CIGNA MEDICAL COVERAGE POLICIES– RADIOLOGY

Pediatric and Special Populations

Spine Imaging Guidelines

Effective Date: February 02, 2027

Instructions for use

The following coverage policy applies to health benefit plans administered by Cigna. Coverage policies are intended to provide guidance in interpreting certain standard Cigna benefit plans and are used by medical directors and other health care professionals in making medical necessity and other coverage determinations. Please note the terms of a customer's particular benefit plan document may differ significantly from the standard benefit plans upon which these coverage policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a coverage policy.

In the event of a conflict, a customer's benefit plan document always supersedes the information in the coverage policy. In the absence of federal or state coverage mandates, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of:

1. The terms of the applicable benefit plan document in effect on the date of service
2. Any applicable laws and regulations
3. Any relevant collateral source materials including coverage policies
4. The specific facts of the particular situation

Coverage policies relate exclusively to the administration of health benefit plans. Coverage policies are not recommendations for treatment and should never be used as treatment guidelines.

This evidence-based medical coverage policy has been developed by EviCore, Inc. Some information in this coverage policy may not apply to all benefit plans administered by Cigna.

These guidelines include procedures EviCore does not review for Cigna. Please refer to the **Cigna CPT code list** for the current list of high-tech imaging procedures that EviCore reviews for Cigna.

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General Guidelines (PEDSP-1.0)

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v1.0.2027

Criteria

- A pertinent clinical evaluation since the onset or change in symptoms, including a detailed history, physical examination with a thorough neurologic examination, appropriate laboratory studies and basic imaging such as plain radiography or ultrasound should be performed prior to considering advanced imaging (CT, MR, Nuclear Medicine), unless the individual is undergoing guideline-supported scheduled imaging evaluation. A meaningful technological contact (telehealth visit, telephone call, electronic mail or messaging) can serve as a pertinent clinical evaluation.
  - A thorough neurologic examination should include results of manual motor testing, specific dermatomal distribution of altered sensation, reflex examination, nerve root tension signs (e.g., straight leg raise test, slump test, femoral nerve tension test), and documentation of any specific radicular features.
- For those spinal conditions/disorders for which the Spine Imaging Guidelines require a plain x-ray of the spine prior to consideration of an advanced imaging study, the plain x-ray must be performed after the current episode of symptoms started or changed and results need to be available to the requesting provider of the advanced imaging study.
- Unless otherwise stated in a specific guideline section, the use of advanced imaging to screen asymptomatic individuals for disorders involving the spine is not supported. Advanced imaging of the spine should only be approved in individuals who have documented active clinical signs or symptoms of disease involving the spine.
- Unless otherwise stated in a specific guideline section, repeat imaging studies of the spine are not necessary unless there is evidence for progression of disease, new onset of disease, and/or documentation of how repeat imaging will affect individual management or treatment decisions.

Health Equity Considerations

Health equity is the highest level of health for all individuals; health inequity is the avoidable difference in health status or distribution of health resources due to the social conditions in which individuals are born, grow, live, work, and age. Social determinants of health are the conditions in the environment that affect a wide range of health, functioning, and quality of life outcomes and risks. Examples include the following: safe housing, transportation, and neighborhoods; racism, discrimination, and violence; education, job opportunities, and income; access to nutritious foods and physical activity opportunities; access to clean air and water; and language and literacy skills.

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Pediatric Spine Imaging Age Considerations (PEDSP-1.1)

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- Many conditions affecting the spine in the pediatric population have different diagnoses than those occurring in the adult population. For those diseases which occur in both pediatric and adult populations, minor differences may exist in management due to individual age, comorbidities, and differences in disease natural history between children and adults.
- Individuals under 19 years of age should be imaged according to the Pediatric Spine Imaging Guidelines if discussed. Any conditions not specifically discussed in the Pediatric Spine Imaging Guidelines should be imaged according to the General Spine Imaging Guidelines. Individuals 19 years of age or older should be imaged according to the General Spine Imaging Guidelines, except where directed otherwise by a specific guideline section.

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Pediatric Spine Imaging Appropriate Clinical Evaluation (PEDSP-1.2)

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- See: **General Guidelines (PEDSP-1.0)**

Pediatric and Special Populations Spine Imaging Guidelines

Pediatric Spine Imaging Modality General Considerations (PEDSP-1.3)

SPP.GG.0001.3.C
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Criteria

- MRI
  - MRI is the preferred modality for imaging the pediatric spine unless otherwise stated in a specific guideline section.
  - Due to the length of time required for MRI acquisition and the need to minimize individual movement, anesthesia is usually required for almost all infants (except neonates) and young children (age <7 years), as well as older children with delays in development or maturity. This anesthesia may be administered via oral or intravenous routes. In this individual population, MRI sessions should be planned with a goal of minimizing anesthesia exposure by adhering to the following considerations:
    - MRI procedures can be performed without and/or with contrast use as supported by these condition based guidelines. If intravenous access will already be present for anesthesia administration and there is no contraindication for using contrast, imaging without and with contrast may be appropriate if requested.
    - Recent evidence based literature demonstrates the potential for gadolinium deposition in various organs including the brain, after the use of MRI contrast.
      - The U.S. Food and Drug Administration (FDA) has noted that there is currently no evidence to suggest that gadolinium retention in the brain is harmful and restricting gadolinium-based contrast agents (GBCAs) use is not warranted at this time. It has been recommended that GBCA use should be limited to circumstances in which additional information provided by the contrast agent is necessary and the necessity of repetitive MRIs with GBCAs should be assessed.
    - If multiple body areas are supported by these guidelines for the clinical condition being evaluated, MRI of all necessary body areas should be obtained concurrently in the same anesthesia session.
- CT
  - CT is generally inferior to MRI for imaging the pediatric spine, but has specific indications in which it is the preferred modality listed in specific sections of these guidelines.
    - CT is the imaging study of choice in the setting of trauma

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        - CT should not be used to replace MRI in an attempt to avoid sedation unless it is listed as a recommended study in a specific guideline section.
    - Myelogram with post-myelogram CT imaging is rarely indicated in children except in certain limited indications (usually requested after specialist consultation), including:
        - Evaluation of spine in individuals with fixation hardware which limits utility of MRI.
        - Severe congenital scoliosis with inconclusive MRI.
        - Evaluation of nerve root avulsion in patients with a brachial plexus injury and inconclusive MRI.
        - Evaluation of paraspinal cyst to assess continuity with the subarachnoid space.
        - Coding note: CT of appropriate spinal level with or without contrast may be appropriate. If the radiologist performs the myelogram the exam should be coded with contrast. If a clinician performs the myelogram the exam should be coded without contrast.
- Ultrasound
    - Spinal canal ultrasound (CPT® 76800) describes the ultrasonic evaluation of the spinal cord (canal and contents) and should not be reported multiple times for imaging of different areas of the spinal canal.
    - Do not use CPT® 76800 for intraoperative spinal canal ultrasound as CPT® 76998 (intraoperative ultrasonic guidance) is the appropriate code in this circumstance.
    - Spinal canal ultrasound (CPT® 76800) is generally limited to infants up to 6 months of age because of the bone mass surrounding the spinal cord limits evaluation of the intraspinal contents in older infants.
        - **Exception:** the persisting acoustic window in children with posterior spinal defects of spinal dysraphism enables spinal canal ultrasound to be performed at any age (see: **Spinal Dysraphism (PEDSP-4)**).
        - In general, additional imaging studies of the spine are not indicated in asymptomatic individuals with normal spinal ultrasound findings.
- The guidelines listed in this section for certain specific indications are not intended to be all-inclusive; clinical judgment remains paramount and variance from these guidelines may be appropriate and warranted for specific clinical situations.

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Pediatric Back and Neck Pain and Trauma (PEDSP-2)

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Introduction (PEDSP-2.1)

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- Currently, only about 20% of back pain in children over age 5 is from a discoverable cause. Scoliosis, spondylitic disorders, Scheuermann disease, tumor, and trauma are the most common causes.
- Back pain in children under age 5 is uncommon and often reflects underlying serious disease when present.
- Disc herniations are rare in children, but become more frequent as activity increases during adolescence.

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Back and Neck Pain in Children Age 5 and Under (PEDSP-2.2)

SPP.TR.0002.2.C
v1.0.2027

Criteria

- A pertinent clinical evaluation including a detailed history, physical examination with thorough neurologic examination and documentation of any specific radicular features, and plain radiography should be performed prior to considering advanced imaging.
- Advanced imaging is medically necessary in all individuals in this age group except those with mild and transient back pain.
  - MRI of the symptomatic spinal region is medically necessary.
    - Individuals in this age group will require sedation to complete MRI imaging. See: **Pediatric Spine Imaging Modality General Considerations (PEDSP-1.3)** for contrast and body area considerations.
  - CT without contrast of the symptomatic spinal region is medically necessary when:
    - plain x-rays suggest an isolated vertebral bone abnormality without any concern for spinal canal or cord abnormalities (which is rare in this age group)
    - a recent MRI does not provide sufficient detail of the bony anatomy to allow for acute patient care decision making

Evidence Discussion

Prior to advanced imaging, a thorough history and physical examination, including neurologic assessment, should be performed, with this clinical evaluation considered medically necessary because most pediatric back pain is mechanical and self-limited (MacDonald et al., 2017). Clinical findings, rather than pain severity alone, distinguish benign presentations from those requiring further workup (León-Domínguez et al., 2023; Biagiarelli et al., 2019). When symptoms persist or worsen, advanced imaging may be considered medically necessary because pediatric individuals have a higher likelihood of identifiable structural pathology than adults with comparable complaints (Calloni et al., 2017; Expert Panel on Pediatric Imaging et al., 2025). MRI of the symptomatic spinal region should serve as the primary advanced imaging modality, with its use considered medically necessary due to its superior detection of infection, neoplasm, and disc pathology without ionizing radiation exposure (Ramirez et al., 2015; Saleh et al., 2021). CT without contrast should be reserved for an isolated bony abnormality without canal or cord concern, or when a recent MRI does not provide sufficient bony detail for acute care decision-making. In these circumstances, CT may be considered medically necessary despite radiation dose considerations in children (Kadom et al.,

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2018; McAlister et al., 2019). For a suspected fracture with negative x-rays, particularly when a stress fracture is suspected, bone scan may be considered medically necessary (Matesan et al., 2016). Bone scan may also be considered medically necessary for suspected spondylolysis or an inconclusive MRI because SPECT is especially sensitive for detecting pars interarticularis bone turnover before it becomes apparent on plain film or MRI, with findings remaining positive for a prolonged period (Tofte et al., 2017; Trout et al., 2015; Kim et al., 2018; Ledonio et al., 2017).

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Back and Neck Pain in Children Age 6 and Older (PEDSP-2.3)

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Criteria

- A pertinent clinical evaluation including a detailed history, physical examination with thorough neurologic examination including results of manual motor testing, the specific dermatomal distribution of altered sensation, reflex examination, and nerve root tension signs (e.g., straight leg raise test, slump test, femoral nerve tension test) and documentation of any specific radicular features, should be performed prior to considering advanced imaging.
- X-rays, while not required prior to conservative treatment, must be obtained before advanced imaging can be approved.
  - The results of plain x-rays performed after the current episode of symptoms started or changed need to be available to the requesting provider of the advanced imaging study.
- Advanced imaging is medically necessary following a recent x-ray when one or more of the following pediatric “red flags” are present:
  - Accompanying systemic symptoms (fever, weight loss, etc.)
  - Functional disability (daily limitation in normal activities because of pain)
  - Pain which is extremely severe or worse at night
  - Constant or radicular pain lasting ≥4 weeks
  - Pain which worsens despite an attempt at symptomatic treatment
  - Neurological symptoms or abnormal neurological examination findings
  - An established diagnosis of cancer other than leukemia
  - Abnormal x-rays
  - Individuals having undergone spinal surgery
  - Associated bowel or bladder dysfunction
- In the absence of any “red flags”, a 4-week trial of provider-supervised conservative treatment (after the current set of symptoms or physical exam findings started or changed) should be attempted before advanced imaging is medically necessary.
  - It can be assumed that children who are being evaluated by a pediatric spine surgeon have failed a reasonable trial of conservative treatment under the care of the primary care provider, as this is by far the most common reason for such referrals.
- X-rays of the involved regions should be obtained prior to advanced imaging in individuals with “red flag” findings, or who remain symptomatic after a 4 week trial of provider-supervised conservative treatment.

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  - The results of plain x-rays performed after the current episode of symptoms started or changed need to be available to the requesting provider of the advanced imaging study.
- MRI without contrast of the symptomatic spinal region is medically necessary for the evaluation of pediatric spine pain, and should be approved unless one of the following conditions applies, in which case MRI without and with contrast is medically necessary:
  - Fever (≥100° F)
  - Clinical suspicion of infection (discitis, osteomyelitis, paraspinous or epidural abscess)
  - Physical examination or plain x-ray suggests a mass lesion
  - New or worsening pain in a patient with an established diagnosis of cancer
- CT without contrast of the symptomatic spinal region is medically necessary when:
  - the request is for re-evaluation of a known vertebral bony disorder
  - plain x-rays show spondylotic changes or suggest an isolated vertebral bone abnormality without any concern for spinal canal or cord abnormalities (which is rare in this age group)
  - a recent MRI does not provide sufficient detail of the bony anatomy to allow for acute individual care decision making

Evidence Discussion

A detailed history and physical examination should precede advanced imaging and include manual motor testing, dermatomal sensory testing, reflex examination, and assessment of nerve root tension signs. This clinical evaluation is considered medically necessary to identify findings that may warrant further diagnostic workup (Calloni et al., 2017; MacDonald et al., 2017). Plain x-rays should generally be obtained before advanced imaging and are considered medically necessary for identifying isolated bony abnormalities and spondylotic changes that may guide subsequent evaluation (Kadom et al., 2018; McAlister et al., 2019). Following x-ray, advanced imaging may be considered medically necessary when a pediatric red flag is present. Red flags include systemic symptoms, functional disability, severe or nocturnal pain, constant or radicular pain lasting four weeks or longer, pain unresponsive to symptomatic treatment, neurologic findings, an established cancer diagnosis other than leukemia, abnormal x-rays, prior spinal surgery, or bowel or bladder dysfunction. These findings are associated with a greater likelihood of identifiable structural pathology in children with persistent symptoms (Calloni et al., 2017; Expert Panel on Pediatric Imaging et al., 2025). In the absence of red flags, a four-week trial of provider-supervised conservative treatment should be completed before advanced imaging. This period of conservative management is considered medically necessary because most pediatric back and neck pain is mechanical and self-limited (MacDonald et al., 2017; León-Domínguez et al., 2023; Biagiarelli et al., 2019). MRI without contrast of the symptomatic spinal

region should serve as the default advanced imaging study and may be considered medically necessary in this setting. MRI without and with contrast may instead be considered medically necessary when fever, suspected infection, a mass lesion, or new or worsening pain in an individual with an established cancer diagnosis is present (Ramirez et al., 2015; Saleh et al., 2021). CT without contrast may be considered medically necessary for reevaluation of a known vertebral bony disorder, evaluation of spondylotic changes or an isolated bony abnormality without canal or cord concern, or when a recent MRI does not provide sufficient bony detail for clinical decision-making (Kadom et al., 2018; McAlister et al., 2019). For a suspected spinal fracture with negative x-rays or an inconclusive MRI, including stress-fracture-specific code combinations, bone scan may be considered medically necessary because SPECT and bone scan have demonstrated sensitivity for detecting occult bony injury in pediatric populations (Matesan et al., 2016; Tofte et al., 2017; Trout et al., 2015).

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Spondylolysis (PEDSP-2.4)

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Criteria

- A pertinent clinical evaluation including a detailed history, physical examination with thorough neurologic examination and documentation of any specific radicular features, and plain radiography should be performed prior to considering advanced imaging.
- Spondylolysis is best recognized on plain x-rays.
  - MRI without contrast of the symptomatic spinal level is medically necessary to evaluate for stress reaction in bone and visualizing nerve roots if symptoms have continued despite a provider-directed 4 week course of conservative care after the current set of symptoms or physical exam findings started or changed, or if there is a documented need for preoperative planning.
  - CT without contrast of the symptomatic spinal level is medically necessary to provide detailed evaluation of bony anatomy, if there is a documented need for preoperative planning.

Evidence Discussion

A detailed history and physical examination, including neurologic examination and documentation of radicular features, along with plain radiography should be performed prior to advanced imaging in spondylolysis, given that it is the most common cause of low back pain in children older than age 10 (MacDonald et al., 2017; Calloni et al., 2017). MRI without contrast of the symptomatic spinal level may be considered medically necessary to evaluate for bony stress reaction and nerve root involvement when symptoms persist despite a four-week trial of conservative care, or when preoperative planning is required (Ramirez et al., 2015; Eckel et al., 2022). SPECT or SPECT/CT may be considered medically necessary to identify stress reaction in radiographically occult spondylolysis or when additional clarification is needed due to associated spondylolisthesis, as bone scan has demonstrated superior sensitivity to MRI for detecting active spondylolysis, identifying bone turnover at the pars interarticularis that remains positive for a prolonged period (Tofte et al., 2017; Trout et al., 2015; Ledonio et al., 2017; Kim et al., 2018). CT without contrast of the symptomatic spinal level may be considered medically necessary for detailed evaluation of bony anatomy when preoperative planning is required, given its established role as the standard for characterizing fracture morphology and bony detail (Kadom et al., 2018; McAlister et al., 2019).

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Spine Pain Due to Infectious Causes (PEDSP-2.5)

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v1.0.2027

Criteria

- A detailed history and physical examination with thorough neurologic examination and plain x-rays should be performed initially.

Initial Imaging Studies

- Plain x-rays should be performed initially.
  - The results of plain x-rays performed after the current episode of symptoms started or changed need to be available to the requesting provider of the advanced imaging study.
- MRI without and with contrast of the symptomatic spinal level is very sensitive at detecting early changes and is medically necessary when discitis or osteomyelitis is clinically suspected.

Follow-Up Imaging Studies

- Follow-up plain x-rays may show disc space narrowing and bony changes of osteomyelitis.
- MRI without and with contrast of the symptomatic spinal level or CT with contrast (including myelography) is medically necessary in follow-up for evaluating bony changes of osteomyelitis or concern for epidural abscess.

Evidence Discussion

A detailed history and physical examination with neurologic assessment should be performed in suspected spine infection, as discitis and vertebral osteomyelitis typically present with sudden back pain, fever, and elevated white blood cell count in the first decade of life (Saleh et al., 2021). Plain x-rays may be considered medically necessary initially, though early films are frequently normal before disc space narrowing and bony changes become apparent (Saleh et al., 2021; Ortiz et al., 2021). MRI without and with contrast of the symptomatic spinal level may be considered medically necessary when discitis or osteomyelitis is clinically suspected, given its high sensitivity for detecting early infectious changes (Saleh et al., 2021; Ortiz et al., 2021). Bone scan, nuclear bone marrow imaging, radiopharmaceutical inflammatory imaging, SPECT, or SPECT/CT may be considered medically necessary for initial evaluation of suspected osteomyelitis, as nuclear medicine studies can become positive within one to two days of symptom onset (Ortiz et al., 2021; Seltzer et al., 2019). For follow-up, MRI without and with contrast

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or CT with contrast, including myelography, may be considered medically necessary to evaluate bony changes of osteomyelitis or concern for epidural abscess, and bone scan, nuclear bone marrow imaging, or radiopharmaceutical localization imaging may be considered medically necessary for evaluating treatment response in established osteomyelitis (Saleh et al., 2021; Ortiz et al., 2021; Seltzer et al., 2019).

Pediatric and Special Populations Spine Imaging Guidelines

Spine Pain Related To Trauma and Painless Spine Trauma (PEDSP-2.6)

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Criteria

- Imaging evaluation of traumatic spine injury in children is generally directed based on clinical examination. 60% to 80% of all spinal injuries in children involve the cervical spine as opposed to the thoracic spine and lumbar spine. Common causes are motor vehicle accidents, falls, and sports-related injuries.
- A pertinent clinical evaluation including a detailed history, physical examination with thorough neurologic examination and documentation of any specific radicular features, should be performed prior to considering advanced imaging.
- When advanced imaging is appropriate, MRI without contrast or CT without contrast of the involved level is considered medically necessary as discussed in **Pediatric Spine Imaging Modality General Considerations (PEDSP-1.3)**
  - If the initial CT or MRI study is considered inconclusive, an exam of the other modality is considered medically necessary if needed to direct clinical management.

Cervical Spine

- The results of plain x-rays performed after the current episode of symptoms started or changed need to be available to the requesting provider of the advanced imaging study
- Advanced imaging of the cervical spine is considered medically necessary in children under 3 years of age when one or more of the following “red flags” are present:
  - Glasgow Coma Scale <14
  - Individual does not open eyes regardless of stimulus
  - Motor vehicle collision
- Advanced imaging of the cervical spine is considered medically necessary in children ≥3 years of age when one or more of the following “red flags” are present:
  - Altered mental status
  - Focal neurologic findings
  - Neck pain
  - Torticollis not present prior to trauma
  - Substantial torso injury
  - Diving or head-first injury
  - High speed motor vehicle collision

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- Predisposing conditions, e.g., Down syndrome
- Advanced imaging of the cervical spine is not considered medically necessary in children older than 2 years of age if they meet ALL of the following criteria:
  - Absence of posterior midline cervical pain
  - Absence of focal neurologic deficit
  - Normal level of alertness
  - No evidence of intoxication
  - Absence of other clinically apparent pain which could distract patient from the pain of a cervical injury

Thoracolumbar Spine

- Advanced imaging of the thoracolumbar spine is considered medically necessary in children following a recent x-ray when x-rays are inconclusive, or there is an abnormal neurological examination.

Suspected Physical Child Abuse

- In children with suspected physical child abuse and documented findings suggesting abuse (e.g., fractures on skeletal survey or other clinical indicators), MRI Cervical (CPT® 72141), Thoracic (CPT® 72146), and Lumbar (CPT® 72148) Spine without contrast are considered medically necessary to search for associated abnormalities.
  - If intravenous access will already be present for anesthesia administration and there is no contraindication for using contrast, imaging without and with contrast is considered medically necessary. See: **Pediatric Spine Imaging Modality General Considerations (PEDSP-1.3)**

Evidence Discussion

Pediatric traumatic spine imaging should be guided by clinical examination because injury patterns differ from those in adults and most pediatric spinal injuries involve the cervical spine. MRI without contrast or CT without contrast of the involved level may be considered medically necessary when pediatric trauma red flags are present, including Glasgow Coma Scale <14, absent eye opening, motor vehicle collision in children younger than 3 years of age, or altered mental status, focal neurologic findings, neck pain, traumatic torticollis, substantial torso injury, diving or head-first injury, high-speed motor vehicle collision, or predisposing conditions in children age 3 years and older. In children older than 2 years, MRI or CT may not be considered medically necessary when all low-risk criteria are met, including no posterior midline cervical pain, no focal neurologic deficit, normal alertness, no intoxication, and no distracting pain. MRI without contrast or CT without contrast of the thoracolumbar spine may be considered medically necessary after recent x-ray when the x-rays are inconclusive or the neurologic examination is abnormal. In suspected physical child abuse with documented findings suggesting abuse, MRI of the cervical, thoracic, and

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lumbar spine without contrast may be considered medically necessary to evaluate for associated spinal abnormalities. MRI without and with contrast may be considered medically necessary when IV access is already present for anesthesia and contrast is not contraindicated (Born et al., 2020; Kadom et al., 2019; McAlister et al., 2019; Wooten-Gorges et al., 2017).

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Kyphosis and Scoliosis (PEDSP-3)

Guideline Page

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Juvenile Thoracic Kyphosis (Scheuermann Disease) (PEDSP-3.1)

SPP.KS.0003.1.A
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Criteria

- This condition is also known as Scheuermann Kyphosis, and these individuals generally present with chronic and recurrent back pain.
- A pertinent clinical evaluation including a detailed history, physical examination with thorough neurologic examination and documentation of any specific radicular features, and plain radiography should be performed prior to considering advanced imaging.
- X-rays will typically show anterior wedging in three or more adjacent vertebral bodies.
  - Lower thoracic kyphosis from developmental vertebral wedging with thoracic kyphosis varying between 20° and 45° should be identified by plain x-rays before considering advanced imaging.
  - MRI is not an effective diagnostic modality and is therefore not considered medically necessary for this condition since the incidence of false positive vertebral changes in normal individuals is high.
- MRI Thoracic Spine without contrast (CPT® 72146) is considered medically necessary preoperatively to rule out any associated spinal cord problems.
- MRI Lumbar Spine without contrast (CPT® 72148) is considered medically necessary preoperatively to rule out any associated spinal cord conditions when there is clinical or radiographic evidence of lumbar abnormalities.

Evidence Discussion

A detailed history and physical examination, including neurologic examination and documentation of radicular features, should be performed prior to advanced imaging (Calloni et al., 2017; Mistovich & Spiegel, 2020). Plain x-rays are considered medically necessary as the initial imaging study, typically demonstrating anterior wedging across three or more adjacent vertebral bodies (Gokce & Beyhan, 2016; Shafa & Shah, 2019). MRI is not considered medically necessary for diagnosis given a high rate of false-positive vertebral changes in normal individuals, though MRI of the thoracic or lumbar spine without contrast is medically necessary preoperatively to rule out associated spinal cord abnormality (Shafa & Shah, 2019; Oetgen, 2018).

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Scoliosis (PEDSP-3.2)

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Criteria

- A pertinent clinical evaluation including a detailed history, physical examination with thorough neurologic examination and documentation of any specific radicular features, detailed examination of the spine in different body positions, and plain radiography should be performed prior to considering advanced imaging.
  - Standing posteroanterior (PA) and lateral x-rays of the spine are the initial imaging studies and are used for follow-up. If anteroposterior (AP) x-rays are to be performed, breast shields should be used to reduce breast radiation exposure.
  - Spine surgical specialists sometimes appropriately request both MRI and CT together for preoperative planning of scoliosis surgery.
    - MR or CT Spine is medically necessary postoperatively when recent postoperative x-rays are inconclusive for managing individual treatment.
      - CT Chest with contrast (CPT® 71260) or without contrast (CPT® 71250)is medically necessary in the perioperative period as well as 2 and 5 years postoperatively to assess lung growth in individuals with severe scoliosis may have compromised lung development.

Congenital Scoliosis

- In infants under 6 months of age spinal ultrasound (CPT® 76800) is medically necessary after initial imaging with plain x-rays.
- MRI Cervical (CPT® 72141), Thoracic (CPT® 72146), and Lumbar (CPT® 72148) Spine without contrast are medically necessary to search for underlying anomalies.
  - If intravenous access will already be present for anesthesia administration and there is no contraindication for using contrast, imaging without and with contrast is medically necessary. See: **Pediatric Spine Imaging Modality General Considerations (PEDSP-1.3)**
- MRI Brain without and with contrast is medically necessary if the clinical evaluation or preliminary imaging studies suggest an associated intracranial anomaly.
- Renal ultrasound (CPT® 76770 or CPT® 76775) is medically necessary since nearly one-third of individuals also have genitourinary anomalies.
  - CT, MRI, or nuclear medicine studies of the genitourinary tract are medically necessary if the ultrasound is abnormal.

Idiopathic Scoliosis

- The following clinical features are associated with an increased risk of underlying vertebral or spinal cord abnormality:

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- Associated back pain
- Age younger than 10 years
- Neurological abnormalities on examination or neurological symptoms
- Left sided curve (concave to right)
- Absence of apical segment lordosis/kyphosis
- Rapid curve progression (>1 degree per month)
- Pes Cavus (see: **Occult Spinal Dysprahism (PEDSP-4.3)**)
- Double curves or high thoracic curves
- Kyphosis
- Spinal x-ray abnormalities other than the curve itself (widened spinal canal, dysplastic changes in spine or ribs, etc.)
- Midline spinal cutaneous markers (esp. sacral) such as dermal tracts, tufts of hair, skin tags, etc.
- Abnormal number or size of café au lait spots (neurofibromatosis)

- MRI Cervical (CPT® 72141), Thoracic (CPT® 72146), and Lumbar (CPT® 72148) Spine without contrast are the medically necessary studies for the evaluation of scoliosis when any of the above clinical features is present or if imaging is requested for individuals who are being actively evaluated for corrective surgery.

Neuromuscular Scoliosis

The appropriate spinal level, modality, and contrast level of advanced imaging will depend on the nature of the underlying disease.

- MRI without contrast or without and with contrast or CT without contrast of the cervical, thoracic, and/or lumbar spine is medically necessary in these individuals with painful neuromuscular scoliosis, or when they are actively being evaluated for spinal deformity corrective surgery.
- Post-surgical considerations are similar to adult post-operative indications (see: **Post-Operative Spinal Disorders (SP-15)** in the General Spine Imaging Guidelines) except as follows:
  - Post-operative CT Chest without contrast (CPT® 71250) with 3D reconstruction is medically necessary for lung volume measurement in children with early onset scoliosis, (e.g., congenital/thoracogenic type), due to risk of restrictive lung disease and thoracic insufficiency syndrome which occur from failure of spine and chest to support normal lung growth.

Evidence Discussion

A pertinent clinical evaluation, including a detailed history, physical examination with thorough neurologic examination, documentation of any specific radicular features, and examination of the spine in different body positions, should be performed prior

to advanced imaging (Calloni et al., 2017; Mistovich & Spiegel, 2020). Scoliosis is conventionally defined as a coronal curvature exceeding 10° by the Cobb technique on a standing posteroanterior radiograph, and radiography remains the primary modality for classifying curves and monitoring progression and response to treatment; standing PA and lateral x-rays may be considered medically necessary as the initial and follow-up imaging studies, with PA projection and breast shielding favored to limit cumulative exposure over serial follow-up (American College of Radiology, 2014; Jones et al., 2019; Ng & Bettany-Saltikov, 2017). MRI is applied selectively to assess for neural axis abnormalities in individuals at elevated risk, while CT is not routine in initial evaluation and has a defined role in characterizing osseous anomalies and in perioperative planning (Jones et al., 2019; Oetgen, 2018). In congenital scoliosis, most curves arise from anomalies of vertebral development and a substantial proportion of affected individuals have associated genitourinary or other organ anomalies; MRI of the cervical, thoracic, and lumbar spine without contrast may be considered medically necessary to evaluate for underlying neural axis anomalies, imaging without and with contrast may be considered medically necessary where intravenous access is already established for anesthesia and no contraindication exists, spinal ultrasound may be considered medically necessary in infants under 6 months of age following initial radiography given incomplete posterior element ossification at this age, renal ultrasound may be considered medically necessary with further genitourinary imaging when sonography is abnormal, and MRI of the brain without and with contrast may be considered medically necessary when clinical evaluation or preliminary imaging suggests an associated intracranial anomaly (Calloni et al., 2017; Jones et al., 2019; Mistovich & Spiegel, 2020).

In idiopathic scoliosis, diagnostic yield for an underlying vertebral or spinal cord abnormality is concentrated in individuals with identifiable clinical or radiographic risk features, including age under 10 years, associated back pain, neurologic symptoms or examination abnormalities, left-sided curve, absence of apical segment lordosis, rapid curve progression, atypical curve patterns, cutaneous midline markers, and radiographic abnormalities beyond the curve itself; MRI of the cervical, thoracic, and lumbar spine without contrast may be considered medically necessary when such features are present or when the individual is being actively evaluated for corrective surgery, and is not routinely indicated in their absence (Calloni et al., 2017; Jones et al., 2019; Ng & Bettany-Saltikov, 2017). In neuromuscular scoliosis, appropriate spinal level, modality, and contrast selection follow the nature of the underlying disorder, and MRI without contrast, MRI without and with contrast, or CT without contrast of the cervical, thoracic, and/or lumbar spine may be considered medically necessary for painful curves or when the individual is being evaluated for spinal deformity corrective surgery (El-Hawary & Chukwunyerenwa, 2014; Mistovich & Spiegel, 2020). Postoperatively, MRI or CT of the spine may be considered medically necessary when recent radiographs are inconclusive for guiding treatment, with modality selection depending on whether instrumentation-related artifact, osseous fusion status, or neural element assessment is the question at hand (Alsharief et al., 2018).

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Spinal Dysraphism and Tethered Spinal Cord (PEDSP-4)

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Introduction (PEDSP-4.1)

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Criteria

Spinal Dysraphism

- Spinal dysraphism refers to a group of disorders characterized by incomplete or absent fusion of posterior midline structures. This includes a range of congenital and/or developmental anomalies of the spinal cord and associated spinal structures that can affect any level of the spine, but most commonly the lumbosacral region.
- Based on clinical classification, dysraphism is grouped into two categories:
  - Open dysraphism (spina bifida aperta), which are non-skin-covered, open neural tube defects (myelomeningocele).
  - Occult spinal dysraphism (also called closed spinal dysraphism), which includes skin-covered defects (either with or without an associated subcutaneous mass).

Normal position of spinal cord

- In newborns, the spinal cord should terminate (at the conus medullaris) at L2-3 or higher.
- By 3 months of age, the conus should lie at or above the L2 level.
- Afterwards, in normal infants and children, the conus medullaris should be positioned at L1-2.
- Of note, however, in premature infants, the conus medullaris may be located at the mid L3-level.
  - If such a finding on an initial spinal ultrasound results in uncertainty as to whether cord termination is low, repeat spinal ultrasound (CPT® 76800) is considered medically necessary in 4 to 6 weeks, since a normal cord will have “moved” higher within the spinal canal by this time.

Tethered cord

- Tethering is certain when the cord terminates at or below L4 and there is other supporting evidence of tethering such as limited spinal cord pulsatility, posterior positioning in the spinal canal, thick filum terminale, intraspinous mass, or lipoma.
- If the conus terminates at a normal position (at L2-3 under 3 months of age, at L2 by 3 months of age, at L1-2 in older infants and children), the cord may still be tethered by an abnormal structure. Such tethering of the spinal cord can be found in some (but not all) individuals with occult spinal dysraphism. Abnormalities can be found in both lumbosacral and thoracic regions and are often associated with spinal lipomas in either region.

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- Open spinal dysraphism is frequently associated with tethering of the spinal cord; symptoms of or findings from that tethering may manifest initially or may increase after the newborn period and the initial imaging evaluation. See: **Open Dysraphism (PEDSP-4.4)**.

"Tethered cord Syndrome"

- "Tethered Cord Syndrome" refers to symptoms and abnormal physical findings (such as low back or leg pain, decreased or absent lower extremity reflexes, urinary urgency, urinary incontinence, bowel incontinence, and constipation) that arise when a pathologic attachment causes abnormal spinal tension (increased by axial growth), with ensuing pathophysiologic effects. Some of these patients do have an abnormally low conus medullaris; other patients have other spinal abnormalities (such as spinal dysraphism) that causes the spinal cord to be abnormally tethered. Other patients with spinal dysraphism who may present with symptoms or findings suggestive of "Tethered Cord Syndrome" may have those clinical manifestations caused by primary dysplasia of neural tissue, instead of being caused by abnormal tethering. See: **Non-Cutaneous Indications to Suspect Occult Spinal Dysraphism (PEDSP-4.3)**.
- Not all anatomically tethered spinal cords result in symptoms of "Tethered Cord Syndrome."

Imaging Studies to Evaluate Suspected Occult Spinal Dysraphism and/or Tethered Cord

- Plain x-rays are not indicated for suspected occult spinal dysraphism and/or tethered cord.
- Spina bifida occulta, an incomplete fusion of the posterior lumbosacral bony elements (present in in about 25% of people), is often discovered as an incidental finding on x-rays and other imaging exams. In asymptomatic individuals it is of no consequence, and is not an indication for further imaging.
- A plain spine x-ray finding suggesting an absent or distorted pedicle (the "winking owl sign") can be indicative of occult spinal dysraphism, for which an initial MRI without contrast or MRI without and with contrast of the appropriate spinal level is considered medically necessary.
- When indicated (See: **Cutaneous Indications to Suspect Occult Spinal Dysraphism (PEDSP-4.2)**, **Non-Cutaneous Indications to Suspect Occult Spinal Dysraphism (PEDSP-4.3)**, and **Open Dysraphism (PEDSP-4.4)** for indications), the following imaging is considered medically necessary:
  - Spinal ultrasound (CPT® 76800) for initial evaluation in infants up to 6 months of age, in premature infants whose "corrected age" (subtracting the number of weeks of prematurity from the infant's actual age) is less than or equal to 6 months, or in older individuals with open spinal dysraphism (see: **Open Dysraphism (PEDSP-4.4)**).

- In a term infant, the diagnosis of tethered cord is likely if the conus terminates below the L2-L3 disc space. Of note, however, in premature infants, the conus medullaris may be located at the mid L3-level; if there is uncertainty as to whether cord termination is low in a premature infant, repeat spinal ultrasound (CPT® 76800) is considered medically necessary in 4 to 6 weeks, since a normal cord will have "moved" higher within the spinal canal by this time.
- MRI Cervical, Thoracic, and Lumbar spine without contrast (CPT® 72141, 72146, and 72148) or without and with contrast (CPT® 72156, 72157, and 72158) is considered medically necessary for initial evaluation in individuals older than 6 months of age.
  - MRI is considered medically necessary at a younger age when there are symptoms or physical findings or concerning findings on ultrasound showing the need for more prompt MRI imaging, or when MRI imaging prior to 6 months of age has been ordered by (or in consultation with) an appropriate specialist for an indication from **Cutaneous Indications to Suspect Occult Spinal Dysraphism (PEDSP-4.2)**, **Non-Cutaneous Indications to Suspect Occult Spinal Dysraphism (PEDSP-4.3)**, or **Open Dysraphism (PEDSP-4.4)**.
- The appropriate spinal level, modality, and contrast level of follow-up advanced imaging will depend on the nature of the underlying disease, usually ordered by (or after consultation with) an appropriate specialist.
- Postoperative MRI is not done routinely but is considered medically necessary if there are recurrent symptoms or findings suggesting recurrent tethering or other deterioration. Contrast level per ordering specialist.
- A complete abdominal ultrasound (CPT® 76700) or retroperitoneal ultrasound (CPT® 76770) is considered medically necessary as an initial evaluation for patients with newly diagnosed neurogenic bladder, myelomeningocele (open spinal dysraphism), or occult spinal dysraphism.
  - A complete retroperitoneal ultrasound (CPT® 76770) is considered medically necessary every 6 to 12 months for follow-up/surveillance for any of the above conditions.
- CT of the effected spinal level is considered medically necessary for surgical planning when a complex bony deformity of the spine is present, or when the Guidelines support doing MRI of the spine in an individual for whom MRI is contraindicated.

Evidence Discussion

Spinal dysraphism encompasses a spectrum of congenital anomalies of incomplete posterior midline fusion, classified clinically as open (spina bifida aperta) or occult (closed) dysraphism, with the spinal cord normally terminating at L2-3 or higher in newborns, at or above L2 by 3 months, and at L1-2 in older infants and children (Trapp, 2021; Kumar, 2017; Kinsman & Johnston, 2020). Tethering is established when the

conus terminates at or below L4 with corroborating features such as limited cord pulsatility, posterior positioning, a thick filum terminale, or an associated lipoma, and Tethered Cord Syndrome describes the symptomatic manifestations (low back or leg pain, diminished lower extremity reflexes, and urinary and bowel dysfunction) that arise when pathologic attachment produces abnormal spinal tension, recognizing that not all anatomically tethered cords are symptomatic (Hertzler, 2010; Tuite, 2018; Proctor, 2020). Because the incompletely ossified posterior elements of the infant spine provide an acoustic window, spinal ultrasound is considered medically necessary as the first-line study for infants up to 6 months of age or premature infants with a corrected age at or below 6 months, with repeat ultrasound considered medically necessary in 4 to 6 weeks when cord termination is borderline low, since a normal cord will have ascended within the canal by that time (AIUM, 2016; Orman, 2019; Inarejos Clemente, 2023; Siegel, 2018). MRI of the appropriate spinal level without contrast or without and with contrast is considered medically necessary for initial evaluation after 6 months of age, or earlier when symptoms, physical findings, concerning ultrasound findings, or specialist direction warrant more prompt imaging, while postoperative MRI is considered medically necessary only for recurrent symptoms or findings suggesting recurrent tethering (O'Neill, 2017; Kumar, 2017; Halevi, 2011). Complete abdominal or retroperitoneal ultrasound is considered medically necessary as the initial genitourinary evaluation for newly diagnosed neurogenic bladder or dysraphism with retroperitoneal ultrasound surveillance considered medically necessary every 6 to 12 months, and CT of the affected level is considered medically necessary for surgical planning when a complex bony deformity is present or when MRI is indicated but contraindicated (Tuite, 2018; Tamura, 2017).

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Cutaneous Indications to Suspect Occult Spinal Dysraphism (PEDSP-4.2)

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Criteria

- More than 80% of individuals with occult spinal dysraphism and/or tethered spinal cord will have a cutaneous lesion overlying the lower spine.
- Spine imaging is considered not medically necessary in the following situations:
  - Pilonidal cysts below the level of the intergluteal fold.
    - For discussion of imaging in pilonidal cysts, see: **Pilonidal Cyst (PV-21.4)** in the Pelvis Imaging Guidelines
  - Non-specific darkened areas of skin over the sacrum (such as dermal melanosis) unless there are other associated midline cutaneous abnormalities
  - Occult bony dysraphism incidentally noted on x-ray
- Screening with advanced imaging is considered medically necessary in the following clinical conditions which are associated with an increased risk of underlying spinal dysraphism:
  - Spinal dimples (midline soft tissue depression over the spine); or deviated or split (bifid) gluteal cleft
    - Spinal ultrasound (CPT® 76800) is considered medically necessary for initial evaluation in infants up to 6 months of age (or in premature infants with a "corrected" age up to 6 months of age). Follow-up of a normal screening spinal ultrasound with ultrasound is considered not medically necessary.
    - MRI of the involved spinal level without contrast or without and with contrast is considered medically necessary for initial evaluation in individuals older than 6 months of age. MRI is considered medically necessary at a younger age when there are symptoms or physical findings or concerning findings on ultrasound showing the need for more prompt MRI imaging, or if ordered by (or in consultation with) an appropriate specialist.
    - A screening MRI is medically necessary after a normal screening spinal ultrasound exam. Follow-up of a normal screening MRI imaging study is considered not medically necessary.
  - Dermal sinuses overlying the lumbar, thoracic, or cervical spine, and sacral dermal sinuses, whether manifested by a dermal sinus tract (a small opening in the skin, which leads into a narrow duct; it may be associated with protruding hairs) or a dermal cyst. They may be associated with an overlying or nearby hairy patch or vascular nevus

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- Spinal ultrasound (CPT® 76800) is considered medically necessary for initial evaluation in infants up to 6 months of age (or in premature infants with a "corrected" age up to 6 months of age). Follow-up of a normal screening spinal ultrasound is considered not medically necessary.
- MRI of the involved spinal level without contrast or without and with contrast is considered medically necessary if an ultrasound shows abnormalities other than a cutaneous dermal cleft, if ordered after 6 months of age, or at a younger age if ordered by (or in consultation with) an appropriate specialist.
- A screening MRI is considered medically necessary after a normal screening spinal ultrasound exam. Follow-up of a normal screening MRI imaging study is considered not medically necessary.

◦ Subcutaneous midline masses (including cysts and lipomas) at any level.
- Plain x-rays are not required to approve other imaging for midline masses overlying the spine when occult spinal dysraphism and/or tethered cord is suspected.
- Spinal ultrasound (CPT® 76800) is considered medically necessary for initial evaluation in infants up to 6 months of age (or in premature infants with a "corrected" age up to 6 months of age), but MRI of the involved spinal level without contrast or without and with contrast is the preferred considered medically necessary initial imaging for midline masses overlying the spine. Repeat ultrasound follow-up of a normal screening spinal ultrasound is considered not medically necessary.
- MRI of the involved spinal level without contrast or without and with contrast is considered medically necessary for initial evaluation in patients older than 6 months of age. MRI is considered medically necessary at a younger age when there are symptoms or physical findings or concerning findings on ultrasound showing the need for more prompt MRI imaging, or if ordered by (or in consultation with) an appropriate specialist.
- A screening MRI is considered medically necessary after a normal screening spinal ultrasound exam. Follow-up of a normal screening MRI imaging study is considered not medically necessary.

◦ Caudal extensions (including tail-like appendages), midline skin tags, abnormal patches of hair over the spine at any level, infantile hemangiomas overlying any spinal level, and complex midline birthmarks above the upper sacral region.
- Spinal ultrasound (CPT® 76800) is considered medically necessary for initial evaluation in infants up to 6 months of age (or in premature infants with a "corrected" age up to 6 months of age). Repeat ultrasound follow-up of a normal screening spinal ultrasound is considered not medically necessary.
- MRI of the involved spinal level without contrast or without and with contrast is considered medically necessary for initial evaluation in individuals older than 6 months of age. MRI is considered medically necessary at a younger

age when there are symptoms or physical findings or concerning findings on ultrasound showing the need for more prompt MRI imaging, or if ordered by (or in consultation with) an appropriate specialist.
    - A screening MRI is considered medically necessary after a normal screening spinal ultrasound exam. Follow-up of a normal screening MRI imaging study is considered not medically necessary.
- Café au lait spots are a marker for type 1 neurofibromatosis
    - See imaging indications in **Neurofibromatosis 1 and 2 (NF1 and NF2) (PEDONC-2.3)** and/or **Neurofibromatosis (PEDPN-2)**.

Evidence Discussion

Screening imaging is considered medically necessary for cutaneous stigmata associated with an increased risk of occult spinal dysraphism, including spinal dimples, dermal sinus tracts, subcutaneous midline masses, and hairy patches, given their established correlation with underlying cord anomalies (Kucera et al., 2015; Gomi et al., 2013; Harada et al., 2014). Ultrasound is considered medically necessary as the initial screening study in infants up to 6 months of age, with MRI medically necessary for initial evaluation beyond that age or when ultrasound is abnormal or inconclusive (Tamura et al., 2017; Trapp et al., 2021). MRI is considered medically necessary for midline masses overlying the spine, including lipomas and hemangiomas, given documented risk of associated intraspinal extension (Subiabre-Ferrer et al., 2019).

Non-Cutaneous Indications to Suspect Occult Spinal Dysraphism (PEDSP-4.3)

SPP.TC.0004.3.A
v1.0.2027

Criteria

- Imperforate anus
- VACTERL (vertebral malformations, anal atresia, cardiac anomalies, tracheo-esophageal fistula, renal abnormalities, and limb defects) syndrome
- Currarino triad (sacral dysgenesis, presacral mass, anorectal malformation), OEIS (omphalocele, exstrophy, imperforate anus, spinal defects) syndrome
- Caudal regression syndrome
- Sacral agenesis (when 2 or more of the sacral vertebral bodies are absent; about 20% of children with sacral agenesis are not detected prior to age of 3 years).
- For all of the above conditions, the following imaging is considered medically necessary:
  - Spinal ultrasound (CPT® 76800) for initial evaluation in infants up to 6 months of age (or in premature infants with a “corrected” age up to 6 months of age). Repeat ultrasound follow-up of a normal screening spinal ultrasound is considered not medically necessary.
  - MRI Lumbar Spine without contrast (CPT® 72148) or without and with contrast (CPT® 72158); and/or MRI Pelvis without contrast (CPT® 72195) or MRI Pelvis without and with contrast (CPT® 72197).
  - Appropriate MRI (or other modality) imaging (including contrast level) of any other spinal level will depend on the nature of the underlying disease, usually ordered by (or in consultation with) an appropriate specialist.
  - Follow-up of a normal screening MRI imaging study is not medically necessary, but an initial MRI can be approved if the first screening study was an ultrasound.
  - Postoperative MRI is not done routinely but is medically necessary if there are recurrent symptoms or findings suggesting recurrent tethering. Contrast level per ordering specialist.
- For Rubinstein-Taybi syndrome (gait abnormalities, short stature, short limbs, characteristic facies, developmental delay, tethered spinal cord), the following imaging is considered medically necessary:
  - Spinal ultrasound (CPT® 76800) for initial evaluation in infants up to 6 months of age (or in premature infants with a “corrected” age up to 6 months of age). Repeat ultrasound follow-up of a normal screening spinal ultrasound is considered not medically necessary.

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- MRI Lumbar spine without contrast (CPT® 72148) or without and with contrast (CPT® 72158)
- Appropriate MRI (or other modality) imaging (including contrast level) of any other spinal level will depend on the nature of the underlying disease, usually ordered by (or in consultation with) an appropriate specialist.
- Follow-up of a normal screening MRI imaging study is considered not medically necessary, but an initial MRI can be approved if the first screening study was an ultrasound.

- For individuals with known DiGeorge Syndrome (22q11.2 deletion syndrome), the following imaging is considered medically necessary when tethered cord syndrome or occult spinal dysraphism is suspected:
  - Spinal ultrasound (CPT® 76800) for initial evaluation in infants up to 6 months of age
  - MRI Lumbar Spine without contrast (CPT® 72148) or without and with contrast (CPT® 72158)
  - Appropriate MRI (or other modality) imaging (including contrast level) of any other spinal level will depend on the nature of the underlying disease, usually ordered by (or in consultation with) an appropriate specialist.
  - Follow-up of a normal screening MRI imaging study is considered not medically necessary, but an initial MRI can be approved if the first screening study was an ultrasound.
- MRI of the involved spinal level without contrast or without and with contrast is considered medically necessary for neurologic related symptoms and physical exam findings suggestive of occult spinal dysraphism, tethered cord syndrome, and/or low lying conus medullaris when any of the following are present:
  - Asymmetry of the feet, with one smaller foot, a high arch, and/or clawing of the toes. This is sometimes called the “neuroorthopedic syndrome”, and is associated with lack of an ipsilateral ankle jerk deep tendon reflex and calf atrophy.
  - Cavus foot (also called pes cavus or pes cavovarus)
  - Toe walking, when associated with upper motor neuron signs including hyperreflexia, spasticity, and positive Babinski sign
  - Ataxia (see: **Ataxia (PEDHD-20)**)
  - Absent perineal sensation
  - Lower urinary tract dysfunction, including urinary urgency or urinary incontinence. Though not a requirement for advanced imaging, some of these patients will have had abnormal urodynamic studies (such as cystometrography and/or sphincter electromyography).
  - Constipation, especially if there are abnormal physical exam findings related to the spine (such as lower extremity weakness, decreased lower extremity tone, abnormal lower extremity reflexes, a tuft of hair over the spine or covering a pilonidal dimple, a sacral dimple, gluteal cleft deviation, or absent anal or

cremasteric reflex), failure of maximal laxative therapy (see: **Constipation, Diarrhea, and Irritable Bowel Syndrome (PEDAB-12)**) and/or bowel incontinence, when tethered cord syndrome or occult spinal dysraphism is suspected as the cause
    - Back or leg pain when tethered cord syndrome or occult spinal dysraphism is suspected as the cause. In this setting, neither a plain x-ray of the spine nor a recent period of provider directed conservative treatment is required to approve an MRI spine).
- See: **Myelopathy (SP-7.1)**, **Myelopathy (PEDSP-6)**, and **Developmental Motor Delay (PEDHD-19.3)** for spinal cord involvement suspected in individuals with developmental motor delay.

Evidence Discussion

Imaging may be considered medically necessary in syndromic and structural conditions associated with occult spinal dysraphism, including VACTERL association, Currarino triad, caudal regression syndrome, and sacral agenesis, given their recognized co-occurrence with tethered cord (Kumar et al., 2017; Moore, 2019; Hervey-Jumper et al., 2011). MRI may be considered medically necessary for neurologic signs and symptoms suggestive of tethered cord syndrome, including asymmetric foot deformity, toe walking with upper motor neuron signs, and lower urinary tract or bowel dysfunction, consistent with the clinical criteria established for evaluating suspected tethering (Tuite et al., 2018; Haynes et al., 2018; Proctor, 2020).

Spinal Dysraphism (PEDSP-4.4)

SPP.TC.0004.4.A
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Criteria

- Clinically significant dysraphism includes findings ranging from complex vertebral anomalies to myelomeningocele.
- Dysraphism is categorized into 2 major groups:
  - Open Dysraphism - lack of skin covering with exposed neural elements
  - Closed Dysraphism - skin covered
- It is rare to perform MRI in neonates with open dysraphism as the diagnosis is usually made with obstetric ultrasound and confirmed with visual inspection
  - MRI of the entire spine is considered medically necessary for preoperative planning if ordered by a specialist.
- MRI Brain without contrast (CPT® 70551) or with and without contrast (CPT® 70553) is considered medically necessary in all cases of open dysraphism as Chiari II malformation will be present
- Closed Dysraphism
  - MRI of the entire spine without contrast or without and with contrast is considered medically necessary at the time of initial diagnosis.
    - MRI Brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) or CT without contrast of the brain (CPT® 70450) is considered medically necessary in cases with associated hydrocephalus, signs of cerebral involvement, or the presence of multiple hydromyelia (which suggests hydrocephalus).
    - MRI Pelvis without contrast (CPT® 72195) or without and with contrast (CPT® 72196) is considered medically necessary once if there are clinical signs of pelvic malformation or anorectal anomaly.
  - MRI Cervical, Thoracic, and Lumbar spine without contrast (CPT® 72141, 72146, 72148) or without and with contrast (CPT® 72156, 72157, 72158) is considered medically necessary when ordered for preoperative planning.
  - Spinal canal ultrasound (CPT® 76800) is considered medically necessary as an alternative to MRI, if requested, in individuals with open dysraphism as the posterior bony defect provides an acoustic window for ultrasound.
  - MRI of the appropriate spinal level without contrast or without and with contrast is considered medically necessary when there are new and/or worsened neurologic symptoms and/or physical exam findings suggestive of new or worsened tethering of the spinal cord, such as any of the following:
    - New or worsened cavus foot

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- New or worsened toe walking and/or upper motor neuron signs (including hyperreflexia, spasticity, and positive Babinski sign)
- New or worsened leg weakness or numbness or difficulty in ambulation
- New or worsened loss of perineal sensation
- New or worsened lower urinary tract dysfunction (including urinary urgency or urinary incontinence, or new or worse changes on diagnostic urodynamic studies)
- New or worsened constipation
- New or worsened pain in the back or legs suspected to have been caused by tethering of the spinal cord
  - MRI Brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) or CT without contrast of the brain (CPT® 70450) is considered medically necessary in cases with associated hydrocephalus, signs of cerebral involvement, or the presence of multiple hydromyelia (which suggests hydrocephalus).
  - MRI Pelvis without contrast (CPT® 72195) or without and with contrast (CPT® 72196) is considered medically necessary once if there are clinical signs of pelvic malformation or anorectal anomaly.

◦ The appropriate spinal level, modality, and contrast level of follow-up advanced imaging will depend on the nature of the underlying disease, usually requested after specialist consultation.

Evidence Discussion

MRI of the entire spine may be considered medically necessary for preoperative planning in open dysraphism, and MRI of the brain may be considered medically necessary in all cases of open dysraphism given the near-universal association with Chiari II malformation (Kinsman & Johnston, 2020; Wang & Bierbrauer, 2017). In closed dysraphism, MRI of the entire spine may be considered medically necessary at initial diagnosis, with MRI or CT of the brain considered medically necessary when hydrocephalus or cerebral involvement is suspected, and MRI of the pelvis considered medically necessary when pelvic malformation or anorectal anomaly is present (Trapp et al., 2021; Greenan et al., 2019). Spinal canal ultrasound may be considered medically necessary as an alternative to MRI in open dysraphism, exploiting the acoustic window provided by the posterior bony defect (Orman et al., 2019; Inarejos Clemente et al., 2023). MRI may be considered medically necessary for new or worsening neurologic symptoms suggestive of progressive tethering, consistent with recommendations to reserve advanced imaging for clinical deterioration rather than routine surveillance (Tuite et al., 2018; Hertzler et al., 2010).

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Tethered Cord (PEDSP-5)

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Tethered Cord (PEDSP-5)

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- See: **Spinal Dysraphism and Tethered Spinal Cord (PEDSP-4)**

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Myelopathy (PEDSP-6)

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Myelopathy (PEDSP-6)

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Myelopathy imaging indications in pediatric individuals are similar to those for adult individuals. See: **Myelopathy (SP-7)** in the Spine Imaging Guidelines and/or **Non-Cutaneous Indications to Suspect Occult Spinal Dysraphism (PEDSP-4.3)**

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Other Congenital and Pediatric Spine Disorders (PEDSP-7)

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General Guidelines - Other Congenital and Pediatric Spine Disorders (PEDSP-7.0)

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- Many congenital spine disorders also affect adults as survival continues to improve for these individuals. Adults with disorders covered in this section may follow these guidelines except where contraindicated by specific statements in the general imaging guidelines.

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Achondroplasia (PEDSP-7.1)

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Criteria

- The diagnosis of achondroplasia is made clinically. Individuals with achondroplasia are at risk for hydrocephalus as well as myelopathy from spinal stenosis with increasing age.
- A pertinent clinical evaluation including a detailed history, physical examination with thorough neurologic examination and documentation of any specific radicular features, and plain radiography should be performed prior to considering advanced imaging.
- MRI without contrast or without and with of the symptomatic spinal region is considered medically necessary when new or worsening clinical symptoms suggest achondroplasia-related spinal stenosis.
- MRI Brain without contrast (CPT® 70551) or CT Head without contrast (CPT® 70450) is considered medically necessary when new or worsening clinical symptoms suggest hydrocephalus.

Evidence Discussion

A detailed history and physical examination with neurologic assessment should be performed prior to advanced imaging, given the clinical diagnosis of achondroplasia and its associated risk of spinal stenosis and hydrocephalus with increasing age (Khalid & Saifuddin, 2021; Dweck & Lachman, 2019). MRI of the symptomatic spinal region without contrast or without and with contrast may be considered medically necessary when new or worsening symptoms suggest achondroplasia-related spinal stenosis, consistent with the progressive nature of foramen magnum and spinal canal narrowing described in this population (White et al., 2016; Sarioglu et al., 2020). MRI of the brain or CT of the head may be considered medically necessary when symptoms suggest hydrocephalus, reflecting the recognized coexistence of ventriculomegaly with cervicomedullary compression in achondroplasia (White et al., 2016).

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Inflammatory Spondylitis (PEDSP-7.2)

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Criteria

- Except as listed below, imaging considerations in pediatric and adult individuals are identical for this condition and these individuals should be imaged according to **Inflammatory Spondylitis (SP-10.2)**.

For pediatric individuals with juvenile idiopathic arthritis, the following imaging is medically necessary:

- MRI without and with contrast or without contrast of the involved levels
- An initial x-ray is not necessary prior to MRI in these individuals.

Evidence Discussion

MRI without contrast or without and with contrast of the involved levels may be considered medically necessary in juvenile idiopathic arthritis without a preceding x-ray requirement, given the demonstrated superiority of MRI over radiography for detecting early sacroiliac and spinal inflammatory change in this population (Herregods et al., 2016; Restrepo et al., 2013; Sudoł-Szopińska et al., 2017). Whole-body radiopharmaceutical localization imaging with SPECT or SPECT/CT may be considered medically necessary for evaluation of facet arthropathy in ankylosing spondylitis, osteoarthritis, or rheumatoid arthritis, consistent with established MRI classification criteria for active inflammatory disease that inform when nuclear imaging is appropriately reserved for facet-specific evaluation (Lambert et al., 2016).

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Atlantoaxial Instability in Trisomy 21 (Down Syndrome) (PEDSP-7.3)

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Criteria

- The diagnosis of atlantoaxial instability is a recognized complication of trisomy 21, and individuals are routinely screened with lateral x-rays of the cervical spine.
- MRI Cervical Spine without contrast (CPT® 72141) or without and with contrast (CPT® 72156) is considered medically necessary in individuals where the lateral cervical spine x-ray demonstrates an atlantodental (pre-dens) interval of ≥4.5 mm, and/or a neural canal width of ≤14 mm.
- MRI Cervical Spine without contrast (CPT® 72141) or without and with contrast (CPT® 72156) is considered medically necessary when new or worsening clinical symptoms suggest myelopathy in a trisomy 21 individual.

Evidence Discussion

Lateral cervical spine x-rays may be considered medically necessary as the initial screening study given the recognized risk of atlantoaxial instability in trisomy 21 (Machida et al., 2022). MRI of the cervical spine without contrast or without and with contrast may be considered medically necessary when x-ray demonstrates an atlantodental interval of 4.5 mm or greater or a neural canal width of 14 mm or less, or when new or worsening symptoms suggest myelopathy, consistent with radiographic-MRI correlation data supporting these thresholds as triggers for further evaluation (Machida et al., 2022).

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Basilar Impression (PEDSP-7.4)

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See: **Basilar Impression/Basilar Invagination (PEDHD-9.4)** in the Pediatric Head Imaging Guidelines

Pediatric and Special Populations Spine Imaging Guidelines

Chiari Malformation (PEDSP-7.5)

SPP.CD.0007.5.A
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See: **Chiari and Skull Base Malformations (PEDHD-9)** in the Pediatric Head Imaging Guidelines

Pediatric and Special Populations Spine Imaging Guidelines

Klippel-Feil Anomaly (Congenital Fusion of Cervical Vertebrae) (PEDSP-7.6)

SPP.CD.0007.6.A
v1.0.2027

Criteria

This is generally an incidental finding. A detailed history and physical examination with thorough neurologic examination, and plain x-rays should be performed initially. Klippel-Feil can occur in conjunction with platybasia and/or Chiari malformation.

- Plain x-rays of the cervical spine are sufficient to establish the diagnosis. Advanced imaging is considered medically necessary if there are acute or worsening neurologic symptoms (including pain), or if multiple levels are involved.
  - MRI Cervical Spine without contrast (CPT® 72141) or CT Cervical Spine without contrast (CPT® 72125) for these indications.

Evidence Discussion

Plain x-rays of the cervical spine may be considered medically necessary and sufficient to establish the diagnosis of Klippel-Feil anomaly, as this is typically an incidental finding, while advanced imaging with MRI or CT of the cervical spine may be considered medically necessary when acute or worsening neurologic symptoms are present or multiple vertebral levels are involved, reflecting the recognized association with platybasia and Chiari malformation (Dweck & Lachman, 2019).

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Marfan Syndrome (PEDSP-7.7)

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Criteria

Individuals with Marfan syndrome are at risk for scoliosis (see **Scoliosis (PEDSP-3.2)**) and dural ectasias. Dural ectasias are usually asymptomatic but can be associated with other spinal lesions.

- A pertinent clinical evaluation including a detailed history, physical examination with thorough neurologic examination and documentation of any specific radicular features, and plain radiography should be performed prior to considering advanced imaging.
- MRI without contrast of the symptomatic spinal region is considered medically necessary for the following:
  - New or worsening clinical symptoms suggest a complicated dural ectasia.
  - The individual is under active consideration for surgery.

Evidence Discussion

A detailed history and physical examination should be performed prior to advanced imaging given the risk of scoliosis and dural ectasia in Marfan syndrome (Child, 2017). MRI without contrast of the symptomatic spinal region may be considered medically necessary when new or worsening symptoms suggest complicated dural ectasia or when surgery is under active consideration, consistent with the recognized potential for dural ectasia to be associated with other spinal lesions despite its typically asymptomatic course (Child, 2017).

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Neurofibromatosis (PEDSP-7.8)

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- See: **Neurofibromatosis 1 and 2 (NF1 and NF2) (PEDONC-2.3)** in the Pediatric and Special Populations Oncology Imaging Guidelines for screening recommendations in neurofibromatosis.
- See: **Neurofibromatosis (PEDPN-2)** in the Pediatric Peripheral Nerve and Neuromuscular Disorders Imaging Guidelines for imaging considerations in neurofibromatosis individuals with known plexiform neurofibromas.
- See: **Non-Rhabdomyosarcoma Soft Tissue Sarcomas (PEDONC-8.3)** in the Pediatric and Special Populations Oncology Imaging Guidelines for imaging in individuals with neurofibromatosis and malignant peripheral nerve sheath tumors.

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Von Hippel-Lindau Syndrome (VHL) (PEDSP-7.9)

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Criteria

- See: **Von Hippel-Lindau Syndrome (VHL) (PEDONC-2.10)** in the Pediatric and Special Populations Oncology Imaging Guidelines for screening recommendations in VHL patients.
- MRI without and with contrast of the affected spinal level is considered medically necessary for individuals with known spinal hemangioblastomas in the following conditions:
  - Annually for asymptomatic individuals with unresected spinal hemangioblastoma(s).
  - Preoperative planning for resection of a hemangioblastoma.
  - New or worsening symptoms suggesting progression of a known hemangioblastoma.

Evidence Discussion

MRI without and with contrast of the affected spinal level may be considered medically necessary annually for asymptomatic unresected spinal hemangioblastoma, for preoperative planning, and when new or worsening symptoms suggest progression, consistent with the natural history of hemangioblastoma growth and surveillance recommendations in VHL (Frantzen et al., 2015).

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Procedure Codes Associated with Spine Imaging (PEDSPINE)

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Procedure Codes Associated with Spine Imaging (PEDSPINE)

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Procedure Codes Associated with Spine Imaging	
MRI	**CPT®**
MRI Cervical without contrast	72141
MRI Cervical with contrast	72142
MRI Cervical without and with contrast	72156
MRI Thoracic without contrast	72146
MRI Thoracic with contrast	72147
MRI Thoracic without and with contrast	72157
MRI Lumbar without contrast	72148
MRI Lumbar with contrast	72149
MRI Lumbar without and with contrast	72158
MRI Unlisted procedure (for radiation planning or surgical software)	76498
MRA	**CPT®**
MRA Spinal Canal	72159
CT	**CPT®**
CT Cervical without contrast	72125
CT Cervical with contrast	72126

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Procedure Codes Associated with Spine Imaging	
CT Cervical without and with contrast	72127
CT Thoracic without contrast	72128
CT Thoracic with contrast	72129
CT Thoracic without and with contrast	72130
CT Lumbar without contrast	72131
CT Lumbar with contrast	72132
CT Lumbar without and with contrast	72133
CT Pelvis without contrast	72192
CT Pelvis with contrast	72193
CT Pelvis without and with contrast	72194
CT Guidance for Placement of Radiation Therapy Fields	77014
CT Unlisted procedure (for radiation planning or surgical software)	76497
Ultrasound	**CPT®**
Ultrasound, spinal canal and contents	76800

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