INTRODUCTION:

Magnetic resonance imaging produces high quality multiplanar images of organs and structures within the body without using ionizing radiation. It is used for evaluation, assessment of severity and follow-up of diseases of the spine and is the preferred modality for imaging intervertebral disc degeneration. High contrast resolution (soft tissue contrast) and multiplanar imaging (sagittal as well as axial planes) are helpful in the evaluation of possible disc herniation and detecting nerve root compression. MRI is one of the most useful techniques to evaluate spine infection and is also used to evaluate tumors, cancer and immune system suppression.

INDICATIONS FOR THORACIC SPINE MRI:

For evaluation of neurologic deficits:
- With any of the following new neurological deficits: extremity weakness; abnormal reflexes; or new onset of abnormal sensory changes along a particular dermatome (nerve distribution) as documented on exam.

For evaluation of chronic or degenerative changes, e.g., osteoarthritis, degenerative disc disease:
- With an abnormal electromyogram (EMG) or nerve conduction study.
- With exacerbation of chronic back pain, muscle weakness, abnormal reflexes, new extremity numbness or tingling and unresponsive to trial of conservative treatment*, including physical therapy or physician supervised home exercise program (HEP)**, for at least six (6) weeks.

For evaluation of new onset of back pain:
- Failure of conservative treatment*, including physical therapy or physician supervised home exercise plan (HEP)**, for at least six (6) weeks.
- With progression or worsening of symptoms during the course of conservative treatment*.
- With an abnormal electromyography (EMG) or nerve conduction study.

For evaluation of trauma or acute injury within past 72 hours:
- Presents with 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*.
For evaluation of known tumor, cancer or evidence of metastasis:
- Staging of known tumor.
- For follow-up evaluation of patient undergoing active treatment.
- Presents with new signs (e.g., laboratory and/or imaging findings) of new tumor or change in tumor.
- Presents with radiculopathy muscle weakness, abnormal reflexes, and/or sensory changes along a particular dermatome (nerve distribution).
- With an abnormal electromyogram (EMG) or nerve conduction study.
- With evidence of metastasis on bone scan or previous imaging study.
- With no imaging/restaging within the past ten (10) months.

For evaluation of suspected tumor:
- Prior abnormal or indeterminate imaging that requires further clarification.

Indication for combination studies for the initial pre-therapy staging of cancer, OR ongoing tumor/cancer surveillance OR evaluation of suspected metastases:
- ≤ 5 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:
- As evidenced by signs/symptoms, laboratory or prior imaging findings.

For evaluation of immune system suppression, e.g., HIV, chemotherapy, leukemia, or lymphoma:
- As evidenced by signs/symptoms, laboratory or prior imaging findings.

For post-operative / procedural evaluation of surgery or fracture occurring within past six (6) months:
- A follow-up study may be needed to help evaluate a patient’s progress after treatment, procedure, intervention or surgery. 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
- With an abnormal electromyogram (EMG) or nerve conduction study.
- Surgical infection as evidence by signs/symptoms, laboratory or prior imaging findings.
- Delayed or non-healing as evidence by signs/symptoms, laboratory or prior imaging findings.
- Continuing or recurring symptoms of any of the following neurological deficits: Lower extremity weakness, lower extremity asymmetric reflexes.

Other indications for a Thoracic Spine MRI:
- For preoperative evaluation
Suspected cord compression with any of the following neurological deficits: extremity weakness; abnormal gait; asymmetric reflexes.

Syringinx or syringomyelia.

**COMBINATION OF STUDIES WITH THORACIC SPINE MRI:**

- **Cervical/Thoracic/Lumbar MRIs** – any combination of these for scoliosis survey in infant/child.
- **Cervical/Thoracic/Lumbar MRIs** – any combination of these for spinal survey in patient with metastases.

**ADDITIONAL INFORMATION RELATED TO THORACIC SPINE MRI**

**MRI imaging** – Metal devices or foreign body fragments within the body, such as indwelling pacemakers and intracranial aneurysm surgical clips that are not compatible with the use of MRI, may be contraindicated. Other implanted metal devices in the patient as well as external devices such as portable O₂ tanks may also be contraindicated.

**Intravascular administration of contrast material may** be contraindicated in patients who have a documented allergy from prior contrast administration or a history of atopy. Intravascular contrast agents may be contraindicated in patients who have impaired renal function.

*Conservative Therapy:* (musculoskeletal) includes a combination of modalities, such as rest, ice, heat, modified activities, medical devices, (such as crutches, immobilizer, metal braces, orthotics, rigid stabilizer or splints, etc and not to include neoprene sleeves), medications, injections (epidural, facet, bursal, and/or joint, not including trigger point), diathermy, chiropractic treatments, physician supervised home exercise program. Part of this combination may include the physician instructing patient to rest the area or stay off the injured part. **NOTE** - conservative therapy can be expanded to require active therapy components (physical therapy and/or physician supervised home exercise) as noted in some elements of the guideline.

**Home Exercise Program** - (HEP) – the following two elements are required to meet guidelines for completion of conservative therapy:

- Information provided on exercise prescription/plan AND
- Follow up with member with information provided regarding completion of HEP (after suitable 4-6 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).

**MRI and Spinal Infections** – Infection of the spine is not easy to differentiate from other spinal disorders, e.g., degenerative disease, spinal neoplasms, and noninfectious inflammatory.
lesions. Infections may affect different parts of the spine, e.g., vertebrae, intervertebral discs and paraspinal tissues. Imaging is important to obtain early diagnose and treatment to avoid permanent neurology deficits. MRI is the preferred imaging technique to evaluate infections of the spine. With its high contrast resolution and direct multiplanar imaging, it has the ability to detect and delineate infective lesions irrespective of their spinal location.

**MRI and Degenerative Disc Disease** – Degenerative disc disease is very common and MRI is indicated when chronic degenerative changes are accompanied by conditions, e.g., new neurological deficits; onset of joint tenderness of a localized area of the spine; new abnormal nerve conductions studies; exacerbation of chronic back pain unresponsive to conservative treatment; and unsuccessful physical therapy/home exercise program.

**MRI and Multiple Sclerosis (MS)** – MRI is a sensitive method of detecting the white matter lesions of MS. These plaques on MRI generally appear as multiple, well demarcated, homogenous, small ovoid lesions which lack mass effect and are oriented perpendicular to the long axis of the lateral ventricles. Sometimes they present as large, space occupying lesions that may be misinterpreted as tumors, abscesses or infarcts.
REFERENCES


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