

	Clinical Protocol: MRI, Thoracic Spine	
	ORIGINAL EFFECTIVE DATE: 01/30/2012	REVIEWED/REVISED DATE(S): 06/18/2019 08/13/2021 07/28/2022 11/15/2023 07/24/2025
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PROTOCOL OVERVIEW

This Clinical Protocol advises on indications and guidelines for Thoracic Spine MRI.

INDICATIONS

- I. Thoracic spine MRI may be indicated for **1 or more** of the following:
 - a. Cancer or neoplasm evaluation or staging needed, as indicated by **1 or more** of the following:
 - b. Localized midline thoracic back pain and **1 or more** of the following:
 - i. Bone scan positive
 - ii. Pain occurs mainly at night.
 - iii. Persistent back pain in patient older than 50 years
 - iv. Personal history or concurrent diagnosis of malignancy
 - v. Weakness, rapidly progressing
 - vi. Weight loss, unexplained
 - c. Myelopathy signs or symptoms (eg, motor weakness, bowel or bladder dysfunction)
 - d. Post-treatment monitoring of spinal metastasis
- II. Congenital spinal conditions, suspected, as indicated by **1 or more** of the following:
 - a. Diastematomyelia (ie, split cord malformation)
 - b. Dorsal dermal sinus
 - c. Hemangioma
 - d. Hydromyelia
 - e. Intradural lipoma
 - f. Myelocele
 - g. Myelomeningocele
 - h. Split notochord syndrome
- III. Infection, known or suspected (eg, vertebral osteomyelitis, disk space infection, epidural abscess), as indicated by **ALL** of the following:
 - a. Localized midline back pain
 - b. Risk factors for spinal infection, as indicated by **1 or more** of the following:
 - i. Bone scan or plain x-ray suggestive for infection
 - ii. Erythrocyte sedimentation rate elevated

- iii. Fever
 - iv. History of intravenous drug abuse, other source of infection, or recent invasive procedure(57)
 - v. Immunosuppression
 - vi. Positive blood culture
 - vii. Recent history of spinal surgery
 - viii. Tuberculosis, concurrent or suspected
- IV. Inflammatory or demyelinating process, suspected (e.g., clinically isolated syndrome, multiple sclerosis, other demyelinating disease), as indicated by **1 or more** of the following:
 - a. Multiple sclerosis, suspected, as indicated by **1 or more** of the following:
 - i. Ascending numbness or tingling (e.g., from foot to trunk)
 - ii. Brown-Sequard syndrome
 - iii. Conditions mimicking multiple sclerosis (e.g., Sjogren syndrome, systemic lupus erythematosus, antiphospholipid syndrome) cannot yet be excluded.
 - iv. MRI of brain nondiagnostic for multiple sclerosis
 - v. Signs or symptoms of myelopathy or myelitis
 - b. Transverse myelitis in spinal cord, suspected (idiopathic or in conjunction with multiple sclerosis), as indicated by **1 or more** of the following:
 - i. Bilateral signs or symptoms of involvement of appropriate level of spinal cord
 - ii. Clearly defined sensory level
 - iii. Sudden onset of sensory, motor, and autonomic dysfunction attributable to appropriate level of spinal cord
- V. Pain localized to thoracic back or radicular in nature, subacute or chronic, as indicated by **ALL** of the following:
 - a. Failure to improve after 6 or more weeks of nonoperative treatment, as indicated by **1 or more** of the following:
 - i. Analgesics and NSAIDs
 - ii. Exercise
 - iii. Modification of activity that exacerbates or produces symptoms
 - iv. Physical therapy
 - b. Patient being considered for invasive treatment (e.g., epidural steroids, surgery)
 - c. Significant interference with daily function
- VI. Postoperative spinal complications, suspected, as indicated by **1 or more** of the following:
 - a. Postoperative hemorrhage or hematoma
 - b. Pseudomeningocele
 - c. Significant new neurologic findings (e.g., spinal cord impingement)
 - d. Significant new pain symptoms (e.g., recurrent or new radicular symptoms, delayed pain at fusion site)
 - e. Spondylodiscitis
 - f. Sterile arachnoiditis
- VII. Scoliosis, as indicated by **1 or more** of the following:
 - a. Congenital scoliosis
 - b. Early-onset scoliosis (age 9 years or younger)
 - c. Neurofibromatosis

- d. Presurgical planning for adolescent idiopathic scoliosis to assess possible neural axis malformation, as indicated by **1 or more** of the following:
 - i. Abnormal neurologic findings on clinical examination
 - ii. Age at first visit 10 years or younger
 - iii. Kyphosis at curve apex
 - iv. Left-sided thoracic curvature
 - v. Male gender
 - vi. Pain, moderate to severe
 - vii. Rapid curve progression (i.e., more than 1 degree per month)
 - viii. Short segment curve (i.e., less than 6 vertebral segments)
 - ix. Thoracic kyphosis 30 degrees or greater
 - x. Vertebral abnormalities (e.g., hemivertebrae, block vertebrae) detected on x-ray
- VIII. Spinal cord compression or myelopathy, suspected, as indicated by **1 or more** of the following:
 - a. Babinski sign positive
 - b. Fecal incontinence
 - c. Gait abnormality (e.g., spastic or ataxic)
 - d. Hyperreflexia or clonus
 - e. Sensory or motor deficits, significant or progressive
 - f. Spasticity
 - g. Urinary urgency, frequency, retention, or overflow incontinence
- IX. Spinal cord compression, myelopathy, or cauda equina syndrome, suspected (eg, positive Babinski sign, depressed ankle deep tendon reflexes, gait abnormality, hyperreflexia, sensory or motor deficits)
- X. Spinal cord infarction or ischemia, suspected (eg, sudden-onset back pain, sensory or motor deficits, urinary retention)
- XI. Spinal cord stimulator placement planning needed, and no MRI of region within 12 months prior to placement
- XII. Spinal dysraphism, suspected, as indicated by **1 or more** of the following:
 - a. For infants, as indicated by **1 or more** of the following:
 - i. Absent reflexes
 - ii. Aplasia cutis congenita
 - iii. Decreased spontaneous leg movement
 - iv. Decreased urinary stream
 - v. Deviation of gluteal cleft
 - vi. Foot asymmetry
 - vii. Leg atrophy
 - viii. Midline lumbosacral skin lesions (eg, atypical dimple, dermal sinus, lipoma, tail)
 - ix. Unilateral lumbosacral hypertrichosis
 - b. For toddlers: developmental delay in walking, abnormal gait
 - c. For older children: spasticity, hyperreflexia, bowel or bladder disturbance, including incontinence
- XIII. Spinal stenosis of thoracic spine, suspected, as indicated by **ALL** of the following:
 - a. Patient being considered for invasive treatment
 - b. Progressive or disabling symptoms of thoracic spine stenosis, as indicated by **1 or more** of the following:
 - i. Hyperactive reflexes

- ii. Muscle weakness
 - iii. Sensory loss
 - iv. Spasticity
- XIV. Stereotactic spine radiotherapy treatment planning
- XV. Syringomyelia in thoracic spine, suspected, as indicated by **1 or more** of the following:
 - a. Muscle wasting in appropriate thoracic spine dermatomes
 - b. Sensory loss in appropriate thoracic spine dermatomes
 - c. Weakness in appropriate thoracic spine dermatomes
- XVI. Tethered cord, suspected, as indicated by **1 or more** of the following:
 - a. Anorectal malformation
 - b. Cutaneous manifestations of occult spina bifida (e.g., nevus, lipoma, tufts of hair, hemangioma, dimple overlying spine, asymmetric gluteal cleft, dermal sinus tract)
 - c. Gait abnormality or difficulty
 - d. Urinary dribbling or lack of bladder control
 - e. Urodynamic tests abnormal
- XVII. Trauma or fracture of thoracic spine, known or suspected, as indicated by **1 or more** of the following:
 - a. Epidural hematoma, suspected
 - b. Fall from height greater than 10 feet (3.1 meters)
 - c. Ligamentous injury, suspected
 - d. Neurologic symptoms associated with traumatic mechanism of injury, as indicated by **1 or more** of the following:
 - i. Ejection from motorcycle
 - ii. High-speed motor vehicle accident (greater than 50 mph (80.5 kph))
 - iii. Intoxicated state
 - iv. Minimal trauma in osteoporotic patient with suspected fragility fracture
 - v. Motor vehicle accident, with acute hyperflexion of spine over seat belt
 - e. Pediatric patient
 - f. Results of plain x-ray or CT scan nondiagnostic or show abnormal spine motion or burst fracture
 - g. Traumatic disk herniation, suspected
- II. Tuberculosis of spine, known or suspected, as indicated by **1 or more** of the following:
 - a. Diagnostic evaluation of suspected spinal tuberculosis
 - b. Preparation for surgical management
- III. Repeat evaluation of specific area or structure with same imaging modality, as indicated by **1 or more** of the following:
 - a. Change in clinical status (eg, worsening symptoms or new associated symptoms)
 - b. Need for interval reassessment that may impact treatment plan
 - c. Need for re-imaging either prior to or after performance of invasive procedure

DISCUSSION

- Thoracic spine MRI is indicated for evidence of thoracic spinal cord compression, trauma, neoplasm, or infection.
- For suspicion of metastatic disease to the spine in patients with known primary malignancy, whole-spine MRI is considered first-line imaging because multiple sites of spinal cord compression are seen

in up to 1/3 of patients with metastatic epidural spinal cord compression. MRI is useful for staging neoplastic meningitis for palliative radiotherapy.

- Thoracic MRI is a first-line option for suspected thoracic spinal infection and inflammation, including spondylitis, epidural abscess, osteomyelitis, and spinal tuberculosis.
- For clinical suspicion of a demyelinating disease such as multiple sclerosis in patients presenting with a clinically isolated syndrome, most commonly manifested as unilateral optic neuritis, brainstem syndrome, or partial myelitis, diagnostic criteria have been developed based on the demonstration of CNS lesions disseminated in space and disseminated in time on MRI imaging of the brain and, if appropriate, on spinal cord imaging. Spinal cord involvement is common with multiple sclerosis, and lesions may be present solely in the spinal cord in up to 25% of patients, with lesions in the cervical spine occurring more commonly than in the thoracic spine. An expert consensus panel recommends spinal cord imaging for patients with suspected demyelinating disease who present with signs or symptoms of spinal cord involvement or if the number of lesions on brain MRI is insufficient to meet established criteria for multiple sclerosis.
- For scoliosis, a review concluded that MRI is not routinely indicated for pain in the absence of abnormal neurologic examination findings or an atypical curve, such as a left-sided curve (levoscoliosis), a short segment or kyphosis near the curve apex. In a prospective study of 250 scoliosis patients undergoing surgery, factors predicting neural axis deformity associated with scoliosis included age at first visit less than 11 years, left-sided thoracic curvature, thoracic kyphosis greater than 30 degrees, neurologic deficit (highest association with sustained clonus or asymmetric loss of superficial abdominal reflex), and presence of moderate or severe back pain.

RECOMMENDED RECORDS

Please submit history and physical or progress notes that show the symptoms, exam findings, and any pertinent diagnostic tests that may have been done. (i.e. X-ray, ultrasound).

CITATION

MCG Care Guidelines 29th Edition, 3/04/2025[MCG Releases 29th Edition of Care Guidelines with Updates for Observation Care and Cellular Therapy - MCG Health](#)

REVISION HISTORY

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