Cohere Medical Policy -
Magnetic Resonance Imaging (MRI), Brain

Clinical Policy for Medical Necessity Review

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Important Notices

Notices & Disclaimers:

GUIDELINES ARE SOLELY FOR COHERE'S USE IN PERFORMING MEDICAL NECESSITY REVIEWS AND ARE NOT INTENDED TO INFORM OR ALTER CLINICAL DECISION-MAKING OF END USERS.

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Other Notices:

Guideline Information:

Specialty Area: Diagnostic Imaging
Guideline Name: Cohere Medical Policy - Magnetic Resonance Imaging (MRI), Brain
Type: [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17yo)

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Medical Necessity Criteria

Service: Magnetic Resonance Imaging (MRI), Brain

Cohere Health takes an evidence-based approach to reviewing imaging and procedure requests, meaning that sufficient clinical information must be provided at the time of submission to determine medical necessity. Documentation must include a recent and detailed history, physical examination related to the onset or change in symptoms, relevant lab results, prior imaging, and details of previous treatments. Advanced imaging or procedures should be requested after a clinical evaluation by the treating provider, which may include a referral to a specialist.

- When a specific clinical indication is not explicitly addressed in the Cohere Health medical policy, medical necessity will be determined based on established clinical best practices, as supported by evidence-based literature, peer-reviewed sources, professional society guidelines, and state or national recommendations, unless otherwise directed by the health plan.
- Requests submitted without clinical documentation, or those that do not align with the provided clinical information—such as mismatched laterality, body part, or CPT code—may be denied for lack of medical necessity due to insufficient or inconsistent clinical information.
- Repeat diagnostic testing due to technical issues—such as patient motion, incomplete exams, or incorrect imaging sequences—may not be considered medically necessary, as it is the responsibility of the imaging center to deliver appropriate, high-quality studies as originally authorized.

Similarly, repeat imaging requested at a different facility based solely on provider preference may not be approved for medical necessity.

- When there are multiple diagnostic or therapeutic procedures requested simultaneously or within the past three months, each will be reviewed independently. Clinical documentation must clearly justify all of the following:
  - The medical necessity of each individual request
  - Why prior imaging or procedures were inconclusive or why additional/follow-up studies are needed
  - How the results will impact patient management or treatment decisions
- Requests involving adjacent or contiguous body parts may be considered not medically necessary if the documentation demonstrates that the patient's primary symptoms can be adequately assessed with a single study or procedure.

Cohere Health evaluates imaging exams based on medical necessity, regardless of contrast use. If an initial non-contrast study is completed and the radiologist later determines that contrast is needed to clarify a finding, the original authorization number may be used—provided the contrast-enhanced exam is performed at the same imaging center and within the original request's validity period, unless otherwise directed by the health plan.

Description

Magnetic resonance imaging (MRI) is an imaging modality in which a magnetic field and radio waves are used to create clear and detailed images of a part of the body.[1] MRI of the brain involves the patient lying on a table, being fit with a brain MRI coil, and then being slid into a tunnel. The MRI technologist then operates the MRI and generates the images from an adjacent room. Injected contrast, often gadolinium, is sometimes used. The images generated are used to detect, diagnose, and stage disease, as well as throughout the treatment process, including in the planning of appropriate treatment, including surgery, treatment monitoring, and post-treatment surveillance for disease recurrence or progression.

Medical Necessity Criteria

Indications

Magnetic resonance imaging (MRI), brain is considered appropriate if **ANY** of the following is **TRUE**[2,3]:

- Headaches as indicated by **ANY** of the following[4]:
  - New onset headache in an adult patient (greater than or equal to 18 years of age) and **ANY** of the following:
    - Sudden onset (worst, most severe headache ever experienced or thunderclap-type); **OR**
    - With optic disc edema; **OR**
    - The patient is greater than or equal to 50 years of age; **OR**
    - History of head trauma; **OR**
    - Headache preceded by cough, sneeze, Valsalva, physical exertion, or sexual activity; **OR**
    - Pregnant or less than 3 months post-partum; **OR**
    - History of hypercoagulable state or bleeding disorder; **OR**
    - Headache wakes the patient from sleep or is always present upon waking; **OR**

- Chronic headache with significant change in character, severity, or frequency of headache; **OR**
- The patient has a history of cancer or immunocompromise; **OR**
- Primary trigeminal autonomic cephalalgias (e.g., cluster headache); **OR**
- Accompanied by features or intracranial hypertension (e.g., papilledema, pulsatile tinnitus, worsening visual symptoms on Valsalva); **OR**
- Accompanied by features of intracranial hypotension (e.g., worse when upright); **OR**
- Focal neurological complaints including dizziness, visual change, acute hypertension, or altered mental status[5]; **OR**
- Hypercoagulable state or bleeding disorder (e.g., sickle cell disorder); **OR**
- Known genetic disorder with predisposition to intracranial mass lesions; **OR**
- The patient is considered pediatric with headache and **ANY** of the following[6,7]:
  - The patient is less than or equal to 5 years of age; **OR**
  - Headaches awakening from sleep, always present upon waking, or associated with morning nausea/vomiting; **OR**
  - Focal findings or symptoms on neurologic examination (including diplopia, abnormal gait); **OR**
  - Cyclic vomiting syndrome or abdominal migraine with any localizing neurological symptoms[8]; **OR**
  - Seizures; **OR**
  - Papilledema on physical exam; **OR**
  - Headache precipitated by coughing, sneezing, physical exertion, or Valsalva; **OR**
  - Thunderclap headache; **OR**

        - Progressive worsening in headache frequency and severity without a period of temporary improvement; **OR**
        - Systemic symptoms (e.g., persistent fever, weight loss, rash, or joint pain); **OR**
- The patient has, or is suspected to have, multiple sclerosis (MS) or a related condition, and **ANY** of the following[9,10]:
    - Initial evaluation of a patient with neurologic symptoms or deficits suspicious for MS or a related condition with **ANY** of the following:
        - Clinically isolated syndrome (e.g., optic neuritis, transverse myelitis, or brain stem syndrome); **OR**
        - Recurrent episodes of variable neurological signs or symptoms not attributable to another cause; **OR**
        - To demonstrate dissemination in time (DIT)[A] for diagnosis (every 6-12 months); **OR**
    - Known MS and **ANY** of the following:
        - To establish a new baseline and **ANY** of the following:
            - No recent imaging; **OR**
            - Postpartum; **OR**
            - 3-6 months after a change in disease-modifying therapy (DMT); **OR**
        - Before starting or switching DMT; **OR**
        - Annually, while on low risk (for progressive multifocal leukoencephalopathy, PML) DMT (e.g., glatiramer acetate) to assess for subclinical disease activity; **OR**
        - Every 6 months while on high-risk (for PML) DMT (e.g. rituximab or ocrelizumab); **OR**
        - New signs or symptoms suggesting exacerbation or unexpected clinical worsening; **OR**

- Progressive multifocal leukoencephalopathy (PML) surveillance for patients on natalizumab (Tysabri) and **ANY** of the following[11,12]:
    - 12 months after treatment initiation; **OR**
    - Every 3–4 months for up to 12 months and **ALL** of the following:
        - The patient is high-risk; **AND**
        - The patient has switched from natalizumab to other therapeutics; **OR**
        - Every 12 months, if the anti-JCV antibody is negative; **OR**
    - Every 3-4 months, if high-risk of PML occurrence and **ANY** of the following:
        - Seropositive for JC virus and treated with natalizumab for at least 18 months; **OR**
        - High anti-JC virus antibody index values (greater than 0.9); **OR**
        - Previously treated with immunosuppressive therapies; **OR**
    - Every 6 months, or sooner if clinically indicated, if the patient is considered pediatric and **ANY** of the following:
        - Highly active disease; **OR**
        - Imaging will change management; **OR**
- In the diagnosis, staging, treatment planning, or monitoring of neoplastic conditions (masses or mass-like conditions) and **ANY** of the following[13,14]:
    - The patient has **ANY** of the following:
        - Mass seen on prior imaging exam and needs further characterization; **OR**
        - Follow-up of known CNS cancer (primary malignant brain tumor or secondary metastasis) and **ANY** of the following:
            - The patient is undergoing active treatment as per NCCN prior imaging; **OR**
            - Suspected recurrence based on signs or symptoms; **OR**

- Known low-grade tumor (WHO I-II) (e.g., meningioma, glioma, astrocytoma, oligodendroglioma) with **ANY** of the following[15,16]:
  - Follow up per NCCN recommendations; **OR**
  - Symptomatic with new/changing signs or symptoms; **OR**
- Known acoustic neuroma (Schwannoma) or cerebellar pontine angle tumor (excluding NF2) and **ANY** of the following[17]:
  - Preoperative exam[18]; **OR**
  - 6 months after initial scan; **OR**
  - Every 12 months for 5 years if no growth 6 months after initial scan; **OR**
- Known or suspected parasellar (e.g., pituitary) tumor and **ANY** of the following[19,86]:
  - Endocrine symptoms or laboratory findings indicative of an anomaly (e.g., central hyperthyroidism, hypopituitarism, Cushing's syndrome, hyperprolactinemia, diabetes insipidus); **OR**
  - Precocious puberty in a child with hormonal studies (e.g., FSH, LH, Testosterone, Estradiol) suggesting a central cause[20]; **OR**
  - Asymptomatic, incidental findings and **ANY** of the following[21,22]:
    - Neurological findings related to a lesion abutting the optic nerve or chiasm (e.g., visual field deficit, diplopia); **OR**
    - Asymptomatic microadenoma (less than 10 mm) and **ANY** of the following
      - Initial imaging; **OR**
      - 12 months after initial imaging; **OR**
      - Every 1-2 years for the first 3 years after initial detection; **OR**
      - Every 2 years from years 4 to 10 after initial detection; **OR**
      - Every 5 years beyond year 10 after initial detection; **OR**
    - Asymptomatic macroadenoma (greater than or equal to 10 mm) and **ANY** of the following:

        - Initial imaging; **OR**
        - Every 6 months in the first year; **OR**
        - Annually for the first 3 years after initial detection if stable; **OR**
        - Every 2 years from years 4 to 10 after initial detection; **OR**
        - Every 5 years beyond year 10 after initial detection; **OR**
    - Pineal cysts and **ANY** of the following[23,24]:
        - No previous MRI if incidentally discovered; **OR**
        - New or worsening symptoms (e.g., headache, focal neurologic deficits); **OR**
- Imaging required for surgical or radiotherapy (RT) planning; **OR**
- The patient is 24-72 hours postoperative following surgical resection; **OR**
- The patient is undergoing systemic therapy or RT and **ANY** of the following:
    - Limited or extensive brain metastases; **OR**
    - As clinically indicated for treatment planning and to monitor treatment response; **OR**
- For post-treatment monitoring, as clinically indicated after completion of systemic therapy, RT, or surgery; **OR**
- The patient has clinical signs or symptoms of deterioration or recurrence; **OR**
- Arachnoid cyst and **ANY** of the following[25-27]:
    - Serial follow-up as clinically indicated and the patient is less than or equal to 4 years of age; **OR**
    - The patient has new signs or symptoms; **OR**
- The patient has genetic risk factors concerning for specific CNS neoplasms, including **ANY** of the following[13]:
    - Lynch syndrome every 1-3 years; **OR**

        - Li-Fraumeni syndrome every 12 months[28]; **OR**
        - Von Hippel-Lindau (VHL) syndrome every 2 years starting at age 10; **OR**
        - Tuberous sclerosis every 1-3 years; **OR**
        - Annual surveillance in a patient greater than or equal to 10 years of age with a known NF2-related schwannomatosis; **OR**
- The patient has tinnitus or hearing loss and **ANY** of the following[29-31]:
    - Tinnitus with **ANY** of the following[29]:
        - Clinical suspicion of mass lesion causing tinnitus; **OR**
        - Asymmetric or unilateral non-pulsatile tinnitus (i.e., tinnitus that localizes to one ear); **OR**
        - Tinnitus associated with focal neurologic abnormalities, including asymmetric hearing loss; **OR**
        - Persistent tinnitus after recent significant trauma; **OR**
        - Pulsatile tinnitus; **OR**
    - Hearing loss confirmed by audiometry (e.g., acquired sensorineural, mixed conductive, sensorineural)[30,31]; **OR**
- The patient has signs of focal neurological disease, including **ANY** of the following[5,32]:
    - Acute, new, or fluctuating neurologic symptoms or deficits that suggest a localizing neurologic process, including **ANY** of the following:
        - Sensory deficits, including **ANY** of the following:
            - Involvement of 2 limbs on the same side of the body; **OR**
            - Face and limb involvement; **OR**
        - Limb weakness, including **ANY** of the following:
            - Involvement of 2 limbs on the same side of the body; OR
            - Face and limb involvement; **OR**
        - Abnormal reflexes (pathological, asymmetric, hyperreflexia); **OR**
        - Speech difficulties; **OR**

        - Vision loss; **OR**
        - Lack of coordination or gait disturbance; **OR**
        - Ataxia; **OR**
        - Mental status changes; **OR**
        - Babinski/Hoffman sign; **OR**
        - Increased tone in the affected limb; **OR**
        - Bladder or bowel dysfunction; **OR**
    - Horner syndrome (unilateral miosis, ptosis, facial anhidrosis); **OR**
    - Papilledema; **OR**
    - **ANY** of the following eye disorders or visual conditions[33]:
        - Abnormal eye findings on physical or neurologic examination (e.g. pathologic nystagmus, paralysis of one or more extraocular muscles, optic atrophy, ocular nerve palsies, new onset anisocoria, visual field deficit, etc); **OR**
        - Suspected orbital cellulitis, uveitis, or scleritis (e.g., eyelid or periocular swelling, lacrimal gland enlargement, extraocular muscle involvement, intra-orbital mass, proptosis, cranial nerve V involvement); **OR**
        - Suspected optic neuritis; **OR**
        - Diplopia after comprehensive eye evaluation[7]; **OR**
    - Brain structural abnormality identified or suspected on prior imaging; **OR**
    - Chronic disequilibrium with signs of cerebellar ataxia[34]; **OR**
    - Symptoms suggestive of cranial nerve (CN) pathology, including **ANY** of the following[32]:
        - Unexplained decrease, distortion, or enhancement in the sense of smell or taste suggestive of CN I pathology; **OR**

- Trigeminal neuropathy/neuropathic pain symptoms suggestive of CN V pathology (e.g., facial weakness, paralysis, pain, or numbness); **OR**
- Facial expression weakness or paralysis suggestive of CN VII pathology (e.g., facial droop, pain around the jaw or ear, hyperacusis, tinnitus, decreased lacrimation or salivation, hemifacial spasm, persistent or atypical Bell palsy); **OR**
- Severe and mixed neurologic effects suggestive of multiple CN pathology (e.g., Millard-Gubler syndrome, Foville syndrome, locked-in syndrome, facial colliculus syndrome); **OR**
- Oropharyngeal pain or neurogenic dysphagia suggestive of pathology to CN IX; **OR**
- Unilateral isolated palatal or vocal cord paralysis suggestive of pathology to CN X; **OR**
- Unilateral isolated weakness or paralysis of sternocleidomastoid or trapezius muscles suggestive of pathology to CN XI (e.g., decreased shoulder abduction, pain, disfiguration, and disability); **OR**
- Unilateral isolated weakness or paralysis of the tongue suggestive of pathology to CN XII (e.g., lesion present on the tongue with dysarthria and deviation of the tongue upon protrusion); **OR**
- Multiple and different lower cranial palsies or combined lower cranial nerve syndromes suggestive of pathology to CN IX - XII (e.g., Wallenberg syndrome, lateral medullary syndrome, demyelinating disease, primary brain stem tumors, metastases, encephalitis, Arnold-Chiari malformations, syringobulbia); **OR**
- Suspected or known perineural tumor spread in a patient with head and neck cancer; **OR**

- Atypical trigeminal neuralgia, defined by **ANY** of the following symptoms[35,36]:

        - Bilateral hearing loss; **OR**
        - Dizziness/vertigo; **OR**
        - Visual changes; **OR**
        - Sensory loss or numbness; **OR**
        - Pain greater than 2 minutes; **OR**
        - Pain outside the trigeminal nerve distribution and progression; **OR**
    - Refractory trigeminal neuralgia when done for surgical planning; **OR**
- The patient has, or is suspected to have, dementia or a neurodegenerative disorder and **ANY** of the following[37-39]:
    - Established initial clinical diagnosis of dementia including **ALL** of the following[40]:
        - **ANY** of the following:
            - Abnormal cognitive status according to objective screening tool, including **ANY** of the following:
                - Montreal cognitive assessment (MoCA) less than 26[41]; **OR**
                - Mini-mental state examination (MMSE) score less than 23[41]; **OR**
                - Saint Louis University mental status (SLUMS) score less than 19[42]; **OR**,
                - Informant questionnaire on cognitive decline in the elderly (IQCODE) score greater than or equal to 3.4[43]; **OR**
                - Mini-cog score less than 3[41]; **OR**
                - Formal neuropsychological testing[41]; **OR**
            - Detailed history showing 6 months longer of cognitive decline, memory loss, or impairment of daily activities; **AND**
        - Completed metabolic workup (e.g., testing for anemia, thyroid function, liver and kidney function, complete blood count, electrolytes, diabetes mellitus, and B12 deficiency); **OR**
    - The patient is taking or is a candidate for lecanemab (leqembi) and **ANY** of the following[87]:

        - Prior to initiation of therapy; **OR**
        - Within 12 months of treatment initiation; **OR**
        - Prior to the 5th, 7th, and 14th infusions; **OR**
        - The patient develops signs or symptoms strongly suggestive of amyloid related imaging abnormalities (ARIA; e.g., headache, confusion, visual changes, dizziness, nausea, gait disturbance, seizures, status epilepticus, encephalopathy, stupor, focal neurological deficits); **OR**
        - Follow-up of known ARIA on prior MRI; **OR**
    - The patient is suspected to have normal pressure hydrocephalus with **AT LEAST TWO** of the following[44]:
        - Gait abnormality; **OR**
        - Urinary incontinence; **OR**
        - Dementia; **OR**
    - The patient has, or is suspected to have, a movement disorder including **ANY** of the following[37,45-47]:
        - Acute onset of movement disorder with concern for stroke or hemorrhage; **OR**
        - Concern for Parkinson's disease with atypical features, including **ANY** of the following:
            - Persistent unilateral signs or symptoms; **OR**
            - Symptom onset in a patient less than or equal to 50 years of age; **OR**
            - Rapid progression; **OR**
            - Incomplete or uncertain response to therapy; **OR**
        - Suspicion of other movement disorder (e.g., Huntington's disease, chorea, Parkinsonian syndromes, hemiballismus, atypical dystonia) to exclude an underlying structural lesion; **OR**

        - Preoperative planning for deep brain stimulation or other surgical treatment; **OR**
    - Suspected dysmyelinating disorder (e.g. adrenoleukodystrophy); **OR**
- The patient has, or is suspected to have, **ANY** of the following CNS infections, infectious, inflammatory, or autoimmune disorders[48-51]:
    - Suspected brain abscess or brain infection with **ANY** of the following:
        - Acute altered mental status; **OR**
        - Seizures, headaches, meningeal signs (neck stiffness); **OR**
        - New focal neurologic deficits with **ANY** of the following:
            - Fever; **OR**
            - Elevated white blood cell count (WBC); **OR**
            - Abnormal CSF analysis; **OR**
        - Follow-up assessment during or after treatment completion; **OR**
        - Known infection elsewhere; **OR**
        - Known immunosuppression; **OR**
    - Neurosarcoidosis with **ANY** of the following[52]:
        - For initial evaluation with **ANY** of the following:
            - Suspected based on neurological sign(s), symptom(s), and lab work (e.g., angiotensin-converting enzyme [ACE], cerebrospinal fluid [CSF]) analysis); **OR**
            - Known history of sarcoidosis with neurological signs or symptoms; **OR**
        - Follow-up of known neurosarcoidosis for **ANY** of the following reasons:
            - To assess treatment response; **OR**
            - Worsening signs or symptoms; **OR**
    - Central nervous system (CNS) involvement in a patient with known or suspected vasculitis or autoimmune disease with **ANY** of the following[53]:
        - Abnormal inflammatory markers; **OR**

        - Autoimmune antibodies; **OR**
    - The patient is immunocompromised (e.g., transplant recipient, HIV with CD4 less than 200, primary immunodeficiency syndromes, hematologic malignancies) and **ANY** of the following[54]:
        - Focal neurologic symptoms; **OR**
        - Headaches; **OR**
        - Behavioral, cognitive, or personality changes; **OR**
    - Suspected autoimmune encephalitis (e.g., rapid-onset and progression of working memory deficits, changes in consciousness, arousal, or personality)[55]; **OR**
- The patient has a trauma-related condition, as indicated by **ANY** of the following[56]:
    - Unexplained cognitive or neurologic deficits following a concussion; **OR**
    - Persistent or worsening symptoms after a concussion and **ALL** of the following:
        - No previous MRI since the trauma; **AND**
        - **ANY** of the following:
            - Symptoms persist for more than four weeks since the injury for children; **OR**
            - Symptoms persist for more than two weeks since the injury for adults; **OR**
    - As a follow-up to prior imaging (e.g., CT) and **ANY** of the following:
        - Unexplained post-traumatic neurological deficits; **OR**
        - Post-traumatic brain injury or new or worsening symptoms following initial imaging (e.g., dizziness, headache); **OR**
    - Subacute or chronic traumatic brain injury with new cognitive and/or neurologic deficit; **OR**
- The patient has a vascular condition, including **ANY** of the following[57]:
    - Known acute ischemic stroke or transient ischemic attack (TIA)[58]; **OR**

- Suspected stroke or TIA with any acute, new, or fluctuating symptoms or deficits (e.g., sensory deficits, limb weakness, speech difficulties, visual loss, transient global amnesia, lack of coordination, or mental status changes); **OR**
- Suspected subarachnoid hemorrhage (SAH); **OR**
- Follow-up for known hemorrhage, hematoma, or vascular abnormalities; **OR**
- Follow-up imaging of known cerebral cavernous malformations (CCM) and **ANY** of the following:
  - To guide treatment decisions; **OR**
  - To investigate new symptoms; **OR**
  - The patient has a first-degree relative with a CCM; **OR**
- Suspected central venous thrombosis; **OR**
- Suspected silent cerebral infarcts and **ANY** of the following[59]:
  - The patient is early school-age (less than or equal to 6 years of age)[60]; **OR**
  - The patient is between 6 and 20 years of age and **ALL** of the following[61]:
    - At risk for silent cerebral infarcts (e.g., sickle cell anemia); **AND**
    - The patient has **ANY** of the following:
      - Neurologic symptoms; **OR**
      - Neuropsychometric deficits; **OR**
      - Elevated artery velocities; **OR**
  - The patient is greater than or equal to 18 years of age and **ANY** of the following:
    - HbSS sickle cell disease; **OR**
    - HbSβ0 thalassemia; **OR**
- High stroke risk in sickle cell patients (2 to 16 years of age) with a transcranial Doppler velocity greater than 200 cm/sec3[62]; **OR**

- Suspected temporal arteritis in a patient greater than or equal to 50 years of age with **ANY** of the following[63]:
  - Temporal headache; **OR**
  - Abrupt visual changes; **OR**
  - Jaw claudication; **OR**
  - Temporal artery tenderness; **OR**
  - Constitutional symptoms; **OR**
  - Elevated erythrocyte sedimentation rate (ESR); **OR**
- **ANY** of the following chronic vascular diseases[57]:
  - Headaches with a family history of aneurysm/arteriovenous malformation (AVM), including **ANY** of the following[64-67]:
    - One first-degree relative with a history of aneurysm/AVM and **ANY** of the following:
      - The patient is symptomatic; **OR**
      - There is clinical concern for aneurysm; **OR**
    - Two or more relatives with a history of aneurysm/AVM (repeat imaging in 5 years); **OR**
  - Arterial or venous/dural venous sinus abnormalities, including **ANY** of the following:
    - Acquired thrombosis/occlusion; **OR**
    - Venous sinus stenosis; **OR**
    - Evaluation of neurological signs or symptoms in vaso-occlusive disease (e.g., sickle cell disease, moyamoya, etc.); **OR**

- The patient has, or is suspected to have, a seizure disorder, and **ANY** of the following[68]:
  - New onset of seizures or newly identified change in seizure activity/pattern; **OR**
  - Known seizure disorder without prior imaging; **OR**

- Medically refractory epilepsy and the patient is compliant with medications; **OR**
- New neurologic deficit or no return to previous neurologic baseline; **OR**
- CT head was previously performed for new onset seizure and MRI brain is required for additional evaluation; **OR**
- Repeat testing for "Epilepsy Protocol" or preoperative or treatment planning; **OR**

- The patient has signs or symptoms of dizziness, vertigo, or syncope with **ANY** of the following[34]:
  - Signs or symptoms suggestive of a CNS lesion (e.g., ataxia, vision loss, double vision, weakness, or a change in sensation); **OR**
  - Progressive unilateral hearing loss; **OR**
  - Risk factors for cerebrovascular disease with concern for stroke; **OR**
  - Syncope with **ANY** of the following[69,70]:
    - Bowel or bladder incontinence; **OR**
    - Tonic-clonic seizure; **OR**
  - Vertigo with **ANY** of the following[30]:
    - Acute persistent vertigo with **ANY** of the following:
      - Abnormal neurologic examination; **OR**
      - Results of head impulse, nystagmus, test of skew (HINTS)[B] consistent with central vertigo[34,71]; **OR**
    - Chronic recurrent vertigo with unilateral hearing loss or tinnitus[34]; **OR**
    - Persistent vertigo suspected to have a central cause[30]; **OR**
    - The patient has a history of malignancy or associated headache; **OR**
- The patient has a hydrocephalus shunt and **ANY** of the following[72]:
  - Post-operative imaging; **OR**
  - 6-12 months after shunt placement procedure; **OR**
  - Annually when neurologic findings are stable; **OR**

    - Any new sign or symptom suggesting shunt malfunction (e.g., consciousness, vomiting, neurologic deterioration); **OR**
- The patient has, or is suspected to have, a mental health, developmental, or related disorder and **ANY** of the following:
    - Pervasive developmental disorders (including autism spectrum disorder) and **ANY** of the following[73]:
        - New or worsening cognitive decline; **OR**
        - Documented focal neurologic symptoms; **OR**
    - Acute change in cognitive functioning, consciousness, or arousal state; **OR**
    - Psychotic, bipolar, or related disorders and **ANY** of the following[74,75]:
        - Acute psychosis in the absence of prior imaging[76]; **OR**
        - The patient has a history of whole brain radiation; **OR**
        - Onset of symptoms in a patient over the age of 40; **OR**
        - Confirmed or suspected comorbid serious medical illness; **OR**
        - Prior to treatment with electroconvulsive therapy (ECT); **OR**
- The patient has, or is suspected to have central sleep apnea due to CNS anomaly (e.g., Chiari malformation, hydrocephalus)[77,78]; **OR**
- The patient requires imaging in the surgical setting, including **ANY** of the following:
    - Surgical planning when surgery is already planned; **OR**
    - Postoperative evaluation if complications are suspected; **OR**
    - Post-treatment complications when surgery was recently performed.
- Repeat imaging (defined as a repeat request following recent imaging of the same anatomic region with the same or similar modality) will be considered reasonable and necessary if **ALL** of the following are **TRUE**:
    - There are no established guidelines; **AND**
    - **ANY** of the following:

- There are new or worsening symptoms not addressed in the guidelines, such that repeat imaging would influence treatment; **OR**
- There is need for a one-time clarifying follow-up of a prior indeterminate finding; **OR**
- In the absence of change in symptoms, there is an established need for monitoring which would influence management.

Non-Indications

Magnetic resonance imaging (MRI), brain is not considered appropriate if **ANY** of the following is **TRUE**:

- The patient has undergone advanced imaging of the same body part within 3 months without undergoing treatment or developing new or worsening symptoms in the absence of established guidelines or criteria supporting more frequent imaging[79]; **OR**
- MRI is not indicated in essential tremor, Tourette' syndrome, or isolated focal dystonia[47,80]; **OR**
- In the pediatric population, imaging is not indicated in simple febrile seizures or in idiopathic focal or generalized epilepsy with typical features of benign epilepsy with centro-temporal spikes (BECTS), childhood absence epilepsy (CAE), juvenile absence epilepsy (JAE), and juvenile myoclonic epilepsy (JME).[81,82]

*NOTE: MRI in patients with claustrophobia should be requested at the discretion of the ordering provider.
**NOTE: MRI in pregnant patients should be requested at the discretion of the ordering provider and obstetric care provider.

Definitions

[A]**Dissemination in Time (DIT):** The development of new lesions over time. MRI can demonstrate dissemination in time through the simultaneous presence of gadolinium-enhancing (acute) and nonenhancing lesions (chronic) at one time or the development of a new T2 lesion on follow-up MRI.

[B]**HINTS:** Three bedside tests (Head Impulse, Nystagmus, Test of Skew) to assess whether acute vestibular symptoms (AVS, e.g., vertigo, nausea) are due to a central cause.
-The head impulse test measures the vestibulo-ocular reflex (VOR) by having the patient focus on a central target during rapid side-to-side head rotation. Inability to maintain fixation in one direction is considered abnormal.
-Nystagmus (i.e., rapid, involuntary eye movements). Nystagmus suggestive of a central cause of AVS includes vertical nystagmus, torsion nystagmus, or nystagmus that changes direction.
-Skew deviation (vertical misalignment of the eyes due to an imbalance of vestibular tone in the oculomotor system) is typically assessed by covering each eye in isolation, assessing for vertical correction of the eye position.

Level of Care Criteria

Inpatient or Outpatient

Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	Code Description
70551	Magnetic resonance imaging (MRI) (e.g., proton), brain (including brain stem); without contrast material
70552	Magnetic resonance imaging (MRI) (e.g., proton), brain (including brain stem); with contrast material(s)
70553	Magnetic resonance imaging (MRI) (e.g., proton), brain (including brain stem); without contrast material, followed by contrast material(s) and further sequences

Medical Evidence

Wangaryattawanich et al (2023) reviewed the imaging spectrum, clinical significance, and management of brain MRI. Rapid advancements have been made in imaging technology and improved accessibility. Consequently, radiologists discover incidental findings during brain MRI scans for unrelated reasons. These unexpected findings can range from clinically insignificant to requiring further investigation or treatment, leading to patient anxiety. Incidental findings encompass a diverse range, including asymptomatic brain infarcts, age-related white matter changes, microhemorrhages, intracranial tumors, intracranial cystic lesions, and anatomic variants.[83]

Maas et al. (2022) analyze facets of managing traumatic brain injury (TBI), including imaging. An initial normal CT scan does not rule out the presence of structural traumatic abnormalities. Structural traumatic abnormalities seen on MRI (2–3 weeks post-injury) were observed in approximately 30% of patients with mild TBI who initially had a normal CT scan. Advanced MRI techniques, such as diffusion tensor imaging and volumetric analyses, can reveal further injuries that may not be discernible through visual examination of conventional clinical MR images. Emerging blood biomarkers, such as glial fibrillary acidic protein (GFAP), aid in refining decisions regarding the necessity of CT scans for patients with mild TBI or the requirement of an MRI if the initial CT scan is normal. Integrating biomarkers, quantitative CT, and MRI findings facilitates the identification of patients at-risk of persistent symptoms, enabling more tailored and frequent follow-up care.[84]

Tekes et al. (2018) review the use of brain MRI in pediatric patients beyond shunted hydrocephalus. In the study period, 800 patients had undergone a previous ultrafast brain MRI scan. Patients diagnosed with ventriculomegaly, macrocephaly, or intracranial cysts were included (n=101). The findings support the use of ultrafast brain MRI to assess these conditions. Given its radiation-free and sedation-free nature, ultrafast brain MRI may be appropriate as a primary screening neuroimaging modality for these indications.[85]

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Clinical Guideline Revision History/Information

Original Date: April 1, 2022		
Review History		
Version 2	8/2/2024	Annual review and policy restructure.
Version 3	10/30/2024	Edited repeat imaging criteria language.
Version 4	09/11/2025	Annual review. Expanded criteria for: headaches; neoplastic conditions; CNS infection; infectious, inflammatory, or autoimmune disorders; trauma-related conditions; vascular conditions; dizziness, vertigo, or syncope; seizure disorder (formerly epilepsy). Expanded and moved the following from "miscellaneous pathologies" to their own categories: tinnitus or hearing loss; focal neurological disease; dementia. Added criteria for: hydrocephalus shunts; mental health, developmental, or related disorders; sleep apnea; imaging in the surgical setting, repeat imaging in the absence of guidelines.