Cohere Medicare Advantage Policy - Magnetic Resonance Imaging (MRI), Brain

Clinical Policy for Medical Necessity Review

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Important Notices

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Other Notices:

Policy Information:

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

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Medical Necessity Criteria

Service: Magnetic Resonance Imaging (MRI), Brain

Related CMS Documents

Please refer to CMS Medicare Coverage Database for the most current applicable CMS National Coverage.[1-5]

- National Coverage Determination (NCD). Magnetic resonance imaging (MRI)(220.2)
- Local Coverage Determination (LCD). MRI and CT scans of the head and neck (L37373)
  - Billing and Coding: MRI and CT scans of the head and neck (A57204)
- Local Coverage Determination (LCD). Multiple imaging in oncology, (L35391)
  - Billing and Coding: Multiple imaging in oncology (A56848)

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.[6] 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.[7]

Medical Necessity Criteria

Indications

Magnetic resonance imaging (MRI), brain is considered appropriate if **ANY** of the following is **TRUE**[7,8]:

- Headaches as indicated by **ANY** of the following[9]:
  - 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 of intracranial hypertension (e.g., papilledema, pulsatile tinnitus, worsening visual symptoms worse on Valsalva[9]; **OR**
  - Accompanied by features of intracranial hypotension (e.g., positional, worse when upright, better when lying down); **OR**
  - Focal neurological complaints including dizziness, visual change, acute hypertension, or altered mental status[10]; **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[11,12]:
    - 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[13]; **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**
        - Hypercoagulable state or bleeding disorder (e.g., sickle cell disorder)[14]; **OR**
- The patient has, or is suspected to have, multiple sclerosis (MS) or a related condition, with **ANY** of the following[15,16]:
    - Initial evaluation of a patient with neurologic symptoms or deficits suspicious for MS 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 with **ANY** of the following:
        - To establish a new baseline with **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 when on high-risk (for PML) DMT (e.g., rituximab or

ocrelizumab); **OR**
        - New signs or symptoms suggested an exacerbation or unexpected clinical worsening; **OR**
    - Progressive multifocal leukoencephalopathy (PML) surveillance for a patient on natalizumab (Tysabri) with **ANY** of the following[17,18]:
        - 12 months after treatment initiation; **OR**
        - Every 3–4 months for up to 12 months with **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 with **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 with **ANY** of the following:
            - Highly active disease; **OR**
            - Imaging will change management; **OR**
- Neoplastic conditions for **ANY** of the following:
    - Initial staging; **OR**
    - Treatment planning; **OR**
    - Response assessment; **OR**
    - Surveillance with **ANY** of the following[4,19-21]:
        - The patient is assumed to have either no known disease or disease that is stable or clinically insignificant (every 6-12 months for an overall duration [e.g., 5 years]); **OR**
        - Suspected recurrence/progression; **OR**
        - Evaluation of response to treatment when a change in therapy is contemplated (no more often than after 2 cycles of chemotherapy and/or 6-8 weeks since the prior imaging evaluation); **OR**
- The patient has tinnitus or hearing loss with **ANY** of the following[22,23]:
    - Tinnitus with **ANY** of the following[22]:
        - Clinical suspicion of a 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)[23,24]; **OR**
- The patient has signs of focal neurological disease, including **ANY** of the following[10,25]:
    - 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[26]:
        - 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[12]; **OR**

- Brain structural abnormality identified or suspected on prior imaging; **OR**
- Chronic disequilibrium with signs of cerebellar ataxia[27]; **OR**
- Symptoms suggestive of cranial nerve (CN) pathology, including **ANY** of the following[25]:
  - 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[28,29]:
  - Bilateral hearing loss; **OR**
  - Dizziness/vertigo; **OR**

        - Visual changes; **OR**
        - Sensory loss or numbness; **OR**
        - Pain greater than 2 minutes; **OR**
        - Pain outside 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, including **ANY** of the following[30-32]:
    - Established initial clinical diagnosis of dementia, including **ALL** of the following[33]:
        - **ANY** of the following:
            - Abnormal cognitive status testing according to an objective screening tool, including **ANY** of the following:
                - Montreal cognitive assessment (MoCA) less than 26[34]; **OR**
                - Mini-mental state examination (MMSE) score less than 23[34]; **OR**
                - Saint Louis University mental status (SLUMS) score less than 19[35]; **OR**
                - Informant questionnaire on cognitive decline in the elderly (IQCODE) score greater than or equal to 3.4[36]; **OR**
                - Mini-cog score less than 3[34]; **OR**
                - Formal neuropsychological testing[34]; **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[37]:
        - 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[38]:

        - Gait abnormality; **OR**
        - Urinary incontinence; **OR**
        - Dementia; **OR**
    - The patient has, or is suspected to have, a movement disorder, including **ANY** of the following[30,39-41]; **OR**
        - Acute onset of a 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)[42]; **OR**
- The patient has, or is suspected to have, **ANY** of the following central nervous system (CNS) infections, infectious, inflammatory, or autoimmune disorders[10,43-45]:
    - 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 or immunosuppression; **OR**
    - Neurosarcoidosis with **ANY** of the following[46]:
        - 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**
  - CNS involvement in a patient with known or suspected vasculitis or autoimmune disease with **ANY** of the following[47]:
    - Abnormal inflammatory markers; **OR**
    - Autoimmune antibodies; **OR**
  - The patient is immunocompromised (e.g., transplant recipients, HIV with CD4 less than 200, primary immunodeficiency syndromes, hematologic malignancies) with **ANY** of the following[48]:
    - 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)[49]; **OR**
- The patient has a trauma-related condition, as indicated by **ANY** of the following[50]:
  - 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) with **ANY** of the following:
    - Unexplained post-traumatic neurological deficits; **OR**
    - Post-traumatic brain injury or persistent 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[51]:
  - Known acute ischemic stroke or transient ischemic attack (TIA)[52,53]; **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) with **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 with **ANY** of the following[53]:
  - The patient is early school-age (less than or equal to 6 years of age)[54]; **OR**
  - The patient is between 6 and 20 years of age with **ALL** of the following[55]:
    - 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[14]; **OR**
- Suspected temporal arteritis in a patient greater than or equal to 50 years of age with **ANY** of the following[56]:
  - 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[51]:

        - Headaches with a family history of aneurysm/arteriovenous malformation (AVM), including **ANY** of the following[57-60]:
            - One first-degree relative with a history of aneurysm/AVM with **ANY** of the following:
                - The patient is symptomatic; **OR**
                - There is clinical concern for an 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 for 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 with **ANY** of the following[61]:
    - 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 of the 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[27]:
    - Signs or symptoms suggestive of a CNS lesion (e.g., ataxia, visual 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[62,63]:
        - Bowel or bladder incontinence; **OR**
        - Tonic-clonic seizure; **OR**
    - Vertigo with **ANY** of the following[24]:
        - Acute persistent vertigo with **ANY** of the following:
            - Abnormal neurologic examination; **OR**

        - Results of head, impulse, nystagmus, test of skew (HINTS) examination consistent with central vertigo[27,64]; **OR**
    - Chronic recurrent vertigo with unilateral hearing loss or tinnitus[27]; **OR**
    - Persistent vertigo suspected to have a central cause[24]; **OR**
    - The patient has a history of malignancy or associated headache; **OR**
- The patient has a hydrocephalus shunt with **ANY** of the following[65]:
    - Postoperative 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[66]:
        - 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[67,68]:
        - Acute psychosis in the absence of prior imaging[69]; **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)[70,71]; **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; **OR**
- Repeat imaging (defined as repeat request following recent imaging of the same anatomic region with the same or similar modality) will be considered reasonable and necessary with **ALL** of the following:
    - 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**:

- Absence of symptoms of brain involvement with **ANY** of the following cancers[2]:
  - Esophageal; **OR**
  - Oropharyngeal; **OR**
  - Prostate; **OR**
  - Skin (non-melanoma); **OR**
- The patient has metallic clips on vascular aneurysms[1,2]; **OR**
- The patient is acutely ill requiring life support systems and monitoring devices that employ ferromagnetic materials[1]; **OR**
- History of claustrophobia[1]; **OR**
- Imaging of cortical bone and calcification[1,2]; **OR**
- Procedures involving spatial resolution of bone or calcification[1,2]; **OR**
- 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; **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)[72,73]; **OR**
- MRI is not indicated in essential tremor, Tourette's syndrome, or isolated focal dystonia.[41,74]

*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.[15]

[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.[64]
-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

Disclaimer: S Codes are non-covered per CMS guidelines due to their experimental or investigational nature.

Evaluation of Clinical Harms and Benefits

Clinical determinations for Medicare Advantage beneficiaries are made in accordance with 42 CFR 422.101 guidance outlining CMS's required approach to decision hierarchy in the setting of NCDs/LCDs identified as being "not fully established". When clinical coverage criteria are "not fully established" Medicare Advantage organizations are instructed to create publicly accessible clinical coverage criteria based on widely-accepted clinical guidelines and/or scientific studies backed by a robust clinical evidence base. Clinical coverage criteria provided by Cohere Health in this manner include coverage rationale and risk/benefit analysis.

The potential clinical harms of using these criteria for magnetic resonance imaging (MRI) of the brain may include:

- Adverse effects from the use of contrast agents (e.g., gadolinium-based contrast agents) may include nausea, headache, and pain at the site of injection. Rarely, patients experience hives, itchy eyes, or other allergic reactions to the contrast material.[75]
- Dynamic magnetic fields during MRI scanning create loud knocking noises which may harm hearing or cause ringing of the ears (tinnitus) if adequate ear protection is not used. They may also cause peripheral muscle or nerve stimulation that may feel like a twitching sensation.[75]
- MRI scanning could lead to heating of the body and thermal injuries, particularly during long scans, due to radiofrequency energy used in the procedure.[75]
- Increased healthcare costs and complications from the inappropriate use of emergency services and additional treatments.

The clinical benefits of using these criteria for magnetic resonance imaging (MRI) of the brain may include:

- MRI, a non-invasive imaging technology that provides detailed three-dimensional anatomical images, is useful in the diagnosis, treatment, and monitoring of Alzheimer's disease, Parkinson's disease, stroke, multiple sclerosis, tumors, amyotrophic lateral sclerosis (ALS), Huntington's disease, and dementia.[76-80]
- MRI of the brain offers insights into the etiology, prognosis, and treatment of intracerebral hemorrhage (ICH). Using echo-planar gradient-echo or

susceptibility-weighted sequences, MRI shows sensitivity and specificity in identifying ICH and in differentiating its primary and secondary causes. Moreover, MRI can assess hemorrhage age, secondary lesions, and progression of perihematomal edema, thereby guiding tailored therapeutic strategies.[81]

- Different MRI imaging biomarkers measure different aspects of the tissues in the brain. For example, T_1 tissue properties help differentiate between white and gray matter, while T_2 tissue properties highlight the water content of the brain. This helps in the identification of lesions, edemas, and other abnormalities. T^*_2 properties can detect hemorrhagic strokes.[82]
- Enhanced overall patient satisfaction and healthcare experience.
- Appropriate allocation of healthcare resources at the individual beneficiary and population levels.

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 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) analyzed 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) reviewed 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. One hundred and one patients diagnosed with ventriculomegaly, macrocephaly, or intracranial cysts were included. 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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Policy Revision History/Information

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Review History		
Version 2	10/16/2025	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. Clarified the indication for repeat imaging to improve usability and organization. Added non-indications for: absence of symptoms of brain involvement with esophageal, oropharyngeal, prostate, and skin (non-melanoma) cancer; metallic clips; pregnancy; life support systems and monitoring; history of claustrophobia; imaging of cortical bone and calcification; and procedures involving spatial resolution of bone or calcification. Removed relative contraindications (contrast allergy, incompatible implantable devices, metallic foreign body).