CLINICAL GUIDELINES

Head Imaging Policy

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eviCore healthcare Clinical Decision Support Tool Diagnostic Strategies: This tool addresses common symptoms and symptom complexes. Imaging requests for individuals with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician, specialist and/or individual's Primary Care Physician (PCP) may provide additional insight.

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Abbreviations for Head Imaging Guidelines

ACTH	adrenocorticotropic hormone
AD	Alzheimer's Disease
ADH	antidiuretic hormone
AION	arteritic ischemic optic neuritis
AVM	arteriovenous malformation
CBCT	Cone-beam computerized tomography
CMV	cytomegalovirus
CSF	cerebrospinal fluid
CT	computed tomography
CTA	computed tomography angiography
DNA	deoxyribonucleic acid
DWI	diffusion weighted imaging (for MRI)
EEG	electroencephalogram
ENT	Ear, Nose, Throat
ESR	erythrocyte sedimentation rate
FDG	fluorodeoxyglucose
FSH	follicle-stimulating hormone
FTD	Frontotemporal Dementia
GCA	giant cell arteritis
GCS	Glasgow Coma Scale
HIV	human immunodeficiency virus
LH	luteinizing hormone
MMSE	mini mental status examination
MRA	magnetic resonance angiography
MRI	magnetic resonance imaging
MRN	magnetic resonance neurography
MS	multiple sclerosis
MSI	magnetic source imaging
NAION	non-arteritic ischemic optic neuritis
NPH	normal pressure hydrocephalus
PET	positron emission tomography
PML	progressive multifocal leukoencephalopathy
PNET	primitive neuro ectodermal tumor
PWI	perfusion weighted imaging (for MRI)
SAH	subarachnoid hemorrhage
SIADH	Syndrome of Inappropriate Antidiuretic Hormone Secretion
SLE	systemic lupus erythematosus
TIA	transient ischemic attack
TMJ	temporomandibular joint disease
TSH	thyroid-stimulating hormone
VBI	vertebrobasilar
VP	ventriculoperitoneal
XRT	radiation therapy

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HD-1: General Guidelines

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HD-1: General Guidelines

- A recent (within 60 days) face to face evaluation including a detailed history, physical examination and appropriate laboratory studies should be performed prior to considering the use of an advanced imaging (CT, MR, Nuclear Medicine) procedure. An exception can be made if the patient is undergoing a guideline-supported, scheduled follow-up imaging evaluation.
  - The clinical evaluation should include a relevant history and physical examination, including a neurological examination (unless the request is for a scheduled follow-up of known problems such as MS, tumors, or hydrocephalus, scheduled surveillance with no new symptoms, screening asymptomatic patient due to family history and otherwise meet criteria for repeat imaging), as well as appropriate laboratory studies and non-advanced imaging modalities
    - A neurological exam is required prior to advanced imaging except in the following scenarios:
      - Tinnitus, TMJ, Sinus or mastoid disease, ear pain, hearing loss and epistaxis.
      - The request is from a neurologist or neurosurgeon who has seen the patient since onset of symptoms
  - Other meaningful contact (telephone call, electronic mail or messaging) with an established patient can substitute for a face-to-face clinical evaluation

HD-1.1: General Guidelines – Anatomic Issues

- If two studies using the same modality both cover the anatomic region of clinical interest, only one is generally needed, with the exception of the following scenarios:
  - Maxillofacial CT (CPT® 70486, CPT® 70487, CPT® 70488) or orbital/temporal bone CT (CPT® 70480, CPT® 70481, CPT® 70482): both cover the structures of the orbits, sinuses, and face. Two separate imaging studies are only supported if there is suspicion of simultaneous involvement of more posterior lesions, especially of the region involving the middle or inner ear
  - Pituitary Gland: one study (either MRI Head [CPT® 70553] or MRI Orbit, Face, Neck [CPT® 70543]) is adequate to report the imaging of the pituitary. If a previous routine MRI Head was reported to show a possible pituitary tumor, a repeat MRI with dedicated pituitary protocol may be performed
  - Internal Auditory Canal: (IAC) MRI can be reported as a limited study with one code from the set (CPT® 70540, CPT® 70542, CPT® 70543), but should not be used in conjunction with MRI Head codes (CPT® 70551, CPT® 70552, CPT® 70553) if IAC views are performed as part of the brain
  - Mandible (jaw): Maxillofacial CT (CPT® 70486, CPT® 70487, CPT® 70488) or Neck CT (CPT® 70490, CPT® 70491, CPT® 70492) can be used to report imaging of the mandible. Neck CT will also image the submandibular space
    - If MRI is indicated, MRI Orbit, Face, Neck (CPT® 70540, CPT® 70542, or CPT® 70543) can be used to report imaging of the mandible and submandibular space

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- MRI of the Temporomandibular Joint(s) (TMJ) is reported as CPT® 70336. This code is inherently bilateral and should not be reported twice on the same date of service

HD-1.2: General Guidelines – Modality

- MRI is preferable to CT for most indications. For exceptions, See **HD-1.4: General Guidelines – CT Head**.
- MRI may be performed for these indications following an initial CT:
  - MRI Head without and with contrast (CPT® 70553) may be performed to follow-up abnormalities seen on CT Head without contrast (CPT® 70450) when a mass, lesion, or infection is found
  - MRI Head without contrast (CPT® 70551) or MRI Head without and with contrast (CPT® 70553) (preferred) may be performed to follow-up abnormalities seen on CT Head without contrast (CPT® 70450) when there is suspected Multiple Sclerosis or other demyelinating disease
  - MRI Head without (CPT® 70551) or MRI Head without and with contrast (CPT® 70553) may be performed to follow up on stroke or TIA when initial CT Head was done on emergent basis
  - MRI Head without and with contrast (CPT® 70553) for evaluation of new onset seizures

HD-1.3: General Guidelines – MRI Head

- MRI, with contrast, (CPT® 70552) should not be ordered except to follow-up on a very recent non-contrast study (within two weeks)

The AMA CPT manual does not describe nor assign any minimum or maximum number of sequences for any CT or MRI study. Both MRI and CT imaging protocols are often influenced by the individual clinical situation of the patient and additional sequences are not uncommon. There are numerous MRI sequences that may be performed to evaluate specific clinical questions, and this technology is constantly undergoing development. Additional sequences, however, are still performed and coded under the routine MRI Brain CPT® 70551, CPT® 70552, or CPT® 70553.

HD-1.4: General Guidelines – CT Head

- Scenarios in which MRI is contraindicated (i.e. pacemakers, ICDs, cochlear implants, aneurysm clips, orbital metallic fragments, etc.)
- Head CT without contrast (CPT® 70450) in nearly all cases, to show:
  - Mass effect
  - Blood/blood products
  - Urgent/emergent settings due to availability and speed of CT
  - Trauma
  - Recent hemorrhage, whether traumatic or spontaneous
  - Bony structures of the head evaluations

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- Hydrocephalus evaluation and follow-up (some centers use limited non-contrast "fast or rapid MRI" (CPT® 70551) to minimize radiation exposure in children - these requests may be approved).
- Prior to lumbar puncture in patients with cranial complaints (without contrast) (CPT® 70450)

HD-1.5: General Guidelines – CT and MR Angiography: (CTA and MRA)

- Head MRA (CPT® 70544) is generally done without contrast
- MRA Neck may be done either without contrast, with contrast, or without and with contrast, depending on facility preference and protocols and type of scanner
- Head MRA or CTA may be considered with suspected intracranial vascular disease, for example:
  - Pulsatile tinnitus
  - Hemifacial spasm if consideration for surgical decompression
  - Evaluation of stroke or TIA (See **HD-21: Stroke/TIA**)
  - Trigeminal neuralgia failed medical therapy
  - Cerebral sinus thrombosis suspected with increased intracranial pressure (refractory headaches, papilledema, diagnosis of pseudotumor cerebri)
  - Aneurysm suspected with acute "thunderclap" headache syndrome and appropriate screening or evaluation of known subarachnoid hemorrhage
  - Intra-cranial pre-operative planning if there is concern of possible vascular involvement or risk for vascular complication from procedure
  - Suspicion of vasculitis based on supporting clinical evidence
  - NOTE: Evaluation of posterior circulation disease requires both neck and head MRA/CTA to visualize the entire vertebral-basilar system.
  - CTA or MRA Head without or with or without and with contrast for follow up of aneurysm clipping or coiling procedures (See **HD-12.1: Intracranial Aneurysms**)
- CT and MR Venography (CTV and MRV) are reported with the same codes as the CTA/MRA counterpart:
  - If arterial and venous CT or MR studies are both performed in the same session, only **one** CPT® code should be used to report both procedures
  - MRA without and with contrast with venous sinus thrombosis to differentiate total from subtotal occlusion

HD-1.6: General Guidelines – PET Coding Notes

- Metabolic Brain PET should be reported as Metabolic Brain PET (CPT® 78608)
- Amyloid Brain PET should be reported as limited PET (CPT® 78811) or limited PET/CT (CPT® 78814)

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HD-1.7: General Guidelines – Other Imaging Situations

- Nausea and vomiting, persistent, unexplained and a negative GI evaluation: can undergo MRI Head without contrast (CPT® 70551)
- See **AB-1.10: Special Considerations** in the Abdomen Imaging Guidelines
- ECT treatment to screen for intracranial disease: can undergo either MRI Head without contrast (CPT® 70551) or Head CT without contrast (CPT® 70450)
- Screening for metallic fragments before MRI should be done initially with plain x-ray.
  - The use of Orbital CT to rule out orbital metallic fragments prior to MRI is rarely necessary
  - Plain x-rays are generally sufficient; x-ray detects fragments of 0.12 mm or more, and CT detects those of 0.07 mm or more
- Plain x-ray is generally sufficient to screen for aneurysm clips
- CPT® 76377 (3D rendering requiring image post-processing on an independent workstation) can be considered when performed in conjunction with conventional angiography (i.e.: conventional 4 vessel cerebral angiography).

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HD-2: Taste and Smell Disorders

HD-2.1: Taste and Smell Disorders 11

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HD-2.1: Taste and Smell Disorders

- MRI Head without and with contrast (CPT® 70553) or without contrast (CPT® 70551) is considered with unexplained unilateral or bilateral anosmia (inability to perceive odor) or dysgeusia (loss of taste)[1,2]
- If sinus or facial bone disorders is suspected, then consider initially Maxillofacial CT without contrast (CPT® 70486)[2]

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2. DeVere R. Disorders of taste and smell. *Continuum*. 2017 Apr;23(2):421-446. Accessed October 11, 2017. https://insights.ovid.com/crossref?an=00132979-201704000-00009.

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HD-3: Ataxia

HD-3.1: Ataxia 13

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HD-3.1: Ataxia

- MRI Head without and with contrast (CPT® 70553) or MRI Head without contrast (CPT® 70551) is considered in all patients with ataxia:[1]
  - If spinal disease is suspected **add** MRI Cervical, Thoracic and/or Lumbar spine without contrast (CPT® 72141, CPT® 72146, CPT® 72148)[1]
  - If these symptoms are acute and stroke is suspected See **HD-21: Stroke/TIA**
  - If MS is suspected, See **HD-16: Multiple Sclerosis (MS) and Related Conditions**
  - If these symptoms are acute following head trauma, CT Head without contrast (CPT® 70450) and/or CT Temporal Bone without contrast (CPT® 70480) can be added[1]

Reference

1. Broderick DF, Wippold II FJ, Cornelius RS, et al. *ACR Appropriateness Criteria*® Ataxia. Date of origin: 1999. Last review date: 2012. Accessed October 11, 2017. https://acsearch.acr.org/docs/69477/Narrative/

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HD-4: Behavioral Disorders

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HD-4: Behavioral Disorders – General Information

Autism: See **PEDHD-17: Autism Spectrum Disorders**

HD-4.1: Behavioral Disorders

Neuroses and psychoses do not routinely need advanced imaging:

- Bipolar disorder, schizophrenia, and related disorders may require advanced imaging in the following clinical circumstances:
  - Atypical clinical presentation
    - Acute onset
    - Late onset over age 40
    - Presents in setting of general medical illness or intensive care setting
    - Non-auditory hallucinations (e.g., visual, tactile, olfactory)
    - Patients who fail to respond to treatment in the expected manner and who manifest features suggestive of an organic brain disorder (for example, focal deficits, severe headache, or seizures) may undergo
- MRI Head without contrast (CPT® 70551) or MRI Head without and with contrast (CPT® 70553), or CT Head without contrast (CPT® 70450)

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2. Rowland LP, Pedley TA, Merritt HH. *Merritt's neurology*. 12th Ed. Philadelphia, PA: Lippincott Williams & Wilkins. 2010; 1053-1075.
3. Practice Guideline for the Treatment of Patients with Schizophrenia, 2nd Ed. American Psychiatric Association. Feb. 2004.

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HD-5: Chiari and Skull-Base Malformation

See Pediatric Head Guidelines, **PEDHD-9: Chiari and Skull Base Malformations**

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HD-6: Facial Palsy (Bell's Palsy)

HD-6.1: Facial Palsy	**18**
HD-6.2: Hemifacial Spasm	**18**

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HD-6.1: Facial Palsy

Typical features of Bell's palsy include spontaneous onset over 72 hours, otherwise normal neurological and systemic examination, variable initial ipsilateral temporal and auricular pain, and slow improvement over several months. Unless "red flags" are present, imaging is not necessary.

- MRI Brain without and with contrast (CPT® 70553) or MRI Head without contrast (CPT® 70551) (with attention to posterior fossa and IACs) is considered with the following "red flags" of unexplained facial paresis/paralysis in clinical scenarios with:[1,2]
  - Trauma to the temporal bone[2]
  - History of tumor[2] systemic cancer, HIV or Lyme disease
  - No improvement in 8 weeks[1]
  - No full recovery in 3 months[2]
  - Gradual onset over weeks to months
  - Vertigo or hearing loss
  - Bilateral involvement
  - Other atypical or Inconsistent features[2] including:
    - Second episode of paralysis on the same side[2]
    - Paralysis of isolated branches of the facial nerve[2]
    - Paralysis associated with other cranial nerves[2]
- MRI Head without and with contrast (CPT® 70553) may be considered for known sarcoidosis with suspected neurosarcoid or CNS involvement

HD-6.2: Hemifacial Spasm

- MRI Brain without and with contrast (CPT® 70553)
- May add CTA Head (CPT® 70496) or MRA Head (CPT® 70544) prior to a vascular decompression surgical procedure to clarify the vascular anatomy in patients who have failed conservative medical management

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1. Baugh RF, Basura GJ, Ishii LE, et al. Clinical practice guideline. Bell's Palsy Executive Summary. *Otolaryngol. Head Neck Surg. 2013 Nov 4;149(5):656-663. Accessed October 11, 2017.* http://journals.sagepub.com/doi/10.1177/0194599813506835
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HD-7: Recurrent Laryngeal Palsy

HD-7.1: Recurrent Laryngeal Palsy 20

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HD-7.1: Recurrent Laryngeal Palsy

The following can be considered with unilateral vocal cord/fold palsy identified by laryngoscopy[1]

- MRI Head without and with contrast (CPT® 70553) or MRI Head without contrast (CPT® 70551)
- CT Neck with contrast (CPT® 70491) or MRI Neck without and with contrast (CPT® 70543)
- CT Chest with contrast (CPT® 71260) may be added with left vocal cord palsy[1]

Reference

1. Policeni B, Corey AS, Burns J, et al. ACR Appropriateness Criteria® Cranial neuropathy. *American College of Radiology (ACR).* Revised 2017. Accessed October 11, 2017. https://acsearch.acr.org/docs/69509/Narrative/.

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HD-8: Dementia

HD-8.1: Dementia	**22**
HD-8.2: Dementia – PET	**22**

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HD-8.1: Dementia

MRI Head without contrast (CPT® 70551) or MRI Head without and with contrast (CPT® 70553) or CT Head without contrast (CPT® 70450) is considered after an initial clinical diagnosis of dementia[3,4] has been established based on a detailed history of memory loss with impairment of day-to-day activities confirmed by family members or others with knowledge of the patient's status and/or abnormal bedside mental status testing such as Mini-Mental Status Exam (MMSE) with score <26, Montreal Cognitive Assessment Survey (MoCA) with score <26, Memory Impairment Screen (MIS) with score <5, and the St. Louis University Mental Status (SLUMS) with score <21. Neuropsychological testing can be performed when history and bedside mental status examination cannot provide a confident diagnosis[1,2].

Practice Notes

3D analysis of the temporal lobes and hippocampus (also known as volumentric analysis or Neuro Quant) lacks sufficient specificity and sensitivity to be clinically useful in the evaluation or follow up of patient with dementia, and it's use is limited to research studies.

HD-8.2: Dementia - PET

Send these requests for Medical Director review. Amyloid Brain PET (CPT® 78811 or CPT® 78814) imaging is considered experimental and investigational in the diagnosis of Alzheimer's disease and in differentiating between Alzheimer's disease and other neurodegenerative/neurologic disorders.[3,4,5] Amyloid PET studies may be approved one time for Medicare patients enrolled in approved clinical trials under Coverage with Evidence Development (CED) program. For CMS, approval with CED is available for patients enrolled in studies approved by CMS. See the link below for a list of the CMS approved clinical trials: https://www.cms.gov/Medicare/Coverage/Coverage-with-Evidence-Development/Amyloid-PET.html

- FDG Brain PET (CPT® 78608) is considered experimental and investigational in the diagnosis of Alzheimer's disease and in differentiating between Alzheimer's disease and other neurodegenerative/neurologic disorders
  - CPT® 78608 is used to report FDG PET metabolic brain studies for dementia, seizure disorders, and dedicated PET tumor imaging studies of the brain
  - CPT® 78609 is used to report PET Brain perfusion studies that are not performed with FDG. These scans are nationally noncovered by Medicare
  - Amyloid-beta (Aβ) Brain Studies:
    - Medicare will reimburse for Brain PET only through CED
    - Only one study will be paid per beneficiary and the radiopharmaceutical must be FDA-approved. As of September 2, 2016, examples of radiopharmaceuticals which met this qualification include Amyvid™ (florbetapir F18), Neuraceq™ (florbetaben F18) and Vizamyl™ (flutemetamol F18)

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- FDG PET for Dementia and Neurodegenerative Diseases
  - Medicare covers FDG PET for individuals with a recent diagnosis of dementia and documented cognitive decline of at least six months who meet diagnostic criteria for both Alzheimer's disease (AD) and Frontotemporal Dementia (FTD).
  - The individual must have been evaluated for specific alternate neurodegenerative diseases or other causative factors, but the etiology of the symptoms remains unclear
  - Other conditions must also be met. For the complete coverage policy, see the Medicare National Coverage Determinations (NCD) Manual, Section 220.6.13
  - Medicare also covers FDG PET for individuals with mild cognitive impairment or early dementia when the study is performed in the context of a CMS-approved clinical trial. Requirements are detailed in Section 220.6.13 of the NCD Manual
  - All other uses of FDG PET for patients with a presumptive diagnosis of dementia-causing neurodegenerative disease for which CMS has not specifically indicated coverage continue to be noncovered. Examples of noncovered indications described in the NCD include: possible or probable Alzheimer's disease (AD), clinically typical fronto-temporal dementia (FTD), dementia of Lewy bodies, and Creutzfield-Jacob disease

    http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/ncd103c1_Part4.pdf

    https://www.cms.gov/Medicare/Coverage/Coverage-with-Evidence-Development/Amyloid-PET.html

Practice Notes

The frontotemporal dementias (FTDs) are a group of neurodegenerative disorders that differ from Alzheimer's disease. The basic pathology involves accumulation of tau proteins in the brain rather than amyloid. Onset tends to be younger (less than 65) and progression usually more rapid than in senile dementia-Alzheimer type (SDAT). There is no treatment, and the medications used to help memory in Alzheimer's disease are not effective.

There are several subtypes of FTD; most common are the behavioral variant with early loss of executive functions, impaired judgment disinhibition and impulsivity, and the semantic variant with primary and progressive loss of language ability. Other less common subtypes include progressive supranuclear palsy, corticobasal syndrome, and FTD associated with motor neuron disease.

Diagnosis is based on clinical features, neuropsychological testing, and brain imaging (preferably MRI) to rule out other structural disease. Metabolic (FDG) PET Brain may also be helpful by demonstrating patterns of abnormality more consistent with FTD than Alzheimer's disease.

For additional information: http://www.alz.org/dementia/fronto-temporal-dementia-ftd-symptoms.asp.

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HD-9: Epilepsy/Seizures

HD-9.1: Epilepsy/Seizure 26

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HD-9.1: Epilepsy/Seizures

- MRI Head without and with contrast (CPT® 70553) or MRI Head without contrast (CPT® 70551) may be considered
  - For refractory or drug resistant seizures
  - For preoperative planning
    - PET (CPT® 78608) can be considered for planning in patients with seizures who are candidates for surgical treatment[1]
- MRI Head without and with contrast (preferred study) (CPT® 70553) or MRI Head without contrast (CPT® 70551) may be considered
  - For new onset seizures
  - If CT Head was performed for an initial evaluation, MRI (as described above) may be approved for additional evaluation
  - Follow-up studies after a previous routine normal study may be considered if performed with special "Epilepsy Protocol" (typically 3T magnet, thin sections with angled slices through hippocampus and temporal lobes)
- FDG PET for Refractory Seizures
  - Medicare covers FDG PET for pre-surgical evaluation for the purpose of localization of a focus of refractory seizure activity.
  - The complete coverage policy is found in the Medicare National Coverage Determinations (NCD) Manual, Section 220.6.9: http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/ncd103c1_Part4.pdf

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HD-10: Facial Pain/Trigeminal Neuralgia

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HD-10.1: Facial Pain/Trigeminal Neuralgia

- MRI head without and with contrast (CPT® 70553) (with special attention to the skull base), and/or facial imaging orbital MRI without and with contrast (CPT® 70543) may be of value in a given case, including:
  - Suspected tic douloureux or one of its cranial nerve variants such as glossopharyngeal neuralgia (CN IX)
  - Concern about an underlying diagnosis of multiple sclerosis.
  - Trigeminal neuralgia which involves the ophthalmic nerve, (periorbital or forehead pain), once post-herpetic neuralgia (a complication of shingles) has been excluded by history
  - See **HD-1.5: General Guidelines - CT and MR Angiography: (CTA and MRA)**
  - See **HD-6.2: Hemifacial Spasm**

Practice Notes

The differential diagnosis of facial pain is extensive, complex, and difficult, and there is considerable case-to-case variation in optimal imaging pathway.

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HD-11: Headache

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HD-11.1: Headache Non-Indications

Neuroimaging is not usually warranted in patients with migraine and a normal neurologic examination.[4]

- Advanced imaging of the head is NOT indicated for any of the following:
  - Primary headache disorder in the absence of focal neurological deficits or "red flags" (headaches that meet criteria for migraine or tension variety) (See **HD-11.2: Headaches with Red Flags**)
  - Chronic headaches or intermittent recurring headaches with a normal exam, no significant recent changes in pattern or character of headache
  - A new, recent onset headache without "red flags" or findings such as focal deficits, papilledema, age over 50, headache that awakens patient from sleep, or "thunderclap" headache

Practice Notes

Cervicogenic Headache - Defined as headaches caused by a disorder of the cervical spine, usually accompanied by neck pain or other signs and symptoms of cervical disease. Typical findings include reduced cervical range of motion, side-locked pain, and symptoms exacerbated by provocative maneuvers such as head movement or digital pressure. If suspected clinically, MRI Cervical Spine without contrast (CPT® 72141) or MRI Cervical Spine without and with contrast (CPT® 72156) if suspicion of infection, neoplasm or recent surgery. See **SP-3: Neck (Cervical Spine) Pain Without/With Neurological Features and Trauma**

HD-11.2: Headaches with Red Flags

- Red Flags:
  - Unusual symptoms or history (fever, cancer history, immunosuppression, sudden onset, new onset age > 50, history of head trauma, headache awakens patient from sleep, headache precipitated by cough or valsalva); OR
  - Abnormal examination findings (altered mental status, papilledema, focal signs or symptoms, headache accompanied by seizures, meningismus)
- Chronic headache with significant change in character, severity or frequency of headache or transformation to chronic daily headache, or development of any "red flag" findings noted above
- If any of the above abnormal findings are present, the following advanced imaging studies may be considered:
  - MRI head without and with contrast (preferred study) (CPT® 70553); or
  - MRI head without contrast (CPT® 70551); or
  - CT head without contrast (CPT® 70450)
  - MRA/MRV (CPT® 70544) or CTA/CTV (CPT® 70496) can be added to evaluate the recent onset of a progressive, severe, daily headache, with or without papilledema.

See **HD-17: Papilledema/Pseudotumor Cerebri**

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HD-11.3: Sudden Onset of Headache

- For sudden onset of headache including:
  - Worst, most severe headache ever experienced or thunderclap-type[1,2,6] (example: awakening from sleep)[2,4]
  - Sudden onset unilateral headache, suspected carotid or vertebral dissection or ipsilateral Horner syndrome[1]
- If any of these onset of headache features are present, the following advanced imaging studies may be considered:
  - CT Head without contrast (preferred study) (CPT® 70450); **or**
  - MRI Head without contrast (CPT® 70551) **or** MRI without and with contrast (CPT® 70553) **and**
  - CTA Head with contrast (CPT® 70496); **or**
  - MRA Head without and with contrast (CPT® 70546); **or**
  - MRA Head without contrast (CPT® 70544); **or**
  - If arterial dissection is suspected an MRA Neck or CTA Neck may also be performed

See **HD-12.1: Intracranial Aneurysms** and **HD-21.1: Stroke/TIA**

HD-11.4: Trigeminal Autonomic Cephalgias

- Trigeminal autonomic cephalgias includes cluster headache short-lasting, unilateral, neuralgiform headache attacks with conjunctival injection and tearing (SUNCT) syndromes; hemicrania continua.
  - May also include one-time pituitary screening[1,12]
- Cluster Headache (may also include pituitary)
- The following advanced imaging studies may be considered for trigeminal autonomic cephalgias and cluster headache:
  - MRI Head without and with contrast (preferred study) (CPT® 70553); or
  - MRI Head without contrast (CPT® 70551)

See **HD-10: Facial Pain/Trigeminal Neuralgia**

HD-11.5: Skull Base, Orbit, Periorbital or Oromaxillary

- Skull base, orbital, periorbital or oromaxillary[1] imaging is appropriate for concern of skull base tumors in patients with head and neck cancers, other skull base abnormalities seen on previous imaging, any invasive sinus infections as well as sinus tumors or orbital tumors with intracranial extension. In these clinical scenarios, any one of the following procedures may be considered:
  - MRI Head and Orbits without and with contrast (preferred study) (CPT® 70553 and CPT® 70543); **or**
  - MRI Head and Orbits without contrast (CPT® 70551 and CPT® 70540); **or**
  - CT Head and Orbits without and with contrast (CPT® 70470 and CPT® 70482); **or**
  - CT Head and Orbits with contrast (CPT® 70460 and CPT® 70481)

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HD-11.6: Suspected Intracranial Extension of Sinusitis or Mastoiditis

- For suspected intracranial extension of sinusitis or mastoiditis[1], **not** cervicogenic
  - MRI Head without and with contrast (CPT® 70553) may be considered (See **HD-29: Sinusitis**)

HD-11.7: New Headache Onset Older than Age 50

- For new onset headache in patients older than 50 years of age[2,6] the following may be considered:
  - MRI Head without and with contrast (preferred study) (CPT® 70553); **or**
  - MRI Head without contrast (CPT® 70551);
  - If Giant Cell Arteritis is suspected, MRA Head without and with contrast (CPT® 70546) may be added.

HD-11.8: Cancer or Immunosuppression

- For new headache in patients with cancer or who are immunocompromised, the following may be considered:
  - MRI Head without and with contrast (preferred study) (CPT® 70553); **or**
  - MRI Head without contrast (CPT® 70551)

HD-11.9: Prothrombotic States

- For Prothrombotic states[1] including anticoagulation, the following may be considered:
  - MRI Head without and with contrast (CPT® 70553); **or**
  - CT Head without contrast (CPT® 70450)
  - If there is concern for venous sinus thrombosis in those with hypercoaguable states, MRA/MRV (CPT® 70544) or CTA/CTV (CPT® 70496) may be added
- Taking one or more anticoagulants is a red flag for headaches or head trauma and imaging is indicated. Anticoagulants include warfarin, Arixtra, Xarelto, Eliquis, Savaysa, Heparin, Fragmin, Innohep, Lovenox, Orgaran, Angiomax, Pradaxa, Acova, Iprivask and Refludan.
- Taking two or more antiaggregants is a red flag for headaches or head trauma and imaging is indicated. Antiaggregants include aspirin, Plavix, Aggrenox, Brilinta, Pravigard, Pletal, Effient, Kengreal, Persantine, and Ticlid.

HD-11.10: Pregnancy

- For new onset headache in pregnancy,[1] the following may be considered:
  - MRI Head without contrast (Gadolinium relatively contraindicated in pregnancy) (CPT® 70551)
  - MRA/MRV (CPT® 70544) or CTA/CTV (CPT® 70496) may be added if there is concern for venous sinus thrombosis.

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HD-11.11: Physical Exertion

- For onset of headache with Valsalva maneuver,[2,6] cough, physical exertion **or** sexual (post-coital) activity,[1,6] but not merely a worsening of a pre-existing headache with these activities, the following procedures may be considered:
  - MRI Head without and with contrast (preferred study) (CPT® 70553); **or**
  - MRI Head without contrast (CPT® 70551); **or**
  - CT Head without contrast (CPT® 70450); **and**
  - MRA Head without contrast (CPT® 70544) **or**
  - CTA Head without and with contrast (CPT® 70496)

HD-11.12: Post-Trauma

- For post-traumatic headaches within 2 weeks of the injury See **HD-13: Head Trauma**
- For post-traumatic headaches persisting for longer than 2 weeks following the injury, but within one year of the injury, the following may be considered:
  - CT Head without contrast (CPT® 70450); **or**
  - MRI Head without contrast (CPT® 70551); **or**
  - MRI Head without and with contrast (CPT® 70553)

HD-11.13: Acute Systemic Infections

- For acute systemic infections with meningeal neck stiffness[1,6] the following may be considered:
  - MRI Head without and with contrast (preferred study) (CPT® 70553); or
  - MRI Head without contrast (CPT® 70551)

HD-11.14: Hydrocephalus Shunts

- For new onset of headache or neurologic deficits in adults with known hydrocephalus and shunts, the following may be considered:
  - MRI Head without and with contrast (CPT® 70553); or
  - CT Head without contrast (CPT® 70450); or
  - MRI Head without contrast (CPT® 70551)

HD-11.15: Low Pressure Headache and CSF Leak

Evaluation of suspected low pressure headache and CSF leak may include MRI Head without and with contrast (CPT® 70553) and MRI Cervical, Thoracic and Lumbar spine, which according to facility protocols may be completed without contrast (CPT® 72141, CPT® 72146, and CPT® 72148), with and without contrast (CPT® 72156, CPT® 72157, and CPT® 72158) or with contrast only (CPT® 72142, CPT® 72147, and CPT® 72149) or CT myelography (CT Cervical, Thoracic, and Lumbar spine with contrast [CPT® 72126, CPT® 72159, CPT® 72132])

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HD-12: Aneurysm and AVM

HD-12.1: Intracranial Aneurysms	**36**
HD-12.2: Arteriovenous Malformations (AVMs) and Related Lesions	**37**

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HD-12.1: Intracranial Aneurysms

- Head CTA (CPT® 70496) or Head MRA (CPT® 70544) can be performed in any of the following clinical scenarios:
  - Symptoms or signs of cerebral aneurysm, including:
    - "Thunderclap headache" See **HD 11.3: Sudden Onset of Headache**
    - Third nerve palsy with pupillary involvement (pupil-sparing third nerve palsies are not caused by external compression)
    - Suspicion of aneurysm bleed [CT Head or MRI Brain or CSF exam showing evidence of subarachnoid hemorrhage (SAH) or intracerebral hemorrhage]
    - Abnormal Head CT or MRI Brain suggesting possible aneurysm
  - Screening for High Risk Populations as defined by the following criteria (screening usually begins at age 20 unless unusual circumstances as aneurysms are uncommon in children and adolescents):
    - Positive Family History: Two or more first degree relatives (parent, sibling, or child) with history of cerebral aneurysm or SAH: screening every 5 years beginning at age 20
      - One first degree relative (parent, sibling, or child) with history of cerebral aneurysm or SAH may also have one screening study but risks and benefits should be discussed with patient
    - Autosomal dominant polycystic kidney disease (screening begins at age 20 to 65 and is repeated at ten-year intervals)
    - Aortic coarctation or bicuspid aortic valve
    - Type 4 (Vascular) Ehlers-Danlos Syndrome
    - Marfan's Syndrome
    - Loeys-Dietz Syndrome
    - Microcephalic osteodysplastic primordial dwarfism
    - Patients with previous history of SAH or treatment for cerebral aneurysm: continued surveillance and screening every 5 years
  - Follow up of known cerebral aneurysm
    - Known incidentally discovered aneurysms which have never bled. The optimal interval and duration of recommended follow up in the literature are undefined. The risk of aneurysm rupture is related to size, location (posterior circulation is higher risk), and patient factors including age, sex (higher for female), and history of smoking and hypertension.
    - Follow up at 6 months, 12 months and then annually for up to 5 years or until aneurysm is determined to be stable; and then at decreasing frequency, generally every 5 years unless judged to be at higher risk (see above risk factors).
    - MRI Brain without contrast (CPT® 70551) or with and without (CPT® 70553) may be added if there are new signs, symptoms or clinical findings, or to evaluate giant aneurysm (>2.5 cm).
  - Follow up of treated aneurysms, clipping or coiling (with or without SAH)
    - Follow up at 3 to 6 month intervals for the first year, then 6 to 12 months for up to 2 years, then annually to ensure that aneurysm is not recanalyzing. If stable and occluded at last imaging then follow up surveillance every 5 years. MRA Head without contrast (CPT® 70544), with contrast (CPT® 70545), or

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without and with contrast (CPT® 70546) or CTA Head (CPT® 70496) at discretion of the specialist (neurosurgeon)

- Spinal MRI (Cervical, Thoracic, Lumbar (without and with contrast) (CPT® 72156, CPT® 72157, CPT® 72158) is appropriate to evaluate patients with SAH and negative studies for brain aneurysm in whom spinal abnormalities (i.e. AVM) may be suspected as the cause of hemorrhage.

HD-12.2: Arteriovenous Malformations (AVMs) and Related Lesions

- MRI Head without and with contrast (CPT® 70553) or without contrast (CPT® 70551) may be considered in the following clinical scenarios:
  - AVM is suspected based on a history of SAH.
  - Screening for:
    - Hereditary hemorrhagic telangiectasia syndrome (Osler Weber Rendu).
    - Familial cavernous malformation: Screening should include MRI Head without or without and with contrast (with gradient echo images).
- In addition to MRI, one Head CTA (CPT® 70496) or Head MRA (CPT® 70544) can be performed for screening. If negative, no further screening studies are indicated
- Head CTA (CPT® 70496) or brain MRA (CPT® 70544 or CPT® 70546) may be considered when known AVM are being evaluated for embolization or surgery
- Repeat advanced imaging with MRI Head without and with contrast (CPT® 70553) or without contrast (CPT® 70551), plus MRA Head (CPT® 70544) or CTA Head (CPT® 70496) may be considered depending on the character of the disease and risk factors, or in the following clinical scenarios:
  - New hemorrhage episode is likely
  - Onset or change of seizures
  - Focal neurological signs
  - As follow up after treatment (surgery or embolization) as requested by specialists.

Practice Notes

Trauma is the most common reason for subarachnoid hemorrhage. Ruptured berry aneurysm is the most common reason for non-traumatic subarachnoid hemorrhage in adults.

Small aneurysms are present in about 1 to 2% of adults, but very few ever reach a size for which bleeding is a risk (> 5 mm). Small (< 3 to 4 mm) unruptured aneurysms in those with no personal history of SAH have a 0.1% to 0.5% a year rate of bleeding. The risk of cerebral aneurysm with family history ranges from 2% with one first degree relative to 30 to 35% for identical twin or two parents. The risks and benefits of screening these populations need to be considered before advanced imaging.

AVMs most often come to clinical notice either by bleeding or by acting as a seizure focus. They are usually congenital, recognized later in life and have an initial risk of bleeding of 2% per year.

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HD-13: Head Trauma

HD-13.1: Head Trauma 40

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HD-13.1: Head Trauma

Patients with head trauma are at risk for facial and cervical trauma.

See **SP-3: Neck (Cervical Spine) Pain Without/With Neurological Features and Trauma**

- Head CT without contrast (CPT® 70450) is the primary imaging modality in patients with acute head trauma and any of the following modified Canadian Criteria:
  - Taking one anticoagulant or two antiaggregants, (e.g., aspirin and Plavix)
  - Known platelet or clotting disorder
  - Renal failure (creatinine > 6)
  - Glasgow coma scale (GCS) score of less than 15 at 2 hours following injury
  - > 30 minutes of amnesia
  - Any “dangerous mechanism of injury” (fall greater than 5 steps down stairs or from height greater than 3 feet; any pedestrian motor vehicle accident or ejection from motor vehicle)
  - Suspected open skull fracture
  - Signs of basilar skull fracture
  - Two or more episodes of vomiting
  - Patient > 64 years old
- MRI Head without contrast (CPT® 70551) is thereafter used when the clinical findings are not explained by the CT results or to evaluate late effect of brain injury
- Follow-up imaging, MRI or CT, for known subdural hematomas, intracerebral hemorrhage, or contusions can be done at the discretion of ordering specialist

Practice Note

Recent studies have shown that Diffusion tensor MRI tractography may be more sensitive in demonstrating abnormalities such as axonal injury in closed head injury than conventional MRI, but these techniques are best described presently as research tools and their use in routine clinical practice is not determined.

Decisions regarding return to normal activities, including sports, are made based on the clinical status of the patient and repeat imaging is unnecessary.

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HD-14: CNS Infection

HD-14.1: CNS Infection 42

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HD-14.1: CNS Infection

- Signs of intracranial infection include: 1) headaches, seizures or new focal deficits in a setting of fever or elevated white blood cell count (WBC); 2) known infection elsewhere; 3) or immunosuppression. The following studies may be considered for suspected intracranial infection[1-4] if any of these signs of infection are present:
  - MRI Head without and with contrast (CPT® 70553) (preferred), **or**
  - MRI Head without contrast (CPT® 70551), **or**
  - CT Head without contrast (CPT® 70450), **or**
  - CT Head without and with contrast (CPT® 70470)

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HD-15: Movement Disorders

HD-15.1: Movement Disorders 44

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HD-15.1: Movement Disorders

- The majority of movement disorders are diagnosed based on a clinical diagnosis and do not require imaging. These include:
  - Typical Parkinson's Disease[1]
  - Essential Tremor or tremors of anxiety or weakness
  - Restless Leg Syndrome
  - Tics or spasms which can be duplicated at will
- MRI of the Brain without, or without and with contrast (CPT® 70551 or CPT® 70553) is considered in the following clinical scenarios:
  - Atypical Parkinsonism because of unusual clinical features (for example, persistent unilateral signs and symptoms, young onset under age of 50, rapid progression), incomplete or uncertain medication responsiveness, or clinical diagnostic uncertainty.[1] These cases should be forwarded for medical director review.
  - Suspected Huntington Disease[1]
  - Evaluation for surgical treatment of Essential Tremor or Parkinson's disease, including Deep Brain Stimulator placement.
- DAT-SPECT (ioflupane I-123 SPECT) (CPT® 78607) may be considered:
  - To evaluate patients in whom the diagnosis and differentiation between Parkinson's disease and Essential Tremor remains unclear after evaluation by experts in movement disorders and medication trials.
  - DAT Scans are not useful for differentiation of subtypes of Parkinson's syndromes, to monitor progression of disease or predict risk of development of disease.

Practice Notes

There is little evidence to support the use of MRA/CTA and PET in the evaluation of movement disorders.[2]

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HD-16: Multiple Sclerosis (MS) and Related Conditions

HD-16.1: Multiple Sclerosis 47

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HD-16.1: Multiple Sclerosis (MS)

- MRI Head without and with contrast (CPT® 70553) and MRI Cervical and Thoracic spine without and with (CPT® 72156 and CPT® 72157) use in these clinical scenarios requires[1] clinical suspicion based on recurrent episodes of variable neurological signs and symptoms or clinically isolated syndromes and[2] the baseline exclusion of appropriate alternative conditions that can mimic MS[1-4]
  - An Orbital MRI without and with contrast (CPT® 70543) may be considered if optic neuritis is suspected, in addition to the above scenario[4]
  - If a non-contrast study shows incidental evidence of possible demyelinating disease, repeat with MRI Brain with contrast (CPT® 70552) may be approved within 2 weeks of previous non-contrast study as the presence of enhancing lesions may be helpful in confirming the diagnosis
    - If non-contrast study was performed more than 2 weeks prior to the request for repeat imaging, an MRI Brain with and without contrast (CPT® 70553) is appropriate.
  - If the diagnosis is still equivocal after initial screening repeat studies in 3 to 6 months may be performed
  - Evidence does not support the use of 3T MRI as being more effective than 1.5T units for diagnosis or follow up of MS. Requests for repeat imaging should meet guidelines for timeliness as noted within these guidelines regardless of type of facility requested
- MRI Lumbar spine usually is not needed since Cervical and Thoracic studies will usually visualize the entire spinal cord
- Repeat Brain and/or Spine imaging in an established patient may be considered in the following scenarios:
  - New episode of neurological deficit[4]
  - Baseline, in 3 to 6 months and then annually when instituting or maintaining immune-modulating agents and when changing therapy[4]
  - Symptoms suggestive of Progressive Multifocal Leukoencephalopathy (PML) during Tysabri therapy.[5]
    - Screening for patients on natalizumab (Tysabri) or other drugs with risk of PML (Progressive Multifocal Leukoencephalopathy)
      - If Anti-JCV antibody negative: MRI Brain annually
      - If Anti-JCV antibody positive: MRI every 6 months
      - If Anti-JCV antibody positive and titer > 1.5, and > two years on treatment: MRI Brain may be performed every 3 months.
  - Repeat imaging requests for MRI without contrast for follow up may be approved when requested by a specialist
- Family members need not be screened, unless they exhibit suspicious signs or symptoms suggestive of MS.

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Practice Notes

Multiple Sclerosis is common and variable with more women affected and at a younger age than men. MS tends to be relapsing-remitting (improves between episodes), relapsing-progressive (worsens with attacks) and chronic progressive (gradual and steady).

MS is a clinical diagnosis, traditionally recognized by "lesions dispersed in time and space," which means involvement of different areas of the neuraxis at different times."

Screening based on family history of MS is not supported by the peer-reviewed evidence.

Sagittal MRI of the Spinal cord with phased array detector coil (CPT® 72156 or CPT® 72157) is an alternative spinal imaging.

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HD-17: Papilledema/Pseudotumor Cerebri

HD-17.1: Papilledema/Pseudotumor Cerebri 50

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HD-17.1: Papilledema/Pseudotumor Cerebri

- MRI Head without and with contrast (CPT® 70553) can be considered when there is suspected elevated intracranial pressure, such as with pseudotumor cerebri (benign intracranial hypertension) and papilledema, to exclude cerebral mass lesions, obstructive hydrocephalus, or occult meningeal disease.
  - Orbital MRI (CPT® 70543) or Orbit CT without and with (CPT® 70482) may be considered if there is concern for orbital pseudotumor or a primary bilateral orbital disorder.
  - Repeat imaging may be considered to evaluate either:
    - Shunt dysfunction in those patients who have had ventriculoperitoneal (VP) or lumboperitoneal (LP) shunts
    - Clinical deterioration
  - MRA Head without contrast or CTA Head without and with contrast can be approved for papilledema with suspected venous sinus thrombosis.
    - CT and MR Venography (CTV and MRV) are reported with the same codes as the CTA/MRA counterpart. If arterial and venous CT or MR studies are both performed in the same session, only **one** CPT® code should be used to report both procedures
  - See **HD-1.5: General Guidelines - CT and MR Angiography: (CTA and MRA)** for information regarding contrast in MRA.

Reference

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HD-18: Paresthesias

HD-18.1: Paresthesias 52

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HD-18.1: Paresthesias

Requests will be sent for Medical Director review. Paresthesia(s) (localized numbness and tingling) are symptoms of a local (nerve entrapment for example), regional (Multiple Sclerosis for example) or central (stroke for example) disorder.[1,2] Advanced imaging can be considered initially, based on the highest suspicion disorder, according to these guidelines.[1,2]

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HD-19: Pituitary

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HD-19.1: Pituitary

- Endocrine laboratory studies should be performed prior to considering advanced imaging, including Prolactin levels; thyroid function levels should also be checked to evaluate for untreated or inadequately treated hypothyroidism as a cause of hyperprolactinemia and pituitary hyperplasia
  - Lab results should be recent, within 6 weeks of the request.
- Pituitary imaging is primarily performed with MRI Head without and with contrast (CPT® 70553):
  - MRI Orbit, Face, Neck (CPT® 70543) or CT Head without and with contrast (CPT® 70470) are alternatives
  - CT Head without contrast (CPT® 70450) or without and with contrast (CPT® 70470) and/or CT Maxillofacial without contrast (CPT® 70486) is occasionally used in addition to MRI to visualize perisellar bony structures in the preoperative evaluation of certain sellar tumors and for preoperative planning for transphenoidal approaches
- Incidentally found lesions on other studies:
  - If a pituitary abnormality is reported incidentally on a MRI Brain or CT Brain performed for other reasons, a follow-up dedicated pituitary study may be obtained (MRI Brain without and with contrast CPT® 70553 or MRI Orbit/Face/Neck CPT® 70543. CPT® 70553 covers both brain and dedicated pituitary if performed at the same time; no additional CPT® codes are needed); further evaluation and subsequent imaging dependent on specific imaging and biochemical laboratory evaluation findings.

Pituitary Imaging

Microadenoma (< 10 mm)		
Indication	**Initial Imaging**	**Repeat Imaging**
Acromegaly**** (Elevated IGF-1 confirmed by lack of suppression of growth hormone on glucose suppression testing, with or without acromegaly)	MRI Head without and with contrast (CPT® 70553)	➢ MRI Brain without and with contrast (CPT® 70553) ◆ At least 12 weeks after surgery to evaluate for residual tumor ◆ If treated with Pegvisomant, 6 to 12 months after treatment initiated, then annually if stable ◆ If hormone levels increase or neurological findings appear
Microadenoma: Nonfunctioning, unexplained pituitary asymmetries, and incidentally found small tumors (< 10 mm)	MRI Head without contrast and with contrast (CPT® 70553)	➢ MRI Head without contrast and with contrast (CPT® 70553) at: ◆ 6 and 12 months, then yearly for 3 years if stable. After 3 years, then every other year for the next 6 years, then every 5 years if stable
Rathke's cleft cyst/Simple cyst	MRI Head without and with contrast (CPT® 70553)	➢ MRI Head without and with contrast (CPT® 70553) in one year; if stable and without mass effect or invasion into surrounding structures, no further imaging is required.

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Prolactinomas*	➢ MRI Head without and with contrast (CPT® 70553) with: ◆ Unexplained elevated prolactin level above normal reference range ◆ After initial start of dopamine agonist therapy, repeat MRI in 1 year (or in 3 months if macroprolactinoma), also repeat if prolactin levels continue to rise while on dopaminergic agents, or if new symptoms emerge (e.g., galactorrhea, visual disturbances, headaches, or other hormonal disorders occur) ◆ Image after 2 years of dopamine agonist treatment for those who are being considered for discontinuation of treatment due to remission ◆ After 2 years of dopamine agonist therapy, for those who have achieved normal Prolactin levels and no visible tumor remnant, and for whom dopamine agonists have been discontinued or tapered, image if prolactin level increases above normal range. ◆ Galactorrhea/nipple discharge with normal prolactin and thyroid function levels: See **BR-7: Nipple Discharge/Galactorrhea**
TSH, FSH, ACTH and LH producing	MRI Head without and with contrast (CPT® 70553) when hormone levels are inappropriately elevated.
Male Hypogonadism	➢ MRI Head without and with contrast (CPT® 70553) if ◆ Severe secondary hypogonadism (morning serum testosterone level < 150 ng/dl and low or normal LH and FSH levels) ◆ Serum, free, or bioavailable morning testosterone level below normal range and low or normal LH and FSH levels accompanied by one of the following: ◆ Panhypopituitarism, hyperprolactinemia, symptoms or signs of tumor mass effect (e.g. headache, visual impairment, or visual field deficit), *****suspected alterations in sex hormone binding globulin (SHBG)
Panhypopituitarism	MRI Head without and with contrast (CPT® 70553)

ADH Abnormalities		
Indication	**Initial Imaging**	**Repeat Imaging for Non-Operative Care**
Diabetes Insipidus (DI)	➢ MRI Head without and with contrast (CPT® 70553) if: ◆ Laboratory testing consistent with DI (serum osmolality should be high and urine osmolality should be low) and etiology uncertain	**NA**
Syndrome of Inappropriate ADH (SIADH)	➢ MRI Head without and with contrast (CPT® 70553) if: ◆ Etiology remains uncertain or is thought to be in the nervous system; ◆ Urine osmolality should be high and serum osmolality low	**NA**

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Macroadenoma (> 10 mm) (if not surgically removed and normal hormonal testing)	MRI Head without and with contrast (CPT® 70553)	➢ MRI Head without and with contrast(CPT® 70553) every: ◆ 6 months for the first year; then ◆ Annually for 5 years (longer if craniopharyngiomas); ◆ Every 6 months if treatment is deferred.
Other Pituitary Region Tumors**	Evaluation may require CT in addition to MRI to evaluate for hyperostosis. Requests will be sent for Medical Director review.	
Enlarged/Empty Sella Turcica***	➢ Head CT without and with contrast (CPT® 70470) or, MRI Head without and with contrast (CPT® 70553) to: ◆ Exclude residual pituitary tumor, and ◆ To assess the position of the chiasm since herniation into the sella, causes Chiasmatic-type visual loss	MRI without and with contrast (CPT® 70553) 1 to 5 years after the initial study can be performed.

Practice Notes

Normal ranges may vary among different labs.
FSH
Male: 5-15 mIU/mL
Female: Follicular or luteal phase 5-20 mIU/mL, Midcycle peak 30-50 mIU/mL, Postmenopausal >35 mIU/mL

LH
Male: 3-15 mIU/mL
Female: Follicular or luteal phase 5-22 mIU/mL, Midcycle peak 30-250 mIU/mL, Postmenopausal >30 mIU/mL

Testosterone
Male 300-1200 ng/dL
Female 20-75 ng/dL

TSH
0.5-5 µIU/mL

GH
After oral glucose, <2 ng/mL

Osmolality
Urine 38-1400 mosm/kg H20
Serum 275-295 mosm/kg H20

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HD 19.2: Additional Imaging

- Post-operatively, follow-up pituitary imaging is generally done at the discretion of the neurosurgeon, usually at 4 months and then at one year if stable
- For those who are treatment resistant on standard or maximal tolerable doses of dopamine agonist therapy (e.g. visible tumor remnant or persistent elevation of Prolactin levels) and who will not be treated with surgery/radiation, continue imaging periodically as per microadenoma or macroadenoma guidelines, accordingly
- For those in whom treatment is discontinued at the onset of menopause, continue imaging periodically as per microadenoma or macroadenoma guidelines, accordingly

Practice Notes

***Prolactinoma Note:** Most common of the secreting Microadenoma (> 50 *To establish the diagnosis of hyperprolactinemia, a **single** measurement of serum prolactin is recommended; a level above the upper limit of normal confirms the diagnosis as long as the serum sample was obtained without excessive venipuncture stress.* Long-term or inadequately treated primary hypothyroidism can cause pituitary hyperplasia that may mimic a pituitary tumor and therefore thyroid functions should also be checked to evaluate for untreated or inadequately treated hypothyroidism as a cause of hyperprolactinemia and pituitary hyperplasia. Routine surveillance during pregnancy is not recommended due to risk to fetus. Repeat imaging with MRI without gadolinium is performed for new or worsening symptoms, such as headaches or visual symptoms. *In women with microprolactinomas, it may be possible to discontinue dopaminergic therapy when menopause occurs. Surveillance for increasing size of the pituitary tumor should continue on a periodic basis.

****Other Pituitary Region Tumor Notes**: Craniopharyngiomas arise in the parasellar area. About 10% of meningiomas arise in this area.

*****Enlarged/Empty Sella Turcica Notes**: An enlarged sella turcica without evident tumor is an incidental finding on MRI Head or CT Head from a defect in the dural diaphragm of the sella (especially if there is elevated intracranial pressure from another cause), pituitary surgery, or as a result of a pituitary tumor which has expanded the sella and then infarcted (pituitary apoplexy).

******Acromegaly**: Rarely, biochemically confirmed acromegaly with a normal pituitary gland on MRI may occur. Somatostatin receptor scintigraphy (Octreoscan) of thorax and abdomen and growth hormone-releasing hormone (GHRH) level may be considered to evaluate ectopically located disease.

*******Male Hypogonadism**: Certain conditions can cause alterations in sex hormone-binding globulin (SHBG) which can impact testosterone levels. Free or bioavailable testosterone concentrations should be measured when total testosterone concentrations are close to the lower limit of the normal range and when altered SHBG levels are suspected (e.g. moderate obesity, nephrotic syndrome, hypo- and hyperthyroidism, use of glucocorticoids, progestins, estrogens, and androgenic steroids, anticonvulsants, acromegaly, diabetes mellitus, aging, HIV disease, liver cirrhosis,

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hepatitis). Note that if the initial testosterone level is found to be low, reversible illness, drugs and nutritional deficiency should be excluded as a cause prior to repeating testosterone level. LH and FSH should be obtained to evaluate for secondary (central) hypogonadism, once low testosterone level is confirmed.

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HD-20: Scalp and Skull Lesions

HD-20.1: Scalp and Skull Lesions 60

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HD-20.1: Scalp and Skull Lesions

The majority of these are benign soft tissue or bony lesions easily defined by physical examination or with skull x-rays or ultrasound.

- CT Head without or without and with contrast (CPT® 70450 or CPT® 70470) is appropriate for the following scenarios:
  - Any lesion on physician examination and skull x-ray or ultrasound which is not clearly benign.
  - Langerhans' cell histiocytosis, myeloma, and metastatic cancer, when symptoms suggest bony lesions.
- MRI Head without contrast (CPT® 70551) or with and without contrast (CPT® 70553) may be considered if there is concern for intracranial extension.

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HD-21: Stroke/TIA

HD-21.1: Stroke/TIA	**62**
HD-21.2: Venous Infarcts	**62**

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HD-21.1: Stroke/TIA

- **One** from each of the following procedures can be considered for the initial occurrence or repeat episodes of TIA, stroke[1-4] or Transient Global Amnesia[5]
  - CT Head without contrast (CPT® 70450) or CT Head without and with contrast (CPT® 70470) **or** MRI Head without and with contrast (CPT® 70553) **or** MRI Head without contrast (CPT® 70551)
    - MRI is preferred with later presentation for evaluation and can be considered after an initial CT head[1-4]
  - Duplex ultrasound of the Carotid Arteries (CPT® 93880) **or** MRA Neck without contrast (CPT® 70547) **or** MRA Neck with contrast (CPT® 70548) **or** MRA Neck without and with contrast (CPT® 70549) **or** Neck CTA (CPT® 70498); **and** MRA Head without contrast (CPT® 70544) or CTA Head (CPT® 70496)
- MRA Head without contrast (CPT® 70544) or CTA Head with contrast (CPT® 70496) may be considered in addition to the above in the following clinical scenarios:
  - Vertebrobasilar stroke (vertigo associated with diplopia, dysarthria, bifacial numbness or ataxia)[1-4]
  - Suspected carotid or vertebral artery dissections.[2-4] Risks may include premature stroke (under age 50), head or neck trauma, fibromuscular dysplasia, Ehlers-Danlos syndrome, and chiropractic neck manipulation
    - Repeat imaging as determined by a specialist.
  - Suspected venous infarcts [as MRV (CPT® 70544) or CTV (CPT® 70496)] if identified on CT/MRI Head[6]
- MRA Neck without and with contrast (CPT® 70549) is reserved for evaluation of possible or known arterial dissection
- Transcranial Doppler Studies may also be performed for patients with documented stroke or TIA (See **HD-24.8: Transcranial Doppler (CPT® 93886)**)

HD-21.2: Venous Infarcts

- MRV (CPT® 70544) or CTV (CPT® 70496) and MRI Head without contrast (CPT® 70551) are appropriate in the following scenarios:
  - Intracranial hypertension with headache, vomiting and papilledema from venous sinus thrombosis
  - Venous infarction is identified on MRI Head or CT Head
  - Women with postpartum stroke or postpartum papilledema
  - Children or young adults who present with a stroke in which headache and seizures are prominent features, or who are known to have an intrinsic system clotting disorder

Practice Notes

Transient Global Amnesia is the "…sudden onset of transient inability to retain new information and to recall previous events for a variable period of time, generally occurring in middle-aged or elderly patients formerly in good health and without significant cardiac or cerebrovascular disease…"[5]

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HD-22: Cerebral Vasculitis

HD-22.1: Cerebral Vasculitis 65

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HD-22.1: Cerebral Vasculitis

- MRI Head without and with contrast (CPT® 70553) is considered when CNS vasculitis is suspected
  - MRA Head without and with contrast (CPT® 70546) and MRA Neck without or with contrast (CPT® 70549); CTA[3] may be considered in addition to MRI

Practice Notes

Classification of vasculitides based on vessel size adapted from Joseph.[1] MRA and CTA are useful for the evaluation of the large proximal arteries; evaluation of a possible small vessel vasculitis may be beyond the resolution of routine Head MRA and CTA. However, other abnormalities, such as atherosclerotic disease, arterial dissection, Moyamoya disease, or reversible cerebral vasoconstriction may be demonstrated. Conventional angiogram is superior to MRA and CTA in demonstrating abnormalities in smaller vessels and is considered the "gold standard" in the evaluation of primary small vessel CNS vasculitis.

Dominant Vessel Involved	Primary	Secondary
Large arteries	• Giant cell arteritis • Takayasu's arteritis	Aortitis with rheumatoid disease; Infection (e.g. syphilis)
Medium Arteries	• Classical polyarteritis nodosa • Kawasaki disease	Infection (e.g. hepatitis B)
Small vessels and medium arteries	• Wegener's granulomatosis • Churg–Strauss syndrome • Microscopic polyangiitis	Vasculitis with rheumatoid disease, systemic lupus erythematosus, Sjögren's syndrome, drugs, infection (e.g. HIV)
Small vessels	• Henoch-Schönlein purpura • Essential cryoglobulinaemia • Cutaneous leukocytoclastic vasculitis	Drugs (e.g. sulphonamides, etc.) Infection (e.g. hepatitis C)

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HD-23: Dizziness, Vertigo and Syncope

HD-23.1: Dizziness, Vertigo, and Syncope 67

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HD-23.1: Dizziness, Vertigo, and Syncope

- The initial components in the evaluation of false sensations of balance or motion include obtaining a patient history and performing a physical examination that can assist in diagnosis. These include the elimination of inciting factors[1,2]
- Evaluation of arterial blood flow (Carotid Doppler, transcranial Doppler, Neck and Head MRA/CTA), CT Head and MRI Head are not indicated unless a primary neurological cause of transient loss of consciousness is suspected based on the presence of neurological symptoms and signs indicating an intracranial disorder. Neurological testing is not indicated for patients with uncomplicated syncope
- Prior to advanced imaging, the minimum initial evaluation should include the following:
  - A detailed description of the symptoms
  - Orthostatic blood pressure[1,2]
  - Dix-Hallpike maneuver or other positional testing[1,2]
  - Nystagmus examination[1,2]
  - Any one Gait examination, including Romberg[1,2]
  - Psychiatric evaluation including for anxiety or panic disorders (if suspected)[1,2]
  - Hearing testing (if associated with hearing loss) to determine if conductive, sensorineural, or mixed[5]
  - Vision examination[1]
- CT Temporal bone without contrast (CPT® 70480) may be considered in addition to the MRI evaluation if concern for trauma, superior canal dehiscence or other bony abnormalities
- MRI Head with attention to internal auditory canal without and with contrast (CPT® 70553) or without contrast (CPT® 70551; limited study CPT® 70540 or CPT® 70543)[3,5] can be considered when the initial evaluation reveals:
  - Any associated neurological signs or symptoms[2]
    - Cerebrovascular symptoms of TIA or CVA[2]
    - Examples include drop attacks, seizures, coincident headache, ataxia, aura or focal neurological findings
  - Equivocal or unusual nystagmus findings, including direction changing or persistent downbeat nystagmus[2,4]
  - Absent head thrust sign[2]
  - Short duration (minutes) recurrent attacks[2]
    - CT Temporal bone without contrast (CPT® 70480) may be considered in addition to the MRI evaluation[5]
  - Hearing loss associated with
    - Progressive unilateral hearing loss[3]
    - Sensorineural[5]
    - Conductive:[5] CT Temporal bone without contrast (CPT® 70480) may be considered in addition to the MRI evaluation
    - Congenital or total hearing loss:[5] CT Temporal bone without contrast (CPT® 70480) may be considered in addition to the MRI evaluation

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- Pre-surgical planning or cochlear implant candidate:[5] CT Temporal bone without contrast (CPT® 70480) may be considered in addition to the MRI evaluation
- Features atypical for benign positional vertigo, which may include abnormal cranial nerve findings, visual disturbances, and severe headache[4]
- Central vertigo
- See **HD-21: Stroke/TIA**

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HD-24: Other Imaging Studies

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Some payers may consider these techniques investigational, and their coverage policies may take precedence over eviCore's guidelines.

HD-24.1: Treatment Planning

- Advanced imaging (CT and MRI) performed for the purpose of surgical planning and navigation should be coded as Unlisted CT (CPT® 76497) or Unlisted MRI (CPT® 76498)
  - All requests for imaging to be performed for the purpose of surgical planning and navigation should be forwarded to Medical Director Review
- Requests may refer to systems such as Brainlab or Stealth imaging procedures
- This includes requests for intraoperative studies (inpatient studies do not require preauthorization)
- Some health plans do not require prior authorization for the unlisted codes for treatment planning, and eviCore is not contracted to review them. Please refer to individual health plan policy.

HD-24.2: Functional MRI (f-MRI)

- f-MRI is useful in pre-operative scenarios to define the "eloquent" areas of brain
- The ordering physician must be a neurosurgeon or radiation oncologist. All other requests should be sent for MD review. It must be evident that brain surgery is planned, and that f-MRI is being performed to avoid the language centers, or other processing centers, of the brain
- f-MRI can be approved with PET Brain in epilepsy surgery planning
- Procedure codes for functional MRI:
  - CPT® 70554 MRI Head, functional MRI, including test selection and administration of repetitive body part movement and/or visual stimulation, not requiring physician or psychologist administration
  - CPT® 70555 MRI Head, functional MRI; requiring physician or psychologist administration of entire neurofunctional testing

HD-24.3: Magnetic Resonance Spectroscopy (MRS)

- All requests for MRS (CPT® 76390) will be forwarded for Medical Director review
- MRS involves analysis of the levels of certain chemicals in a pre-selected voxels (small regions) on an MRI scan done at the same time
- MRS is evaluated on a case-by-case basis, and may be considered:
  - Distinguish recurrent brain tumor from radiation necrosis as an alternative to PET (CPT® 78608)
  - Diagnosis of certain rare inborn errors of metabolism affecting the CNS (primarily pediatric patients)

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HD-24.4: CSF Flow Imaging

- This is generally imaged as a part of a head MRI study. It is not coded separately for preoperative evaluation of hydrocephalus and Chiari syndrome, with either features of hydrocephalus or syrinx
- There is no specific or unique procedure code for this study; it is done as a special sequence of a routine MRI head without contrast (CPT® 70551)
- If not previously performed as part of recent study, a second study for the purpose of evaluating CSF flow may be performed

HD-24.5: CT or MRI Perfusion

- Performed as part of a CT Head or MRI Head examination in the evaluation of patients with very new strokes or brain tumors.
- Category III 0042T - "cerebral perfusion analysis using CT". The study is generally limited to evaluation of acute stroke (< 6 hours). Other indications are usually regarded as investigational and experimental. Individual health plan policies should be confirmed.
- There is no specific CPT® code for MRI Perfusion. Perfusion weighted images are obtained with contrast and are not coded separately from a contrasted MRI Head examination. If MRI Head without and with contrast is approved, no additional CPT® codes are necessary or appropriate to perform MRI perfusion.

HD-24.6: Magnetic Resonance Neurography (MRN)

MRN is currently considered investigational by most payers.

HD-24.7: Cone Beam Computed Tomography (CBCT)

- MD review is required
- CPT® Codes: CPT® 70486, CPT® 70487, CPT® 70488, CPT® 70480, CPT® 70482 (No separate 3-D rendering codes should be reported)

See **HD-30: Temporomandibular Joint Disease (TMJ) and Dental/Periodontal/Maxillofacial Imaging**

HD-24.8: Transcranial Doppler (CPT® 93886)

- Transcranial Doppler (TCD) is a noninvasive ultrasonic technique that measures local blood flow velocity and direction in the proximal portions of large intracranial arteries
- It is used principally in the evaluation and management of patients with cerebrovascular disease
  - Annual screening for patients with Sickle Cell Anemia (Hb-SS) and Sickle Beta Thalassemia (Sß)
  - Evaluation of right to left cardiac shunts: Detection of microemboli in patients with stroke or TIA.

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- Evaluation of intracranial occlusive disease in patients with documented stroke or TIA
- Evaluation of hemodynamic effects of known severe extra-cranial occlusive disease
- Other indications and uses of TCD generally involve in-patient settings: Evaluation of vasospasm in SAH, determination of brain death, evaluation of acute stroke and need for thrombolytics or other intervention, and intraoperative monitoring

➢ Screening for moyamoya disease for patient with known disease in other immediate family members.

Note: TCD studies are not indicated for evaluation of brain tumors, degenerative disease, psychiatric disorders, epilepsy, migraine or other headache disorders.

CPT® Codes	
93886	Transcranial Doppler study of the intracranial arteries; complete study
93888	Limited study (follow up)
93890	Vasoreactivity study
93892	Emboli detection without intravenous microbubble injection
93893	Emboli detection with intravenous microbubble injection

Note: CPT® 93890, CPT® 93891, CPT® 93892, CPT® 93893 represent add on services that require additional expertise, lab time, and equipment not included in the complete and limited codes.

CPT® 93890 Vasoreactivity Study: Measures response of cerebral blood flow to increased CO2 levels (following breath holding or administration of acetazolamide); It is used to evaluate risk of stroke and significance of carotid stenosis; patients with loss of normal reactive changes are likely to be at increased risk of stroke.

CPT® 93892/CPT® 93893: Identification of right to left shunts (microembolic signals may be detected during TCD monitoring) and may indicate source of emboli in patients with stroke or TIA. TCD bubble test is very sensitive and may be superior to transthoracic and transesophageal echocardiography in detection of right to left shunts.

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HD-25: Epistaxis

HD-25.1: Epistaxis 76

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HD-25.1: Epistaxis

- All cases should go to Medical Director for review.
- Maxillofacial CT without or without and with contrast (CPT® 70486 or CPT® 70488) and/or MRI orbit, face, and/or neck without and with contrast (CPT® 70549) is appropriate based on endoscopic findings of mass lesion during ENT examination.

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HD-26: Mastoid Disease

HD-26.1: Mastoid Disease 78

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HD-26.1: Mastoid Disease

- See Pediatric Head Guidelines, **PEDHD-16.2: Ear Pain**

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HD-27: Hearing Loss

HD-27.1: Hearing Loss 80

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HD-27.1: Hearing Loss

- MRI Head with attention to internal auditory canal without and with contrast (CPT® 70553), or MRI Head with attention to internal auditory canal without contrast (CPT® 70551) or CT Temporal bone without contrast (CPT® 70480) can be considered for hearing loss.[1] Clinical information provided should include evaluation of hearing either by bedside testing or by formal audiology.
- Limited Study MRI with attention to internal auditory canal (CPT®70540, CPT® 70542, CPT®70543) can be approved in place of MRI Head with attention to internal auditory canal when requested by the provider in the following scenarios:
  - Any sensorineural hearing loss (cochlea or auditory nerve)[1]
  - Any conductive hearing loss[1](including Cholesteatoma[2])
  - Cochlear implants candidate[1]
  - Fluctuating hearing loss[1]

Practice Note

An initial evaluation generally determines whether a patient's hearing loss is conductive (external or middle ear structures) or sensorineural (inner ear structures, such as cochlea or auditory nerve) hearing loss.[1,2]

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HD-28: Ear Pain (Otalgia)

HD-28.1: Ear Pain (Otalgia) 82

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HD-28.1: Ear Pain (Otalgia)

- CT Temporal bone without and with contrast (CPT® 70482) or without contrast (CPT® 70480) and/or MRI Head without contrast (CPT® 70551) or without and with contrast (CPT® 70553) can be considered for:
  - Common causes of ear pain including ear infections, dental problems, sinus infection, neck problems, tonsillitis, and pharyngitis, as well as otitis media or otitis externa or no obvious cause, which do not improve with treatment over a reasonable time
  - Cerebellopontine angle or other intracranial tumor is suspected
  - Nervus intermedius neuralgia in order to exclude a structural lesion

See **HD-27: Hearing Loss**

References

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HD-29: Sinusitis

HD-29.1: Sinus Imaging in Adults 84

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HD-29.1: Sinus Imaging in Adults

- There is no evidence to support advanced imaging of acute (< 4 weeks) and subacute (4 to 12 weeks) uncomplicated rhinosinusitis[1,3]
- There is no evidence to support routine follow-up advanced imaging after treatment with clinical improvement of sinusitis[1]
- CT Maxillofacial without contrast (CPT® 70486) or limited sinus CT without contrast (CPT® 76380) is considered for any of the following:
  - Acute (< 4 weeks) and sub-acute (4 to 12 weeks) rhinosinusitis in immune-deficient patients (i.e., fungal sinusitis)[1]
  - Recurrent (< 30 days episodes separated by at least 10 asymptomatic days) acute/subacute/chronic rhinosinusitis.[1,2,3]
  - Sinonasal polyposis[1]
  - Chronic (> 12 weeks) sinusitis[3] with at least two of the following signs and symptoms:
    - Mucopurulent drainage
    - Nasal obstruction
    - Facial pain –pressure, fullness
    - Decreased sense of smell
  - Worsening or failure to improve within 72 hours of initial management [4]
  - Acute sinusitis with no improvement in symptoms after a minimum of 4 weeks of treatment
- In addition to standard Sinus CT imaging (CPT® 70486), both CT and MRI imaging may be approved in the following scenarios:
  - Orbital and/or Intracranial complications with ocular and/or neurological deficit[1,3,4]
    - MRI Face, Orbit, and Neck without and with contrast (CPT® 70543) **or**
    - MRI Head without and with contrast (CPT® 70553) **or**
    - MRI Head without contrast (CPT® 70551) **and/or**
    - CT Orbit without contrast (CPT® 70480) **or**
    - CT Orbit with contrast (CPT® 70481) **or**
    - CT Head without and with contrast (CPT® 70470)
  - A new obstructing sinus mass, including retention cysts and nasal polyps, that obscures the physician's view on endoscopy MRI Face, Orbit, and Neck without and with contrast (CPT® 70543) **or**
    - MRI Head without and with contrast (CPT® 70553) **or**
    - MRI Head without contrast (CPT® 70551) **and/or**
    - CT Orbit without contrast (CPT® 70480) **or**
    - CT Orbit with contrast (CPT® 70481) **or**
    - CT Head without and with contrast (CPT® 70470)
  - Fungal Sinusitis[1]
    - MRI Face, Orbit, and Neck without and with contrast (CPT® 70543) **or**
    - MRI Head without and with contrast (CPT® 70553) **or**
    - MRI Head without contrast (CPT® 70551) **and/or**
    - CT Orbit without contrast (CPT® 70480) **or**
    - CT Orbit with contrast (CPT® 70481) **or**
    - CT Head without and with contrast (CPT® 70470) **or**

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- One time repeat imaging may be approved in the following scenarios:
  - An ENT specialist requests the imaging **and**:
  - There is no improvement after an additional 4 weeks of conservative treatment after initial imaging was completed; **and**
  - There has been a follow-up visit since the previous imaging; **or**
  - If there is a new abnormality on exam such as obstructing mass
- CT Maxillofacial (CPT® 70486) may be approved following MRI Brain if request otherwise meets criteria for imaging of sinus disease
- 3D Rendering (CPT® 76376 or CPT® 76377) may be added if ordered by a specialist for sinus surgery preoperative planning

Practice Notes

- Rhinosinusitis is defined as inflammation of the nasal cavity and adjacent paranasal sinuses. Acute sinusitis refers to symptom duration < 4 weeks, subacute 4 to 12 weeks, and chronic > 12 weeks. Complicated sinusitis refers to symptoms suggesting spread of disease into adjacent structures, including orbital or intracranial complications.[1,2,3]

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HD-30: Temporomandibular Joint Disease (TMJ) and Dental/Periodontal/Maxillofacial Imaging

HD-30.1: Temporomandibular Joint Disease (TMJ)	87
HD-30.2: Dental/Periodontal/Maxillofacial Imaging	87

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HD-30.1: Temporomandibular Joint Disease (TMJ)

- TMJ MRI (CPT® 70336) is the diagnostic study of choice and should be reserved for those who fail a minimum of 6 weeks of non-surgical treatment and who are actively being considered for TMJ surgery
- CT Maxillofacial without contrast (CPT® 70486) or without and with contrast (CPT® 70488) may be performed when there is suspicion of bony involvement from the MRI and if primary bony pathologies are suspected clinically
- Ultrasound (CPT® 76536) can be used to look for the presence of a joint effusion and to evaluate cartilage and disk displacement with open and closed mouth imaging and to guide injections
- TMJ imaging in children with Juvenile Rheumatoid Arthritis, See **PEDHD-25: Temporomandibular Joint (TMJ) Imaging in Children**

HD-30.2: Dental/Periodontal/Maxillofacial Imaging

- All requests will be forwarded to Medical Director for review
- Cone beam CT may be supported for surgical planning when plain x-rays alone are insufficient. Potential indications include but are not limited to:
  - Impacted teeth
  - Supernumerary teeth
  - Dentoalveolar trauma
  - Root resorption
  - Foreign body
  - Odontogenic cysts, tumors, or other jaw pathology
  - Cleft pathology
  - Orthognathic surgery for dentofacial anomalies
  - Osteomyelitis and odontogenic infections (MRI is the preferred modality after x-ray, See **MS-9.1: Infection – General**)
  - Bisphosphonate-related osteonecrosis of the jaw
  - Salivary gland stones
  - Maxillofacial bone graft planning
  - Dental implants related to tooth loss from injury, trauma, or jaw pathology such as cysts, tumors, or cancer
- Some payers do not include orthodontic clinical conditions such as replacement of teeth lost due to caries or periodontal disease, non-trauma related dental implantology, or endodontic treatment not related to trauma to the natural tooth in their coverage policies
  - Thus, Cone beam CT scans in these patients would also not be included in the coverage policy
  - These coverage policies will take precedence over eviCore's guidelines
- Cone Beam CT: Report with CPT® Codes: CPT® 70486, CPT® 70487, CPT® 70488, CPT® 70480, CPT® 70482
- 3-D rendering (CPT® 76376 or CPT® 76377) should NOT be reported separately
- Cone beam CT (CBCT) may also be called i-CAT scanner or mini-CAT scanner

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HD-31: Tinnitus

HD-31.1: Tinnitus 90

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HD-31.1: Tinnitus

- Advanced imaging is not usually indicated in the evaluation of tinnitus, unless one or more of the following signs and symptoms are present:
  - Tinnitus localized to a single ear
  - Pulsatile tinnitus
  - Focal neurological abnormalities
  - Asymmetric hearing loss
- If one or more of these signs and symptoms are present, the following advanced imaging studies can be considered:
  - MRI Head without and with contrast[1,2,3] (CPT® 70553) **or**
  - CT Temporal bone[3] without or without and with contrast (CPT® 70480 or CPT® 70482) **or**
  - MRI Head with attention to internal auditory canal[3] without and with contrast (CPT® 70553) or MRI Head and internal auditory canal[3] without contrast (CPT® 70551) **or**
  - Limited Study MRI with attention to internal auditory canal (CPT® 70540, CPT® 70541, CPT® 70542, CPT® 70543) can be approved in place of MRI Head with attention to internal auditory canal when requested by the provider
  - MRA Head without contrast (CPT® 70544) and/or MRA Neck without contrast (CPT® 70547) or MRA Neck with contrast (CPT® 70548) or CTA Head (CPT® 70496) and/or CTA Neck (CPT® 70498) can be added if there is suspicion of vascular lesions
  - Head CT[1,2] without contrast (CPT® 70450) or Head CT without and with contrast (CPT® 70470) can be approved for:
    - Suspected intracranial extension of a tumor
    - Patient is unable to have an MRI

Practice Notes

The history in patients with tinnitus should include a description of the tinnitus (episodic or constant, pulsatile or non-pulsatile, rhythmicity, pitch, quality of the sound), as well as inciting or alleviating factors. Continuous and pulsatile tinnitus are more concerning for an underlying and significant disorder.[2] Audiometric assessment can be used as initial diagnostic testing[1,2,3] particularly in patients with tinnitus that is unilateral, persistent (> 6 months) or associated with hearing difficulties.

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HD-32: Eye Disorders

HD-32.1: Eye Disorders 93

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HD-32.1: Eye Disorders

- MRI Head without and with contrast (CPT® 70553) and/or MRI Orbit without and with contrast (CPT® 70543) or MRI Head without contrast (CPT® 70551) and/or MRI Orbit without contrast (CPT® 70540). May be considered in the following scenarios*:
  - Anisocoria which is of new onset (e.g. not present in previous photographs) and ≥ 1 mm
  - Acute or progressive vision loss due to any cause, including suspected optic neuritis
  - Ophthalmoplegia
  - Binocular Diplopia
  - Horner's Syndrome, for which CT Neck with contrast and/or CT Chest with contrast may be considered in addition to the head or orbital imaging
  - CT Head without contrast may be substituted for the MRI imaging if there has been a head injury
- Evaluation of a third nerve palsy may be accomplished with an MRI Head without and with contrast (CPT® 70553) and/or MRA Brain without contrast (CPT® 70544)
  - CT Head without and with contrast (CPT® 70470) and/or CT Orbit with contrast (CPT® 70481) can be approved if there is a clinical question of blood in the subarachnoid space
- If MRI is contraindicated or cannot be performed, CT Head without and with contrast (CPT® 70470), CT Orbit with contrast (CPT® 70481) or CT Orbit without and with contrast (CPT® 70482) may be considered as substitutes

See **HD-16: Multiple Sclerosis (MS) and Related Conditions**

Practice Notes

*Advanced imaging of the brain and orbit are not routinely paired. Medical necessity for each region is needed to image both regions, based on suspicion of these disorders.

Orbital imaging alone may be sufficient unless other signs or symptoms suggest brain involvement. Signs or symptoms strongly suggestive and localizing to orbital disease include proptosis, conjunctival injection, chemosis, eye pain, enophthalmos, gaze-evoked amaurosis, eyelid retraction, unilateral optic disc swelling, choroidal and retinal folds, optocilliary shunt vessels, and numb cheek syndrome.

Non-localizing symptoms and signs, for which both brain and orbit imaging may be indicated, include bilateral optic disc swelling, papilledema, diplopia, headache, relative afferent pupillary defect, visual field defects.

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HD-33: Acoustic Neuroma and Other Cerebellopontine Angle Tumors

HD-33.1: Acoustic Neuroma & Other Cerebellopontine Angle Tumors 96

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HD-33.1: Acoustic Neuroma and Other Cerebellopontine Angle Tumors

- Clinical information should include evaluation of hearing either by bedside testing or by formal audiology
- Initial diagnosis can be accomplished with MRI Head without and with contrast (CPT® 70553) which should be done with attention to the internal auditory canals. Clinical information provided should include evaluation of hearing either by bedside testing or by formal audiology
- MRI Head without contrast (CPT® 70551) may be approved if performed with FIESTA protocol
- MRI Orbits, Neck, or Face without and with contrast (CPT® 70543) may be considered with audiologic or clinical features of retrocochlear hearing loss and a negative head MRI and in the rare patient in whom a detailed search is indicated for both a lesion of the cerebellopontine angle **and** lesions of the cerebral hemispheres
- After surgical resection, MRI Head without and with contrast with attention to the internal auditory canals (CPT® 70553) is performed at 6 to 12 months to document the completeness of tumor removal and to serve as a baseline for further follow-up. Assuming complete tumor removal, additional follow up is done at 5 and 10 years. If the findings at 10 years are normal, no further imaging should be performed unless new clinical symptoms occur
- Following stereotactic radiation therapy or continued observation without treatment: MRI Head without and with contrast with attention to the internal auditory canals (CPT® 70553) is performed at 6 months and then annually

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HD-34: Pineal Cysts

See Pediatric Head Guidelines, **PEDHD-13.2: Pineal Cysts**

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HD-35: Arachnoid Cysts

See Pediatric Head Guidelines, **PEDHD-13.1: Arachnoid Cysts**

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HD-36: Nuclear Medicine

- Nuclear Medicine
  - Nuclear medicine studies may be used in the evaluation of some head/brain disorders, and other rare indications as well:
    - Brain Scintigraphy with or without vascular flow (any one of CPT® 78600, CPT® 78601, CPT® 78605, or CPT® 78606)
      - Establish brain death (rarely done in outpatient setting)
    - Brain Imaging SPECT with Technetium-99m or thallium-201 (CPT® 78607)[1]
      - Immunocompromised patients with mass lesion detected on CT or MRI for differentiation between lymphoma and infection
      - In distinguishing recurrent brain tumor from radiation necrosis
    - Brain Imaging Vascular Flow (CPT® 78610)
      - Cerebral ischemia
      - Establish brain death
    - CSF Leakage Detection (CPT® 78650)
      - Evaluation of CSF rhinorrhea, otorrhea, or refractory post-lumbar puncture headache
- Suspected normal pressure hydrocephalus with gait disturbance and either dementia or urinary incontinence
- Radiopharmaceutical Dacryocystography (CPT® 78660)
  - Suspected obstruction of nasolacrimal duct due to excessive tearing
- Cisternogram (CPT® 78630) can be approved for the following:
  - Known hydrocephalus with worsening symptoms
  - Suspected obstructive hydrocephalus
- Cerebrospinal Ventriculography (CPT® 78635) can be approved for the following:
  - Evaluation of internal shunt, porencephalic cyst, or posterior fossa cyst
- Nuclear Medicine Shunt Evaluation (CPT® 78645) and CSF Flow SPECT (CPT® 78647) can be approved for the following:
  - Suspected malfunction of ventriculoperitoneal, ventriculopleural, or ventriculovenous shunts.
- Imaging SPECT with Ioflupane I-23 (CPT® 78607) can be approved for differentiation of Parkinsonian syndrome (PS) and non-neurodegenerative disorders, such as essential tremor (ET) or drug-induced tremor, due to the overlap of clinical symptoms.[2] DAT-SPECT has significant impact on clinical diagnosis and management of diagnostic uncertainty in cases of PS.[3] See **HD-15: Movement Disorders**

Reference

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HD-37: Sleep-Related Requests

HD 37.1: General Guidelines Sleep-Related Requests 101

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HD 37.1: General Guidelines Sleep-Related Requests

- Oral Appliance: There is a lack of published case-controlled clinical studies in Sleep literature validating the use of advanced imaging with respect to oral appliance therapy (pretreatment assessment). Previous literature has demonstrated support for cephalometric studies (x-ray)[1] in predicting treatment success. Nasoendoscopy (sedated and non-sedated with provocative maneuvers such as Mueller maneuver) has been helpful as well in this regard.[2] Routine use of advanced is not supported at this time
- Hypersomnolence: MRI Brain with and without contrast (CPT® 70553) may be indicated when there are focal neurologic signs or suspicion for an inflammatory neurologic process as the etiology. Recognition and treatment of a comorbid sleep disorders is paramount, and a complete neurologic history and examination should precede any request for advanced imaging[3]
- Central Sleep Apnea: MRI Brain with and without contrast (CPT® 70553) may be indicated for unexplained central sleep apnea syndrome when a primary CNS etiology is suspected; i.e., unassociated with CHF, COPD or other potential etiology. Specific etiologies should be stated for imaging requests, including but not limited to, suspected Chiari malformation, stroke, CNS demyelinating disease, posterior fossa lesion, anoxia or infection[4]

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