CLINICAL GUIDELINES

Pediatric Musculoskeletal Imaging Guidelines

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VERSION 1.0.2026

EviCore By EVERNORTH

EviCore healthcare Clinical Decision Support Tool Diagnostic Strategies: This tool addresses common symptoms and symptom complexes. Imaging requests for individuals with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician, specialist, and/or individual's Primary Care Physician (PCP) may provide additional insight.

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Procedure Codes Associated with Musculoskeletal Imaging (PEDMS)

MSP.GG.ProcedureCodes.A
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MRI	CPT®
MRI Upper Extremity non-joint without contrast	73218
MRI Upper Extremity non-joint with contrast (rarely used)	73219
MRI Upper Extremity non-joint without and with contrast	73220
MRI Upper Extremity joint without contrast	73221
MRI Upper Extremity joint with contrast (rarely used)	73222
MRI Upper Extremity joint without and with contrast	73223
MRI Lower Extremity non-joint without contrast	73718
MRI Lower Extremity non-joint with contrast (rarely used)	73719
MRI Lower Extremity non-joint without and with contrast	73720
MRI Lower Extremity joint without contrast	73721
MRI Lower Extremity joint with contrast (rarely used)	73722
MRI Lower Extremity joint without and with contrast	73723
Unlisted MRI procedure (for radiation planning or surgical software)	76498

MRA	CPT®
MRA Upper Extremity	73225
MRA Lower Extremity	73725

CT	CPT®
CT Upper Extremity without contrast	73200
CT Upper Extremity with contrast	73201
CT Upper Extremity without and with contrast	73202
CT Lower Extremity without contrast	73700
CT Lower Extremity with contrast	73701
CT Lower Extremity without and with contrast	73702
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CT Abdomen with contrast	74160
CT Pelvis with contrast	72193
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Bone Mineral Density CT, one or more sites, axial skeleton	77078
CT Guidance for Placement of Radiation Therapy Fields	77014
Unlisted CT procedure (for radiation planning or surgical software)	76497

CTA	CPT®
CTA Upper Extremity	73206
CTA Lower Extremity	73706

Nuclear Medicine	CPT®
PET Imaging; limited area (this code not used in pediatrics)	78811
PET Imaging: skull base to mid-thigh (this code not used in pediatrics)	78812

Nuclear Medicine	CPT®
PET Imaging: whole body (this code not used in pediatrics)	78813
PET with concurrently acquired CT; limited area (this code rarely used in pediatrics)	78814
PET with concurrently acquired CT; skull base to mid-thigh	78815
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Bone Marrow Imaging Limited Areas	78102
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Nuclear Bone Scan Limited	78300
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Bone Scan Three Phase	78315
DEXA Bone Densitometry, axial skeleton	77080
DEXA Bone Densitometry, peripheral skeleton	77081
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); planar, single area (eg, head, neck, chest, pelvis), single day imaging	78800
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); planar, 2 or more areas (eg, abdomen and pelvis, head and chest), 1 or more days imaging or single area imaging over 2 or more days	78801

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Nuclear Medicine	CPT®
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); planar, whole body, single day imaging	78802
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); tomographic (SPECT), single area (eg, head, neck, chest, pelvis), single day imaging	78803
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); tomographic (SPECT) with concurrently acquired computed tomography (CT) transmission scan for anatomical review, localization and determination/detection of pathology, single area (eg, head, neck, chest, pelvis), single day imaging	78830
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); tomographic (SPECT), minimum 2 areas (eg, pelvis and knees, abdomen and pelvis), single day imaging, or single area imaging over 2 or more days	78831
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); tomographic (SPECT) with concurrently acquired computed tomography (CT) transmission scan for anatomical review, localization and determination/detection of pathology, minimum 2 areas (eg, pelvis and knees, abdomen and pelvis), single day imaging, or single area imaging over 2 or more days	78832

Ultrasound	CPT®
Ultrasound, extremity, nonvascular; complete joint	76881
Ultrasound, extremity, nonvascular; limited, anatomic specific for focal abnormality	76882

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Ultrasound	CPT®
Ultrasound, infant hips; dynamic (requiring physician manipulation)	76885
Ultrasound, infant hips; limited, static (not requiring physician manipulation)	76886
Ultrasound, axilla	76882
Ultrasound, upper back	76604
Ultrasound, lower back	76705
Ultrasound, other soft tissue areas not otherwise specified	76999
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Duplex scan of upper extremity arteries or arterial bypass grafts; complete bilateral	93930
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Duplex scan of hemodialysis access (including arterial inflow, body of access and venous outflow)	93990

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General Guidelines (PEDMS-1.0)

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- A pertinent clinical evaluation including a detailed history, physical examination, appropriate laboratory studies and basic imaging such as plain x-ray 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.
- Plain x-ray should be done prior to advanced imaging. 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. X-ray can rule out those situations that do not require advanced imaging, such as acute/healing fracture, osteomyelitis, and tumors of bone amenable to biopsy or radiation therapy (in known metastatic disease), etc.
  - Even in soft tissue masses, plain x-rays are helpful in evaluating for calcium/bony deposits, e.g. myositis ossificans and invasion of bone.
- Unless otherwise stated in a specific guideline section, repeat imaging studies of the same body area 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.
- Provider-directed conservative care may include any or all of the following: R.I.C.E (rest, ice, compression, and elevation), NSAIDs (non-steroidal anti-inflammatory drugs), narcotic and non-narcotic analgesic medications, oral or injectable corticosteroids, viscosupplementation injections, a provider-directed home exercise program, cross-training, physical medicine, or immobilization by splinting/casting/bracing.
- These guidelines are based upon using advanced imaging to answer specific clinical questions that will affect patient management. Imaging is not indicated if the results will not affect individual management decisions. Standard medical practice would dictate continuing conservative therapy prior to advanced imaging in individuals who are improving on current treatment programs.

Health Equity Consideration

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;

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education, job opportunities, and income; access to nutritious foods and physical activity opportunities; access to clean air and water; and language and literacy skills.

Age Considerations (PEDMS-1.1)

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- Many conditions affecting the musculoskeletal system 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, differences may exist in management due to individual age, comorbidities, and differences in disease natural history between children and adults.
- Individuals who are ≤18 years old should be imaged according to the Pediatric Musculoskeletal Imaging Guidelines if discussed. Any conditions not specifically discussed in the Pediatric Musculoskeletal Imaging Guidelines should be imaged according to the General Musculoskeletal Imaging Guidelines. Individuals who are >18 years old should be imaged according to the General Musculoskeletal Imaging Guidelines except where directed otherwise by a specific guideline section.

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Appropriate Clinical Evaluation and Conservative Treatment (PEDMS-1.2)

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

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Modality General Considerations (PEDMS-1.3)

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- MRI
  - MRI without contrast is the preferred modality for pediatric musculoskeletal imaging unless otherwise stated in a specific guideline section, as it is superior in imaging the soft tissues and can also define physiological processes in some instances, e.g. edema, loss of circulation (AVN), and increased vascularity (tumors).
  - MRI without and with contrast is frequently recommended for evaluation of tumors, infection, post-operative evaluation, arthrography, and juvenile idiopathic arthritis, as described in the disease-specific guideline sections.
  - Due to the length of time required for MRI acquisition and the need to minimize 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 route. 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 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. By doing so, the requesting provider may avoid repetitive anesthesia administration to perform an MRI with contrast if the initial study without contrast is inconclusive.
      - 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 imaging session.

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- The presence of surgical hardware or implanted devices may preclude MRI, as magnetic field distortion may limit detail in adjacent structures. CT may be the procedure of choice in these cases.
- The selection of best examination may require coordination between the provider and the imaging service.

- CT
  - CT without contrast is generally superior to MRI for imaging bone and joint anatomy; thus it is useful for studying complex fractures (particularly of the joints, dislocations, and assessing delayed union or non-union of fractures, integration of bone graft material, if plain x-rays are equivocal.
    - CT should not be used to replace MRI in an attempt to avoid sedation unless listed as a recommended study in a specific guideline section.
  - CT beam attenuation can result in streak artifact which can obscure adjacent details. This can occur with radiopaque material such as metal objects or dense bones.
  - The selection of best examination may require coordination between the requesting provider and the rendering imaging facility.
- Ultrasound
  - Ultrasound is frequently used to evaluate infants for hip dysplasia, to detect and/or aspirate joint effusion, and as an initial evaluation of extremity soft tissue masses.
  - CPT® codes vary by body area and the use of Doppler imaging. These CPT® codes are included in the table at the beginning of this guideline.
- Nuclear Medicine
  - Nuclear medicine studies are commonly used in evaluation of the peripheral musculoskeletal system, and other rare indications exist as well:
    - Bone scan (CPT® 78315), Distribution of Radiopharmaceutical Agent SPECT (CPT® 78803, or 78831), or SPECT/CT (CPT® 78830) is indicated for evaluation of suspected loosening of orthopedic prostheses when recent plain x-ray is nondiagnostic.
    - Nuclear medicine bone marrow imaging (CPT® codes: CPT® 78102, CPT® 78103, or CPT® 78104), SPECT (CPT® code: 78803), or SPECT/CT (CPT® 78830) is indicated for detection of ischemic or infarcted regions in sickle cell disease.
    - Triple phase bone scan (CPT® 78315) is indicated for evaluation of complex regional pain syndrome or reflex sympathetic dystrophy.
- 3D Rendering
  - 3D Rendering indications in pediatric musculoskeletal imaging are identical to those in the general imaging guidelines. See: **3D Rendering (MS-3)** for imaging guidelines.
- Bilateral Imaging

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- Coding for bilateral imaging may vary from health care plan to health care plan. Not all coding options may be available for all health care plans.

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.

References (PEDMS-1)

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Fracture and Dislocation (PEDMS-2)

Guideline Page

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Fracture and Dislocation (PEDMS-2)

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- A pertinent clinical evaluation including a detailed history, physical examination, and plain x-ray should be performed prior to considering advanced imaging.

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Acute Fracture (PEDMS-2.1)

MSP.FX.0002.1.A

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- Plain x-rays should be performed initially in any obvious or suspected acute fracture or dislocation.
  - If plain x-rays are positive, no further imaging is medically necessary except in complex (comminuted or displaced) joint fractures where MRI or CT without contrast is medically necessary for preoperative planning.
  - 3D Rendering may sometimes be medically necessary for complex fracture repairs. See: **3D Rendering (MS-3)** in the Musculoskeletal Imaging Guidelines.
- Ultrasound (CPT® 76881 or CPT® 76882) is medically necessary for evaluation of fracture, but is not required to allow for other advanced imaging, especially in infants. Ultrasound is typically a secondary method of fracture detection when used, though some centers use it as the sole imaging modality for skull and clavicle fractures.
- CT or MRI without contrast is medically necessary if plain x-rays are negative or equivocal for fracture, and fracture or bone marrow edema is still clinically suspected, and if the results will determine immediate treatment decisions as documented by the treating physician.
- Bone scan is medically necessary for evaluation of suspected fracture when two x-rays are negative at least 10 days apart, using any of the following CPT® code combinations:
  - CPT® 78300, CPT® 78305, or CPT® 78306 as a single study
  - See: **Stress/Occult Fracture (PEDMS-2.5)** for bone scan indications

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Joint-Adjacent Fracture (PEDMS-2.2)

MSP.FX.0002.2.A

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- CT without contrast is medically necessary in complex (comminuted or displaced) fractures seen on plain x-ray involving a joint for preoperative planning.
- CT without contrast is medically necessary when there is clinical concern for delayed union or non-union of fracture or joint fusions on follow-up plain x-ray.

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Growth Plate Injuries (Salter-Harris Fractures) (PEDMS-2.3)

MSP.FX.0002.3.A

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- These fractures can generally be diagnosed and managed adequately with plain x-ray.
- In case of severe injury with displacement of bone fractures seen on plain x-ray, CT without contrast is medically necessary prior to surgical intervention.
- If there is concern for delayed union or non-union of the bone seen on plain x-ray, CT without contrast is medically necessary.
- MRI without contrast is medically necessary for the evaluation of a suspected physeal bar in a healing fracture or other complication of a fracture involving the growth plate seen on plain x-ray or CT which may result in abnormal growth. While physeal bars may be seen on CT, some fibrous physeal bars can be missed on CT. As such, MRI is the preferred imaging modality.
- Compressive injuries of the growth plate (Salter-Harris V) injuries may be difficult to identify on plain films, and MRI without contrast is medically necessary for confirmation.

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Osteochondral or Chondral Fractures, Including Osteochondritis Dissecans (PEDMS-2.4)

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An osteochondral fracture is a tear of the cartilage which covers the end of a bone, within a joint. It is also known as Osteochondritis Dissecans. In both disorders, the osteochondral fragment may separate from the articular surface and form loose bone fragments in a joint.

- If x-rays are negative and an osteochondral fracture is still suspected, or if x-ray or clinical exam suggests an unstable osteochondral injury, either MRI without contrast, MR arthrogram, or CT arthrogram of the involved joint is medically necessary.
- If plain x-rays show a non-displaced osteochondral fragment, follow up imaging should be with plain x-rays. Advanced imaging is not medically necessary.
- MRI without contrast or CT without contrast is medically necessary when healing cannot be adequately assessed on follow up plain x-rays.

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Stress/Occult Fracture (PEDMS-2.5)

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- These fractures can usually be adequately evaluated by history, physical exam, and x-ray. Advanced imaging may be medically necessary as discussed below if the initial evaluation of history, physical exam, and plain x-ray fails to establish a definitive diagnosis.
- Plain x-rays should be performed before advanced imaging. Plain x-rays are often negative initially, but may become positive after 14 days.
- If stress or occult fracture is suspected involving the pelvis, sacrum, hip, femur, tibia, tarsal navicular, proximal 5th metatarsal, or scaphoid, and initial plain x-ray fails to establish a definitive diagnosis:
  - MRI or CT without contrast is medically necessary, without conservative care or follow-up plain x-rays OR
  - Bone scan (CPT® 78315, 78306, or 78300), SPECT/CT (CPT® 78830), or Distribution Of Radiopharmaceutical Agent SPECT (CPT® 78803) is medically necessary in place of MRI or CT if provider requests
- For all other suspected stress or occult fractures, if follow-up plain x-rays are negative after 10 days of conservative care, or initial non-diagnostic x-ray is obtained a minimum of 14 days after the onset of symptoms:
  - MRI or CT without contrast is medically necessary OR
  - Bone scan (CPT® 78315, 78306, or 78300), SPECT/CT (CPT® 78830), or Distribution Of Radiopharmaceutical Agent SPECT (CPT® 78803) is medically necessary in place of MRI or CT if provider requests
- Periodic follow-up plain x-rays will usually show progressive healing.
  - CT without contrast is medically necessary when there is clinical concern for non-union.

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Compartment Syndrome (PEDMS-2.6)

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- Acute compartment syndrome is a clinical diagnosis made by direct measurement of compartment pressure and is a surgical emergency. Advanced imaging is not medically necessary.
- See: Compartment syndrome within the **Muscle and Tendon Injuries (MS-11.0)** section of the Musculoskeletal Imaging Guidelines.

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Physical Child Abuse (PEDMS-2.7)

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- See: **Suspected Physical Child Abuse (PEDMS-7)** for imaging guidelines.

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References (PEDMS-2)

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Soft Tissue and Bone Masses (PEDMS-3)

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Soft Tissue and Bone Masses – General Considerations (PEDMS-3.1)

MSP.ST.0003.1.A
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- A pertinent clinical evaluation including a detailed history and physical examination should be performed prior to considering advanced imaging.
  - History and physical exam of any palpable soft tissue mass should include documentation of any of the following pertinent clinical features: location, size, and any association with pain.
- Plain x-rays should be performed as initial imaging. This is true even for soft tissue masses that are clearly not directly associated with osseous structures. Details such as soft tissue calcification, presence or absence of phleboliths, radiographic density, and any effect on adjacent bone are all potentially significant plain film findings that may help better identify the etiology of the mass and determine the optimal modality and contrast level when advanced imaging is indicated.
- Evaluation by a surgical specialist or oncologist is strongly recommended to help determine the most helpful advanced imaging studies for an individual.
- Ultrasound (CPT® 76881 or CPT® 76882) is medically necessary if initial plain x-ray is negative to evaluate:
  - ill-defined masses or areas of swelling
  - hematomas
  - subcutaneous lipomas with inconclusive clinical examination
  - lipomas in other locations
  - masses that have been present and stable for ≥1 year
  - vascular malformations (see: **Vascular Anomalies (PEDPVD-2)** in the Pediatric Peripheral Vascular Disease Imaging Guidelines)
- MRI without and with contrast or without contrast is medically necessary for any of the following:
  - soft tissue mass >5 cm in diameter
  - soft tissue mass increasing in size
  - painful soft tissue mass
  - deep soft tissue mass or subfascial location
- Advanced imaging is not medically necessary for the following entities:
  - ganglion cysts
  - sebaceous cysts
  - hematomas
  - subcutaneous lipomas
    - MRI without or without and with contrast can be performed if surgery is planned.

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- MRI without and with contrast, or ultrasound (CPT® 76881 or CPT® 76882) is medically necessary for lipomas in other locations (not subcutaneous).

Soft Tissue Mass with Negative X-ray and Abnormal Ultrasound (PEDMS-3.2)

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- MRI without and with contrast is medically necessary when plain x-ray is negative and ultrasound is abnormal.
  - CT without or with contrast is medically necessary if MRI is contraindicated.

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Soft Tissue Mass with Calcification/ Ossification on X-ray (PEDMS-3.3)

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- MRI without and with contrast is medically necessary when calcification/ossification is noted on plain x-ray.
  - CT without or with contrast is medically necessary if MRI is contraindicated.

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Mass Involving Bone (Including Suspected Lytic and Blastic Metastatic Disease) (PEDMS-3.4)

MSP.ST.0003.4.A

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- Plain x-rays of the entire bone containing the lesion are required prior to consideration of advanced imaging. Many benign bone tumors have a characteristic appearance on plain x-ray and advanced imaging is not medically necessary unless one of the following applies:
  - MRI without and with contrast and/or CT without is medically necessary for preoperative planning.
  - MRI without and with contrast is medically necessary when the diagnosis is uncertain based on plain x-ray appearance.
    - CT without or with contrast is medically necessary if MRI is contraindicated.
- Surveillance of benign bony lesions is with plain x-ray
  - MRI without and with contrast is medically necessary for new findings on x-ray, or new or worsening clinical symptoms not explained by recent x-ray.
- Osteochondroma, osteoid osteoma, osteogenic sarcoma, and Ewing sarcoma family of tumors should be imaged according to **Bone Tumors (PEDONC-9)** in the Pediatric and Special Populations Oncology Imaging Guidelines.
- If there is concern for metastatic disease in an individual with a known malignancy, refer to the appropriate Pediatric and Special Populations Oncology Imaging Guideline.

References (PEDMS-3)

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Limping Child (PEDMS-4)

Guideline Page

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General Evaluation of the Limping Child (PEDMS-4.1)

MSP.LC.0004.1.A

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- This guideline primarily applies to children under the age of 6 years. It may also be applied to older children with pre-existing conditions who may not be able to communicate, such as a child with severe intellectual disability. Many of these cases will be urgent, because of the risk of adverse outcomes in delay of diagnosis.
- A pertinent clinical evaluation, including a detailed history and physical examination, should be performed, which will help determine any indication for advanced imaging. Based on this clinical evaluation, the most likely etiology should be determined, usually trauma, infection, or neither trauma nor infection.
- X-ray should be obtained if there are no localized findings on physical examination.

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Limping Child with Suspected Trauma (PEDMS-4.2)

MSP.LC.0004.2.A

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- Plain x-rays are indicated for detection of fractures, destructive lesions, and avascular necrosis. For children under age 4 this may require x-rays of the entire leg from hip to foot. If clinical suspicion is high for “toddler fracture” imaging may start with tibia/fibula x-rays, and if a fracture is demonstrated, additional imaging may not be required.
- If initial x-rays are negative, but limping symptoms or avoidance of weight-bearing persist, follow-up x-rays in 7 to 10 days are indicated.
  - If plain films are negative and suspicion remains high for stress fractures or soft tissue injury, the following are medically necessary:
    - MRI without contrast of the affected body area OR
    - Radionuclide bone scan (CPT® 78300, CPT® 78305, CPT® 78306, or CPT® 78315), SPECT/CT (CPT® 78830), or SPECT (CPT® 78803) if implanted hardware or devices precluding MRI are present.
- CT use is limited in the evaluation of the limping child with suspected trauma.

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Limping Child with Suspected Infection (PEDMS-4.3)

MSP.LC.0004.3.A
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- Pain localized to hip:
  - It is essential to exclude septic arthritis. Ultrasound of the hip (CPT® 76881 or 76882) is used to exclude hip joint effusion.
    - Hip joint fluid aspiration to distinguish infection from non-infectious etiologies If hip joint effusion is demonstrated.
    - Plain x-rays should be obtained if no hip joint effusion is demonstrated.
    - MRI without contrast (CPT® 73721) or without and with contrast (CPT® 73723) is medically necessary if plain films are not diagnostic.
- Pain localized distal to hip:
  - MRI without contrast or without and with contrast of the affected body part is medically necessary if plain x-rays are not diagnostic.
- Non-localized pain:
  - Plain x-rays of the spine, pelvis, and lower extremities may be necessary to localize the abnormality.
  - If plain x-ray is not diagnostic and suspicion for infection remains high, one of the following:
    - Whole-body bone scan (CPT® 78306) OR
    - SPECT (CPT® 78803) OR
    - SPECT/CT (CPT® 78830) OR
    - MRI without contrast or without and with contrast of the affected body area

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Limping Child with No Evidence of Trauma or Infection (PEDMS-4.4)

MSP.LC.0004.4.A
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- This differential diagnosis is quite broad.
  - Transient (or toxic) synovitis of the hip:
    - Ultrasound of the hip (CPT® 76881 or CPT® 76882) is the medically necessary initial exam.
      - Plain x-rays if no hip effusion is demonstrated.
      - Hip joint fluid aspiration is indicated if a hip joint effusion is demonstrated. This is usually performed with US guidance, though fluoroscopic guidance or blind aspiration may be required.
  - Avascular Necrosis, see: **Avascular Necrosis (AVN)/ Legg-Calvé-Perthes Disease (PEDMS-6)**
  - Juvenile Idiopathic Arthritis, see: **Juvenile Idiopathic Arthritis (PEDMS-10.1)**
  - Histiocytic Disorders, see: **Histiocytic Disorders (PEDONC-18)** in the Pediatric and Special Populations Oncology Imaging Guidelines
  - Neoplasm, see: **General Guidelines (PEDONC-1)**, **Pediatric Leukemias (PEDONC-3)**, **Neuroblastoma (PEDONC-6)**, **Pediatric Soft Tissue Sarcomas (PEDONC-8)**, or **Bone Tumors (PEDONC-9)** in the Pediatric and Special Populations Oncology Imaging Guidelines
  - Child abuse, see: **Suspected Physical Child Abuse (PEDMS-7)**

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References (PEDMS-4)

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Developmental Dysplasia of the Hip (PEDMS-5)

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Developmental Dysplasia of the Hip (PEDMS-5)

MSP.DZ.0005.A
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Screening studies

- The routine use of ultrasound in screening neonates and infants without risk factors for developmental dysplasia of the hip (DDH) is not recommended by the American Academy of Pediatrics and the American Academy of Orthopedic Surgeons.
- Screening ultrasound (CPT® 76885 or CPT® 76886) is medically necessary for infants between 4 weeks of age and 4 months of age with one or more of the following risk factors:
  - Breech presentation
  - Family history of DDH
  - Abnormal hip exam (e.g., positive Ortolani or Barlow maneuvers, asymmetric thigh folds, shortening of the thigh observed on the dislocated side, limitation of hip abduction)
- For children between 4 and 6 months of age plain x-ray is the initial imaging modality as femoral head ossification is often seen on x-ray in normal individuals.
  - If x-ray is inconclusive, ultrasound (CPT® 76885 or CPT® 76886) is medically necessary.

Follow-Up/Diagnostic Studies

- Ultrasound is medically necessary earlier than 4 weeks of age in individuals with unstable/dislocated hip(s) undergoing abduction brace treatment.
- Follow-up hip ultrasound (CPT® 76885 or CPT® 76886) is medically necessary for the following:
  - Graf type IIA hip with an alpha angle (bony angle) between 50 to 59 degrees in a child less than 3 months of age and follow up hip ultrasound is requested to confirm normal development
  - Subluxation or dislocation was diagnosed on previous hip ultrasound using the dynamic Harke imaging method
  - Prior ultrasound demonstrates abnormal hip and treatment has been applied (such as a Pavlik harness or other device) to document effectiveness of treatment, to ensure the femoral head remains located in the acetabulum, or to identify treatment failure.
    - The usual interval for follow-up sonography is monthly, but earlier imaging is medically necessary for clinical suspicion of treatment failure, subluxation or dislocation of the hip.

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- MRI without and with contrast (CPT® 73723), MRI without contrast (CPT® 73721), or CT without contrast (CPT® 73700) is medically necessary to evaluate alignment following reduction. Children in casts or following surgery may require repeated advanced imaging to ensure the reduction remains satisfactory, or to assess incorporation of bone graft material.
- Hip ultrasound is NOT medically necessary for the following:
  - Infants older than 6 months of age as plain x-ray of the hips become more reliable due to femoral head ossification and should be used in infants over 6 months of age.
  - Type I, IIB, IIC, IID, and III hips diagnosed on a previous hip ultrasound using the Graf method. Type I hip is normal, and Type IIB, IIC, IID, and III will have imaging as directed by treating provider.
  - Plain x-ray of the hips should be performed rather than ultrasound if there is a clinical suspicion for teratogenic dysplasia.

Background and Supporting Information

- Developmental dysplasia of the hip (DDH) was formerly known as congenital dislocation of the hip. DDH includes a spectrum of abnormalities including abnormal acetabular shape (dysplasia) and malposition of the femoral head ranging from reducible subluxation to irreducible subluxation or dislocation of the femoral head. 60 to 80% of abnormalities are identified by physical exam, and more than 90% are identified by ultrasound. Treatment may involve placement in a Pavlik harness, casting, or surgery in extreme or refractory cases.
- Hip laxity is normal after birth and usually resolves spontaneously.
- There are two sonographic methods of evaluating the hip: the dynamic stress (Harcke) technique and the static (Graf) technique
- The overwhelming majority of Graf type IIA hips mature spontaneously but follow up may be required to ensure that maturation has occurred.

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References (PEDMS-5)

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Avascular Necrosis (AVN) / Legg-Calvé-Perthes Disease / Idiopathic Osteonecrosis (PEDMS-6)

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Avascular Necrosis and Legg-Calvé-Perthes Disease (PEDMS-6.1)

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- Plain x-ray is the initial imaging study and may be all that is necessary for follow-up.
- MRI Hip without contrast (CPT® 73721) or MRI Hip without and with contrast (CPT® 73723) is medically necessary if the diagnosis is uncertain on plain x-ray, or for preoperative planning.
  - If MRI is contraindicated or unavailable, any one of the following studies is medically necessary in lieu of MRI:
    - CT scan without contrast, OR
    - Nuclear bone scan (CPT® codes: 78300, 78305, 78306, or 78803) OR
    - SPECT/CT (CPT® 78830)

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Osteonecrosis (PEDMS-6.2)

MSP.AN.0006.2.A

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- Osteonecrosis can occur in a number of conditions, including during treatment for developmental dysplasia of the hip.
- Individuals with acute lymphoblastic leukemia, lymphoblastic lymphoma, or other conditions with recurrent exposure to high dose corticosteroids and known or suspected osteonecrosis should be imaged according to guidelines in: **Acute Lymphoblastic Leukemia (ALL) (PEDONC-3.2)** in the Pediatric and Special Populations Oncology Imaging Guidelines.
- Known or suspected osteonecrosis in long-term cancer survivors should be imaged according to guidelines in: **Osteonecrosis in Long Term Cancer Survivors (PEDONC-19.4)** in the Pediatric and Special Populations Oncology Imaging Guidelines.
- X-ray is indicated as initial imaging study
- MRI either without contrast or without and with contrast is medically necessary in other individuals with concern for osteonecrosis and negative or inconclusive recent x-ray, if imaging results will change current individual management. Early phase of osteonecrosis may be seen on MR with normal x-ray findings.
  - CT scan without contrast is medically necessary for surgical planning.

References (PEDMS-6)

v1.0.2026

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Suspected Physical Child Abuse (PEDMS-7)

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Suspected Physical Child Abuse (PEDMS-7)

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The suspicion of physical abuse of a child often requires imaging, both for clinical management and for forensic purposes. Every effort should be made to support reasonable requests for imaging in these children.

Child abuse injuries may affect any organ or system. Fractures are common, but injuries may also involve solid and hollow visceral organs, and/or superficial and deep soft tissue injuries. Some fracture patterns are highly correlated with non-accidental mechanisms, such as the classic metaphyseal lesion, also known as a corner fracture or bucket handle fracture, but fractures may occur in any bone. Unsuspected fractures, multiple fractures at various stages of healing, or fractures of a configuration or distribution inconsistent with the history provided, may raise the suspicion for physical abuse.

Skeletal Injury

- The x-ray skeletal survey is the primary imaging procedure for detecting fractures, especially in children age 24 months or younger. In older children, skeletal survey may be indicated, but more tailored x-ray evaluation based on history and physical examination may be preferable to skeletal survey.
- When skeletal survey is negative, but clinical suspicion remains high, either of the following are medically necessary:
  - Bone scan (CPT® codes: CPT® 78300, 78305, 78306, 78315, or 78830) OR
  - Distribution of Radiopharmaceutical Agent SPECT (CPT® 78803)
- Suspected injury to the spine should usually first be evaluated with plain x-rays. CT without contrast and/or MRI without contrast or without and with contrast may be required for complete evaluation of osseous and soft tissue spine injuries. If requested for suspected or known physical abuse, both CT without contrast and/or MRI without contrast or without and with contrast of suspected sites are medically necessary.
- CT Chest without contrast (CPT® 71250) is medically necessary in individuals with a negative skeletal survey and a high clinical suspicion for rib fracture associated with child abuse.
- A repeat skeletal survey performed approximately 2 weeks after the initial examination can provide additional information on the presence and age of child abuse fractures and should be performed when abnormal or equivocal findings are found on the initial study and when abuse is suspected on clinical grounds

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Head Injury

- CT Head without contrast (CPT® 70450) is medically necessary when there is clinical evidence of head injury or when skull fracture of any age is detected on survey skull x-ray.
  - CT Head without contrast (CPT® 70450) is also medically necessary when known or suspected cervical trauma is present in a pediatric individual.
  - CT Head without contrast (CPT® 70450) is medically necessary in individuals less than 1 year of age, even if no neurologic symptoms are detected due to the great potential morbidity of abuse head trauma. MRI Brain without contrast (CPT® 70551) is also medically necessary.
  - MRI Spine without contrast (CPT® 72141, 72146, 72148) or without and with contrast (CPT® 72156, 72157, 72158) is medically necessary when there is clinical evidence of head injury or when skull fracture of any age is detected on survey skull x-ray. CT Spine (CPT® 72125, CPT® 72128, CPT® 72131) is medically necessary if MRI is not readily available.
- MRI Brain without contrast (CPT® 70551) or without and with contrast (CPT® 70553) is medically necessary to evaluate brain parenchymal injury, or in a child where the clinical signs of brain injury are not sufficiently explained by CT findings.

Other Body Area Injuries

- CT should be performed with contrast unless an absolute contraindication exists.
- ANY of the following imaging studies are medically necessary for suspected injury to the abdomen or pelvis:
  - Abdominal ultrasound (CPT® 76700)
  - Pelvic ultrasound (CPT® 76856)
  - CT Abdomen with contrast (CPT® 74160)
  - CT Pelvis with contrast (CPT® 72193)
  - CT Abdomen and Pelvis with contrast (CPT® 74177)
- ANY of the following imaging studies are medically necessary for suspected injury to the chest:
  - CT Chest without contrast (CPT® 71250)
  - CT Chest with contrast (CPT® 71260)

Screening of other children

- Contacts are defined as the asymptomatic siblings, cohabiting children, or children under the same care as an index child with suspected child physical abuse. All contact children should undergo a thorough physical examination and a history elicited prior to imaging. Contact children younger than 12 months should have neuroimaging, and skeletal survey. CT Head without contrast (CPT® 70450) or MRI Brain without contrast (CPT® 70551) is medically necessary. Contact children aged

12 to 24 months should undergo skeletal survey. No routine imaging is medically necessary in asymptomatic children older than 24 months.

References (PEDMS-7)

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Infection/Osteomyelitis (PEDMS-8)

Guideline Page

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Infection/Osteomyelitis (PEDMS-8)

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- Infection and osteomyelitis imaging indications in pediatric individuals are similar to those for adult individuals other than the limping child.
  - See: **General Infection/Osteomyelitis (MS-9.1)** and **Charcot and Septic Joint (MS-9.2)** in the Musculoskeletal Imaging Guidelines for circumstances other than in the limping child.
  - See: **Limping Child with Suspected Infection (PEDMS-4.3)** for imaging guidelines when limping is present.
  - See: **Inflammatory Musculoskeletal Disease (PEDMS-10)** for imaging guidelines for chronic recurrent multifocal osteomyelitis (CRMO, which is an autoimmune disease).
- Ultrasound of the involved extremity (CPT® 76881 or CPT® 76882) is medically necessary to evaluate for effusion or soft tissue fluid collection
  - Ultrasound is not a prerequisite for other advanced imaging studies
- Bone scan (CPT® 78300, 78305, 78306, or 78315), SPECT/CT (CPT® 78830, or 78832), or SPECT (CPT® 78803, or 78831) is medically necessary for evaluation of suspected bone infection if MRI cannot be done and when infection is multifocal, or when the infection is associated with orthopedic hardware or chronic bone alterations from trauma or surgery. Combining bone scintigraphy with a labeled leukocyte scan enhances sensitivity. A labeled leukocyte scan (radiopharmaceutical localization of tumor, inflammatory process, or distribution of radiopharmaceutical agent(s) imaging) - one of the following CPT® codes: CPT® 78800, CPT® 78801, 78802, or CPT® 78803 in concert with Tc-99m sulfur colloid marrow imaging (one of CPT® codes: CPT® 78102, CPT® 78103, or CPT® 78104) or SPECT/CT (CPT® 78830) is medically necessary in cases with altered bone marrow distribution, such as joint prosthesis.

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References (PEDMS-8)

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Foreign Body (PEDMS-9)

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Foreign Body (PEDMS-9)

MSP.FB.0009.A

v1.0.2026

- Foreign body imaging indications in pediatric individuals are similar to those for adult individuals. See: **Foreign and Loose Bodies (MS-6.0)** for imaging guidelines.
- The common soft tissue foreign bodies in children are wood, glass, and metal slivers. The latter two elements are radiopaque and visible to some degree on plain x-rays, whereas wood is usually radiolucent and nearly always imperceptible on x-rays. When a radiolucent foreign body is suspected, ultrasound (CPT® 76881 or 76882) is medically necessary to identify the foreign body.

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Reference (PEDMS-9)

v1.0.2026

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Inflammatory Musculoskeletal Disease (PEDMS-10)

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Inflammatory Musculoskeletal Disease (PEDMS-10.0)

MSP.MD.0010.0.A

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- A pertinent clinical evaluation including a detailed history, physical examination, and plain x-rays should be performed prior to considering advanced imaging.
- Inflammatory arthritis imaging indications in pediatric individuals are very similar to those for adult individuals. See: **Inflammatory Arthritis (MS-12.1)** in the Musculoskeletal Imaging Guidelines. Specific pediatric considerations are included below.

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Juvenile Idiopathic Arthritis (PEDMS-10.1)

MSP.MD.0010.1.A

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- Ultrasound (CPT® 76881 or 76882) is medically necessary for assessment of: size and characteristics of joint effusions, extent of synovial hypertrophy (which is the hallmark of juvenile idiopathic arthritis), and involvement of tendinous structures.
  - Repeat imaging is medically necessary for monitoring treatment or with planned treatment change
  - MRI of the most symptomatic joint without contrast or without and with contrast is medically necessary if ultrasound is inconclusive and MRI findings would alter individual management
- Distribution of Radiopharmaceutical Agent SPECT (CPT® 78802, or 78803), or SPECT/CT (CPT® 78830), is medically necessary for evaluation of facet arthropathy in patients with ankylosing spondylitis, osteoarthritis, or rheumatoid arthritis.
- MRI TMJ (CPT® 70336) is medically necessary annually for detecting silent TMJ arthritis in children with juvenile idiopathic arthritis (JIA).
- MRI without or without and with of the most involved joint is medically necessary to evaluate involved or symptomatic joints in the following situations:
  - When diagnosis is uncertain prior to initiation of drug therapy
  - To study the effects of treatment with disease modifying anti-rheumatic drug (DMARD) therapy
  - To determine a change in treatment
- MRI (with the exception of the annual screening MRI of the TMJ discussed above) is not medically necessary for routine follow-up of treatment.

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Chronic Recurrent Multifocal Osteomyelitis (PEDMS-10.2)

MSP.MD.0010.2.A
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Chronic recurrent multifocal osteomyelitis (CRMO) is a rare autoimmune disease affecting multiple bones, arising most commonly during the second decade of life. Treatment consists of anti-inflammatory and immunomodulatory therapies, and is directed predominantly by status of clinical symptoms (most commonly pain).

- The following imaging is medically necessary for undividuals with CRMO for evaluation of new or worsening pain, or response to treatment in individuals without complete clinical resolution of pain symptoms, when plain x-rays are non-diagnostic:
  - Bone scan (CPT® codes: 78300, 78305, 78306, 78315) OR
  - SPECT (CPT® codes: 78803, or 78831), OR
  - Nuclear Bone Marrow imaging (CPT® codes: 78102, 78103, or 78104), OR
  - Radiopharmaceutical localization of tumor, inflammatory process, or distribution of radiopharmaceutical agent imaging (CPT® codes: 78800, 78801, 78802, or 78803), OR
  - SPECT/CT (CPT® codes: 78830, or 78832)
  - MRI without contrast of specific painful body areas when plain x-ray and bone scan are insufficient to direct acute individual care decisions.
- Literature suggests MRI may have greater sensitivity for clinically occult lesions than bone scan. Whole-body MRI (CPT® 76498) is medically necessary for CRMO in the following situations:
  - Individuals suspected of having CRMO if characteristic MR findings of CRMO would preclude the need for a biopsy.
    - Characteristic finding include multiple lesions most commonly involving the juxtaphyseal/peri-physeal portions of the tibia and femur, the clavicle and thoracolumbar spine.
  - Every 6-12 months in individuals with an established diagnosis of CRMO to monitor treatment or to evaluate for clinically occult but radiographically active lesions.
  - See: **Whole Body MR Imaging (Preface-5.2)** for additional details.

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Inflammatory Muscle Diseases (PEDMS-10.3)

MSP.MD.0010.3.A
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- A pertinent clinical evaluation including a detailed history, physical examination, and plain x-rays should be performed prior to considering advanced imaging.

Inflammatory Muscle Diseases:

These include but are not limited to dermatomyositis, polymyositis, and sporadic inclusion body myositis. MRI without contrast of a single site is medically necessary in these disorders for the following purposes:

- Selection of biopsy site
- Clinical concern for progression
- Treatment monitoring
- Detection of occult malignancy

Juvenile Dermatomyositis:

Contrary to adult dermatomyositis, juvenile dermatomyositis is very rarely paraneoplastic in nature, and routine screening for occult neoplasm is not medically necessary.

The following are medically necessary for juvenile dermatomyositis:

- MRI without contrast to confirm the diagnosis and thus avoid a biopsy.
- CT without contrast (CPT® 73700) or MRI (CPT® 73718) to follow progressive calcification in muscles
  - Both CT and MRI are rarely indicated concurrently.
- CT Chest (CPT® 71260) and Abdomen and Pelvis (CPT® 74177) with contrast for individuals with palpable lymphadenopathy or hepatosplenomegaly.

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References (PEDMS-10)

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Muscle/Tendon Unit Injuries (PEDMS-11)

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Muscle/Tendon Unit Injuries (PEDMS-11)

MSP.MI.0011.A

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- Muscle and tendon unit injury imaging indications in pediatric individuals are identical to those in the general imaging guidelines. See: **Muscle and Tendon Injuries (MS-11.0)** in the Musculoskeletal Imaging Guidelines.

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Osgood-Schlatter Disease (PEDMS-12)

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Osgood-Schlatter Disease (PEDMS-12)

MSP.OD.0012.A

v1.0.2026

- Osgood-Schlatter Disease is defined as traction apophysitis of the tibial tubercle in skeletally immature individuals. Diagnosis is by clinical examination and x-ray, and treatment is conservative.
- Advanced imaging is not indicated in this disorder.

Background and Supporting Information

- The condition is self-limited and is secondary to repetitive extensor mechanism stress activities, such as jumping and sprinting.

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References (PEDMS-12)

v1.0.2026

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Popliteal (Baker) Cyst (PEDMS-13)

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Popliteal (Baker) Cyst (PEDMS-13)

MSP.PC.0013.A
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Popliteal or Baker cyst in children is a different clinical entity than in adults and is almost never due to intra-articular pathology. These lesions are usually treated conservatively and rarely require surgery.

- Ultrasound (CPT® 76881 or 76882) is the medically necessary initial imaging study.
- MRI without contrast (CPT® 73721) is medically necessary for preoperative planning or if ultrasound is non-diagnostic.

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References (PEDMS-13)

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Slipped Capital Femoral Epiphysis (SCFE) (PEDMS-14)

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Slipped Capital Femoral Epiphysis (SCFE) (PEDMS-14)

MSP.FE.0014.A
v1.0.2026

Slipped capital femoral epiphysis (SCFE) should be considered in young adolescents or preadolescents with groin, anterior thigh, or atraumatic knee pain. Symptoms often include a history of intermittent limp and pain for several weeks or months that are often poorly localized to the thigh, groin, or knee. Any obese adolescent or preadolescent presenting with a history of a limp and thigh, knee, or groin pain for several weeks to one month should be presumed to have a slipped capital femoral epiphysis (SCFE).

Imaging studies:

- Anteroposterior and lateral x-rays (frog leg or cross table lateral) of both hips will confirm or exclude the diagnosis.
  - If clinical suspicion remains after negative plain films, MRI without contrast (CPT® 73721) or without and with contrast (CPT® 73723) is medically necessary to detect widening of the physis before the femoral head is displaced (pre-slip).
- Because a significant percentage of SCFE is bilateral at presentation, it is medically necessary to evaluate the contralateral hip if requested, as some surgeons advocate surgical treatment of pre-slip.
- If MRI was not completed for diagnosis, MRI without contrast (CPT® 73721) is medically necessary for preoperative planning.

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References (PEDMS-14)

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Limb Length Discrepancy (PEDMS-15)

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Limb Length Discrepancy (PEDMS-15)

MSP.LL.0015.A

v1.0.2026

- Limb length discrepancy imaging indications in pediatric individuals are identical to those in the general imaging guidelines. See: **Limb Length Discrepancy (MS-17.0)** in the Musculoskeletal Imaging Guidelines.

Congenital Anomalies of the Foot and Lower Extremity (PEDMS-16)

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Tarsal Coalition (Calcaneonavicular Bar/ Rigid Flat Foot) (PEDMS-16.1)

MPS.CD.0016.1.A

v1.0.2026

- Plain x-rays should be performed initially since the calcaneonavicular bar is readily visible in older children and adults.
  - Talocalcaneal coalition is more difficult to evaluate on plain x-rays.
- CT without contrast (CPT® 73700) or MRI without contrast (CPT® 73718) is medically necessary if tarsal coalition is suspected (because of restricted hindfoot motion on physical exam), and plain x-rays are inconclusive.

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Club Foot (PEDMS-16.2)

MSP.CD.0016.2.A
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Club Foot is a congenital foot contracture with foot in equinus (plantar flexion) and heel and forefoot in varus/adduction (turned in). Immediate diagnosis and specialty evaluation in the first week of life provide the best chance for successful correction.

- Plain x-rays should be performed initially since the anomaly is readily visible in older children and adults.
- Ultrasound (CPT® 76881 or 76882) is medically necessary to characterize the cartilaginous tarsal bones and demonstrate tarsal bone alignment in infants with non-ossified tarsal bones.
- MRI (CPT® 73718) or CT (CPT® 73700) is medically necessary to determine residual deficits following repair.
  - Ultrasound is not required prior to MRI or CT if those studies are appropriate.

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Vertical Talus (PEDMS-16.3)

MSP.CD.0016.3.A

v1.0.2026

- Congenital vertical talus (also known as congenital rocker-bottom foot) is a fixed foot deformity characterized by irreducible talonavicular dislocation. The talus is plantar flexed and does not articulate with the navicular bone.
- Plain x-rays should be performed initially since the anomaly is readily visible in older children and adults.
- MRI (CPT® 73718) or CT (CPT® 73700) are medically necessary to determine residual deficits following repair.

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Femoral Anteversion and Tibial Torsion (PEDMS-16.4)

MSP.CD.0016.4.A
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- Femoral anteversion is a rotational deformity of the femur, which may lead to an in-toeing gait.
- Tibial torsion is a rotational deformity of the tibia that may lead to in-toeing or out-toeing gait, and can be associated with the foot deformities already discussed in **Tarsal Coalition (Calcaneonavicular Bar/Rigid Flat Foot) (PEDMS-16.1)**, **Club Foot (PEDMS-16.2)**, and **Vertical Talus (PEDMS-16.3)**.
- Both deformities are typically diagnosed on clinical examination, but CT Lower Extremity without contrast (CPT® 73700) OR MRI Lower Extremity without contrast (CPT® 73718) is medically necessary for preoperative evaluation.

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References (PEDMS-16)

v1.0.2026

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