is met

- Sudden onset and severe, including thunderclap or worst headache of life; OR
- Progressively worsening with increased frequency and severity over short timeframe and/or despite physician supervised appropriate therapy; OR
- With new focal neurologic signs, particularly papilledema, visual field defects and nuchal rigidity; OR
- New-onset headaches in a cancer or immunodeficient patient
Common Diagnostic Indications

**Hearing loss - progressive asymmetrical hearing deficit, associated with**
- Abnormal neurological evaluation; **AND/OR**
- Abnormal ear, nose and throat (ENT) evaluation such as, audiometry or auditory brainstem response (ABR)

**Hemorrhage / hematoma**
- Refers to non-traumatic, non-CVA and non-tumor-related intra-cranial bleed. Examples include hypertensive hemorrhage and hemorrhage secondary to anti-coagulation or bleeding diathesis
- MRI is usually preferred for evaluation of subacute and chronic hemorrhage
- CT is the preferred technique for evaluation of acute intra-cranial hemorrhage

**Hydrocephalus (ventriculomegaly)**
- MRI is often the preferred for initial evaluation of patients with hydrocephalus. For patients with an indwelling shunt, CT is usually adequate in the diagnostic follow-up of hydrocephalus

**Hypoxic ischemic encephalopathy**
- Including but not limited to the following:
  - Cerebral or Cerebellar Abscess
  - Encephalitis (including limbic encephalitis)\(^7,8\)
  - Meningitis
  - Neurocysticercosis
  - Opportunistic Infection, particularly with immunosuppressed or other immunodeficient conditions
  - Subdural Empyema

**Mental status changes, with documented objective evidence from neurologic exam**

**Movement disorders**
- Including Parkinson’s disease (particularly atypical cases with poor response to levodopa, in which there may be an underlying structural disorder producing parkinsonian features); Huntington’s disease; idiopathic sporadic cerebellar ataxia (olivopontocerebellar atrophy); hemifacial spasm; and other conditions

**Multiple sclerosis and other white-matter diseases**
- Initial diagnosis; **OR**
- Periodic scans to assess asymptomatic progression in multiple sclerosis during the course of disease; **OR**
- Tracking the progress of multiple sclerosis to establish a prognosis or evaluation of response to treatment; **OR**
- To evaluate changes in neurologic signs and symptoms

**Neurocutaneous disorders**
- Including but not limited to the following:
  - Neurofibromatosis
  - Sturge-Weber Syndrome
  - Tuberous Sclerosis
  - Von Hippel-Lindau Disease (VHL)
Common Diagnostic Indications

Neuroendocrine abnormality suggestive of a pituitary lesion
- Relevant laboratory and clinical abnormalities are required

Papilledema

Post-operative or post-procedure evaluation

Note: This indication is to be used for pre-operative evaluation of conditions not specifically referenced elsewhere in this guideline

Seizure disorder
- New onset; OR
- Increasing frequency; OR
- Increasing severity; OR
- Prior to the discontinuation of antiepileptic medications in a patient without prior MRI

Sensorineural hearing loss (SNHL) - Diagnosis
- Confirmed by audiogram or auditory brainstem reflex
- Suggestive of a retrocochlear cause
  - Sudden onset
  - Asymmetric/unilateral

Syncope
- Syncope (complete loss of consciousness) and near syncope (partial loss of consciousness)
  - When any of the following (a-c) applies:
    a. Seizure activity was witnessed or is highly suspected at the time of the syncope
    b. There is an abnormality on neurologic examination
    c. The patient has at least one persistent neurologic symptom

Tinnitus – Diagnosis
- After audiometry
- Suggestive of retrocochlear pathology
  - Unilateral/asymmetric
  - Sudden onset
  - Secondary neurological signs
- Suggestive of a vascular etiology
  - Pulsatile
Common Diagnostic Indications

Trauma to head
- MRI is generally used to evaluate suspected shearing lesions and diffuse axonal injury in closed head trauma as well as assessment of the subacute or chronic sequelae of head injury
- CT is often performed as the initial imaging exam in acute head trauma, particularly when associated with:
  - Calvarial fracture
  - Change in mental status or amnesia
  - Focal neurological deficits
  - Loss of consciousness
  - Seizures
  - Signs of increased intracranial pressure
  - Nausea / vomiting
  - Worsening headaches
- Suspected hemorrhage, or subdural or epidural hematoma

Trigeminal neuralgia (particularly when atypical) or atypical facial pain without focal objective signs
- Atypical manifestations of trigeminal neuralgia include facial burning, boring crushing or pulsating sensations, which may be relatively constant
- Typical features of trigeminal neuralgia include the sudden, extremely sharp, stabbing, shock-like or throbbing pain in the facial region

Tumor evaluation – benign and malignant
- Including but not limited to the following lesions:
  - Primary intra-cranial tumors
  - Metastatic disease

Unexplained mass lesion identified on prior imaging – surveillance, without pathologic tissue confirmation
- Examples include suspected Arachnoid Cyst or Epidermoid Cyst

Vascular abnormalities
- Including but not limited to:
  - Aneurysm
  - Arteriovenous malformation (AVM)
  - Cavernous malformation
  - Cerebral vein thrombosis
  - Dural arteriovenous fistula (DAVF)
  - Dural venous sinus thrombosis
  - Venous angioma

Note: Either CTA or MRA may be preferred

Vasculitis
Common Diagnostic Indications

Ventricular shunt assessment

Vertigo and dizziness
- With recurrent or persistent symptoms and when evaluation for other etiologies has not been revealing
- Abnormal audiogram or auditory brainstem response

Visual disturbance - such as visual field loss, diplopia and other alterations in vision that are unexplained by ophthalmologic exam and patient history

References

CPT Codes

- 70544.............. Magnetic resonance angiography, head, without contrast
- 70545.............. Magnetic resonance angiography, head, with contrast
- 70546.............. Magnetic resonance angiography, head, without contrast, followed by re-imaging with contrast

Standard Anatomic Coverage

- MRA may be performed to assess the major intra-cranial arteries of the anterior and posterior circulations (including the Circle of Willis) as well as the venous structures (major cerebral veins and dural venous sinuses)
- For specific clinical indications, exams may be tailored to the region of interest

Imaging Considerations

- MRA refers to a group of diverse MR pulse sequences. These include time-of-flight (TOF) imaging, phase contrast (PC) techniques and three-dimensional (3-D), T1-weighted gradient echo acquisitions obtained during intravenous bolus infusion of a paramagnetic contrast agent (gadolinium chelate)
- A workstation is necessary for most MRA studies, to acquire multiplanar reformations, shaded surface displays, volume renderings and maximum intensity projection (MIP) images. Post-processing of MRA data with a MIP reconstruction algorithm allows for 3-dimensional images to be rotated and viewed in different planes, improving visualization of superimposed vessels
- CTA of the head is an alternative exam in patients who cannot undergo MRA
- An MRA of the head includes imaging of the entire arteriovenous system of the brain. Separate requests for concurrent imaging of the arteries and the veins in the head are inappropriate

Common Diagnostic Indications

The following diagnostic indications for head MRI are accompanied by pre-test considerations as well as supporting clinical data and prerequisite information

Abnormalities detected on other imaging studies which require additional clarification to direct treatment

Aneurysm
- Including but not limited to:
  - Follow-up of known or suspected intra-cranial aneurysm, OR
  - Family history of intra-cranial aneurysm, OR
  - Associated hereditary disorders, such as autosomal dominant polycystic kidney disease (10-20% occurrence of aneurysm), Ehlers Danlos syndrome type IV and neurofibromatosis type

Arteriovenous malformation (AVM)

Congenital anomalies of the cerebral circulation

Dural arteriovenous fistula (DAVF)

Dissection
Common Diagnostic Indications

Endovascular neuro-interventional procedure for intra-cranial aneurysm, arteriovenous malformation (AVM) and dural arteriovenous fistula (DAVF): for post-treatment evaluation

Headache: sudden onset of the worst headache of life; exertional headache; positional headache

Intra-cranial hemorrhage
- For identification of the source of hemorrhage

Intramural hematoma

Multiple sclerosis
- Evaluation of venous structures to assess for venous stenosis as a cause of multiple sclerosis, and referred to as chronic cerebrospinal venous insufficiency or CCSVI is considered not medically appropriate. MRV in preparation for either a neurosurgical or percutaneous procedure to treat multiple sclerosis is therefore considered not medically appropriate

Post-operative or post-procedural evaluation

Pre-operative or pre-procedure evaluation
*Note: This indication is to be used for pre-operative evaluation of conditions not specifically referenced elsewhere in this guideline*

Pulsatile tinnitus, diagnosis

Recent cerebrovascular accident
- Demonstrated on head CT or MRI

Stenosis or occlusion of carotid and cerebral arteries
- In patients with clinically suspected or known steno-occlusive disease
- In adult patients (atherosclerotic disease being a common etiology) and pediatric population (etiologies include Moyamoya or idiopathic progressive arteriopathy of childhood)
- Common clinical manifestations may include:
  - Confusion
  - Difficulty speaking or understanding speech
  - Dizziness
  - Gait disturbance
  - Loss of balance or coordination
  - Loss of consciousness
  - Numbness, weakness or paralysis of the face, arm or leg, on one side of the body
  - Sudden severe headache, that is unexplained
  - Visual disturbance, particularly in one eye
Common Diagnostic Indications

Stenosis or occlusion of vertebral and basilar arteries
- In patients with signs and symptoms of Vertebrobasilar Insufficiency (VBI) or Vertebral Basilar Ischemia
- Symptoms of VBI are usually temporary, due to diminished blood flow in the posterior circulation of the brain
- Common clinical manifestations may include:
  - Acute sensorineural hearing loss
  - Ataxia
  - Diplopia
  - Dysarthria
  - Dysphagia
  - Facial numbness and paresthesias
  - Limb and trunk sensory deficits
  - Loss of taste sensation
  - Motor paresis
  - Nystagmus
  - Syncope
  - Vertigo
  - Visual field defects

Thromboembolic disease of major intra-cranial arterial and/or venous systems, including dural venous sinus thrombosis

Traumatic vascular injury

Vascular abnormalities associated with sickle cell disease in children

Vascular supply to tumors

Vasculitis
CPT Codes

70554.................. Magnetic resonance imaging, brain, functional MRI; including test selection and administration of repetitive body part movement and/or visual stimulation, not requiring physician or psychologist administration

70555.................. Magnetic resonance imaging, brain, functional MRI; including test selection and administration of repetitive body part movement and/or visual stimulation, requiring physician or psychologist administration of entire neurofunctional testing

Standard Anatomic Coverage

- From the skull base to vertex, covering the intra-cranial contents
- Scan coverage may vary, depending on the specific clinical indication

Imaging Considerations

- Functional MRI of the brain may be used to localize eloquent areas in the brain, prior to resection of neoplasm or medically intractable epileptogenic foci
- Studies have shown excellent agreement in language localization, when comparing functional brain MRI with the Wada test and direct electrical stimulation
- Advantages of functional brain MRI over a Wada test include the non-invasive technique (not requiring catheter placement and contrast injection), lack of ionizing radiation, shorter time-requirement, lower cost and quicker post-procedural recovery. Additionally, the Wada test is considered limited in right hemisphere dominance
- Advantages of functional brain MRI over intraoperative electrocortical stimulation include its non-invasive technique and more extensive anatomic brain mapping. Direct electrical stimulation is an invasive procedure, which usually evaluates only one hemisphere (limiting assessment for partial or bilateral language dominance) and usually identifies only eloquent brain regions on the surface of the brain
- Functional MRI may successfully map primary brain activities related to motor, sensory and language functions. Examples of tasks which may be used include sentence completion (to map language) and bilateral hand squeeze task (for sensory motor mapping)

Common Diagnostic Indications

The following diagnostic indications for functional MRI (fMRI) of the brain are accompanied by pre-test considerations and supporting clinical data

**Brain tumors**
- For pre-operative neurosurgical planning, as a replacement for a Wada test or direct electrical stimulation mapping

**Seizures refractory to medical treatment**
- For pre-operative neurosurgical planning, as a replacement for a Wada test or direct electrical stimulation mapping
CPT Codes

78608 .................. PET brain, metabolic evaluation

Commonly Used Radiopharmaceuticals

- 2-(fluorine-18) fluoro-2-deoxy-d-glucose (FDG)

Scan coverage may vary, depending on the specific clinical indication

Imaging Considerations

- Enrollee coverage for PET imaging of Alzheimer’s disease or fronto-temporal lobe dementia may be limited to one (1) per lifetime
- Coding conventions call for this code to be used for oncologic scanning of brain tumors

Common Diagnostic Indications

The following diagnostic indications for brain PET are accompanied by pre-test considerations as well as supporting clinical data and prerequisite information

Brain tumors

- For initial strategy (diagnosis, staging)
- For subsequent strategy follow up when being used to differentiate post treatment (radiation, surgery, chemotherapy) scarring versus residual / recurrent disease

Refractory seizures / epilepsy

- Pre-surgical evaluation to locate the foci of intractable seizure activity, in patients who have failed conventional medical therapy and who are undergoing pre-surgical evaluation

Fronto-temporal lobe dementia and Alzheimer’s disease

- Use of PET is approved only to differentiate between fronto-temporal dementia (FTD) and Alzheimer’s disease, when the patient’s clinical presentation fits both diagnoses and other conventional testing has been unable to reveal a definitive diagnosis and when all of the following conditions are met; or
- Use of PET is approved when part of a CMS approved clinical trial specific to diagnosis and treatment of dementing neurodegenerative disease

Conditions

The use of FDG-PET scan in the diagnosis of Alzheimer’s disease and fronto-temporal lobe dementia is medically necessary and appropriate provided all of the following conditions are met:

- The patient has a recent diagnosis of Alzheimer’s disease or frontal-temporal lobe dementia and a documented cognitive decline of at least six (6) months duration and meets the diagnostic criteria for Alzheimer’s disease or fronto-temporal lobe dementia
- The patient’s clinical presentation includes such symptoms as:
  - Social disinhibition
  - Awkwardness
  - Difficulties with language, or
  - Loss of executive function
- The patient has had a comprehensive clinical evaluation which has included:
A comprehensive medical history including an assessment of activities of daily living from a well-acquainted informant other than the patient;

- A physical and mental status examination formally documenting the patient’s cognitive decline for a minimum of six (6) months; and
- Cognitive scales or neuropsychological testing, laboratory testing, and structural imaging such as MRI or CT, to aid in identifying structural, metabolic, and chemical abnormalities as a cause for cognitive impairment

- The patient is evaluated by a physician experienced in the diagnosis and assessment of Alzheimer’s disease and fronto-temporal lobe dementia

- The results of previous physical and mental examinations, laboratory testing, and structural imaging have not clearly determined either a specific neurodegenerative disease or other cause for the clinical symptoms and the results of the FDG-PET will help clarify the diagnosis of Alzheimer’s disease or fronto-temporal lobe dementia, to guide future treatment

- A brain SPECT scan has not been obtained for the same indication

- The referring (ordering) provider submits the following medical information regarding the enrollee:
  - Date of onset of the cognitive decline
  - Clinical documentation supporting the diagnosis of a clinical syndrome such as Alzheimer’s disease or fronto-temporal lobe dementia
  - Results of a mini-mental status exam (MMSE) or similar test score
  - Differential diagnosis of Alzheimer’s disease or fronto-temporal lobe dementia
  - Results of all neuropsychological testing performed
  - Results of all CT and/or MRI structural imaging performed
  - Results of recent B12 and thyroid Hormone laboratory blood tests
  - Name(s) of currently prescribed medications
Computed Tomography (CT) Orbit, Sella Turcica, Posterior Fossa, Temporal Bone, including Mastoids

CPT Codes

- 70480................. CT of orbit, sella or posterior fossa and outer, middle or inner ear, without contrast
- 70481................. CT of orbit, sella or posterior fossa and outer, middle or inner ear, with contrast
- 70482................. CT of orbit, sella or posterior fossa and outer, middle or inner ear, without contrast, followed by re-imaging with contrast

Standard Anatomic Coverage

- The anatomic coverage and protocol specifications will vary, depending on the clinical indication. Anatomic evaluation includes the internal auditory canals (IACs), posterior fossa, sella turcica, orbits and temporal bone, with the mastoid air cells.
- Targeted evaluation, such as CT of the temporal bones, involves collimated views through the region of interest, often in two imaging planes: axial images (petrous bones through mastoid tips) and coronal views (temporomandibular joints through temporal bones).

Imaging Considerations

- CT is often the preferred study for suspected fracture or follow-up of a known fracture, foreign body detection, assessment of calcified lesions and temporal bone evaluation.
- With capability for high-resolution osseous imaging, CT can provide detailed anatomic depiction of the temporal bone anatomy, including the middle and inner ear structures.
- MRI (unless contraindicated) is usually preferred over CT for evaluation of the sella turcica, internal auditory canal regions and visual pathways, as well as for most soft tissue tumor evaluation.
- Bony changes from a sellar, para-sellar or orbital mass or infectious process are usually well demonstrated by CT.
- Ordering a CT of the head (CPT codes 70450-70470) in addition to a CT of the orbits is not necessary in most cases. According to Medicare’s correct coding edits, CT of the head and CT of the orbits are mutually exclusive procedures.
- This exam is inherently a bilateral procedure. Duplicate requests for imaging the right and left orbits should not be authorized.

Common Diagnostic Indications

The following diagnostic indications for CT of the orbit, sella, posterior fossa and temporal bone are accompanied by pre-test considerations as well as supporting clinical data and prerequisite information.

Abnormalities detected on other imaging studies which require additional clarification to direct treatment

Cholesteatoma

- Includes both acquired and congenital types of cholesteatoma
  - Acquired (secondary) cholesteatoma: more common form (98%), presenting as a mass comprised of keratin debris and lined by squamous epithelium
  - Congenital (primary) cholesteatoma (epidermoid): uncommon lesion (2%), arising from aberrant embryonic ectodermal rests in middle ear, mastoids or petrous bone

Cochlear implant – pre-operative and post-operative evaluation
Common Diagnostic Indications

Conductive hearing loss

Congenital anomalies of the orbit, temporal bone, sella turcica and posterior fossa

Foreign body
- Evaluation for metallic foreign bodies in the orbits should be initiated with conventional radiographs, which detect the majority of radiopaque foreign bodies
- CT may be performed if radiographs are inconclusive or if there remains high clinical suspicion for a foreign body

Infectious or inflammatory process
- Including but not limited to the following:
  - Abscess
  - Cellulitis (for example, orbital cellulitis)
  - Malignant otitis externa
  - Osteomyelitis
  - Otomastoiditis

Orbital / ocular evaluation of symptoms and objective findings
- Including but not limited to evaluation of the following:
  - Exophthalmos – abnormal protrusion of the eyeball
  - Extraocular myopathy
  - Nystagmus – rapid, involuntary, oscillating ocular movements
  - Optic neuritis
  - Papilledema
  - Proptosis – forward displacement of the eyeball
  - Strabismus – inability of one eye to accomplish binocular vision with the other, due to extra-ocular muscle imbalance
  - Thyroid ophthalmopathy
  - Visual field defect
  - Visual loss unexplained by ophthalmic evaluation

Orbital pseudotumor

Osseous lesion evaluation
- Such as fibrous dysplasia, Paget’s disease and otosclerosis

Localized facial pain – when persistent and unexplained

Post-operative or post-procedure evaluation

Pre-operative or pre-procedure evaluation

Note: This indication is to be used for pre-operative evaluation of conditions not specifically referenced elsewhere in this guideline
Common Diagnostic Indications

Sensorineural hearing loss
- Documented by audiology
- As work-up for Acoustic Neuroma (Vestibular Schwannoma) – also see Primary Intra-cranial Tumors

Skull base evaluation – for suspected or known tumors

Tinnitus

Trauma
- Including but not limited to the following:
  - Soft tissue injury
  - Fracture

Tumor evaluation – benign and malignant
- Including but not limited to the following lesions:
  - Primary intra-cranial tumors
  - Metastatic disease

Vertigo and dizziness
- With recurrent or persistent symptoms and when evaluation for other etiologies has not been revealing
- Abnormal audiogram or auditory brainstem response
CPT Codes

- 70540............. MRI orbit, face and neck, without contrast
- 70542............. MRI orbit, face and neck, with contrast
- 70543............. MRI orbit, face and neck, without contrast, followed by re-imaging with contrast

Standard Anatomic Coverage

- Scan coverage is dependent on the specific anatomic area of clinical interest. Exams usually include multi-planar imaging, using different pulse sequences

Imaging Considerations

- MRI is usually preferred over CT for evaluation of the sella turcica and visual pathways, unless contraindicated
- CT is generally the modality of choice for traumatic injury, calcified lesions, localized infection (for example, orbital extension of an adjacent complicated sinusitis), and foreign body evaluation, after initial radiographic evaluation for a radiopaque foreign body
- CT of the neck is an alternative exam in patients who cannot undergo MRI
- Duplicate exam requests for two or more MRI studies of the head (for example, bilateral head MRIs for right and left orbital evaluation) or neck are inappropriate. These exams are inherently bilateral
- MRI of the orbit, face and neck is not allowed for imaging the IACs. See MRI of the brain (CPT codes 70551 – 70553)

Common Diagnostic Indications

The following diagnostic indications for MRI of the orbit, face and neck (soft tissues) are accompanied by pre-test considerations as well as supporting clinical data and prerequisite information

Abnormalities detected on other imaging studies which require additional clarification to direct treatment

Congenital anomalies

- Further assessment following endoscopic detection

Glottic lesion

- Further assessment following endoscopic detection

Hoarseness

- Unexplained, following direct visualization and/or prior non-diagnostic imaging of neck/upper chest (extending along the course of the recurrent laryngeal nerves)\(^1,2\)

Infectious or inflammatory process

- Including but not limited to the following conditions:
  - Abscess
  - Cellulitis (for example, orbital cellulitis)
  - Osteomyelitis

Laryngeal edema
Common Diagnostic Indications

**Lymphadenopathy – suspected or known**
- When persistent and unexplained

**Mass lesion**
- Palpable neck mass: OR
- Non-palpable and unexplained on prior imaging exam – for surveillance, without pathologic tissue confirmation; OR
- Evaluation of lesions including:
  - Branchial cleft cyst
  - Thyroglossal duct cyst
  - Lymphangioma
  - Cystic hygroma

**Nasal indications – not listed elsewhere**
- Anosmia
- Recurrent epistaxis
- Nasal airway obstruction or polyposis refractory to medical therapy

**Obstructive thyroid nodule or thyromegaly (goiter)**
- Following thyroid US or thyroid scintigraphy
- When associated with mass effect on the upper airway or esophagus
- For pre-operative evaluation

**Orbital indications – not listed elsewhere**
- Including but not limited to:
  - Extraocular myopathy
  - Extraocular weakness or non-conjugate eye movements
  - Nystagmus
  - Optic neuritis
  - Orbital pseudotumor
  - Papilledema (refers to swelling and elevation of optic disc – a sign of increased intracranial pressure)
  - Proptosis
  - Strabismus
  - Thyroid ophthalmopathy
  - Visual loss unexplained by ophthalmic evaluation

**Osteonecrosis of the Jaw**
- Also includes bisphosphonate related osteonecrosis (BRONJ)
- For diagnosis and management, when Panorex/radiographs are non-diagnostic

**Stridor**
- For subacute and chronic stridor, advanced imaging may follow neck (soft tissue) radiographs and ENT evaluation
Common Diagnostic Indications

Trauma to the orbit and face
● CT preferable for bony assessment

Trauma to the soft tissues of the neck

Tumor evaluation – primary neoplasm and metastatic disease
● Including but not limited to the following anatomic structures:
  ○ Facial structures
  ○ Larynx and subglottic regions
  ○ Nasopharynx, oropharynx and hypopharynx
  ○ Neck soft tissues, surrounding the airway and glands
  ○ Optic nerve
  ○ Orbit
  ○ Salivary glands
  ○ Sella turcica (pituitary tumors including macroadenoma and microadenoma)
  ○ Sinuses
  ○ Thyroid and parathyroid glands

Upper airway obstruction
● Including but not limited to tracheal stenosis

Vocal cord paralysis
● Unexplained, following endoscopic diagnosis
● May be unilateral or bilateral

Wegener’s granulomatosis – suspected or known

References

Computed Tomography (CT)
Paranasal Sinus & Maxillofacial Area

CPT Codes

- 70486.................. CT of maxillofacial area, without contrast
- 70487.................. CT of maxillofacial area, with contrast
- 70488.................. CT of maxillofacial area, without contrast, followed by re-imaging with contrast

Standard Anatomic Coverage

- Includes the sinuses, facial structures and maxillary regions. Individual scan coverage depends on the specific clinical request, but generally includes images through the entire frontal, ethmoid, maxillary and sphenoid sinuses. Coverage may be extended to include the mandible and temporomandibular joint (TMJ) in select cases and depending on the clinical indication. CT sections may be obtained in one or two (usually coronal and axial) planes

Imaging Considerations

- The prevalence of sinus inflammatory disease is high; estimated to affect approximately 33 million US citizens
- This guideline includes reference to rhinosinusitis in the evaluation of sinus inflammatory disease, since sinusitis usually involves the nasal passage as well as the paranasal sinuses
- A common classification of sinusitis / rhinosinusitis is based on duration of symptoms, as follows:
  - Acute sinusitis / rhinosinusitis – symptoms last for less than 4 weeks and include persistent symptoms of an upper respiratory tract infection, purulent rhinorrhea, postnasal drainage, anosmia, nasal congestion, facial pain, headache, fever, cough, and/or purulent discharge
  - Subacute sinusitis / rhinosinusitis – symptoms last from 4 to 12 weeks
  - Chronic sinusitis / rhinosinusitis – the same symptoms as in acute sinusitis that persist for at least 12 weeks, with varying severity. Chronic sinusitis may sometimes present with vague or insidious symptoms
  - Recurrent sinusitis / rhinosinusitis – 3 or more episodes of acute sinusitis per year; individual episodes may be caused by different organisms
- Clinicians should distinguish presumed acute bacterial rhinosinusitis from acute rhinosinusitis due to viral upper respiratory infections and non-infectious conditions
- Acute sinusitis is considered a self-limiting disease, since most patients improve within 2 weeks, despite the etiology and treatment option used
- Chronic sinusitis is reported by the Centers for Disease Control and Prevention (CDC) to be the most commonly encountered condition below the age of 45 years and the second most common condition between 45-64 years, following hypertension
- Sinus CT is not usually performed at the time of initial clinical presentation with acute uncomplicated sinusitis
- Sinus CT is often reserved for difficult cases or delineation of anatomy prior to planned sinus surgery, as follows:
  - Limited (coronal) Sinus CT – typically used for recurrent or refractory sinus inflammatory disease, or if the diagnosis is in doubt
  - Full Sinus CT – generally performed for surgical planning to interrogate for osteomeatal obstruction, fungal sinusitis, facial or orbital cellulitis complicating sinusitis and suspected malignancy
- CT of the paranasal sinuses is appropriately coded to CPT 70486. There are no required number of slices or phases for contrast-enhanced exams that constitute a paranasal sinus and maxillofacial CT study. This code may be used to describe limited or complete imaging of the sinuses
- CT of the maxillofacial area is a bilateral study. Separate requests to image the right and left facial area are not allowed
- For temporomandibular joints, CT may be used after MRI if diagnosis still in doubt or when MRI cannot be done

Common Diagnostic Indications

The following diagnostic indications for sinus CT are accompanied by pre-test considerations as well as supporting clinical data and prerequisite information

Anosmia

Abnormalities detected on other imaging studies which require additional clarification to direct treatment
## Common Diagnostic Indications

### Congenital anomalies

### Foreign body in the maxillofacial region

### Fungal and other complex sinus infections

### Mucocele of paranasal sinuses

### Nasal airway obstruction refractory to medical therapy

### Osteomyelitis of the facial bones

### Osteonecrosis of the Jaw

- Also includes bisphosphonate related osteonecrosis (BRONJ)
- For diagnosis and management, when Panorex/radiographs are non-diagnostic

### Polyposis

### Post-operative or post-procedure evaluation

*Note: This indication is to be used for pre-operative evaluation of conditions not specifically referenced elsewhere in this guideline*

### Pre-operative or pre-procedure evaluation

### Recurrent epistaxis

### Sinusitis / rhinosinusitis

- For pediatric patients, please see the pediatric section below

#### Acute, Uncomplicated Sinusitis / Rhinosinusitis

- Defined as symptoms that last for less than 4 weeks. Common symptoms include purulent rhinorrhea, postnasal drainage, anosmia, nasal congestion, facial pain, headache, fever, cough, purulent discharge and/or findings of an upper respiratory tract infection
- No radiographic imaging is usually necessary for immunocompetent patients with acute rhinosinusitis, unless a complication or alternative diagnosis is suspected that requires imaging
- CT may be performed if symptoms persist beyond 3-4 weeks of adequate treatment, which may include antibiotics, nasal steroids and/or decongestants. Under these circumstances, a complication of acute sinusitis/rhinosinusitis or an alternative diagnosis may warrant CT imaging of the paranasal sinuses

#### Acute Recurrent Sinusitis / Rhinosinusitis

- Defined as 3 or more separate episodes of sinusitis during the past year
- Imaging used to corroborate the diagnosis and/or investigate for underlying causes of acute recurrent sinusitis
- Clinicians should assess patients with recurrent acute sinusitis / rhinosinusitis for factors that modify management, such as allergic rhinitis, cystic fibrosis, immunocompromised states, ciliary dyskinesia and anatomic variations

#### Chronic Sinusitis / Rhinosinusitis

- Defined as signs and symptoms of sinusitis that last for 12 weeks or longer
- Imaging used to corroborate the diagnosis and/or investigate for underlying causes of chronic sinusitis
- Clinicians should assess patients with chronic sinusitis / rhinosinusitis for factors that modify management, such as allergic rhinitis, cystic fibrosis, immunocompromised states, ciliary dyskinesia and anatomic variations

### Peri-Orbital Swelling Associated with Sinus Infection

### Barosinusitis / Headache Refractory to Antibiotics and Responding only to Decongestants / Oral Steroids
Common Diagnostic Indications

Temporomandibular Disease (TMD)

Diagnosis of Temporomandibular Disease (TMD)\(^2\)

Temporomandibular Disease (TMD) is a collective term, which includes disorders of both the masticatory muscles and the temporomandibular joint\(^1,2\). CT is generally not indicated when a muscular etiology for TMD is suspected and most TMJ pathology can be evaluated with a panorex radiograph.\(^2\)

For diagnosis of a temporomandibular joint (TMJ) source of TMD when:
- Panorex is inconclusive or not available; **OR**
- Panorex is abnormal requiring further characterization:
  - Trauma
  - Arthritis (infectious or inflammatory – especially rheumatoid)
  - Osteolysis
  - Bone neoplasm
  - Bone infarct; **OR**
- Panorex is normal with high clinical suspicion for TMJ pathology when the results will change management including but not limited to:
  - Headache of oromaxillofacial origin\(^3\)

Trauma to the facial bones – significant injury

Tumor or mass lesion in the sino-nasal region

Wegener’s granulomatosis - suspected or known

References

CPT Codes

70336.................. MRI of Temporomandibular Joint(s)

Standard Anatomic Coverage

- Bilateral study, including open and closed mouth views, often performed with surface coils
- Images may be obtained in axial, (oblique) sagittal and (oblique) coronal planes

Imaging Considerations

- Conventional radiographs and/or Panorex films should be used for initial evaluation of bony abnormalities
- Some of the common causes for temporomandibular joint dysfunction include direct trauma, habitual misuse of the TMJs and various arthritides, including degenerative joint disease
- For a known or suspected fracture of the mandibular condyles and TMJ regions, further evaluation following initial radiographs is usually undertaken with CT
- MRI may be used to evaluate for internal derangements and articular disc dysfunction in the TMJs
- Dynamic ultrasound is an alternative technique for detecting disc displacement in the TMJs
- MRI of the temporomandibular joint(s) is inherently a bilateral procedure. Separate entries for the right and left temporomandibular joints are not allowed
- CT may be used after MRI if diagnosis still in doubt, when MRI cannot be done, or as a primary modality when evaluation of the osseus components of the TMJ is the primary goal (for instance trauma)

Common Diagnostic Indications

The following diagnostic indications for temporomandibular joints (TMJ) MRI are accompanied by pre-test considerations as well as supporting clinical data and prerequisite information

Abnormalities detected on other imaging studies which require additional clarification to direct treatment

Arthropathy of the temporomandibular joints
- Often preceded by conventional radiographs and/or Panorex views of the TMJs
- Including but not limited to the following:
  - Inflammatory arthritis (rheumatoid arthritis is the most common)
  - Infectious arthritis
  - Post-traumatic arthritis

Frozen jaw
Persistent symptoms of temporomandibular joint dysfunction, after failed conservative treatment – with NSAIDs and/or acetaminophen, a short-term trial of soft diet and proper chewing techniques as well as an oral appliance (such as a bite block)

- Common symptoms include but are not limited to the following:
  - Clicking sensation, particularly during jaw movement
  - Persistent orofacial pain
  - Locking
  - Facial asymmetry and/or deformity (stable or changing)
  - Unstable occlusion, with or without other symptoms
  - Other functional impairments with mastication
- Often preceded by conventional radiographs and/or Panorex views of the TMJs

Pre-operative evaluation

Note: This indication is to be used for pre-operative evaluation of conditions not specifically referenced elsewhere in this guideline

Trauma to the temporomandibular joints

- For assessment of meniscal position and integrity
- Often preceded by conventional radiographs, Panorex views and/or CT of the TMJs
Computed Tomography (CT) 
Neck for Soft Tissue Evaluation

CPT Codes

- 70490.................. CT Soft Tissues of Neck, without contrast
- 70491.................. CT Soft Tissues of Neck, with contrast
- 70492.................. CT Soft Tissues of Neck without contrast, followed by re-imaging with contrast

Standard Anatomic Coverage

- Axial images from the skull base to the clavicles

Imaging Considerations

- CT is generally the modality of choice for the following indications: detection of sialolithiasis (salivary gland calculi); following trauma to the soft tissues of the neck; and during foreign body evaluation, after initial radiographic assessment for a radiopaque foreign body

Common Diagnostic Indications

Abnormalities detected on other imaging studies which require additional clarification to direct treatment

- Foreign body in the upper aero-digestive tract or surrounding neck tissues
  - Following neck radiographs (for soft tissue evaluation)

Glottic lesion

- Further assessment following endoscopic detection

Hoarseness

- Unexplained, following direct visualization and/or prior non-diagnostic imaging of neck/upper chest (extending along the course of the recurrent laryngeal nerves) \(^1,2\)

Infectious or inflammatory process

- Including but not limited to the following:
  - Abscess
  - Cellulitis
  - Osteomyelitis

Laryngeal edema

- When persistent and/or unexplained

Lymphadenopathy

- When persistent and/or unexplained
Common Diagnostic Indications

Mass lesion
- Palpable neck mass: OR
- Non-palpable and unexplained on prior imaging exam – for surveillance, without pathologic tissue confirmation; OR
- Evaluation of lesions including:
  - Branchial cleft cyst
  - Thyroglossal duct cyst
  - Lymphangioma
  - Cystic hygroma

Obstructive thyroid nodule or thyromegaly (goiter)
- Following thyroid ultrasound or thyroid scintigraphy
- When associated with mass effect on the upper airway or esophagus
- For pre-operative evaluation

Osteonecrosis of the Jaw
  - Also includes bisphosphonate related osteonecrosis (BRONJ)
  - For diagnosis and management, when Panorex/radiographs are non-diagnostic

Parathyroid adenoma
  - Following parathyroid ultrasound or parathyroid scintigraphy; OR
  - CT is indicated for patients with a failed parathyroidectomy, or to assist in preoperative planning in those patients with aberrant anatomy

Note: MRI may be used for patients with recurrent hyperparathyroidism when there is a need to locate residual abnormal parathyroid tissue

Retropharyngeal neck mass

Salivary / parotid gland ductal calculi (sialolithiasis)

Stridor
- For subacute and chronic stridor, advanced imaging may follow neck (soft tissue) radiographs and ENT evaluation

Traumatic injury to the soft tissues of the neck

Tumor evaluation – benign and malignant (primary neoplasm and metastatic disease)
- For diagnosis, staging, evaluation of response to treatment and pre-operative assessment

Upper airway obstruction
- Including but not limited to tracheal stenosis

Vocal cord paralysis
- Unexplained, following endoscopic diagnosis
- May be unilateral or bilateral; CT may aid in localizing the side and level of vocal cord paralysis
References


CT Angiography (CTA) Neck

CPT Codes

70498.................. CTA of neck, with contrast material(s), including noncontrast images, if performed, and image post-processing

Standard Anatomic Coverage

- CTA of the neck involves image acquisition from the aortic arch to the skull base, to visualize major vessels which include the extracranial carotid arteries and vertebral arteries. The major venous structures may also be interrogated with CT angiographic technique

Imaging Considerations

- Duplex Doppler examination of the extracranial carotid arteries is often performed prior to CTA
- CTA of the neck is an alternative exam in patients who cannot undergo MRA
- Screening for carotid artery stenosis is not indicated in asymptomatic adult patients

Common Diagnostic Indications

The following diagnostic indications for neck CTA are accompanied by pre-test considerations as well as supporting clinical data and prerequisite information

Abnormalities detected on carotid Doppler ultrasound or other imaging studies which require additional clarification to direct treatment

- Aneurysm
- Arteriovenous malformation
- Congenital anomalies of the carotid and vertebrobasilar circulations
- Dissection
- Intramural hematoma

Multiple sclerosis

- Evaluation of venous structures to assess for venous stenosis as a cause of multiple sclerosis, and referred to as chronic cerebrospinal venous insufficiency or CCSVI is considered not medically appropriate. MRV in preparation for either a neurosurgical or percutaneous procedure to treat multiple sclerosis is therefore considered not medically appropriate

Post-operative or post-procedural evaluation
Common Diagnostic Indications

Pre-operative evaluation prior to cardiac surgery

- Evaluation of carotid artery disease prior to cardiac surgery is indicated when symptoms or high-risk criteria are present, including but not limited to the following:
  - Age greater than or equal to 65 years
  - Prior history of CVA
  - Prior history of TIA
  - Diabetes
  - Hypertension
  - Left main coronary stenosis
  - Peripheral arterial disease
  - Smoking history
  - History of known cervical carotid disease
  - Carotid bruit on exam
  - 50% or greater known carotid stenosis
  - Atrial fibrillation
  - Known extensive aortic calcification
  - History of prior cardiac surgery
  - History of prior myocardial infarction
  - History of congestive heart failure
  - History of chronic renal insufficiency

Pre-operative or pre-procedural evaluation

*Note: This indication is to be used for pre-operative evaluation of conditions not specifically referenced elsewhere in this guideline*

Stenosis or occlusion of the extracranial carotid arteries

- Following work-up with duplex Doppler examination of the carotid arteries, unless diagnosis is substantiated by clinical exam findings
- Common clinical manifestations may include:
  - Confusion
  - Difficulty speaking or understanding speech
  - Dizziness
  - Gait disturbance
  - Loss of balance or coordination
  - Loss of consciousness
  - Numbness, weakness or paralysis of the face, arm or leg on one side of the body
  - Sudden severe headache that is unexplained
  - Visual disturbance, particularly in one eye
Common Diagnostic Indications

Stenosis or occlusion of vertebral arteries

- In patients with signs and symptoms of vertebrobasilar insufficiency (VBI) or vertebral basilar ischemia
- Symptoms of VBI are usually temporary, due to diminished blood flow in the posterior circulation of the brain
- Common clinical manifestations may include:
  - Acute sensorineural hearing loss
  - Ataxia
  - Diplopia
  - Dysarthria
  - Dysphagia
  - Facial numbness and paresthesias
  - Limb and trunk sensory deficits
  - Loss of taste sensation
  - Motor paresis
  - Nystagmus
  - Vertigo
  - Visual field defects

Thromboembolic disease of major extracranial arterial and/or venous systems

Note: This includes venous occlusion

Traumatic vascular injury to the extracranial carotid and vertebral arteries

Vasculopathy, including fibromuscular dysplasia (FMD)

Venous thrombosis or compression

References


CPT Codes

- 70547: MRA of Neck without contrast
- 70548: MRA of Neck with contrast
- 70549: MRA of Neck without contrast, followed by re-imaging with contrast

Standard Anatomic Coverage

- Acquisitions from the aortic arch to the skull base, to visualize the major vessels including the extracranial carotid arteries and vertebral arteries. The major venous structures may also be interrogated with MR angiographic techniques.

Imaging Considerations

- Duplex Doppler examination of the extracranial carotid arteries is often performed prior to MRA.
- CTA of the neck is an alternative exam in patients who cannot undergo MRA.
- An MRA of the neck is inherently bilateral. Duplicate requests to image the right and left side of the neck are not allowed.

Common Diagnostic Indications

The following diagnostic indications for Neck MRA are accompanied by pre-test considerations as well as supporting clinical data and prerequisite information.

Abnormalities detected on carotid Doppler ultrasound or other imaging studies which require additional clarification to direct treatment.

Aneurysm

Arteriovenous malformation

Congenital anomalies of the carotid and vertebrobasilar circulations

Dissection

Intramural hematoma

Multiple sclerosis

- Evaluation of venous structures to assess for venous stenosis as a cause of multiple sclerosis, and referred to as chronic cerebrospinal venous insufficiency or CCSVI is considered not medically appropriate. MRV in preparation for either a neurosurgical or percutaneous procedure to treat multiple sclerosis is therefore considered not medically appropriate.

Post-operative or post-procedural evaluation

Pre-operative or pre-procedural evaluation

Note: This indication is to be used for pre-operative evaluation of conditions not specifically referenced elsewhere in this guideline.
Common Diagnostic Indications

**Stenosis or occlusion of the extracranial carotid arteries**
- Following work-up with duplex Doppler examination of the carotid arteries, unless diagnosis is substantiated by clinical exam findings
- Common clinical manifestations may include:
  - Confusion
  - Difficulty speaking or understanding speech
  - Dizziness
  - Gait disturbance
  - Loss of balance or coordination
  - Loss of consciousness
  - Numbness, weakness or paralysis of the face, arm or leg on one side of the body
  - Sudden severe headache that is unexplained
  - Visual disturbance, particularly in one eye

**Stenosis or occlusion of the vertebral arteries**
- Symptoms of vertebrobasilar insufficiency are usually temporary, due to diminished blood flow to the posterior circulation of the brain
- Common clinical manifestations may include:
  - Acute sensorineural hearing loss
  - Ataxia
  - Diplopia
  - Dysarthria
  - Dysphagia
  - Facial numbness and paresthesias
  - Limb and trunk sensory deficits
  - Loss of taste sensation
  - Motor paresis
  - Nystagmus
  - Syncope
  - Vertigo
  - Visual field defects

**Thromboembolic disease of major extracranial arterial and/or venous systems**
*Note: This includes venous occlusion*

**Traumatic vascular injury to the extracranial carotid and vertebral arteries**

**Vasculopathy, including fibromuscular dysplasia (FMD)**

**Venous thrombosis or compression**


