CLINICAL APPROPRIATENESS GUIDELINES

# ADVANCED IMAGING

## Appropriate Use Criteria: Imaging of the Head and Neck

**EFFECTIVE JANUARY 1, 2019**
**Proprietary**

8600 West Bryn Mawr Avenue
South Tower – Suite 800 Chicago, IL 60631
www.aimspecialtyhealth.com

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# Description and Application of the Guidelines

The AIM Clinical Appropriateness Guidelines (hereinafter “the AIM Clinical Appropriateness Guidelines” or the “Guidelines”) are designed to assist providers in making the most appropriate treatment decision for a specific clinical condition for an individual. As used by AIM, the Guidelines establish objective and evidence-based criteria for medical necessity determinations where possible. In the process, multiple functions are accomplished:

- To establish criteria for when services are medically necessary
- To assist the practitioner as an educational tool
- To encourage standardization of medical practice patterns
- To curtail the performance of inappropriate and/or duplicate services
- To advocate for patient safety concerns
- To enhance the quality of health care
- To promote the most efficient and cost-effective use of services

The AIM guideline development process complies with applicable accreditation standards, including the requirement that the Guidelines be developed with involvement from appropriate providers with current clinical expertise relevant to the Guidelines under review and be based on the most up-to-date clinical principles and best practices. Relevant citations are included in the References section attached to each Guideline. AIM reviews all of its Guidelines at least annually.

AIM makes its Guidelines publicly available on its website twenty-four hours a day, seven days a week. Copies of the AIM Clinical Appropriateness Guidelines are also available upon oral or written request. Although the Guidelines are publicly-available, AIM considers the Guidelines to be important, proprietary information of AIM, which cannot be sold, assigned, leased, licensed, reproduced or distributed without the written consent of AIM.

AIM applies objective and evidence-based criteria, and takes individual circumstances and the local delivery system into account when determining the medical appropriateness of health care services. The AIM Guidelines are just guidelines for the provision of specialty health services. These criteria are designed to guide both providers and reviewers to the most appropriate services based on a patient’s unique circumstances. In all cases, clinical judgment consistent with the standards of good medical practice should be used when applying the Guidelines. Guideline determinations are made based on the information provided at the time of the request. It is expected that medical necessity decisions may change as new information is provided or based on unique aspects of the patient’s condition. The treating clinician has final authority and responsibility for treatment decisions regarding the care of the patient and for justifying and demonstrating the existence of medical necessity for the requested service. 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. If requested by a health plan, AIM will review requests based on health plan medical policy/guidelines in lieu of the AIM Guidelines.

The Guidelines may also be used by the health plan or by AIM for purposes of provider education, or to review the medical necessity of services by any provider who has been notified of the need for medical necessity review, due to billing practices or claims that are not consistent with other providers in terms of frequency or some other manner.

# Administrative Guidelines

## Ordering of Multiple Studies

Requests for multiple imaging studies to evaluate a suspected or identified condition and requests for repeated imaging of the same anatomic area are subject to additional review to avoid unnecessary or inappropriate imaging.

### Simultaneous Ordering of Multiple Studies

In many situations, ordering multiple imaging studies at the same time is not clinically appropriate because:

- Current literature and/or standards of medical practice support that one of the requested imaging studies is more appropriate in the clinical situation presented; or
- One of the imaging studies requested is more likely to improve patient outcomes based on current literature and/or standards of medical practice; or
- Appropriateness of additional imaging is dependent on the results of the lead study.

When multiple imaging studies are ordered, the request will often require a peer-to-peer conversation to understand the individual circumstances that support the medically necessity of performing all imaging studies simultaneously.

Examples of multiple imaging studies that may require a peer-to-peer conversation include:

- CT brain and CT sinus for headache
- MRI brain and MRA brain for headache
- MRI cervical spine and MRI shoulder for pain indications
- MRI lumbar spine and MRI hip for pain indications
- MRI or CT of multiple spine levels for pain or radicular indications
- MRI foot and MRI ankle for pain indications
- Bilateral exams, particularly comparison studies

There are certain clinical scenarios where simultaneous ordering of multiple imaging studies is consistent with current literature and/or standards of medical practice. These include:

- Oncologic imaging – Considerations include the type of malignancy and the point along the care continuum at which imaging is requested
- Conditions which span multiple anatomic regions – Examples include certain gastrointestinal indications or congenital spinal anomalies

### Repeated Imaging

In general, repeated imaging of the same anatomic area should be limited to evaluation following an intervention, or when there is a change in clinical status such that imaging is required to determine next steps in management. At times, repeated imaging done with different techniques or contrast regimens may be necessary to clarify a finding seen on the original study.

Repeated imaging of the same anatomic area (with same or similar technology) may be subject to additional review in the following scenarios:

- Repeated imaging at the same facility due to motion artifact or other technical issues
- Repeated imaging requested at a different facility due to provider preference or quality concerns
- Repeated imaging of the same anatomic area (MRI or CT) based on persistent symptoms with no clinical change, treatment, or intervention since the previous study
- Repeated imaging of the same anatomical area by different providers for the same member over a short period of time

## Pre-Test Requirements

Critical to any finding of clinical appropriateness under the guidelines for specific imaging exams is a determination that the following are true with respect to the imaging request:

- A clinical evaluation has been performed prior to the imaging request (which should include a complete history and physical exam and review of results from relevant laboratory studies, prior imaging and supplementary testing) to identify suspected or established diseases or conditions.
- For suspected diseases or conditions:
    - Based on the clinical evaluation, there is a reasonable likelihood of disease prior to imaging; and
    - Current literature and standards of medical practice support that the requested imaging study is the most appropriate method of narrowing the differential diagnosis generated through the clinical evaluation and can be reasonably expected to lead to a change in management of the patient; and
    - The imaging requested is reasonably expected to improve patient outcomes based on current literature and standards of medical practice.
- For established diseases or conditions:
    - Advanced imaging is needed to determine whether the extent or nature of the disease or condition has changed; and
    - Current literature and standards of medical practice support that the requested imaging study is the most appropriate method of determining this and can be reasonably expected to lead to a change in management of the patient; and
    - The imaging requested is reasonably expected to improve patient outcomes based on current literature and standards of medical practice.
- If these elements are not established with respect to a given request, the determination of appropriateness will most likely require a peer-to-peer conversation to understand the individual and unique facts that would supersede the pre-test requirements set forth above. During the peer-to-peer conversation, factors such as patient acuity and setting of service may also be taken into account.

## History

| Status | Date | Action |
|---|---|---|
| Reviewed and revised | 07/26/2016 | Independent Multispecialty Physician Panel review and revision |
| Created | 03/30/2005 | Original effective date |

# Head and Neck Imaging

## General Information/Overview

### Scope

These guidelines address advanced imaging of the head and neck in both adult and pediatric populations. For interpretation of the Guidelines, and where not otherwise noted, “adult” refers to persons age 19 and older, and “pediatric” refers to persons age 18 and younger. Where separate indications exist, they are specified as **Adult** or **Pediatric**. Where not specified, indications and prerequisite information apply to persons of all ages.

See the Coding section for a list of modalities included in these guidelines.

### Technology Considerations

There are a number of advanced imaging modalities available to visualize structures of the head and neck. Choice of imaging in this area is determined primarily by anatomic location.

**CT orbit/sella/posterior fossa** utilizes specific protocols depending on the clinical indication. Coverage may include the internal auditory canals, posterior fossa, sella turcica, orbits and temporal bone, and mastoid air cells. 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. CT is usually effective at demonstrating bony changes from a sellar, parasellar, or orbital mass.

**CT of the paranasal sinuses and maxillofacial area** is used to evaluate 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 in select cases and depending on the clinical indication. CT sections may be obtained in 1 or 2 (usually coronal and axial) planes.

**CT soft tissue neck** provides axial images from the skull base to the clavicles. Coverage includes the submandibular area and salivary glands as well as the pharynx, larynx, and proximal trachea. Thyroid and parathyroid glands are also included.

Disadvantages of CT include exposure to ionizing radiation and risks associated with infusion of iodinated contrast media, including allergic reactions or renal compromise.

**MRI orbit/face/neck** utilizes protocols tailored to the clinical indication. Coverage may include facial structures; larynx and subglottic regions; nasopharynx, oropharynx and hypopharynx; neck soft tissues, surrounding the airway and glands; optic nerve; orbit; salivary glands; sinuses; thyroid and parathyroid gland.

MRI is usually preferred over CT for evaluation of the sella turcica and visual pathways. For imaging of the internal auditory canals, MRI brain is the appropriate study (see Brain Imaging guidelines).

**MRI temporomandibular joint (TMJ)** is a 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.

The presence of implantable devices such as pacemakers or defibrillators, a potential need for sedation in pediatric patients, and claustrophobia are the main limitations of MRI. Infusion of gadolinium may also confer an unacceptable risk in persons with advanced renal disease.

### Definitions

**Phases of the care continuum are broadly defined as follows:**

- **Screening** – testing in the absence of signs or symptoms of disease

- **Diagnosis –** testing based on a reasonable suspicion of a particular condition or disorder, usually due to the presence of signs or symptoms
- **Management –** testing to direct therapy of an established condition, which may include preoperative or postoperative imaging, or imaging performed to evaluate the response to nonsurgical intervention
- **Surveillance –** periodic assessment following completion of therapy, or for monitoring known disease that is stable or asymptomatic

**Statistical terminology[1]**

- **Confidence interval (CI)** – range of values which is likely to contain the cited statistic. For example, 92% sensitivity (95% CI, 89%-95%) means that, while the sensitivity was calculated at 92% on the current study, there is a 95% chance that, if a study were to be repeated, the sensitivity on the repeat study would be in the range of 89%-95%.
- **Diagnostic accuracy** – ability of a test to discriminate between the target condition and health. Diagnostic accuracy is quantified using sensitivity and specificity, predictive values, and likelihood ratios.
- **Hazard ratio** – odds that an individual in the group with the higher hazard reaches the outcome first. Hazard ratio is analogous to odds ratio and is reported most commonly in time-to-event analysis or survival analysis. A hazard ratio of 1 means that the hazard rates of the 2 groups are equivalent. A hazard ratio of greater than 1 or less than 1 means that there are differences in the hazard rates between the 2 groups.
- **Likelihood ratio** – ratio of an expected test result (positive or negative) in patients *with* the disease to an expected test result (positive or negative) in patients *without* the disease. Positive likelihood ratios, especially those greater than 10, help rule in a disease (i.e., they substantially raise the post-test probability of the disease, and hence make it very likely and the test very useful in identifying the disease). Negative likelihood ratios, especially those less than 0.1, help rule out a disease (i.e., they substantially decrease the post-test probability of disease, and hence make it very unlikely and the test very useful in excluding the disease).
- **Odds ratio** – odds that an outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure. An odds ratio of 1 means that the exposure does not affect the odds of the outcome. An odds ratio greater than 1 means that the exposure is associated with higher odds of the outcome. An odds ratio less than 1 means that the exposure is associated with lower odds of the outcome.
- **Predictive value** – likelihood that a given test result correlates with the presence or absence of disease. Positive predictive value is defined as the number of true positives divided by the number of test positives. Negative predictive value is defined as the number of true negatives divided by the number of test negative patients. Predictive value is dependent on the prevalence of the condition.
- **Pretest probability** – probability that a given patient has a disease prior to testing. May be divided into very low (less than 5%), low (less than 20%), moderate (20%-75%), and high (greater than 75%) although these numbers may vary by condition.
- **Relative risk** – probability of an outcome when an exposure is present relative to the probability of the outcome occurring when the exposure is absent. Relative risk is analogous to odds ratio; however, relative risk is calculated by using percentages instead of odds. A relative risk of 1 means that there is no difference in risk between the 2 groups. A relative risk of greater than 1 means that the outcome is more likely to happen in the exposed group compared to the control

group. A relative risk less than 1 means that the outcome is less likely to happen in the exposed group compared to the control group.

- **Sensitivity** – conditional probability that the test is positive, given that the patient has the disease. Defined as the true positive rate (number of true positives divided by the number of patients with disease). Excellent or high sensitivity is usually greater than 90%.
- **Specificity** – conditional probability that the test is negative, given that the patient does not have the disease. Defined as the true negative rate (number of true negatives divided by the number of patients without the disease). Excellent or high specificity is usually greater than 90%.

# Clinical Indications

The following section includes indications for which advanced imaging of the head and neck is considered medically necessary, along with prerequisite information and supporting evidence where available. Indications, diagnoses, or imaging modalities not specifically addressed are considered not medically necessary.

It is recognized that imaging often detects abnormalities unrelated to the condition being evaluated. Such findings must be considered within the context of the clinical situation when determining whether additional imaging is required.

## Congenital and Developmental Conditions

Advanced imaging is considered medically necessary for diagnosis and management of congenital and developmental conditions in the head and neck region when the results of imaging will impact treatment.

**IMAGING STUDY**

- CT orbit, sella, or posterior fossa and outer, middle or inner ear
- MRI orbit, face and neck (soft tissue)
- CT paranasal sinuses and maxillofacial area
- CT soft tissue neck

## Infection and Inflammatory Conditions

### Sinusitis/rhinosinusitis

***ADULT***

Advanced imaging is considered medically necessary for diagnosis and/or management (including preoperative and postoperative evaluation) of **ANY** of the following conditions:

- Acute uncomplicated sinusitis/rhinosinusitis
  - Evaluation of symptoms persisting beyond 3 to 4 weeks of adequate treatment, which may include antibiotics, nasal steroids and/or decongestants.

  *Note: Under these circumstances, a complication of acute sinusitis/rhinosinusitis or an alternative diagnosis may warrant imaging.*

- Acute recurrent sinusitis/rhinosinusitis
- Chronic sinusitis/rhinosinusitis
- Periorbital swelling associated with sinus infection
- Barosinusitis/headache refractory to antibiotics and responding only to decongestants/oral steroids

***PEDIATRIC***

- Acute and subacute sinusitis in **EITHER** of the following scenarios:
  - Screening of a patient who is immunocompromised or likely to become immunocompromised by therapy, such as prior to chemotherapy or transplant
  - Management of **ANY** of the following complications of acute sinusitis
    - Abscess, intracranial or orbital
    - Encephalitis or cerebritis
    - Meningitis
    - Sinus thrombosis
    - Invasive fungal sinusitis in immunocompromised individuals
- Chronic or recurrent sinusitis in **ANY** of the following scenarios:
  - Confirmation of chronic sinusitis prior to a prolonged course of antibiotics
  - Evaluation in immunocompromised individuals
  - Evaluation of unilateral sinusitis
  - To assist in diagnosing **ANY** of the following underlying medical conditions:
    - Chronic allergies or asthma
    - Ciliary motility disorder
    - Craniofacial abnormality
    - Cystic fibrosis
  - Preoperative evaluation to determine whether the patient is a surgical candidate
  - Preoperative image guidance study
  - Management of postoperative complications

*Note: Radiographic imaging is not indicated for immunocompetent patients with acute rhinosinusitis unless a complication or alternative diagnosis is suspected.*

**IMAGING STUDY**

- CT paranasal sinuses and maxillofacial area

**Rationale**

ADULT SINUSITIS

Rhinosinusitis is defined as symptomatic inflammation of the paranasal sinuses and nasal cavity. The term rhinosinusitis is preferred because sinusitis is almost always accompanied by inflammation of the contiguous nasal mucosa. Twelve percent of the U.S. population (nearly 1 in 8 adults) reported being diagnosed with rhinosinusitis.[2]

Acute uncomplicated rhinosinusitis is defined as rhinosinusitis lasting less than 4 weeks, without clinically evident extension of the inflammation outside the paranasal sinuses and nasal cavity at the time of diagnosis, e.g., no neurologic, ophthalmologic, or soft tissue involvement.[3] There is strong, consistent specialty society consensus that imaging should not be performed for acute uncomplicated sinusitis. The American Academy of Otolaryngology–Head and Neck Surgery states that, as long as the clinical diagnostic criteria are met for patients with acute uncomplicated rhinosinusitis, imaging of the paranasal sinuses is unnecessary.[4] Clinicians should offer either watchful waiting (without antibiotics) or prescribe initial antibiotic therapy for adults with uncomplicated acute bacterial rhinosinusitis and that clinicians should not obtain radiographic imaging for acute bacterial rhinosinusitis unless a complication or alternative diagnosis is suspected.[3] In a prospective study of 174 patients suspected of having acute maxillary sinusitis, the authors

found that CT scans contributed little to the final diagnosis, while clinical findings such as elevated C-reactive protein or erythrocyte sedimentation rate were more reliable indicators.[5]

Complications of sinusitis may be intraorbital (such as orbital cellulitis, cavernous sinus thrombosis, or subperiosteal or orbital abscess) or intracranial (such as encephalitis, cerebritis, meningitis, abscess, or venous sinus thrombosis). Osteomyelitis and sinonasal mucocele or mucopyocele are also potential complications of sinusitis. Suggestive findings on physical examination include proptosis, visual changes, severe headache, abnormal extraocular movements, changes in mental status, and periorbital inflammation, edema, or erythema.[3]

The American College of Radiology states that either MRI with and without contrast or CT sinus with and/or without contrast is usually appropriate. MRI provides superior visualization of the orbits and intracranial soft tissues, and CT is useful when osteomyelitis is suspected.[6]

The primary role of advanced imaging in chronic rhinosinusitis and recurrent acute rhinosinusitis (defined as 3 or more separate episodes of acute sinusitis within a year) is to evaluate the anatomy of the paranasal sinuses prior to surgery. Status of the paranasal sinus drainage pathways including occlusion of the ostiomeatal units, frontoethmoidal or sphenoethmoidal drainage pathways help determine whether functional endoscopic sinus surgery will be beneficial. In addition, anatomic variants are important to know in advance of endoscopic surgery to reduce postoperative complication risk. For instance, an anatomically depressed or asymmetric cribriform plate increases the risk of intracranial penetration, while bony dehiscence of the carotid canal or pneumatization of the sphenoid and clinoids increases the risk of vascular or optic nerve injury. CT without contrast is optimal for visualization of paranasal sinus bony anatomy and is the imaging method of choice.[6]

Clinicians should recommend saline nasal irrigation, topical intranasal corticosteroids, or both for symptom relief of chronic rhinosinusitis.[3] The presence of nonspecific inflammation of the paranasal sinuses would likely lead to repeat imaging requests, due to obscuration of the underlying anatomy. Therefore, even though a patient has been symptomatic for 12 weeks, the accurate diagnosis of chronic sinusitis will require a trial of medication to reduce inflammation in the paranasal sinuses prior to imaging.

The American Academy of Otolaryngology–Head and Neck Surgery states that only one CT is needed—and another should not be ordered within 90 days—to evaluate patients with uncomplicated chronic rhinosinusitis as long as the CT obtained is of adequate quality and resolution to be interpreted by the clinician and used for clinical decision-making and/or surgical planning.[4]

PEDIATRIC SINUSITIS

The American Academy of Pediatrics states that imaging to differentiate acute bacterial sinusitis from viral upper respiratory infection should not be performed as it does not contribute to the diagnosis.[7] For suspected orbital or central nervous system complications, a contrast-enhanced CT of the paranasal sinuses should be performed.[7]

Chronic sinusitis is commonly due to nonstructural causes including asthma, gastroesophageal reflux disease, or allergic rhinitis.[8] The American College of Radiology indicates that CT is usually appropriate in pediatric patients with chronic sinusitis that does not respond to treatment or that is recurrent.[8]

## Infectious disease – not otherwise specified

*Applies to conditions not otherwise referenced in Head and Neck Imaging*

Advanced imaging is considered medically necessary for infection in the head and neck region when the results of imaging are essential to establish a diagnosis and/or direct management.

**IMAGING STUDY**

- CT orbit, sella, or posterior fossa and outer, middle or inner ear
- MRI orbit, face, and neck (soft tissue)
- CT paranasal sinuses and maxillofacial area
- CT soft tissue neck

## Inflammatory conditions – not otherwise specified

*Includes Wegener's granulomatosis (granulomatosis with polyangiitis).*

Advanced imaging is considered medically necessary for diagnosis and management of inflammatory disease in the head and neck region when the results of imaging will impact treatment.

**IMAGING STUDY**

- CT orbit, sella, or posterior fossa and outer, middle or inner ear

- MRI orbit, face, and neck (soft tissue)
- CT paranasal sinuses and maxillofacial area
- CT soft tissue neck

# Trauma

## Trauma

Advanced imaging is considered medically necessary for traumatic injury to the head and neck region when the results of imaging are essential to establish a diagnosis and/or direct management.

**IMAGING STUDY**

- CT orbit, sella, or posterior fossa and outer, middle or inner ear
- MRI orbit, face, and neck (soft tissue)
- CT paranasal sinuses and maxillofacial area
- CT soft tissue neck
- MRI temporomandibular joint

*Note: Conventional radiographs, Panorex views, or CT of the temporomandibular joint are preferred for initial evaluation of temporomandibular joint trauma.*

# Tumor/Soft Tissue Mass

*For management of documented malignancy, see Oncologic Imaging guidelines.*

## Cholesteatoma

Advanced imaging is considered medically necessary when the results of imaging are essential to establish a diagnosis and/or direct management.

**IMAGING STUDY**

- CT orbit, sella, or posterior fossa and outer, middle, or inner ear

## Neck mass

***ADULT***

Advanced imaging is considered medically necessary in **ANY** of the following scenarios:

- Evaluation of a palpable neck mass
- Follow up of a nonpalpable neck mass identified on a prior imaging study
- Management (including perioperative evaluation) of known cystic neck mass or other benign tumor

***PEDIATRIC***

Advanced imaging is considered medically necessary in **ANY** of the following scenarios:

- Initial evaluation of a palpable neck mass when ultrasound demonstrates a solid mass other than a lymph node
- Management of a known cystic neck mass or other benign tumor when ultrasound is not sufficient to guide treatment
- Evaluation of a retropharyngeal neck mass

**IMAGING STUDY**

- MRI orbit, face, and neck (soft tissue)
- CT soft tissue neck

**Rationale**

ADULT NECK MASS

The American Academy of Otorhinolaryngology–Head and Neck Surgery recommends a neck CT or MRI with contrast for patients with a neck mass found to be at increased risk for malignancy;[9] this approach is also endorsed by best practice guidelines.[9] A variety of factors increase the clinical pretest probability for a malignant neck mass, including age over 40, persistence for greater than 2 weeks, and absence of infectious symptoms.[10]

PEDIATRIC NECK MASS

Unlike neck masses in adults, the majority of pediatric neck masses are benign. Ultrasound is usually the first-line imaging modality for pediatric neck masses, especially given the risk of radiation, inaccessibility of MRI and potential need for sedation.[11] Ultrasound has lower but comparable diagnostic accuracy to CT in the diagnosis of lateral neck masses in children[12] and helps to select patients with midline neck masses who require surgery.[13] CT or MRI may be indicated for a negative ultrasound with high clinical suspicion or to further evaluate anatomic extent and/or composition of incompletely characterized ultrasound findings.[11] CT or MRI may be appropriate as an initial imaging test when deep neck space or retropharyngeal masses are suspected; in the setting of acute infection, the positive predictive value for CT is 100%.[14]

## Parathyroid adenoma

Advanced imaging is considered medically necessary in **ANY** of the following scenarios:

- Evaluation of suspected adenoma following abnormal parathyroid ultrasound or scintigraphy
- Preoperative planning in patients with aberrant anatomy
- Localization of residual parathyroid tissue following failed parathyroidectomy

**IMAGING STUDY**

- MRI orbit, face, and neck (soft tissue)
- CT soft tissue neck

**Rationale**

Ultrasound and sestamibi scintigraphy are the most common initial imaging tests used to evaluate suspected parathyroid adenoma and have a diagnostic accuracy of approximately 82%.[15] When ultrasound and sestamibi exams are not diagnostic, 4 dimensional CT, including dynamic contrast enhancement, has high sensitivity (94%) and specificity (96%).[16]

## Thyroid nodule or thyromegaly (goiter)

Advanced imaging is considered medically necessary in **EITHER** of the following scenarios:

- Mass effect on the upper airway or esophagus
- Preoperative evaluation

**IMAGING STUDY**

- Thyroid ultrasound or scintigraphy recommended for initial evaluation
- MRI orbit, face, and neck (soft tissue) or CT neck (soft tissue) when further imaging is required to direct treatment

### Tumor – not otherwise specified

Advanced imaging is considered medically necessary when the results of imaging are essential to establish a diagnosis and/or direct management.

**IMAGING STUDY**

- CT orbit, sella, or posterior fossa and outer, middle or inner ear
- MRI orbit, face, and neck (soft tissue)
- CT paranasal sinuses and maxillofacial area
- CT soft tissue neck

## Nasal Indications

Advanced imaging is considered medically necessary for evaluation of **ANY** of the following indications:

### Anosmia

### Cerebrospinal fluid leak

### Foreign body

### Mucocele of the paranasal sinus

### Nasal airway obstruction refractory to medical therapy

### Nasal or sinus polyposis

### Recurrent epistaxis

**IMAGING STUDY**

- CT paranasal sinuses and maxillofacial area

## Orbital Indications

Advanced imaging is considered medically necessary for evaluation of **ANY** of the following conditions:

### Absence of red reflex (pediatric only)

### Dysconjugate gaze

### Exophthalmos or proptosis

### Extraocular muscle weakness

### Nystagmus

### Optic neuritis

### Orbital pseudotumor

### Papilledema

### Strabismus

### Thyroid ophthalmopathy

**IMAGING STUDY**

- MRI orbit, face, and neck (soft tissue)
- CT orbit, sella, or posterior fossa and outer, middle or inner ear

## Temporomandibular Joint Pathology

### Arthropathy of the temporomandibular joints

*Includes traumatic, inflammatory or infectious arthritis.*

Advanced imaging is considered medically necessary when the results of imaging are essential to establish a diagnosis and/or direct management.

**IMAGING STUDY**

- Radiographs required for initial evaluation in pediatric patients
- MRI temporomandibular joint

### Frozen jaw

Advanced imaging is considered medically necessary when the results of imaging are essential to establish a diagnosis and/or direct management (including perioperative evaluation).

**IMAGING STUDY**

- MRI of temporomandibular joint

### Juvenile idiopathic arthritis (Pediatric only)

Advanced imaging of the head and neck is considered medically necessary for management of established juvenile idiopathic arthritis when radiographs are not sufficient to guide treatment.

**IMAGING STUDY**

- MRI of temporomandibular joint

### Rationale

Juvenile idiopathic arthritis (JIA) is an umbrella term that encompasses all forms of arthritis that begin before age 16, persist for more than 6 weeks, and are of unknown etiology. Specific examples of JIA include oligoarthritis, polyarthritis, systemic arthritis, psoriatic and enthesis-related arthritis. JIA is the most common childhood rheumatic disease, with a prevalence of 0.6 to 1.9 in 1000 children.[17]

JIA is primarily a clinical diagnosis. General practitioners should base diagnosis of JIA on history and clinical examination, with strong suspicion of JIA indicated by pain and swelling of single or multiple joints, persistent or worsening loss of function, fever of at least 10 days with unknown cause, often associated with transient erythematous rash, decreased range of motion, and joint warmth or effusion.[18]

Laboratory assessment with appropriate tests can assist in increasing diagnostic certainty, excluding differential diagnoses, and predicting patients likely to progress to erosive disease. Base investigations usually include erythrocyte sedimentation rate or C-reactive protein, full blood count, and rheumatoid factor, antinuclear antigen, or human leukocyte antigen B27 as clinically indicated.[18]

When there is doubt, conventional radiographs, ultrasound or MRI can be used to improve the certainty of a diagnosis of JIA.[19] MRI is the most sensitive noninvasive imaging modality to evaluate for inflammation of the joints, tendons, and entheses and is the only modality that can depict bone marrow edema. Currently, MRI with contrast is the most sensitive tool for determining active synovitis.[20] When the imaging modalities are directly compared, MRI and ultrasound detected more joint damage than conventional radiographs, particularly at the hip and the wrist.[19] Imaging studies can help identify children with a high likelihood of early erosive joint damage, providing an opportunity to implement aggressive therapy at an early stage in an attempt to reduce morbidity.[20]

## Temporomandibular disease

*Includes disorders of the masticatory muscles and the temporomandibular joint.*

Advanced imaging is considered medically necessary in **ANY** of the following scenarios:

- Panorex is inconclusive or not available
- Panorex findings require further characterization
- Panorex is normal but high clinical suspicion for temporomandibular joint pathology remains, and the results will change management (including perioperative evaluation)

**IMAGING STUDY**

- CT paranasal sinuses and maxillofacial area

## Temporomandibular joint dysfunction

Advanced imaging is considered medically necessary when **ALL** of the following requirements are met:

- Symptoms have not improved with conservative treatment, including nonsteroidal anti-inflammatory drugs or acetaminophen, a short-term trial of soft diet and proper chewing techniques, and an oral appliance (such as a bite block)
- Radiographs or Panorex have not provided sufficient information to guide treatment
- Intervention is being considered

**IMAGING STUDY**

- MRI of temporomandibular joint

# Miscellaneous Conditions

## Cochlear implant

Advanced imaging is considered medically necessary for perioperative evaluation related to cochlear implant placement when the results of imaging will impact management.

**IMAGING STUDY**

- CT orbit, sella, or posterior fossa and outer, middle or inner ear

## Foreign body evaluation

Advanced imaging is considered medically necessary when radiographs are nondiagnostic.

**IMAGING STUDY**

- CT orbit, sella, or posterior fossa for foreign body in ear canal or orbit
- CT soft tissue neck for foreign body in aerodigestive tract

## Laryngeal edema

Advanced imaging is considered medically necessary when the results of imaging are essential to establish a diagnosis and/or direct management (including perioperative evaluation).

**IMAGING STUDY**

- CT soft tissue neck
- MRI orbit, face, and neck (soft tissue)

## Osseous lesions

*Include fibrous dysplasia, Paget's disease, and otosclerosis*

Advanced imaging is considered medically necessary for diagnosis and management (including perioperative evaluation) of lesions in the temporal bones, sella turcica, orbit or posterior fossa when the results of imaging will impact treatment.

**IMAGING STUDY**

- CT orbit, sella, or posterior fossa and outer, middle or inner ear

## Osteonecrosis of the jaw

Advanced imaging is considered medically necessary when radiographs or Panorex have been performed and further imaging is needed to direct management.

**IMAGING STUDY**

- MRI orbit, face, and neck (soft tissue)
- CT paranasal sinuses and maxillofacial area
- CT soft tissue neck

## Salivary gland ductal calculi

Advanced imaging is considered medically necessary when the results of imaging are essential to establish a diagnosis and/or direct management.

**IMAGING STUDY**

- CT soft tissue neck

## Torticollis (Pediatric only)

- Congenital muscular torticollis in infants age 8 months or younger
  - When ultrasound of the neck and cervical spine radiographs are nondiagnostic, and there is no improvement following 4 weeks of conservative treatment
- Childhood (acquired) torticollis
  - Evaluation for secondary causes (such as infection, neoplasm, trauma) when clinically indicated

**IMAGING STUDY**

- CT soft tissue neck
- MRI orbit, face, and neck (soft tissue)

### Tracheal stenosis or upper airway obstruction

Advanced imaging is considered medically necessary when the results of imaging are essential to establish a diagnosis and/or direct management (including perioperative evaluation).

**IMAGING STUDY**

- CT soft tissue neck
- MRI orbit, face, and neck (soft tissue)

## Signs and Symptoms

### Dizziness or vertigo

*Also see Brain Imaging guidelines.*

Advanced imaging is considered medically necessary in **EITHER** of the following scenarios:

- Evaluation of signs or symptoms suggestive of a central nervous system lesion
- Symptoms associated with abnormal audiogram or auditory brainstem response

*Note: Vertigo or dizziness that is clearly related to positional change does not require advanced imaging.*

**IMAGING STUDY**

- CT orbit/sella/posterior fossa

**Rationale**

For isolated vertigo without additional neurological signs or symptoms, the diagnostic yield of imaging for a structural cause is low. In a large single institution retrospective study (N = 1028), CT found structural causes for dizziness or vertigo in only 6.17% of patients and only 0.74% of these findings were clinically significant.[21] In a retrospective study comparing different imaging modalities for the work-up of dizziness, the likelihood of CT angiography and MRI affecting management has been reported in the range of 1.1%-1.3%.[22] The diagnostic yield for imaging of benign paroxysmal positional vertigo on clinical exam is also low and routine imaging is not warranted. The American Academy of Otolaryngology–Head and Neck Surgery recommends that initial imaging should not be performed for patients who meet the diagnostic criteria for benign paroxysmal positional vertigo and that patients should be reassessed after 1 month of observation or treatment for the resolution or persistence of symptoms.[23]

When central vertigo is suspected, prompt use of advanced imaging is generally appropriate to rule out acute potentially life-threatening causes. One study found that the odds ratios for identifying stroke in patients presenting with gait instability, neurologic findings, and focal neurologic deficits were 9.3, 8.7, and > 20 respectively.[24] In 2 single-center retrospective studies, MRI changed management in 16%-22% of patients with central vertigo.[25,26] The American College of Radiology recommends MRI brain with and without contrast for patients with central vertigo.[27] CT brain may also be performed although MRI is more sensitive than CT for detection of posterior fossa strokes.[24,26]

### Hearing loss

*Also see Brain Imaging guidelines for sensorineural hearing loss.*

***ADULT***

Advanced imaging is considered medically necessary for detecting a structural cause of hearing loss in **EITHER** of the following scenarios:

- Conductive hearing loss
- Sensorineural hearing loss characterized by **EITHER** of the following features:
  - Gradual onset of unilateral or asymmetric hearing loss demonstrated by audiometric testing (15 dB or greater at 2 consecutive frequencies between 0.5 and 3 kHz)
  - Hearing loss associated with at least 1 neurologic sign or symptom known to increase the pretest probability of a retrocochlear lesion

**IMAGING STUDY**

- MRI brain for evaluation of sensorineural hearing loss
- CT brain for evaluation of sensorineural hearing loss when MRI contraindicated
- CT orbit/sella/posterior fossa for evaluation of conductive hearing loss

***PEDIATRIC***

Advanced imaging is considered medically necessary to evaluate for a structural cause of sensorineural, conductive, or mixed hearing loss.

**IMAGING STUDY**

- MRI brain preferred for evaluation of sensorineural hearing loss
- CT orbit/sella/posterior fossa preferred for evaluation of conductive or mixed hearing loss

**Rationale**

The primary purpose of imaging sensorineural hearing loss is to detect retrocochlear pathology, typically a tumor of the vestibular nerve (cranial nerve 8) or cerebellopontine angle (CPA). More than 85% of these tumors are acoustic neuromas (also called vestibular schwannomas). However, vestibular schwannomas are rare, with an overall prevalence of 1 per 100,000, and they are found only in 2% to 8% of patients with autoimmune sensorineural hearing loss.

A 15 dB or greater difference at 2 consecutive frequencies has a sensitivity of 97% and a specificity of 49% for the diagnosis of vestibular schwannoma. For optimum specificity (~67%) with high sensitivity (~90%) the American Academy of Otolaryngology–Head and Neck Surgery protocol is recommended, which proposes ≥ 15 dB between ears, averaging 0.5 to 3 kHz.[122]

MRI of the head and the internal auditory canal, commonly known as an IAC protocol, is most effective in screening for CPA tumors. Clinicians should not order CT of the head/brain in the initial evaluation of a patient with presumptive sudden sensorineural hearing loss.[123]

## Hoarseness, dysphonia, and vocal cord weakness/paralysis

***ADULT***

Advanced imaging is considered medically necessary in **ANY** of the following scenarios:

- Following laryngoscopy, when findings suggest recurrent laryngeal nerve dysfunction or identify a suspicious lesion
- Evaluation of symptoms persisting longer than 1 month which are unexplained by laryngoscopy
- Presence of at least **ONE** of the following high-risk features:
  - Tobacco use
  - Alcohol abuse
  - Hemoptysis
  - History of radiation therapy
  - Known head and neck malignancy

***PEDIATRIC***

Advanced imaging is considered medically necessary in **EITHER** of the following scenarios:

- Following abnormal or nondiagnostic laryngoscopy
- Evaluation of symptoms persisting longer than 1 month

**IMAGING STUDY**

- CT soft tissue neck
- MRI orbit, face, and neck (soft tissue)

**Rationale**

Most hoarseness is self-limited or caused by a pathology that can be identified by laryngoscopy.

Clinicians should visualize the patient's larynx, or refer the patient to a clinician who can visualize the larynx, when hoarseness fails to resolve by a maximum of 3 months after onset, or irrespective of duration if a serious underlying cause is suspected.[28,29] Benign lesions of the vocal cords such as cysts, nodules, polyps, and gastroesophageal reflux are frequently diagnosed and managed with laryngoscopy alone. Accuracy of history and physical exam in hoarseness is low (5%) and laryngoscopy increases the accuracy of diagnosis by approximately 68%.[30]

Hoarseness is common in young children (15%-24%) and usually due to benign lesions that can be seen on laryngoscopy. Vocal cord nodules are the most common type of these benign lesions, accounting for approximately 77% of cases.[28] American Academy of Otolaryngology–Head and Neck Surgery Foundation states that advanced imaging (CT or MRI) should not be performed in patients with a primary complaint of hoarseness prior to examining the larynx.[31]

## Horner's syndrome

Advanced imaging is considered medically necessary for evaluation when the results of imaging will impact management.

**IMAGING STUDY**

- CT soft tissue neck
- MRI orbit, face, and neck (soft tissue)

**Rationale**

Horner's syndrome is a condition that results from disruption of the sympathetic nervous supply to the eye and is characterized by the triad of miosis, ptosis and anhidrosis.[32]

Evaluation of Horner's syndrome begins with a complete neurological and ophthalmological examination which may reveal an etiology for the condition such as surgical trauma. Additional neurological features such as additional cranial nerve deficits may localize the pathology to the brain in which case a sequential diagnostic testing strategy starting with brain MRI may be possible. In nonlocalized cases, the entire course of the oculosympathetic pathway may need to be visualized including an MRI of the brain and an MRI, CT, or MRA/CTA of the neck if there is concern for carotid dissection as a cause. The yield of diagnostic imaging in isolated Horner's syndrome is approximately 15%-20%,[33,34] and the most common etiologies identified by neuroimaging are carotid artery dissections and cavernous sinus masses.

For pediatric patients, one study found that neuroimaging (MRI head, neck, and chest if indicated) identified a cause in up to 33% of cases.[35] Unlike in adults, neoplasms such as neuroblastoma and Ewing sarcoma are the most common etiologies for Horner's syndrome identified by neuroimaging in pediatric patients.

## Localized facial pain

Advanced imaging is considered medically necessary for evaluation when localized facial pain is persistent and unexplained, and when the results of imaging will impact management.

**IMAGING STUDY**

- CT orbit, sella, or posterior fossa and outer, middle or inner ear

## Lymphadenopathy

***ADULT***

Advanced imaging is considered medically necessary for evaluation when persistent and unexplained, and when the results of imaging will impact management.

***PEDIATRIC***

Advanced imaging is considered medically necessary in **ANY** of the following scenarios:

- Ultrasound findings suggestive of nodal malignancy
- Nondiagnostic ultrasound and failure to resolve following a 6-week course of empiric therapy
- Nondiagnostic ultrasound and presence of at least **ONE** of the following features:
  - Absence of pain or tenderness
  - Constitutional symptoms
  - Firm/immobile and size greater than 3 cm in diameter
  - Persistent enlargement on exam for longer than 2 weeks
  - Presence of ulceration
  - Supraclavicular or posterior triangle location

*Note: Biopsy may be more appropriate than imaging when any of these features are present.*

**IMAGING STUDY**

- CT soft tissue neck
- MRI orbit, face, and neck (soft tissue)

**Rationale**

Persistent unexplained neck masses in adults, especially over age 40, are often malignant whereas those in children are typically benign.[10] Advanced imaging is most useful to evaluate the extent of lymphadenopathy and to evaluate nodal locations that are not palpable or accessible to ultrasound (such as the lateral retropharyngeal nodes). Ultrasound is the primary modality for evaluating and following lymph nodes in children.[36,37] Sonographic characteristics such as size, loss of fatty hilar morphology, and shape increase the likelihood of malignancy but do not replace biopsy.[38] Additional high-risk features of adenopathy such as supraclavicular location or firmness increase the likelihood of malignancy. Advanced imaging may be indicated as an adjuvant to biopsy to look for adenopathy in other locations, particularly in places where ultrasound assessment is limited.

## Stridor

Advanced imaging is considered medically necessary in **EITHER** of the following scenarios:

- Evaluation of acute stridor
- Evaluation of subacute or chronic stridor, following nondiagnostic radiograph and otolaryngology (ENT) evaluation

**IMAGING STUDY**

- CT soft tissue neck
- MRI orbit, face, and neck (soft tissue)

## Tinnitus

*See Brain Imaging guidelines.*

## Pulsatile tinnitus (Pediatric only)

*Also see Vascular Imaging guidelines.*

Advanced imaging is considered medically necessary when the results of imaging will impact management.

**IMAGING STUDY**

- CT orbit/sella turcica/posterior fossa

## Visual disturbance or visual field defect

Advanced imaging is considered medically necessary to evaluate for orbital or optic nerve pathology when suggested by the ophthalmologic exam.

**IMAGING STUDY**

- MRI orbit, face, and neck (soft tissue)
- CT orbit, sella, or posterior fossa and outer, middle or inner ear

**Rationale**

Advanced imaging is usually not appropriate in patients whose visual disturbance is explained by the ophthalmologic exam.[39] MRI of the orbits, typically with and without contrast, is appropriate to further characterize abnormalities on the ophthalmologic exam.[39]

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## Codes



The following codes may be applicable to the head and neck imaging and may not be all inclusive.

### CPT

| | |
|---|---|
| 70336 | MRI of the temporomandibular joint(s) |
| 70450 | CT head/brain, without contrast |
| 70460 | CT head/brain, with contrast |
| 70470 | CT head/brain, without contrast, followed by re-imaging with contrast |
| 70480 | CT of orbit, sella, or posterior fossa or outer, middle or inner ear, without contrast |
| 70481 | CT of orbit, sella, or posterior fossa or outer, middle or inner ear, with contrast |
| 70482 | CT of orbit, sella, or posterior fossa or outer, middle or inner ear, without contrast, followed by re-imaging with contrast |
| 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 |
| 70490 | CT, soft tissue neck, without contrast |
| 70491 | CT, soft tissue neck, with contrast |
| 70492 | CT, soft tissue neck, without contrast, followed by re-imaging with contrast |
| 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 |
| 70551 | MRI brain (including brain stem), without contrast |
| 70552 | MRI brain (including brain stem), with contrast |
| 70553 | MRI brain (including brain stem), without contrast, followed by re-imaging with contrast |

### HCPCS

None

### ICD-10 Diagnosis

Refer to the ICD-10 CM manual

## History

| Status | Date | Action |
|---|---|---|
| Restructured | 01/01/2019 | Advanced Imaging guidelines redesigned and reorganized to a condition-based structure |
| Reviewed | 08/15/2017 | Last Independent Multispecialty Physician Panel review |
| Revised | 11/01/2016 | Independent Multispecialty Physician Panel revision |
| Created | 03/30/2005 | Original effective date |