National Imaging Associates, Inc.	
Clinical guidelines **LOWER EXTREMITY CT** **(Foot, Ankle, Knee, Leg or Hip CT)**	**Original Date: September 1997**
CPT Codes: 73700, 73701, 73702	**Last Revised Date: May 2023~~March 2022~~**
Guideline Number: NIA_CG_057-2	**Implementation Date: January 2024~~23~~**

GENERAL INFORMATION

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*

INDICATIONS FOR LOWER EXTREMITY CT (FOOT, ANKLE, KNEE, LEG or HIP)
(Plain radiographs must precede CT evaluation)

Some indications are for MRI, CT, or MR or CT Arthrogram. More than one should not be approved at the same time.

If a CT Arthrogram fits approvable criteria below, approve as CT.

Joint or muscle pain without positive findings on an orthopedic exam as listed below and , after x-ray completed[1-3] (does not apply to young children). If MRI contraindicated or cannot be performed or requested as a CT ~~arthogram~~arthrogram~~..~~

- Persistent joint or musculotendinous pain unresponsive to conservative treatment*, within the last 6 months which includes active medical therapy (physical therapy, chiropractic treatments, and/or physician supervised exercise**) of at least four (4) weeks, **OR**
- With progression or worsening of symptoms during the course of conservative treatment

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Joint specific approvable provocative orthopedic examination tests and suspected injuries[4] (If MRI contraindicated or cannot be performed or requested as a CT ~~arthogram~~arthrogram).

Note: With a positive orthopedic sign, an initial x-ray is always preferred, however, it is not required to approve advanced imaging **UNLESS** otherwise specified in **bold** below. Any test that suggests joint instability requires further imaging (list is not all inconclusive)

ANKLE[5-7]

- Syndesmotic injury (high ankle injury) with tenderness to palpation over the syndesmosis (AITFL – anterior inferior tibiofibular ligament) and any of the following:
  - P~~p~~ositive stress x~~X~~-rays ~~OR~~
  - Squeeze test~~, OR~~
  - Cotton test~~, OR~~
  - Dorsiflexion external rotation test.

~~**Joint-specific provocative orthopedic examination** when MRI is contraindicated or cannot be performed (see Table 1)~~

~~**Note**: With a positive orthopedic sign, an initial x-ray is always preferred. However, it is not required to approve advanced imaging.~~

- ~~Ankle~~
- ~~Unstable syndesmotic injury (high ankle injury)~~
  - ~~With inconclusive stress x-rays (a standing CT is preferred)~~
  - ~~Can have positive fibular translation, squeeze or cotton test, but imaging may be needed to confirm diagnosis~~
- ~~Knee[1-7]~~
- ~~Any positive test listed~~
  - ~~McMurray's~~
  - ~~Apley's~~
  - ~~Lachman's~~
  - ~~Anterior or Posterior Drawer sign~~
  - ~~Varus or valgus stress~~
  - ~~Acute mechanical locking of the knee not due to guarding[8]~~
- ~~Hip~~
- ~~Anterior Impingement sign (labral tear)[9-11]~~
- ~~Posterior Impingement sign (labral tear)[12]~~

- Unstable lateral injury to ATFL (anterior talofibular ligament) with suspicion of a possible associated fracture around the ankle or a possible osteochondral injury of the talus **AFTER non-diagnostic or inconclusive x~~X~~-rays** and any ONE of the following:
  - Positive stress x~~X~~-rays ~~OR~~
  - Positive anterior drawer test ~~OR~~
  - Positive posterior drawer test

- Achilles tendon tear
  - Thompson test

KNEE[1, 8-12]

- Anterior cruciate ligament (ACL) Injury
  - Positive testing:
    - Anterior drawer
    - Lachman's
    - Pivot shift test

  OR

- Suspected ACL Rupture - Acute knee injury with physical exam limited by pain and swelling **AFTER initial x-ray completed**[13, 14] ~~47,48~~
  - Based on mechanism of injury, i.e., twisting, blunt force
    - Normal x-ray:
  - Extreme pain, inability to stand, audible pop at time of injury, very swollen joint
  - Abnormal x-ray:
    - Large joint effusion on x-ray knee effusion
- ~~——————————~~Acute mechanical locking of the knee not due to guarding[15]
- Meniscal injury/tear (A positive test is denoted by pain or audible/palpable clunk)~~,~~
  - McMurray's Compression
  - Apley's
  - Thessaly test
- Patellar dislocation (acute or recurrent)
  - P~~p~~ositive patellofemoral apprehension test ~~**OR**~~
  - R~~r~~adiographic findings compatible with a history of patellar dislocation (i.e., lipohemarthrosis or osteochondral fracture)
- Posterior cruciate ligament (PCL) injury
  - Posterior drawer
  - Posterior tibial sag (Godfrey or step-off test)
- Medial collateral ligament tear
  - Positive valgus stress testing/laxity
- Lateral Collateral ligament tear
  - Positive Varus stress testing/laxity

HIP

- Femoroacetabular impingement (FAI)/ Labral tear
  - Anterior Impingement sign (aka FADIR test)[16-18]
  - Posterior Impingement sign (Pain with hip extension and external rotation on exam)[19]

- Persistent hip mechanical symptoms (**after initial radiographs completed)** including clicking, locking, catching, giving way or hip instability with a clinical suspicion of labral tear and/or **radiographic findings** suggestive of FAI (i.e cross over sign/pistol grip deformity) and suspected labral tear
- To determine candidacy for hip preservation surgery for known FAI[20]

NOTE: For evaluation of both hips when the patient meets hip MRI guidelines (x-ray + persistent pain unresponsive to conservative treatment) for both the right and left hip, Pelvis MRI (**NIA_CG_037**) is the preferred study.

- If labral tear is suspected and fulfills above ~~criteria~~criteria, then bilateral hip MRIs are the preferred studies (not Pelvis MRI) ~~OR~~
- If bilateral hip arthrograms are requested and otherwise meet guidelines, bilateral hip MRIs are the preferred studies (not Pelvis MRI)

Tendon Rupture after x~~X~~-r~~R~~ay[21-24] (not listed in above) - If MRI contraindicated or cannot be performed.

- High clinical suspicion of specific tendon rupture based on mechanism of injury and physical findings (i.e., palpable defect in quadriceps or patellar tendon rupture)

~~**Joint or muscle pain without positive findings on an orthopedic exam as listed above,** after x-ray completed and an MRI is contraindicated or cannot be performed (does not apply to young children)[3,13]~~

- ~~Persistent joint or musculotendinous pain unresponsive to conservative treatment*, within the last 6 months which includes active medical therapy (physical therapy, chiropractic treatments, and/or physician-supervised exercise**) of at least four (4) weeks, **OR**~~
- ~~With progression or worsening of symptoms during the course of conservative treatment~~
- ~~Persistent hip mechanical symptoms including clicking, locking, catching, giving way or hip instability with a clinical suspicion of labral tear, with or without clinical findings suggestive of impingement[12,14]~~

Trauma

Bone Fracture (If MRI contraindicated or cannot be performed)

- Hip and f~~F~~emur ~~(If MRI contraindicated or cannot be performed)~~
  - Suspected occult, stress or insufficiency fracture with a negative or non-diagnostic initial x-ray[25]:
    - Approve an immediate CT -if contraindication to MRI or MRI cannot be performed (no follow up radiographs required)
- Non-hip extremities: s~~S~~uspected occult, stress, or insufficiency fracture ~~(If MRI contraindicated or cannot be performed)~~
  - i~~I~~f x-rays, taken 10-14 days after the injury or clinical assessment, are negative or nondiagnostic[26]

- If at high risk for a complete fracture with conservative therapy (e.g., navicular bone), then immediate CT is warranted[27]

- Pathologic or concern for impending fracture on x-ray[28] - approve immediate CT ~~(If MRI contraindicated or cannot be performed.)~~
- Suspected ligamentous/tendon injury with known fractures on x-ray that may require surgery ~~(If MRI contraindicated or cannot be performed.)~~

Fracture Nonunion

Nonunion or delayed union as demonstrated by no healing between two sets of x-rays. If a fracture has not healed by 4-6 months, there is delayed union. Incomplete healing by 6-8 months is nonunion~~**Ankle instability and suspected anterior talofibular ligament rupture** (anterior and posterior drawer tests) as a result of a sprain requires initial active conservative therapy (above) and x-ray~~

-

Osteochondral Lesions (defects, fractures, osteochondritis dissecans) and x-ray done ~~(If MRI contraindicated or cannot be performed)~~ [8, 29-32]

- Clinical suspicion based on mechanism of injury and physical findings

Joint prosthesis/replacement

- Suspected joint prosthesis loosening or dysfunction, (i.e. pseudotumor formation) after initial x-rays [33, 34]
- Suspected metallosis with painful metal on metal hip replacement after initial x-rays
  - After initial x-rays and Cobalt - cChromium levels > 7ppb[35]
  - Abnormal joint aspiration

~~**Non-diagnostic computer assisted prosthesis (i.e. Zimmer or Makoplasty).**~~
~~One exam request is approvable for these indications.~~

~~**Painful acquired or congenital flatfoot deformity in an adult**, after x-ray completed and MRI is contraindicated~~
~~- After failure of active conservative therapy listed above[15,16]~~

Extremity Mass

- Mass or lesion after non-diagnostic x-ray or ultrasound[36] ~~and MRI cannot be performed~~. MRI preferred. CT is better than MRI to evaluate mass calcification or bone involvement and may complement or replace MRI[37]
  - Baker's cyst should be initially evaluated with ultrasound
  - If superficial, then ultrasound is the initial study
  - If deep, then x-ray is the initial study
- Vascular malformations

- After initial evaluation with ultrasound and results will change management or for preoperative planning[38]
  - CTA is also approvable for initial evaluation
- Follow up after treatment/embolization

Known Primary Cancer of the Extremity[39-43]

- Initial ~~Cancer~~ staging primary extremity tumor
- Follow-up of known primary cancer of patient undergoing active treatment within the past year or as per surveillance imaging guidance for that cancer~~Cancer rRestaging~~
- Signs or symptoms or imaging findings suspicious for ~~f~~recurrence
- Suspected metastatic disease with signs/symptoms and after initial imaging with radiographs

Further evaluation of indeterminate or questionable findings on prior imaging and MRI cannot be performed or CT is preferred (~~i.e.~~i.e., tumor matrix):

- For initial evaluation of an inconclusive finding on a prior imaging report (i.e., x-ray, ultrasound, MRI) that requires further clarification.
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam

Osteonecrosis (Avascular necrosis (AVN), Legg-Calve-Perthes Disease) when MRI is contraindicated or cannot be performed[44-46]

- To further characterize a prior abnormal x-ray
  ~~Abnormal x-ray~~
- Normal or indeterminate x-rays but symptomatic and high risk (e.g., glucocorticosteroid use, renal transplant recipient, glycogen storage disease, alcohol abuse,[47] sickle cell anemia[48])
- Known osteonecrosis to evaluate a contralateral joint after initial x-rays

Loose bodies or synovial chondromatosis and after x-ray or ultrasound completed (If MRI contraindicated or cannot be completed)

- In the setting of joint pain or mechanical symptoms[49]

Infection of Bone, ~~or~~ Joint, or Soft tissue abscess[50, 51]

Note: MRI and nuclear medicine studies are recommended for acute infection as they are more sensitive in detecting early changes of osteomyelitis.[52, 53] CT is better at demonstrating findings of chronic osteomyelitis (sequestra, involucrum, cloaca, sinus tracts) as well as detecting soft tissue gas and foreign bodies.[54]

- Abnormal x-ray or ultrasound
- Negative x-ray but with a clinical suspicion of infection
    - Signs and symptoms of joint or bone infection include:
        - Pain and swelling
        - Decrease range of motion
        - Fevers
    - Laboratory findings of infection include any of the following:
        - Elevated ESR or CRP
        - Elevated white blood cell count
        - Positive joint aspiration
- Ulcer (diabetic, pressure, ischemic, traumatic) with signs of infection (redness, warm, swelling, pain, discharge which may range from white to serosanguineous) that is not improving despite treatment and bone or deep infection is suspected[55]
    - Increased suspicion if size or temperature increases, bone is exposed/positive probe-to-bone test, new areas of breakdown, new smell[56]
- Neuropathic foot with friable or discolored granulation tissue, foul odor, non-purulent discharge, and delayed wound healing[57]

Pre-operative/procedural evaluation

- Pre-operative evaluation for a planned surgery or procedure

Post-operative/procedural evaluation

- When imaging, physical, or laboratory findings indicate joint infection, delayed or non-healing, or other surgical/procedural complications
~~Joint prosthesis loosening or dysfunction, x-rays non-diagnostic[67,68]~~
- Trendelenburg sign or other indication of muscle or nerve damage after recent hip surgery

~~**Osteonecrosis (Avascular necrosis (AVN), Legg-Calve-Perthes Disease)** when MRI is contraindicated or cannot be performed[32-34]~~

~~- Abnormal x-ray~~
~~- Normal or indeterminate x-rays but symptomatic and high risk (e.g., glucocorticosteroid use, renal transplant recipient, glycogen storage disease, alcohol abuse,[35] sickle cell anemia[36])~~

For evaluation of known or suspected autoimmune disease (e.g., rheumatoid arthritis) and MRI is contraindicated or cannot be performed[58]

- Further evaluation of an abnormality or non-diagnostic findings on prior imaging
- Initial imaging of a single joint for diagnosis or response to therapy after plain films and appropriate lab tests (e.g., RF, ANA, CRP, ESR)

- To determine change in treatment or when diagnosis is uncertain prior to start of treatment
- Follow-up to determine treatment efficacy of the following:
    - ~~e~~Early rheumatoid arthritis
    - ~~Follow-up to determine treatment efficacy of a~~Advanced rheumatoid arthritis if x-ray and ultrasound are equivocal or non-contributory

Known or suspected inflammatory myopathies (If MRI contraindicated or cannot be performed): (Includes polymyositis, dermatomyositis, immune-mediated necrotizing myopathy, inclusion body myositis)[59, 60]

- For diagnosis
- For biopsy planning

Crystalline Arthropathy

- Dual-energy CT can be used to characterize crystal deposition disease~~, such as~~ (i.e., gout) ~~versus CPPD~~ after
    - ~~a~~Appropriate rheumatological work up ~~and~~and initial x-rays AND
    - After inconclusive joint aspiration or when joint aspiration cannot be performed OR[61]
    - In the setting of extra-articular crystal deposits (i.e., tendons or bursa)

Peripheral Nerve Entrapment (e.g., tarsal tunnel, Morton's neuroma) and MRI is contraindicated or cannot be performed, including any of the following[62-65]

- Abnormal Electromyogram or Nerve conduction study
- Abnormal x-ray or ultrasound
- Clinical suspicion and failed 4 weeks conservative treatment including at least 2 of the following (active treatment with physical therapy is not required):
    - Activity modification
    - Rest, ice, or heat
    - Splinting or orthotics
    - Medication

Leg length discrepancy

- CT scanogram [66, 67] ~~(one code will cover both extremities - CPT code 77073)~~

~~**Trauma**~~

~~**Bone Fracture**~~

- ~~Suspected stress or insufficiency fracture with a negative initial x-ray[39-41].~~

- If hips and MRI cannot be done
- Non-hip extremities: if x-rays, taken 10-14 days after the injury or clinical assessment, are negative or nondiagnostic[42]
- If at high risk for a complete fracture with conservative therapy (e.g., navicular bone) and MRI cannot be performed[43]

- Suspected acute hip fracture with initial x-rays negative or non-diagnostic[11,44]
- Intra-articular fractures that may require surgery (i.e., depressed tibial plateau fracture)[45]
- Nonunion or delayed union as demonstrated by no healing between two sets of x-rays. If a fracture has not healed by 4-6 months, there is delayed union. Incomplete healing by 6-8 months is nonunion[46,47]

Tendon or Muscle Rupture after X-Ray and MRI is contraindicated or cannot be performed[48-50]
- Clinical suspicion based on mechanism of injury and physical findings

Suspected ACL Rupture - Acute knee injury with physical exam limited by pain and swelling with x-ray completed (Wheeless, 2018) if MRI is contraindicated[6]
- Inability to perform because of pain and swelling should be considered a red flag
- Suspicion should be based on mechanism of injury, i.e., twisting, blunt force
- Normal x-ray:
  - Extreme pain, inability to stand, audible pop at time of injury, very swollen joint, leg numbness
- Abnormal x-ray:
  - Large joint effusion on x-ray knee effusion[51]

Osteochondral Lesions (defects, fractures, osteochondritis dissecans) and x-ray done (if MRI contraindicated or cannot be done)[6,52-55]
- Clinical suspicion based on mechanism of injury and physical findings

Foreign Body[68]

- Indeterminate x-ray and ultrasound

Painful acquired or congenital flatfoot deformity in an adult, after x-ray completed and MRI is contraindicated or cannot be performed.

- After failure of active conservative therapy listed above[69, 70]

Loose bodies or synovial chondromatosis seen on x-ray or ultrasound
- In the setting of joint pain[57]

Peripheral Nerve Entrapment (e.g., tarsal tunnel, Morton's neuroma) and MRI is contraindicated, including any of the following[58-61]
  - Abnormal Electromyogram or Nerve conduction study

- ~~Abnormal x-ray or ultrasound~~
- ~~Clinical suspicion and failed 4 weeks conservative treatment including at least 2 of the following (active treatment with physical therapy is not required):~~
    - ~~Activity modification~~
    - ~~Rest, ice, or heat~~
    - ~~Splinting or orthotics~~
    - ~~Medication~~

Pediatrics

- ~~**Note**: Leg length discrepancy – the literature indicates that standing plain film x-rays are preferred, but there are some advantages to using a CT scanogram instead and may be preferred[62,63]~~
- Osteoid Osteoma after an x-ray is done[71]
- Painful flatfoot (p~~P~~es planus) deformity with suspected tarsal coalition, not responsive to active conservative care[72]
    - When MRI cannot be ~~performed;~~performed~~,~~ ~~**OR**~~
    - Extra-articular coalition is suspected (bony bridges around the joints)~~;~~ ~~**OR**~~
    - ~~When needed for surgical planning[73]~~
    - ~~Slipped Capital Femoral Epiphysis and Chronic Recurrent Multifocal Osteomyelitis – MRI is the appropriate modality, rather than CT~~
    -

~~Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines, and state/national recommendations.~~ ~~**Pre-operative/procedural evaluation**~~

- ~~Pre-operative evaluation for a planned surgery or procedure~~

~~**Post-operative/procedural evaluation**~~

- ~~When imaging, physical, or laboratory findings indicate joint infection, delayed or non-healing, or other surgical/procedural complications~~
- ~~Joint prosthesis loosening or dysfunction, x-rays non-diagnostic[67,68]~~
- ~~Trendelenburg sign or other indication of muscle or nerve damage after recent hip surgery~~

~~Table 1: Positive Orthopedic Joint Tests, Lower Extremity~~

~~ANKLE~~

- ~~Fibular translation~~
- ~~Squeeze~~
- ~~Cotton~~
- ~~Thompson~~
- ~~Thumb squeeze test~~
- ~~Mulder click~~

~~HIP~~

~~KNEE~~

- ~~Anterior draw~~
- ~~Pivot Shift Test~~
- ~~Lachman~~
- ~~Posterior tibial Sag~~
- ~~Posterior Draw~~
- ~~McMurray's Test~~
- ~~Valgus stress~~
- ~~Varus stress~~
- ~~Ege~~

BACKGROUND

Plain radiographs are typically used as the first-line modality for assessment of lower extremity conditions. Computed tomography (CT) is used for evaluation of tumors, metastatic lesions, infection, fractures, and other problems. Magnetic resonance imaging (MRI) is the first-line choice for imaging of many conditions, but CT may be used in these cases if MRI is contraindicated or unable to be performed.

OVERVIEW

***Conservative Therapy** – (musculoskeletal) should include a multimodality approach consisting of a combination of active and inactive components. Inactive components such as rest, ice, heat, modified activities, medical devices (such as crutches, immobilizer, metal braces, orthotics, rigid stabilizer, or splints, etc. and not to include neoprene sleeves), medications, injections (bursal, and/or joint, not including trigger point), and diathermy, can be utilized. Active modalities may consist of physical therapy, a physician-supervised home exercise program**, and/or chiropractic care.

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

- Information provided on exercise prescription/plan AND
- Follow up with member with information provided regarding completion of HEP (after suitable 4-week period), or inability to complete HEP due to physical reason- i.e., increased pain, inability to physically perform exercises. (Patient inconvenience or noncompliance without explanation does not constitute "inability to complete" HEP).

Joint Implants and Hardware – Dual-energy CT may be useful for metal artifact reduction if available but is also imperfect as the correction is based on a projected approximation of x-ray absorption, and it does not correct for scatter.[74] Dual-energy CT can be used to characterize crystal deposition disease, such as gout versus CPPD (calcium pyrophosphate deposition).[61]

~~**CT and Ankle Fractures –** One of the most frequently injured areas of the skeleton is the ankle. These injuries may include ligament sprains, as well as fractures. A suspected fracture is first imaged with conventional radiographs in anteroposterior, internal oblique and lateral projections. CT is used in patients with complex ankle and foot fractures after radiography.~~

~~**CT and Hip Trauma –** Computed tomography is primarily used to evaluate acute trauma, e.g., acetabular fracture or hip dislocation. It can detect intraarticular fragments and associated articular surface fractures, and it is useful in surgical planning.~~

~~**CT and Knee Fractures –** CT is used after plain films to evaluate fractures to the tibial plateau. These fractures occur just below the knee joint, involving the cartilage surface of the knee. Soft tissue injuries are usually associated with the fractures. The meniscus is a stabilizer of the knee, and it is very important to detect meniscal injury in patients with tibial plateau fractures. CT of the knee with two-dimensional reconstruction in the sagittal and coronal planes may be performed for evaluation of injuries with multiple fragments and comminuted fractures. Spiral CT has an advantage of rapid acquisition and reconstruction times and may improve the quality of images of bone. Soft tissue injuries are better demonstrated with MRI.~~

~~**CT and Knee Infections –** CT is used to depict early infection which may be evidenced by increased intraosseous density or the appearance of fragments of necrotic bone separated from living bone by soft tissue or fluid density. Contrast-enhanced CT may help in the visualization of abscesses and necrotic tissue.~~

~~**CT and Knee Tumors –** CT complements arthrography in diagnosing necrotic malignant soft-tissue tumors and other cysts and masses in the knee. Meniscal and ganglion cysts are palpable masses around the knee. CT is useful in evaluations of the vascular nature of lesions.~~

~~**CT and Legg-Calve-Perthes Disease (LPD) –** This childhood condition is associated with an insufficient blood supply to the femoral head which is then at risk for osteonecrosis. Clinical~~

~~signs of LPD include a limp with groin, thigh, or knee pain. Flexion and adduction contractures may develop as the disease progresses and eventually movement may only occur in the flexion-extension plane. This condition is staged based on plain radiographic findings. CT scans are used in the evaluation of LPD and can demonstrate changes in the bone trabecular pattern. They also allow diagnosis of bone collapse and sclerosis early in the disease where plain radiography is not as sensitive.~~

CT and Osteolysis – Since computed tomography scans show both the extent and the location of lytic lesions, they are useful to guide treatment decisions, as well as to assist in planning for surgical intervention when needed, in patients with suspected osteolysis after Total Hip Arthroplasty (THA).

~~**CT and Tarsal Coalition –** This is a congenital condition in which two or more bones in the mid-foot or hind-foot are joined. It usually presents during late childhood or late adolescence and is associated with repetitive ankle sprains. Mild pain, deep in the subtalar joint and limited range of motion are clinical symptoms. Tarsal coalition is detectable on oblique radiographs, but these are not routinely obtained at many institutions. Clinical diagnosis is not simple; it requires the expertise of skilled examiners. CT is valuable in diagnosing tarsal coalition because it allows differentiation of osseous from non-osseous coalitions and depicts the extent of joint involvement as well as degenerative changes. It may also detect the overgrowth of the medial aspect of the talus that may be associated with talocalcaneal coalitions.~~

American Academy of Pediatrics "Choosing Wisely" Guidelines advise against ordering advanced imaging studies (MRI or CT) for most musculoskeletal conditions in a child until all appropriate clinical, laboratory and plain radiographic examinations have been completed. **"**History, physical examination, and appropriate radiographs remain the primary diagnostic modalities in pediatric orthopedics, as they are both diagnostic and prognostic for the great majority of pediatric musculoskeletal conditions. Examples of such conditions would include, but not be limited to, the work up of injury or pain (spine, knees and ankles), possible infection, and deformity. MRI examinations and other advanced imaging studies frequently require sedation in the young child (5 years old or less) and may not result in appropriate interpretation if clinical correlations cannot be made. Many conditions require specific MRI sequences or protocols best ordered by the specialist who will be treating the patient…if you believe findings warrant additional advanced imaging, discuss with the consulting orthopedic surgeon to make sure the optimal studies are ordered."[75]

~~**POLICY HISTORY**~~

~~**Date**~~	~~**Summary**~~
~~January 2023~~	~~Updated orthopedic signs~~ ~~Added~~ ~~Wwhen contraindicated to MRI where appropriate~~ ~~Added Mmetallosis~~

	~~Evaluation of indeterminate findings on imaging reports~~ ~~Non-diagnostic imaging~~ ~~CPT code for leg length~~ ~~Statement regarding clinical indications not addressed in the guideline~~ ~~Clarified hip versus pelvis imaging~~ ~~Added evaluation of indeterminate findings on imaging reports~~ ~~Added non-diagnostic imaging~~ ~~Added cpt code for leg length~~ ~~Updated DECT~~ ~~Modified~~ ~~Rreferences.~~ ~~Modified Bbackground section~~
~~March 2022~~	• ~~Clarification of language for non-hip stress fractures~~ • ~~Deleted Thessaly sign based on updated literature~~
~~May 2021~~	• ~~Added unstable syndesmotic injury~~ • ~~Removed ankle instability~~ • ~~Added the following: navicular bone to high risk stress fracture, information about suspected bone infection in the setting of ulcers and neuropathy and following treatment for rheumatoid arthritis~~ • ~~Clarified that pre-operative imaging is for *a planned surgery or procedure*~~ • ~~Removed *CT or MRI requests are *not* approvable for the following total knee arthroplasty (TKA) procedures:~~ ○ ~~Procedures utilizing computer-navigated or patient-specific or gender-specific instrumentation (Johnson, 2011)~~ ○ ~~Bicompartmental arthroplasty (investigational at this time) (Dudhniwala, 2016)~~ ○ ~~**Note**: Robot-assisted TKA (Makoplasty) (Banerjee, 2015; Nair, 2014)~~ ~~These surgical procedures are not considered a covered service and are not reimbursable based on lack of current scientific evidence for clinically important improvement, safety or efficacy; or based on scientific evidence of increased risk of serious complications.~~ • ~~Included early complications of hip surgery to the post operative evaluation list~~
~~May 2020~~	• ~~Expanded orthopedic signs listing and moved to the top~~

	• ~~Added note: With a positive orthopedic sign, an initial x-ray is always preferred. However, it is not required to approve advanced imaging.~~ • ~~Added labral tear/posterior impingement to approvable list~~ • ~~Added flatfoot deformity~~ • ~~Expanded section about initial work-up of a mass~~ • ~~Added the National Comprehensive Care Network as a reference for imaging guidance~~ • ~~Expanded the section on osteomyelitis~~ • ~~Added section on crystalline arthropathy~~ • ~~Revised the section on non or delayed union~~ • ~~Added a section on loose bodies and synovial chondromatosis~~ • ~~Added a pediatric section~~ • ~~Removed Makoplasty from not approvable list~~ • ~~Added a section about joint implants and hardware to the background section~~ • ~~Updated references~~
~~May 2019~~	• ~~Reformatting in parallel with the new LE MRI. Updated references~~ • ~~Added indication: peripheral nerve entrapment~~ • ~~Criteria for approval of existing indications specified within the parameters of the current evidence base~~ • ~~Added initial statement about approvals: 'Some indications are for MRI, CT, or MR or CT Arthrogram. More than one should not be approved at the same time'.~~ • ~~Added Extremity mass indications including peripheral lymphadenopathy; and mass with increased risk for malignancy~~ • ~~Modified Known Cancer indication to be more broad – 'cancer staging, cancer restaging, signs or symptoms of recurrence'~~ • ~~Expanded section for infection of bone or joint to include list of signs or symptoms and laboratory findings (elevated ESR or CRP, elevated white blood cell count, positive joint aspiration)~~

REFERENCES

1. Katz JN, Brophy RH, Chaisson CE, et al. Surgery versus physical therapy for a meniscal tear and osteoarthritis. *N Engl J Med*. May 2 2013;368(18):1675-84. doi:10.1056/NEJMoa1301408
2. Mordecai SC, Al-Hadithy N, Ware HE, Gupte CM. Treatment of meniscal tears: An evidence based approach. *World J Orthop*. Jul 18 2014;5(3):233-41. doi:10.5312/wjo.v5.i3.233
3. American College of Radiology. ACR Appropriateness Criteria® Chronic Foot Pain. American College of Radiology (ACR). Updated 2020. Accessed Janaury 23, 2023. https://acsearch.acr.org/docs/69424/Narrative/
4. Fox MG, Chang EY, Amini B, et al. ACR Appropriateness Criteria(®) Chronic Knee Pain. *J Am Coll Radiol*. Nov 2018;15(11s):S302-s312. doi:10.1016/j.jacr.2018.09.016
5. Chen ET, Borg-Stein J, McInnis KC. Ankle Sprains: Evaluation, Rehabilitation, and Prevention. *Curr Sports Med Rep*. Jun 2019;18(6):217-223. doi:10.1249/jsr.0000000000000603
6. Scillia AJ, Pierce TP, Issa K, et al. Low Ankle Sprains: A Current Review of Diagnosis and Treatment. *Surg Technol Int*. Jul 25 2017;30:411-414.
7. Petersen W, Rembitzki IV, Koppenburg AG, et al. Treatment of acute ankle ligament injuries: a systematic review. *Arch Orthop Trauma Surg*. Aug 2013;133(8):1129-41. doi:10.1007/s00402-013-1742-5
8. American College of Radiology. ACR Appropriateness Criteria® Acute Trauma to the Knee. American College of Radiology (ACR). Updated 2019. Accessed January 23, 2023. https://acsearch.acr.org/docs/69419/Narrative/
9. Doral MN, Bilge O, Huri G, Turhan E, Verdonk R. Modern treatment of meniscal tears. *EFORT Open Rev*. May 2018;3(5):260-268. doi:10.1302/2058-5241.3.170067
10. Mohankumar R, White LM, Naraghi A. Pitfalls and pearls in MRI of the knee. *AJR Am J Roentgenol*. Sep 2014;203(3):516-30. doi:10.2214/ajr.14.12969
11. Smith BE, Thacker D, Crewesmith A, Hall M. Special tests for assessing meniscal tears within the knee: a systematic review and meta-analysis. *Evid Based Med*. Jun 2015;20(3):88-97. doi:10.1136/ebmed-2014-110160
12. Smoak JB, Matthews JR, Vinod AV, Kluczynski MA, Bisson LJ. An Up-to-Date Review of the Meniscus Literature: A Systematic Summary of Systematic Reviews and Meta-analyses. *Orthop J Sports Med*. Sep 2020;8(9):2325967120950306. doi:10.1177/2325967120950306
13. Cecava ND, Dieckman S, Banks KP, Mansfield LT. Traumatic knee injury: correlation of radiographic effusion size with the presence of internal derangement on magnetic resonance imaging. *Emerg Radiol*. Oct 2018;25(5):479-487. doi:10.1007/s10140-018-1605-z
14. Wheeless CR, Nunley JA, Urbaniak JR, Duke University Medical Center's Division of Orthopedic Surgery, . *Wheeless' textbook of orthopaedics*. Data Trace Internet Publishing, LLC; 2016. Updated 2018. http://www.wheelessonline.com/
15. Hussin P, Mawardi M, Nizlan NM. The 'Chalky Culprit' of acute locked knee. *G Chir*. Sep-Oct 2014;35(9-10):239-40.
16. Hananouchi T, Yasui Y, Yamamoto K, Toritsuka Y, Ohzono K. Anterior impingement test for labral lesions has high positive predictive value. *Clin Orthop Relat Res*. Dec 2012;470(12):3524-9. doi:10.1007/s11999-012-2450-0

17. Naraghi A, White LM. MRI of Labral and Chondral Lesions of the Hip. *AJR Am J Roentgenol*. Sep 2015;205(3):479-90. doi:10.2214/ajr.14.12581
18. American College of Radiology. ACR Appropriateness Criteria® Acute Hip Pain-Suspected Fracture. American College of Radiology. Updated 2018. Accessed Janaury 23, 2023. https://acsearch.acr.org/docs/3082587/Narrative/
19. Groh MM, Herrera J. A comprehensive review of hip labral tears. *Curr Rev Musculoskelet Med*. Jun 2009;2(2):105-17. doi:10.1007/s12178-009-9052-9
20. Li AE, Jawetz ST, Greditzer HGt, Burge AJ, Nawabi DH, Potter HG. MRI for the preoperative evaluation of femoroacetabular impingement. *Insights Imaging*. Apr 2016;7(2):187-98. doi:10.1007/s13244-015-0459-0
21. Wilkins R, Bisson LJ. Operative versus nonoperative management of acute Achilles tendon ruptures: a quantitative systematic review of randomized controlled trials. *Am J Sports Med*. Sep 2012;40(9):2154-60. doi:10.1177/0363546512453293
22. Rubin DA. Imaging diagnosis and prognostication of hamstring injuries. *AJR Am J Roentgenol*. Sep 2012;199(3):525-33. doi:10.2214/ajr.12.8784
23. Peck J, Gustafson K, Bahner D. Diagnosis of Achilles tendon rupture with ultrasound in the emergency department setting. Images in Academic Medicine: Republication. *International Journal of Academic Medicine*. May 1, 2017 2017;3(3):205-207. doi:10.4103/ijam.Ijam_16_17
24. Garras DN, Raikin SM, Bhat SB, Taweel N, Karanjia H. MRI is unnecessary for diagnosing acute Achilles tendon ruptures: clinical diagnostic criteria. *Clin Orthop Relat Res*. Aug 2012;470(8):2268-73. doi:10.1007/s11999-012-2355-y
25. Bencardino JT, Stone TJ, Roberts CC, et al. ACR Appropriateness Criteria(®) Stress (Fatigue/Insufficiency) Fracture, Including Sacrum, Excluding Other Vertebrae. *J Am Coll Radiol*. May 2017;14(5s):S293-s306. doi:10.1016/j.jacr.2017.02.035
26. Uthgenannt BA, Kramer MH, Hwu JA, Wopenka B, Silva MJ. Skeletal self-repair: stress fracture healing by rapid formation and densification of woven bone. *J Bone Miner Res*. Oct 2007;22(10):1548-56. doi:10.1359/jbmr.0070614
27. Kellar J, Givertz A, Mathias J, Cohen J. Bisphosphonate-related Femoral Shaft Fracture. *Clin Pract Cases Emerg Med*. Feb 2020;4(1):62-64. doi:10.5811/cpcem.2019.10.45007
28. Fayad LM, Kawamoto S, Kamel IR, et al. Distinction of long bone stress fractures from pathologic fractures on cross-sectional imaging: how successful are we? *AJR Am J Roentgenol*. Oct 2005;185(4):915-24. doi:10.2214/ajr.04.0950
29. Mintz DN, Roberts CC, Bencardino JT, et al. ACR Appropriateness Criteria(®) Chronic Hip Pain. *J Am Coll Radiol*. May 2017;14(5s):S90-s102. doi:10.1016/j.jacr.2017.01.035
30. Smith TO, Drew BT, Toms AP, Donell ST, Hing CB. Accuracy of magnetic resonance imaging, magnetic resonance arthrography and computed tomography for the detection of chondral lesions of the knee. *Knee Surg Sports Traumatol Arthrosc*. Dec 2012;20(12):2367-79. doi:10.1007/s00167-012-1905-x
31. van Bergen CJ, van den Ende KI, Ten Brinke B, Eygendaal D. Osteochondritis dissecans of the capitellum in adolescents. *World J Orthop*. Feb 18 2016;7(2):102-8. doi:10.5312/wjo.v7.i2.102

32. van Dijk CN, Reilingh ML, Zengerink M, van Bergen CJ. Osteochondral defects in the ankle: why painful? *Knee Surg Sports Traumatol Arthrosc*. May 2010;18(5):570-80. doi:10.1007/s00167-010-1064-x
33. Fritz J, Lurie B, Potter HG. MR Imaging of Knee Arthroplasty Implants. *Radiographics*. Sep-Oct 2015;35(5):1483-501. doi:10.1148/rg.2015140216
34. Fritz J, Lurie B, Miller TT, Potter HG. MR imaging of hip arthroplasty implants. *Radiographics*. Jul-Aug 2014;34(4):E106-32. doi:10.1148/rg.344140010
35. Hart AJ, Sabah SA, Bandi AS, et al. Sensitivity and specificity of blood cobalt and chromium metal ions for predicting failure of metal-on-metal hip replacement. *The Journal of Bone & Joint Surgery British Volume*. 2011;93-B(10):1308-1313. doi:10.1302/0301-620x.93b10.26249
36. Kransdorf MJ, Murphey MD, Wessell DE, et al. ACR Appropriateness Criteria(®) Soft-Tissue Masses. *J Am Coll Radiol*. May 2018;15(5s):S189-s197. doi:10.1016/j.jacr.2018.03.012
37. Subhawong TK, Fishman EK, Swart JE, Carrino JA, Attar S, Fayad LM. Soft-tissue masses and masslike conditions: what does CT add to diagnosis and management? *AJR Am J Roentgenol*. Jun 2010;194(6):1559-67. doi:10.2214/ajr.09.3736
38. American College of Radiology. ACR Appropriateness Criteria® Clinically Suspected Vascular Malformation of the Extremities. American College of Radiology. Updated 2019. Accessed March 30, 2023. https://acsearch.acr.org/docs/3102393/Narrative/
39. American College of Radiology. ACR Appropriateness Criteria® Primary Bone Tumors. American College of Radiology. Updated 2019. Accessed January 23, 2023. https://acsearch.acr.org/docs/69421/Narrative/
40. American College of Radiology. ACR Appropriateness Criteria® Malignant or Aggressive Primary Musculoskeletal Tumor-Staging And Surveillance. American College of Radiology. Updated 2022. Accessed January 23, 2023. https://acsearch.acr.org/docs/69428/Narrative/
41. Holzapfel K, Regler J, Baum T, et al. Local Staging of Soft-Tissue Sarcoma: Emphasis on Assessment of Neurovascular Encasement-Value of MR Imaging in 174 Confirmed Cases. *Radiology*. May 2015;275(2):501-9. doi:10.1148/radiol.14140510
42. Kircher MF, Willmann JK. Molecular body imaging: MR imaging, CT, and US. Part II. Applications. *Radiology*. Aug 2012;264(2):349-68. doi:10.1148/radiol.12111703
43. NCCN Imaging Appropriate Use Criteria™. National Comprehensive Cancer Network (NCCN). Accessed January 23, 2023. https://www.nccn.org/professionals/imaging/default.aspx
44. Felten R, Perrin P, Caillard S, Moulin B, Javier RM. Avascular osteonecrosis in kidney transplant recipients: Risk factors in a recent cohort study and evaluation of the role of secondary hyperparathyroidism. *PLoS One*. 2019;14(2):e0212931. doi:10.1371/journal.pone.0212931
45. Murphey MD, Foreman KL, Klassen-Fischer MK, Fox MG, Chung EM, Kransdorf MJ. From the radiologic pathology archives imaging of osteonecrosis: radiologic-pathologic correlation. *Radiographics*. Jul-Aug 2014;34(4):1003-28. doi:10.1148/rg.344140019
46. American College of Radiology. ACR Appropriateness Criteria® Osteonecrosis. American College of Radiology. Updated 2022. Accessed January 23, 2023. https://acsearch.acr.org/docs/69420/Narrative/

47. Fukushima W, Fujioka M, Kubo T, Tamakoshi A, Nagai M, Hirota Y. Nationwide epidemiologic survey of idiopathic osteonecrosis of the femoral head. *Clin Orthop Relat Res*. Oct 2010;468(10):2715-24. doi:10.1007/s11999-010-1292-x
48. Wali Y, Almaskari S. Avascular Necrosis of the Hip in Sickle Cell Disease in Oman: Is it serious enough to warrant bone marrow transplantation? *Sultan Qaboos Univ Med J*. Feb 2011;11(1):127-8.
49. Rajani R, Quinn RH, Fischer SJ. Synovial Chondromatosis. American Academy of Orthopaedic Surgeons (AAOS). Updated January 2022. Accessed January 23, 2023. https://orthoinfo.aaos.org/en/diseases--conditions/synovial-chondromatosis
50. Dodwell ER. Osteomyelitis and septic arthritis in children: current concepts. *Curr Opin Pediatr*. Feb 2013;25(1):58-63. doi:10.1097/MOP.0b013e32835c2b42
51. Glaudemans A, Jutte PC, Cataldo MA, et al. Consensus document for the diagnosis of peripheral bone infection in adults: a joint paper by the EANM, EBJIS, and ESR (with ESCMID endorsement). *Eur J Nucl Med Mol Imaging*. Apr 2019;46(4):957-970. doi:10.1007/s00259-019-4262-x
52. Mandell JC, Khurana B, Smith JT, Czuczman GJ, Ghazikhanian V, Smith SE. Osteomyelitis of the lower extremity: pathophysiology, imaging, and classification, with an emphasis on diabetic foot infection. *Emerg Radiol*. Apr 2018;25(2):175-188. doi:10.1007/s10140-017-1564-9
53. American College of Radiology. ACR Appropriateness Criteria® Suspected Osteomyelitis, Septic Arthritis, or Soft Tissue Infection (Excluding Spine and Diabetic Foot). American College of Radiology (ACR). Updated 2022. Accessed January 23, 2023. https://acsearch.acr.org/docs/3094201/Narrative/
54. Fayad LM, Carrino JA, Fishman EK. Musculoskeletal infection: role of CT in the emergency department. *Radiographics*. Nov-Dec 2007;27(6):1723-36. doi:10.1148/rg.276075033
55. Walker EA, Beaman FD, Wessell DE, et al. ACR Appropriateness Criteria® Suspected Osteomyelitis of the Foot in Patients With Diabetes Mellitus. *J Am Coll Radiol*. Nov 2019;16(11s):S440-s450. doi:10.1016/j.jacr.2019.05.027
56. Bowers S, Franco E. Chronic Wounds: Evaluation and Management. *Am Fam Physician*. Feb 1 2020;101(3):159-166.
57. Pitocco D, Spanu T, Di Leo M, et al. Diabetic foot infections: a comprehensive overview. *Eur Rev Med Pharmacol Sci*. Apr 2019;23(2 Suppl):26-37. doi:10.26355/eurrev_201904_17471
58. Colebatch AN, Edwards CJ, Østergaard M, et al. EULAR recommendations for the use of imaging of the joints in the clinical management of rheumatoid arthritis. *Ann Rheum Dis*. Jun 2013;72(6):804-14. doi:10.1136/annrheumdis-2012-203158
59. Jia Y, Tian H, Deng J, Yu K. Multimodal imaging for the clinical assessment of dermatomyositis and polymyositis: A systematic review. *Radiology of Infectious Diseases*. 2017/06/01/ 2017;4(2):81-87. doi:https://doi.org/10.1016/j.jrid.2017.01.003
60. Joyce NC, Oskarsson B, Jin LW. Muscle biopsy evaluation in neuromuscular disorders. *Phys Med Rehabil Clin N Am*. Aug 2012;23(3):609-31. doi:10.1016/j.pmr.2012.06.006
61. Chou H, Chin TY, Peh WC. Dual-energy CT in gout - A review of current concepts and applications. *J Med Radiat Sci*. Mar 2017;64(1):41-51. doi:10.1002/jmrs.223

62. Domkundwar S, Autkar G, Khadilkar SV, Virarkar M. Ultrasound and EMG-NCV study (electromyography and nerve conduction velocity) correlation in diagnosis of nerve pathologies. *J Ultrasound*. Jun 2017;20(2):111-122. doi:10.1007/s40477-016-0232-3
63. Dong Q, Jacobson JA, Jamadar DA, et al. Entrapment neuropathies in the upper and lower limbs: anatomy and MRI features. *Radiol Res Pract*. 2012;2012:230679. doi:10.1155/2012/230679
64. Donovan A, Rosenberg ZS, Cavalcanti CF. MR imaging of entrapment neuropathies of the lower extremity. Part 2. The knee, leg, ankle, and foot. *Radiographics*. Jul-Aug 2010;30(4):1001-19. doi:10.1148/rg.304095188
65. Tos P, Crosio A, Pugliese P, Adani R, Toia F, Artiaco S. Painful scar neuropathy: principles of diagnosis and treatment. *Plastic and Aesthetic Research*. 2015;2:156-164. doi:10.4103/2347-9264.160878
66. Guggenberger R, Pfirrmann CW, Koch PP, Buck FM. Assessment of lower limb length and alignment by biplanar linear radiography: comparison with supine CT and upright full-length radiography. *AJR Am J Roentgenol*. Feb 2014;202(2):W161-7. doi:10.2214/ajr.13.10782
67. Sabharwal S, Kumar A. Methods for assessing leg length discrepancy. *Clin Orthop Relat Res*. Dec 2008;466(12):2910-22. doi:10.1007/s11999-008-0524-9
68. Laya BF, Restrepo R, Lee EY. Practical Imaging Evaluation of Foreign Bodies in Children: An Update. *Radiol Clin North Am*. Jul 2017;55(4):845-867. doi:10.1016/j.rcl.2017.02.012
69. Abousayed MM, Alley MC, Shakked R, Rosenbaum AJ. Adult-Acquired Flatfoot Deformity: Etiology, Diagnosis, and Management. *JBJS Rev*. Aug 2017;5(8):e7. doi:10.2106/jbjs.Rvw.16.00116
70. Thorpe SW, Wukich DK. Tarsal coalitions in the adult population: does treatment differ from the adolescent? *Foot Ankle Clin*. Jun 2012;17(2):195-204. doi:10.1016/j.fcl.2012.03.004
71. Iyer RS, Chapman T, Chew FS. Pediatric bone imaging: diagnostic imaging of osteoid osteoma. *AJR Am J Roentgenol*. May 2012;198(5):1039-52. doi:10.2214/ajr.10.7313
72. Bouchard M, Mosca VS. Flatfoot deformity in children and adolescents: surgical indications and management. *J Am Acad Orthop Surg*. Oct 2014;22(10):623-32. doi:10.5435/jaaos-22-10-623
73. Glaser C. Tarsal Coalitions: A Practical Approach to a Not-So-Rare Entity. *J Belg Soc Radiol*. 2016;100(1):104. doi:10.5334/jbr-btr.1224
74. Boas FE, Fleischmann D. CT artifacts: Causes and reduction techniques. *Imaging Med*. 2012;4(2):229-40.
75. American Academy of Pediatrics. Five things physicians and patients should question: Do not order advanced imaging studies (MRI or CT) for most musculoskeletal conditions in a child until all appropriate clinical, laboratory and plain radiographic examinations have been completed. Choosing Wisely Initiative ABIM Foundation. Updated February 12, 2018. Accessed January 23, 2023. https://www.choosingwisely.org/clinician-lists/aap-posna-mri-or-ct-for-musculoskeletal-conditions-in-children/

~~ADDITIONAL RESOURCES~~

1. Dommett RM, Redaniel MT, Stevens MC, Hamilton W, Martin RM. Features of cancer in teenagers and young adults in primary care: a population-based nested case-control study. *Br J Cancer*. Jun 11 2013;108(11):2329-33. doi:10.1038/bjc.2013.191
2. Fox MG, Graham JA, Skelton BW, et al. Prospective Evaluation of Agreement and Accuracy in the Diagnosis of Meniscal Tears: MR Arthrography a Short Time After Injection Versus CT Arthrography After a Moderate Delay. *AJR Am J Roentgenol*. Jul 2016;207(1):142-9. doi:10.2214/ajr.15.14517
3. Gaddey HL, Riegel AM. Unexplained Lymphadenopathy: Evaluation and Differential Diagnosis. *Am Fam Physician*. Dec 1 2016;94(11):896-903.
4. Hesper T, Zilkens C, Bittersohl B, Krauspe R. Imaging modalities in patients with slipped capital femoral epiphysis. *J Child Orthop*. Apr 2017;11(2):99-106. doi:10.1302/1863-2548-11-160276
5. Kamegaya M, Saisu T, Nakamura J, Murakami R, Segawa Y, Wakou M. Drehmann sign and femoro-acetabular impingement in SCFE. *J Pediatr Orthop*. Dec 2011;31(8):853-7. doi:10.1097/BPO.0b013e31822ed320
6. Khan AN. Legg-Calve-Perthes Disease Imaging. WebMD, LLC. Updated May 17, 2018. Accessed November 22, 20221. https://emedicine.medscape.com/article/410482-overview
7. Kopf S, Beaufils P, Hirschmann MT, et al. Management of traumatic meniscus tears: the 2019 ESSKA meniscus consensus. *Knee Surg Sports Traumatol Arthrosc*. Apr 2020;28(4):1177-1194. doi:10.1007/s00167-020-05847-3
8. Lefevre N, Naouri JF, Herman S, Gerometta A, Klouche S, Bohu Y. A Current Review of the Meniscus Imaging: Proposition of a Useful Tool for Its Radiologic Analysis. *Radiol Res Pract*. 2016;2016:8329296. doi:10.1155/2016/8329296
9. Lipsky BA, Senneville É, Abbas ZG, et al. Guidelines on the diagnosis and treatment of foot infection in persons with diabetes (IWGDF 2019 update). *Diabetes Metab Res Rev*. Mar 2020;36 Suppl 1:e3280. doi:10.1002/dmrr.3280
10. Mohseni S, Shojaiefard A, Khorgami Z, Alinejad S, Ghorbani A, Ghafouri A. Peripheral lymphadenopathy: approach and diagnostic tools. *Iran J Med Sci*. Mar 2014;39(2 Suppl):158-70.
11. Mullan CP, Madan R, Trotman-Dickenson B, Qian X, Jacobson FL, Hunsaker A. Radiology of chest wall masses. *AJR Am J Roentgenol*. Sep 2011;197(3):W460-70. doi:10.2214/ajr.10.7259
12. Peck DM, Voss LM, Voss TT. Slipped Capital Femoral Epiphysis: Diagnosis and Management. *Am Fam Physician*. Jun 15 2017;95(12):779-784.
13. Rabinovich RV, Haleem AM, Rozbruch SR. Complex ankle arthrodesis: Review of the literature. *World J Orthop*. Sep 18 2015;6(8):602-13. doi:10.5312/wjo.v6.i8.602
14. Sinha S, Peach AH. Diagnosis and management of soft tissue sarcoma. *Bmj*. Dec 29 2010;341:c7170. doi:10.1136/bmj.c7170
15. Scalcione LR, Gimber LH, Ho AM, Johnston SS, Sheppard JE, Taljanovic MS. Spectrum of carpal dislocations and fracture-dislocations: imaging and management. *AJR Am J Roentgenol*. Sep 2014;203(3):541-50. doi:10.2214/ajr.13.11680
16. Turan A, Çeltikçi P, Tufan A, Öztürk MA. Basic radiological assessment of synovial diseases: a pictorial essay. *Eur J Rheumatol*. Jun 2017;4(2):166-174. doi:10.5152/eurjrheum.2015.0032

17. Vuurberg G, Hoorntje A, Wink LM, et al. Diagnosis, treatment and prevention of ankle sprains: update of an evidence-based clinical guideline. *Br J Sports Med*. Aug 2018;52(15):956. doi:10.1136/bjsports-2017-098106
18. Wheeless CR, Nunley JA, Urbaniak JR, Duke University Medical Center's Division of Orthopedic Surgery. Wheeless' textbook of orthopaedics. Data Trace Internet Publishing, LLC; 2016. Updated 2018. http://www.wheelessonline.com/
19. Zollars ES, Hyer M, Wolf B, Chapin R. Measuring lupus arthritis activity using contrasted high-field MRI. Associations with clinical measures of disease activity and novel patterns of disease. *Lupus Sci Med*. 2018;5(1):e000264. doi:10.1136/lupus-2018-000264

POLICY HISTORY

Date	Summary

May 2023	• Updated orthopedic signs
	• Added
	  ○ When contraindicated to MRI where appropriate
	  ○ Metallosis
	  ○ Evaluation of indeterminate findings on imaging reports
	  ○ Non-diagnostic imaging
	  ○ CPT code for leg length
	  ○ Statement regarding clinical indications not addressed in the guideline
	• Clarified hip versus pelvis imaging
	• Updated DECT
	• Modified
	  ○ References.
	  ○ Background section
	  ○ Cancer of the extremity section

March 2022	• Clarification of language for non-hip stress fractures • Deleted Thessaly sign based on updated literature

Reviewed / Approved by NIA Clinical Guideline Committee

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GENERAL INFORMATION

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