

AmeriHealth Caritas Louisiana

National Imaging Associates, Inc.*	
Clinical guidelines LUMBAR SPINE MRI	Original Date: September 1997
CPT Codes: 72148, 72149, 72158	Last Revised Date: May 2020
Guideline Number: NIA(CG)_044	Implementation Date: <u>January 2021 TBD</u>

GENERAL INFORMATION:

It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. All prior relevant imaging results, and the reason that alternative imaging (gold standard, protocol, contrast, etc.) cannot be performed must be included in the documentation submitted.

INDICATIONS FOR LUMBAR SPINE MRI:

For evaluation of neurologic deficits

- With any of the following new neurological deficits: lower extremity myotomal weakness; abnormal reflexes; abnormal sensory changes along a particular dermatome (nerve distribution) as documented on exam; evidence of Cauda Equina Syndrome; bowel or bladder dysfunction; new foot drop.

For evaluation of ~~chronic~~ back pain with any of the following: (Allegri, 2016)

(AAFP, 2012; ACEP, 2014; ACR, 2015; AAFP, 2012; ACEP, 2014; Allegri, 2016; Ammendolia, 2015; NASS, 2013; Jarvik, 2015; Last, 2009; NASS, 2013; Quaseem, 2017; Schneider, 2019)

- With new or worsening objective neurologic deficits on exam
- Failure of conservative treatment* for at least six (6) weeks within the last six (6) months
- With progression or worsening of symptoms during the course of conservative treatment*
- With an abnormal electromyography (EMG) or nerve conduction study (if performed) indicating a lumbar radiculopathy. (EMG is not recommended to determine the cause of axial lumbar, thoracic, or cervical spine pain (NASS, 2013)).

For evaluation of new onset of back pain

(ACR, 2018; AANSCNS, 2014; ACA, 2017; ACEP, 2014; Allegri, 2016; Quaseem, 2017)

- With new or worsening objective neurologic deficits on exam

* **National Imaging Associates, Inc. (NIA) is a subsidiary of Magellan Healthcare, Inc.**

- ~~Failure of conservative treatment*, for at least six (6) weeks within the last six (6) months.~~
- ~~With progression or worsening of symptoms during the course of conservative treatment*~~
- ~~With an abnormal electromyography or nerve conduction study (if performed) indicating a lumbar radiculopathy. (EMG is not recommended to determine the cause of axial lumbar, thoracic or cervical spine pain (NASS, 2013)).~~

For evaluation of neurologic deficits

- **With any of the following new neurological deficits: lower extremity muscular weakness; abnormal reflexes; abnormal sensory changes along a particular dermatome (nerve distribution) as documented on exam; evidence of Cauda Equina Syndrome; bowel or bladder dysfunction; new foot drop.**

For evaluation of trauma or acute injury

(ACR, 2012; Quaseem, 2017)

- Presents with any of the following neurological deficits: **radiculopathy**, muscle weakness, abnormal reflexes, and/or sensory changes along a particular dermatome (nerve distribution).
- With progression or worsening of symptoms during the course of conservative treatment*.
- **History of underlying spinal abnormalities (i.e. ankylosing spondylitis) (Koivikko, 2008)**

Pars defect (spondylolysis) or spondylolisthesis spondylolisthesis

- Pars defect (spondylolysis) or **spondylolisthesis** spondylolisthesis in adults when Flexion/Extension x-rays show instability.
- **Clinically suspected** Pars defect (spondylolysis) with spondylolisthesis which is not seen on plain films in pediatric population (<18 yr) (flexion extension instability not required) and imaging would change treatment (Cohen, 2005; Kobayashi, 2013; Rush, 2015).

NOTE: Initial imaging (x-ray, or planar bone scan without SPECT; Bone scan with SPECT is superior to MRI and CT in the detection of pars intrarticularis pathology including spondylolysis) (Matesan, 2016).

For evaluation of known or new compression fractures with worsening back pain (ACR, 2018)

- With history of malignancy-
 - **To aid in differentiation of benign osteoperotic fractures from metastatic disease**
 - **A follow up MRI in 6-8 weeks after initial MRI when initial imaging cannot decipher benign osteoperotic fracture from metastatic disease**
- With an associated new focal neurologic deficit
- Prior to a planned surgery/intervention or if the results of the MRI will change management.

For evaluation of known tumor, cancer, or evidence of metastasis with any of the following:

(Last, 2009) (MRI is usually the preferred study, but CT may help characterize solitary indeterminate bone lesions) (ACR, 2018).

;(Kim, 2012)

- For staging of known tumor.
- For follow-up evaluation of patient undergoing active cancer treatment.
- Presents with new signs or symptoms (e.g. physical, laboratory and/or imaging findings) of new tumor or change in tumor
- With evidence of metastasis on bone scan or previous imaging study.
- **Initial imaging of new or increasing non-traumatic back pain or radiculopathy or back that pain occurs at night, and wakes the patient from sleep with known active cancer and a tumor that tends to metastasize to the spine (ACR, 2018; Ziu, 2019).**

For evaluation of suspected tumor

(ACR, 2018)

- Prior abnormal or indeterminate imaging that requires further clarification.

Indication for combination studies for the initial pre-therapy staging of cancer, OR active monitoring for recurrence as clinically indicated, OR evaluation of suspected metastases

- ≤ 5 concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Neck, Abdomen, Pelvis, Chest, Brain, Cervical Spine, Thoracic Spine or Lumbar Spine.

For evaluation of known or suspected infection, abscess, or inflammatory disease

(ACR, 2018; Last, 2009; Lener, 2018)

- **Infection:**
 - Most common site is the lumbar spine (58%), followed by the thoracic spine (30%) and the cervical spine (11%)
 - As evidenced by signs and/or symptoms, laboratory (-i.e., abnormal white blood cell count, ESR and/or CRP) or prior imaging findings (Bond, 2016).
 - High risk populations (indwelling hardware, history of endocarditis, IVDA, recent procedures) with appropriate signs/symptoms.
 - **Follow up imaging of infection**
 - With worsening symptoms/laboratory values (i.e., white blood cell count, ESR/CRP) or radiographic findings (Berbari, 2015)
- As evidenced by signs/symptoms, laboratory or prior imaging findings.

For evaluation of spine abnormalities related to immune system suppression, e.g., HIV, chemotherapy, leukemia, or lymphoma

(ACR, 2018)

- As evidenced by signs/symptoms, laboratory or prior imaging findings.

As part of initial post-operative / procedural evaluation (“CT best examination to assess for hardware complication, extent of fusion” (ACR, 2018; Rao, 2018) and MRI for cord, nerve root compression, disc pathology, or post-op infection):

- A follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery in the last 6 months. Documentation requires a medical reason that clearly indicates why additional imaging is needed for the type and area(s) requested.
- Changing neurologic status post-operatively.
- Surgical infection as evidenced by signs/symptoms, laboratory, or prior imaging findings.
- Residual or recurrent symptoms with any of the following neurological deficits: Lower extremity weakness, objective sensory loss, or abnormal reflexes (Rao, 2018).

Other Indications for a Lumbar Spine MRI

- For preoperative evaluation.
- Suspected cord compression with any of the following neurological deficits: extremity weakness; sensory deficits, abnormal gait; abnormal reflexes; spinal level; bowel or bladder incontinence.
- Tethered cord, or spinal dysraphism (known or suspected) based on preliminary imaging, neurological exam, and/or **high-risk** cutaneous stigmata (AANS, 2019; Duz, 2008; Milhorat, 2009; NIH).
- Suspicious sacral dimple (those that are deep, larger than 0.5 cm, located within the superior portion of the gluteal crease or above the gluteal crease, or associated with other cutaneous markers) (D'Alessandro, 2009) in patients <6 months should have ultrasound.
- For suspected Ankylosing Spondylitis/Spondyloarthropathies with non-diagnostic or indeterminate x-ray and rheumatology workup
- Known Arnold-Chiari syndrome (Milhorat, 2009; Strahle, 2015).
- Congenital abnormalities (Trenga, 2016):
 - In the presence of neurologic deficit, progressive spinal deformity, or for preoperative planning (Trenga, 2016)
 - Back pain in a child with vertebral anomalies (hemivertebrae, hypoplasia, agenesis, butterfly, segmentation defect, bars, or congenital wedging) seen on preliminary imaging.
 - Scoliosis with any of the following:
 - Progressive spinal deformity;
 - Neurologic deficit;
 - Early onset;
 - Atypical curve (e.g., short segment, > 30° kyphosis, left thoracic curve, associated organ anomalies);
 - Pre-operative planning; OR
 - When office notes clearly document how imaging will change management.
- CSF leak highly suspected and supported by patient history and/or physical exam findings.
- For pediatric population (ACR, 2016)
 - Red flags that prompt imaging should include **one or more of the following: the presence of constant pain, night pain, and radicular pain lasting for 4 weeks or more and initial radiographs preformed (ACR, 2016).**
 - Back pain associated with suspected inflammation, infection, or malignancy

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COMBINATION OF STUDIES WITH LUMBAR SPINE MRI:

Cervical/Thoracic/Lumbar MRIs:

- Any combination of these for scoliosis survey in infant/child with congenital scoliosis or under the age of 10 (Strahle, 2015, ACR, 2018; Strahle, 2015).
- Any combination of these for spinal survey in patient with metastasis.
- For evaluation of spinal abnormalities associated with Arnold-Chiari Malformation (C/T/L spine due to association with tethered cord and syringomyelia) (Milhorat, 2009; Strahle, 2015)
- Suspected Leptomeningeal carcinomatosis (LC) (Shah, 2011)
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- Tethered cord, or spinal dysraphism (known or suspected) based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata (AANS; AANS, 2019; Duz, 2008; Milhorat, 2009; NIH), when anesthesia required for imaging.
- Drop metastasis from brain or spine (imaging also includes brain).
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- Tumor evaluation and monitoring in neurocutaneous syndromes - See Background
- CSF leak highly suspected and supported by patient history and/or physical exam findings

BACKGROUND:

Magnetic resonance imaging (MRI) is used in the evaluation, diagnosis, and management of spine related conditions, e.g., degenerative disc disease, cauda equine compression, radiculopathy, infections, or cancer in the lumbar spine. MRI provides high quality multiplanar images of organs and structures within the body without the use of x-rays or radiation. In the lumbar area where gonadal exposure may occur, MRI's lack of radiation is an advantage.

OVERVIEW:

Ankylosing Spondylitis/Spondyloarthropathies is a cause of back or sacroiliac pain of insidious onset (usually > 3 month), associated with morning stiffness not relieved with rest (usually age at onset < 40). It is associated with any of the following (Akgul, 2011; Bennett, 2010; Ostergaard, 2012; Seiper, 2014):

- Sedimentation rate and/or C-reactive protein (not an essential criteria).
- HLA B27 (not an essential criteria).
- Non-diagnostic or indeterminate x-ray
- Personal or family history of sacroilitis, peripheral inflammatory arthritis, and/or inflammatory bowel disease.

***Conservative Therapy:** (Spine) should include a multimodality approach consisting of a **combination of active and inactive components**. Inactive components, such as rest, ice, heat, modified activities, medical devices, acupuncture and/or stimulators, medications, injections (epidural, facet, bursal, and/or joint, not including trigger point), and diathermy can be utilized. **Active modalities may consist of physical therapy, a physician supervised home exercise program**, and/or osteopathic manipulative medicine (OMT) or chiropractic care. Active modalities may consist of physical therapy, a physician supervised home exercise program**, and/or chiropractic care.**

****Home Exercise Program - (HEP)/Therapy** – the following elements are required to meet guidelines for completion of conservative therapy (ACR, 2015; Last, 2009):

- Information provided on exercise prescription/plan; AND
- Follow up with member with documentation provided regarding lack of improvement (failed) after completion of HEP (after suitable 6 week period), or inability to complete HEP due to physical reason- i.e. increased pain, inability to physically perform exercises. (Patient inconvenience or noncompliance without explanation does not constitute “inability to complete” HEP).
- Dates and duration of failed PT, physician supervised HEP, or chiropractic treatment should be documented in the original office notes or an addendum to the notes.

Infection, Abscess, or Inflammatory disease

- **Most common site is the lumbar spine (58%), followed by the thoracic spine (30%) and the cervical spine (11%) (Graeber, 2019)**
- **High risk populations (indwelling hardware, history of endocarditis, IVDA, recent procedures) with appropriate signs/symptoms**

MRI and Cutaneous Stigmata (Dias, 2015)

TABLE 1 Risk Stratification for Various Cutaneous Markers

High Risk	Intermediate Risk	Low Risk
Hypertrichosis	Capillary malformations (also referred to as NFS or salmon patch when pink and poorly defined, or PWS when darker red and well defined)	Coccygeal dimple
Infantile hemangioma		Light hair
Atretic meningocele		Isolated café au lait spots
DST		Mongolian spots
Subcutaneous lipoma		Hypo- and hypermelanotic macules or papules
Caudal appendage		Deviated or forked gluteal cleft
Segmental hemangiomas in association with LUMBAR syndrome		Nonmidline lesions

LUMBAR, lower body hemangioma and other cutaneous defects, urogenital abnormalities, ulcerations, myelopathy, bony defects, anorectal malformations, arterial anomalies, and renal anomalies.

MRI and Back Pain – MRI is the initial imaging modality of choice in the evaluation of complicated low back pain. Contrast administration may be used to evaluate suspected inflammatory disorders, e.g., discitis, and it is useful in evaluating suspected malignancy. Radiculopathy, disease of the nerve roots is the most common indication for MRI of patients with low back pain. The nerve roots become irritated and inflamed, due to direct pressure from degenerative changes in the lumbar spine, creating pain and numbness. Symptoms of radiculopathy also include muscle weakness. MRI is indicated for this condition if the symptoms do not improve after conservative treatment over six weeks. MRI is also performed to evaluate Cauda equina syndrome, severe spinal compression.

Sacral Dimples - Simple midline dimples are the most commonly encountered dorsal cutaneous stigmata in neonates and indicate low risk for spinal dysraphism. Only atypical dimples are associated with a high risk for spinal dysraphism, particularly those that are large (>5 mm), high on the back (>2.5 cm from the anus) or appear in combination with other lesions (D'Alessandro, 2009). High-risk cutaneous stigmata in neonates include hemangiomas, upraised lesions (i.e., masses, tails, and hairy patches), and multiple cutaneous stigmata.

Tethered spinal cord syndrome - a neurological disorder caused by tissue attachments that limit the movement of the spinal cord within the spinal column. Although this condition is rare, it can continue undiagnosed into adulthood. The primary cause is myelomeningocele and lipomyelomeningocele; the following are other associations that vary in severity of symptoms and treatment.

- Dermal sinus tract (a rare congenital deformity)
- Diastematomyelia (split spinal cord)
- Lipoma
- Tumor
- Thickened/tight filum terminale
- History of spine trauma/surgery

- Arnold Chiari Malformation

Magnetic resonance imaging (MRI) can display the low level of the spinal cord and a thickened filum terminale, the thread-like extension of the spinal cord in the lower back. Treatment depends upon the underlying cause of the tethering. If the only abnormality is a thickened, shortened filum then limited surgical treatment may suffice.

Spina Bifida Occulta (AANS, 2020)

- Called the hidden spina bifida, as the spinal cord and the nerves are usually normal and there is no opening on the skin on the back.
- This subtype, occurs in about 12% of the population and the majority of people are not aware that they have spina bifida occulta, unless it is discovered on an x-ray performed for an unrelated reason.
- Approximately, 1 in 1,000 individuals can have an occult structural finding that leads to neurological deficits or disabilities as bowel or bladder dysfunction, back pain, leg weakness or scoliosis

Back Pain with Cancer - History Radiographic (x-ray) examination should be performed in cases of back pain when a patient has a cancer history. This can make a diagnosis in many cases. This may occasionally allow for selection of bone scan in lieu of MRI in some cases. When radiographs do not answer the clinical question, then MRI may be appropriate after a consideration of conservative care.

Neoplasms causing VCF (vertebral compression fractures) include: primary bone neoplasms, such as hemangioma or giant cell tumors, and tumor-like conditions causing bony and cellular remodeling, such as aneurysmal bone cysts, or Paget's disease (osteitis deformans); infiltrative neoplasms including and not limited to multiple myeloma and lymphoma, and metastatic neoplasms (ACR, 2018).

Most common spine metastasis involving primary metastasis originate from the following tumors in descending order: breast (21%), lung (19%), prostate (7.5%), renal (5%), gastrointestinal (4.5%), and thyroid (2.5%). While all tumor can seed to the spine, the cancers mentioned above metastasize to the spinal column early in the disease process (Ziu, 2019).

CAUDA EQUINA SYNDROME:

- Symptoms include severe back pain or sciatica along with one or more of the following:
 - Saddle anesthesia - loss of sensation restricted to the area of the buttocks, perineum, and inner surfaces of the thighs (areas that would sit on a saddle).
 - Recent bladder/bowel dysfunction (as listed above)

- Achilles reflex absent on both sides
- Sexual dysfunction that can come on suddenly
- Absent anal reflex and bulbocavernosus reflex

MRI and Neurocutaneous Syndromes

- In NF-1, clinical evaluation appears to be more useful to detect complications than is screening imaging in asymptomatic patients. Imaging is indicated in evaluation of suspected tumors based clinical evaluation and for follow-up of known intracranial tumors (Borofsky, 2013).
- Conversely in NF-2, routine MR imaging screening is always indicated, given the high prevalence of CNS tumors especially vestibular schwannomas. In patients with NF-2, routine screening brain/IAC imaging is indicated annually starting from age 10 if asymptomatic or earlier with clinical signs/symptoms. Most individuals with NF2 eventually develop a spinal tumor, mostly commonly schwannomas, but meningioma and ependymomas are also seen. Spinal imaging at baseline and every 2 to 3 years is also advised with more frequent imaging if warranted based on sites of tumor involvement (Evans, 2017).
- In patients with Tuberous Sclerosis, Brain MRI should be obtained every 1-3 years up until age 25 for surveillance for CNS abnormalities (Krueger, 2013).
- In Von Hippel Lindau Syndrome, imaging of the brain and spinal cord for hemangioblastomas is recommended every 2 years (Von Hippel-Lindau, 2017).
- In Sturge Weber Syndrome, Brain MRI can rule out intracranial involvement after only after age 1 and is recommended in patients <1 year only if symptomatic (Comi, 2011).

POLICY HISTORY:

Review Date: June 2019

Review Summary:

- Added:
 - new or worsening objective neuro deficits for chronic and acute back pain
 - CSF leak
 - last 6 months for allowable post op f/u period and removed EMG comment
 - red flags specifically for peds back pain and pain related to malignancy, infection, inflammation
 - new sections: pars defect; compression fractures; congenital abnormalities including section on scoliosis and vertebral anomalies in children w/back pain;
 - For combination studies cervical/thoracic/lumbar added drop metastasis, tumor evaluation for neurocutaneous syndromes, and abnormalities associated w/Arnold Chiari, as well as separate indication for tethered cord or spinal dysraphism
- Expanded on tethered cord in Other Indications for imaging and added section on sacral dimple

Review Date: May 2020

Review Summary:

• **Added:**

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- For evaluation of neurologic deficits added new deficits
- Added ankylosing spondylitis for evaluation of trauma/acute injury
- Added follow up of osteoperotic fracture from metastatic disease
- Added Osteopathic Manipulative medicine to conservative care therapy
- Added suspected leptomeningeal carcinomatosis to combination spine imaging
- Modified Initial imaging of new or increasing non-traumatic back pain or radiculopathy or back pain that occurs at night and wakes the patient from sleep with known active cancer and a tumor that tends to metastasize to the spine
- Modified Pars fracture to not seen on radiograph and imaging would change management
- Added spina bifida occulta to background section

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