This tool addresses common symptoms and symptom complexes. Imaging requests for patients with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician, specialist and/or patient’s Primary Care Physician (PCP) may provide additional insight.

MUSCULOSKELETAL GUIDELINES
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MedSolutions, Inc. Clinical Decision Support Tool
for Advanced Diagnostic Imaging

Common symptoms and symptom complexes are addressed by this tool. Imaging requests for patients with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician may provide additional insight.

This version incorporates MSI accepted revisions prior to 11/30/06
ABBREVIATIONS for MUSCULOSKELETAL GUIDELINES

AVN: avascular necrosis
CMS: Centers for Medicare and Medicaid Services
CPK: creatine phosphokinase
CT: computed tomography
DEXA: dual-energy x-ray absorptiometry
DMARDS: disease-modifying anti-rheumatic drugs
EMG: electromyogram
ESR: erythrocyte sedimentation rate
MRI: magnetic resonance imaging
NCV: nerve conduction velocity
NSAIDS: non steroidal anti-inflammatory drugs
RA: Rheumatoid arthritis
RICE: rest, ice, compression, elevation
SI: sacro-iliac
### MS-1 ~ GENERAL GUIDELINES

### MS-2 ~ IMAGING TECHNIQUES

### MS-3 ~ 3-D RENDERING

### MS-4 ~ MASS

### MS-5 ~ INFECTION

### MS-6 ~ FRACTURE AND DISLOCATION

### MS-7 ~ MUSCLE/TENDON UNIT INJURIES/DISEASES

### MS-8 ~ TENDONITIS/ BURSITIS

### MS-9 ~ FOREIGN BODY

### MS-10 ~ OSTEOARTHRITIS

### MS-11 ~ OSTEOCHONDRITIS DISSECANS

### MS-12 ~ AVASCULAR NECROSIS (AVN)

### MS-13 ~ RHEUMATOID ARTHRITIS (RA)

### MS-14 ~ OSTEOPOROSIS

### MS-15 ~ PAGET’S DISEASE

### MS-16 ~ SHOULDER

### MS-17 ~ ELBOW

### MS-18 ~ WRIST

### MS-19 ~ PELVIS

### MS-20 ~ HIP

### MS-21 ~ KNEE

### MS-22 ~ANKLE

### MS-23 ~FOOT

### REFERENCES

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**PEDIATRIC TABLE OF CONTENTS**

### MS-1 ~ GENERAL GUIDELINES

### MS-12 ~ AVASCULAR NECROSIS (AVN)

### MS-20 ~ HIP

### MS-21 ~ KNEE

### MS-23 ~FOOT

### REFERENCES
MUSCULOSKELETAL IMAGING GUIDELINES

MS-1 ~ GENERAL GUIDELINES

- Advanced imaging can be ordered in almost any musculoskeletal condition and does show abnormality in most musculoskeletal conditions, however, that does not mean that it is indicated in these situations.
- These guidelines will attempt to guide the clinician in the most appropriate use of musculoskeletal imaging.
- The guidelines are divided into two basic sections:
  - 1) Disease/Injury Category and 2) Anatomical Area Category
  - Some conditions, e.g. tumors can occur in any area and some, e.g. torn meniscus are specific to certain anatomical areas.
- These guidelines are diagnosis oriented so it is imperative that the reviewer have a working/tentative diagnosis prior to review.
  - Advanced imaging should serve as an adjunct in arriving at a more definitive diagnosis.
- **Pediatric guidelines:** The Musculoskeletal guidelines are the same for both the pediatric population and the adult population, unless there are specific Pediatric guidelines (highlighted in yellow).

MS-2 ~ IMAGING TECHNIQUES

- **Plain X-Ray**
  - Should be done prior to advanced imaging in most musculoskeletal conditions* to rule out those situations that do not require advanced imaging, such as osteoarthritis, acute/healing fracture, osteomyelitis, and tumors of bone amenable to biopsy or radiation therapy (in known metastatic disease), etc.
  - *ACR Appropriateness Criteria 2005*
  - Even in soft tissue masses, plain x-rays are helpful in evaluating for calcium/bony deposits, e.g. myositis ossificans and invasion of bone.
- **MRI vs CT**
  - In general MRI is the preferred imaging modality in musculoskeletal conditions because 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).
  - CT is better at imaging bone and joint anatomy; thus it is useful for studying complex fractures (particularly of the joints) and dislocations.
- **Contrast Issues**
  - Most musculoskeletal imaging (MRI or CT) is without contrast.
  - **Exceptions:**
    - Tumors and osteomyelitis (without and with contrast)
- MR arthrograms, CT myelogram, CT for discogram (with contrast only)
- MRI for rheumatoid arthritis (generally with contrast only)
- In postoperative joint studies, MRI with contrast (direct or indirect arthrogram) can be approved if requested.

### MS-3 ~ 3-D RENDERING

- CMS approves 3-D rendering both on an independent workstation (CPT 76377) and on a non-independent workstation (CPT 76376) if they are **medically necessary**. However, certain health plans do not reimburse these 3-D CPT codes and their coverage policies will take precedence over MedSolutions’ guidelines. Prior authorization does not guarantee payment of the study.
- Musculoskeletal indications for 3-D imaging are as follows:
  - Complex fractures of any joint or the pelvis
  - Spine fractures
  - Preoperative planning in complex surgical cases*
    - These requests should be sent for Medical Director review.
  *ACR 2006 Coding Update Sept/Oct 2005

### DISEASE/INJURY CATEGORY

#### MS-4 ~ MASS

- **General Considerations**
  - History and Physical exam--information should include location, size, duration, solid/cystic, fixed/not fixed to bone
  - Plain x-rays should be performed initially (see MS-2 Imaging Techniques).
  - Most **discrete** masses warrant imaging (usually MRI without and with contrast).
  - **Exceptions** - advanced imaging is generally **not** indicated for these entities:
    - Ganglia
    - Sebaceous cyst
    - Ill-defined mass/swelling which should have ultrasound performed as the initial study
    - Mass that has been present and stable for 1 year
    - Most hematomas
  - Orthopedic or Surgical evaluation is helpful in determining the need for advanced imaging.
- **Soft tissue mass with negative x-ray**
  - MRI without and with contrast can be performed (Ultrasound or CT with contrast if MRI contraindicated)*
    *ACR Appropriateness Criteria, Soft Tissue Masses 2005
  - Soft tissue mass with calcification on x-ray
- CT without contrast if Myositis Ossificans (bone formation in muscle tissue after trauma) is suspected.*
  *ACR Appropriateness Criteria, Soft Tissue Masses 2005
- MRI without and with contrast if not demonstrated to be Myositis Ossificans by CT*
  *ACR Appropriateness Criteria, Soft Tissue Masses 2005
- Bone or Attached to Bone (including lytic and blastic metastatic disease)
  - MRI (contrast as requested); CT without and with contrast if contraindication to MRI*
    *ACR Appropriateness Criteria, Bone Tumors 2005

### MS-5 ~ INFECTION

- General Considerations
  - History and Physical exam—information should include location, open/closed, systemic signs, cultures performed?
  - Plain x-ray initially to rule out extension either into or out of bone and to look for gas in soft tissues which is seen in *Clostridium perfringens* and other gas forming infections.*
    *Green WB (Ed.). *Essentials of Musculoskeletal Care, 2nd Ed.* Rosemont,IL, American Academy of Orthopaedic Surgeons, 2001, p.211
  - CT scan shows anatomy (e.g. bony destruction) better than plain x-rays, but its use should be discouraged in favor of the more definitive MRI.
    - CT can be approved in the setting of negative plain x-rays and contraindication to MRI.
- Soft Tissue Infections
  - MRI without and with contrast can be performed if plain x-rays are negative, patient is not responding to therapy, and abscess is suspected.
- Bone (Osteomyelitis)
  - MRI without and with contrast if plain x-rays are negative.*
    *Greene WB (Ed.). *Essentials of Musculoskeletal Care, 2nd Ed.* Rosemont,IL, American Academy of Orthopaedic Surgeons, 2001, p.687
  - If plain x-rays are positive, there is generally no need for advanced imaging unless the physician (usually Orthopedic or Infectious Disease specialist) is looking for dead bone.
- Joint Infections
  - Septic arthritis can almost always be diagnosed by history, physical examination, and joint aspiration with cell count and culture.*
    - Acute septic arthritis is an urgent/emergent surgical problem and should almost never be evaluated in an outpatient setting.
    *Am Fam Physician 2000 April;61(8):2391-2400
• **Acute**
  o Plain x-rays should be performed initially in any obvious or suspected acute fracture or dislocation.
  o If plain x-rays are positive, no further imaging is generally indicated except in complex joint fractures where noncontrast CT is helpful.¹²
  o If plain x-rays are equivocal for fracture, CT or MRI without contrast can be performed.²
  o Orthopedic evaluation is helpful in determining the appropriate imaging pathway.
  o If x-rays are negative and a fracture is clinically suspected, a several week trial of conservative therapy with periodic re-evaluation and repeat x-rays are indicated prior to considering advanced imaging.
    ¹ACR Appropriateness Criteria, Acute Hand and Wrist Trauma 2005
    ²Greene WB (Ed.). Essentials of Musculoskeletal Care. 2nd Ed. Rosemont, IL, American Academy of Orthopaedic Surgeons, 2001, p.36

• **Joint**
  o CT can be approved in complex fractures involving a joint for preoperative planning. *
    *Greene WB (Ed.). Essentials of Musculoskeletal Care. 2nd Ed. Rosemont, IL, American Academy of Orthopaedic Surgeons, 2001, p.41
    *ACR Appropriateness Criteria, Acute Hand and Wrist Trauma 2005
  o Orthopedic evaluation is helpful in determining the need for advanced imaging.

• **Metaphysis (end of bone)/Diaphysis (shaft of bone)**
  o These fractures can generally be managed adequately with plain x-ray.
  o If there is concern for delayed union or non-union of the bone, CT without contrast is appropriate.

• **Osteochondral/Chondral**
  o These fractures are joint fractures essentially of the joint surface (a piece of bone with attached cartilage, or a piece of cartilage alone).
  o If x-rays are negative and an osteochondral fracture is suspected, MRI without contrast is the appropriate imaging study.
  o CT without contrast can be approved if MRI is contraindicated. *
    *ACR Appropriateness Criteria, Chronic Ankle Pain 2005

• **Stress/Occult**
  o These fractures, almost always in weight bearing bones, can be evaluated adequately by history, physical exam, plain x-ray and bone scan.
  o Plain x-rays should be performed initially.¹
  o A history of increased physical activity is often elicited and swelling and tenderness are present on exam.
Plain x-rays are usually negative initially and become positive at 3-4 weeks. Bone scan will be positive within 72 hours of onset.

Treatment includes protected weight bearing with or without casting. Occasionally surgery is necessary, particularly for 5th metatarsal fractures.

Periodic follow-up plain x-rays will usually show progressive healing.

Except in situations where there is concern for non-union, advanced imaging is not routinely performed.

- **Exceptions** are hip and tibial stress fractures--MRI without contrast or CT without contrast can be approved if stress fracture is suspected because prolonged healing with a poor outcome can occur with delayed diagnosis.

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**MS-7 ~ MUSCLE/TENDON UNIT INJURIES/DISEASES**

- Almost all complete tendon ruptures can be diagnosed by physical exam showing loss of function of the affected joint and/or palpable disruption of the involved tendon.
- If history and physical exam point to a suspected partial tendon rupture of a specific tendon named in the clinical information, then MRI without contrast is appropriate.
- Muscle belly strains/muscle tears can be diagnosed clinically by history and physical exam. Although MRI is positive, it is not needed for diagnosis.
- Inflammatory myopathies (polymyositis, dermatomyositis, inclusion body myositis, myositis of malignancy) have positive but nonspecific findings on MRI. The diagnosis is made by labs (elevated CPK and ESR) and muscle biopsy.
  - MRI may rarely be needed to determine site for biopsy in polymyositis.
  - Also see PN-6.2 Inflammatory muscle diseases in the Peripheral Nerve Disorders guidelines.
**MS-8 ~ TENDONITIS/ BURSITIS**

- Plain x-rays first to rule out entities such as calcific tendonitis/bursitis.*
  
  *Am Fam Physician 1998 Feb;57(4):667-674
- A trial of at least 6 to 8 weeks of conservative therapy with NSAIDS/cortisone dosepack/cortisone injection/physical therapy is warranted prior to considering advanced imaging.
- MRI without contrast is the appropriate study if advanced imaging is indicated.
- Orthopedic evaluation is helpful in determining the need for advanced imaging.

**MS-9 ~ FOREIGN BODY**

- MRI (contrast as requested) can be approved after plain x-rays rule out the presence of radiopaque foreign bodies.*
  
  *Am Fam Physician 2003 June;67(12):2557-2562

**MS-10 ~ OSTEOARTHRITIS**

- Plain x-rays should be performed initially,¹,² which will most often reveal “characteristic joint space narrowing and osteophytic spurring.”³
- Advanced imaging is usually not necessary except in special circumstances—e.g. suspected concomitant internal derangement in the knee (MRI without contrast) and preoperative planning in joint replacement (CT without contrast).
  
  ¹ACR Appropriateness Criteria, Chronic Hip Pain 2005
  ²American Academy of Orthopedic Surgeons- Knee Osteoarthritis Guidelines
  ²Am Fam Physician 2000 April;61(8):2391-2400

**MS-11 ~ OSTEOCHONDritis DISSECANS**

- A condition of uncertain etiology sometimes attributed to avascular necrosis (AVN) or trauma.
- Can heal if non-displaced.
- Plain x-rays should be performed initially.*
  
  *ACR Appropriateness Criteria. Non Traumatic Knee Pain 2005
- MRI or CT without contrast after 8-12 weeks to evaluate healing can be approved if follow-up plain x-rays are equivocal.
MS-12 ~ AVASCULAR NECROSIS (AVN)

- If AVN is suspected, plain x-rays should be performed initially.¹
- If plain x-rays are positive, no further imaging is necessary, as follow-up can be performed with plain x-rays.²
- MRI without contrast is the modality of choice to evaluate suspected AVN with negative X-rays.¹ Either unilateral hip MRI (CPT 73721) or pelvis MRI (CPT 72195) [to visualize bilateral hips] can be performed.
- If the differential diagnosis is AVN vs labral tear, then MRI (CPT 73721) of the more symptomatic hip should be performed initially. If that hip is positive for AVN, then MRI (CPT 73721) of the other hip can be imaged if requested.

For AVN in children (Legg-Perthe's), see MS-20 Hip

¹ ACR Appropriateness Criteria, Chronic Hip Pain 2005
² Major N. Pitfalls in Musculoskeletal Imaging—the Hip. Presented at: 33rd Annual Radiology Refresher Course of the International Skeletal Society, September 13-16, 2006; Vancouver, British Columbia, Canada

MS-13 ~ RHEUMATOID ARTHRITIS (RA)

- The rheumatological disorders are usually recognized by clinical patterns supplemented by laboratory tests of immune reactions.
- MRI is increasingly being used in clinical trials to study the effects of treatment with DMARDS and in clinical practice to identify seronegative RA patients that might benefit from early DMARD therapy.*
- Prior to advanced imaging, physical exam, laboratory studies and plain x-rays should be performed.
- If a diagnosis of RA is still uncertain, then MRI either with contrast or without and with contrast of the most symptomatic joint, or of the dominant hand or wrist* can be considered to establish the diagnosis prior to institution of therapy with potent therapeutic agents.
  *Journal of Rheumatology 2001;28(5):1158-1161
- Advanced imaging is not indicated to routinely follow the result of treatment.
- Neither evidence-based nor consensus guidelines for the use of serial follow up MRI scans in RA patients have been established due to multiple factors including:
  o Lack of a good reproducible scoring system for erosions, bone edema, and synovitis (the primary lesion in Rheumatoid Arthritis¹)
  o Disagreement on the relationship between synovitis and erosions
  o Differences of opinion on use of contrast
Low versus high field magnet discussion

- There are no well-controlled large cohort studies relating MRI use to improved clinical outcomes.\(^1\)
  \(^1\) *Journal of Rheumatology* 2005;32(12):2462-2464
  \(^2\) *Journal of Rheumatology* 2005;32(12):2465-2469
  \(^2\) *Journal of Rheumatology* 2003;30(4):671-679
  \(^2\) *Joint Bone Spine* 2005;72:229-234

- MRI without contrast can be approved in special situations in RA, such as suspected internal derangement in the knee (see MS-21 Knee) or rotator cuff tear in the shoulder (see MS-16 Shoulder).

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**MS-14 ~ OSTEOPOROSIS**

- Patients at risk are postmenopausal women over age 65, patients on bedrest, patients on steroids, and alcoholics.
- At particularly high risk is the female with early surgical menopause post hysterectomy.
- DEXA scan is recommended for all patients at risk.
- DEXA scan is the modality of choice for screening and therapeutic follow-up in patients with suspected/known osteoporosis.\(^1,2\)
- CMS allows imaging every two years for the following:
  - Estrogen deficient female
  - Patients with osteopenia or fracture on spine films
  - Patients on long term steroid therapy
  - Patients with primary hyperparathyroidism
  - Patients under treatment for osteoporosis\(^3\)
- Quantitative CT scan (*CPT 77078* which replaces *CPT 76070* for CT bone mineral density study, axial skeleton) can be approved in the following special circumstances where DEXA scan is known to be inaccurate:
  - Multiple healed compression fractures
  - Significant scoliosis
  - Severe degenerative disk disease with large marginal osteophytes
  - Follow-up in cases where Quantitative CT was the original study

\(^1\) Greene WB (Ed.). *Essentials of Musculoskeletal Care, 2nd Ed.* Rosemont,IL, American Academy of Orthopaedic Surgeons, 2001, p.58
\(^2\) Grisanti JM and Simonelli C. *A Call to Action: Integrating Current Clinical Evidence in the Assessment and Treatment of Osteoporosis. CME Program* 2006.
\(^3\) *Physician’s Guide to Prevention and Treatment of Osteoporosis-2003 National Osteoporosis Foundation*
MS-15 ~ PAGET’S DISEASE

- Paget’s Disease is asymptomatic in the majority of cases, but pain can sometimes be severe.
- Diagnosis is by laboratory results (marked elevation of alkaline phosphatase) and findings on plain x-ray.
- MRI without contrast can be performed if the diagnosis is in doubt or if malignant degeneration is suspected (occurs in up to 10% of the cases).

ANATOMICAL AREAS

General Considerations
- Areas are organized from head to toe. Plain x-ray should almost always be performed prior to advance imaging (see MS-2 Imaging Techniques).

MS-16 ~ SHOULDER

- **MS-16.1 See Disease/Injury Categories (MS-4 through MS-15)**
  - Studies can be approved if applicable to the shoulder.
- **MS-16.2 Impingement**
  - Definition: Pressure-induced tendonitis of the rotator cuff (chiefly the supraspinatus) caused by the acromion process during shoulder abduction.
  - Diagnosis is generally by history and physical exam with the “impingement sign” (abduction and internal rotation of the shoulder) being positive.
  - Suspected impingement should be managed with a conservative program (NSAIDS, physical therapy, steroid dosepack, and/or steroid injection) for 6 to 8 weeks prior to considering advanced imaging.1,2,3,4
  - Orthopedic consultation is helpful in determining when to proceed with imaging.5
  - Variants of the acromion process such as down-turned acromion, can contribute to impingement syndrome.
    - Noncontrast MRI of the shoulder (CPT 73221) can be performed to identify these variants if surgery is being considered.5

Accessed November 27, 2006
• **MS-16.3 Tendinitis**
  o Definition: Inflammation of tendons, generally the rotator cuff (subscapularis, supraspinatus, and infraspinatus), but also of the tendon of the long head of the biceps which traverses the shoulder joint.
  o As with impingement, tendonitis should be managed conservatively (NSAIDS, physical therapy, steroid dosepack, and/or steroid injection) for 6 to 8 weeks prior to considering advanced imaging.\(^1\), \(^2\), \(^3\), \(^4\)
    
    \(^1\) *Am Fam Physician* 1998 Feb;57(4):667-674
    \(^2\) *American Academy of Orthopedic Surgeons- Shoulder Pain Guideline 2001*
    \(^3\) *Am Fam Physician* 2000 June;61(11):3291-3300

  o Although tendonitis can be diagnosed by noncontrast MRI, MRI is rarely indicated except to rule out other more serious problems.
  o Noncontrast MRI (CPT 73221) should be approved only after a protracted (at least 6 to 8 weeks) trial of conservative measures has failed or the physician expresses concern for malignancy.

• **MS-16.4 Tendon (Biceps Long Head) Rupture**
  o Common shoulder injury which can also occur spontaneously.
  o Usually diagnosed clinically.
  o Diagnosis can be difficult in obese patients.
    
    ➢ Noncontrast MRI (CPT 73218) can be performed in obese patients with suspected biceps long head rupture.
  o Conservative treatment is performed in the vast majority of patients since the biceps has two tendons of origin and remains quite functional.*
    
    ➢ MRI rarely affects treatment.
  o Surgical repair is more likely to be performed in patients under age 35.
    
    *Greene WB (Ed.). *Essentials of Musculoskeletal Care, 2nd Ed.* Rosemont,IL, American Academy of Orthopaedic Surgeons, 2001, p.146

• **MS-16.5 Rotator Cuff Tear**
  o The rotator cuff is composed of three musculotendinous units: subscapularis (anteriorly), supraspinatus (superiorly), and the infraspinatus (posteriorly) which function to assist in rotating and stabilizing the humeral head.
  o Other muscles such as the deltoid and pectoralis major can also affect shoulder rotation, so there is no good clinical test to evaluate rotator cuff function.
  o Pain on abduction, a positive drop test, and limited shoulder rotation are **not** reliable signs of rotator cuff tear and can be positive in other pain-producing shoulder conditions.
Rotator cuff tear is not a surgical emergency, and suspected rotator cuff tear should be treated conservatively for 4 to 6 weeks\(^1\) with NSAIDS, steroid dosepack, steroid injection and physical therapy in most cases prior to advanced imaging.

- This is particularly true in the older patient with impingement.\(^2\)
- The exception is the acute injury in the patient under age 40.
  - Surgical repair should be done in these patients within 3 weeks, and noncontrast shoulder MRI (CPT 73221) is appropriate.\(^3\)

1. *American Academy of Orthopedic Surgeons-Shoulder Pain Guideline 2001*  

Noncontrast shoulder MRI (CPT 73221) is the study of choice for the chronic rotator cuff tear, but should be reserved as a preoperative study for patients who have failed conservative therapy.

Orthopedic consultation is useful in determining the need for imaging and operative treatment.

- **MS-16.6 Dislocation/Subluxation/Labral Tear**
  - The glenoid (shoulder socket) labrum is a fibrocartilagenous ring/rim that deepens the glenoid cavity.
  - The labrum is torn in acute twisting injuries of the shoulder joint that also can cause dislocation. Chronic tears occur in throwing athletes.
  - Symptoms/signs can be pain, a popping or clicking with shoulder motion, and a positive apprehension sign (anxiety and pain with shoulder abduction and external rotation).
  - Labral tear, if symptomatic, is generally treated surgically and Orthopedic input is helpful.
  - Shoulder MRI with contrast (MR arthrogram CPT 73222) is the appropriate study and can be approved when labral tear is suspected\(^1\) as documented on an appropriate physical examination.
  - Frank shoulder dislocation is reduced emergently in the Emergency Department/office and should be imaged by plain x-ray including axillary view if necessary.\(^2\)


Advanced imaging in patients with shoulder dislocation is rarely needed. **Exception:** noncontrast shoulder CT (CPT 73200) to evaluate large Hill-Sachs lesions (impaction/indentation fractures of the humeral head caused by the edge of the glenoid in a dislocation) can be performed prior to surgery.

Some subtle dislocations/subluxations (e.g. posterior dislocations) are difficult to see on plain x-ray. Noncontrast shoulder CT (CPT 73200) can be approved\(^1\) if the treating physician suspects this condition.
• **MS-16.7 Frozen Shoulder/Adhesive Capsulitis**
  o Definition: condition of extremely limited shoulder motion caused by adhesions (fibrous bands) within the joint and a thickened contracted capsule.
  o This condition is often precipitated by shoulder injury/disease.
  o The diagnosis is made clinically.
  o Treatment is conservative with NSAIDS, steroid injection, and physical therapy.
  o Shoulder manipulation under anesthesia can be performed for the unresponsive cases.*
    
    *American Academy of Orthopedic Surgeons- Shoulder Pain Guideline 2001
    Brigham and Women’s Hospital. [http://www.brighamandwomens.org](http://www.brighamandwomens.org)
    Accessed November 28, 2006
  
  o Advanced imaging is rarely indicated.
  o Orthopedic evaluation is helpful in determining the need for advanced imaging.

• **MS-16.8 Osteoarthritis**
  o Treatment is generally conservative with NSAIDS, heat, range of motion exercises, and steroid injection.*
    
    *American Academy of Orthopaedic Surgeons- Shoulder Pain Guideline 2001
  
  o Advanced imaging is rarely needed in osteoarthritis. **Exception:** noncontrast shoulder CT or MRI (CPT 73200 or 73221) as ordered by the operating surgeon for preoperative planning.

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**MS-17 ~ ELBOW**

• See Disease/Injury Categories (MS-4 through MS-15)
  o Studies can be approved if applicable to the elbow.

• Epicondylitis /Tendonitis (Tennis Elbow)
  o Diagnosis is made clinically.
  o Treatment is conservative with NSAIDS, steroid injection, steroid dosepack, and physical therapy.
  o Surgery is reserved for conservative treatment failures.*
    
Advanced imaging should rarely be needed.

- **Ruptured Biceps Insertion (at elbow)**
  - Complete rupture can often be diagnosed clinically by palpation, but patients will still have active elbow flexion with complete rupture because of the brachialis muscle.
  - Often treated operatively, and noncontrast elbow MRI (CPT 73221) is appropriate if requested.*


### MS-18 ~ WRIST

- **See Disease/Injury Categories (MS-4 through MS-15)**
  - Studies can be approved as above if applicable to the wrist.
- **Rheumatoid Arthritis**
  - See MS-13 Rheumatoid arthritis
- **Carpal Tunnel**
  - Also see SP-12 Cervical Radiculopathy in the Spine guidelines and PN-2.1Carpal tunnel syndrome in the Peripheral Nerve Disorders guidelines.
  - Diagnosis is made clinically and with NCV/EMG.
  - Imaging studies are rarely indicated.
  - MRI can show wrist anatomy but has not been shown to be useful in diagnosing carpal tunnel.* However, if a mass is being considered as the etiology, noncontrast wrist MRI (CPT 73221) can be performed preoperatively.

  *National Institute of Neurological Disorders and Stroke, Carpal Tunnel Fact Sheet. Updated August 2, 2006
  [http://ninds.nih.gov/disorders/carpal_tunnel/detail_carpal_tunnel.htm](http://ninds.nih.gov/disorders/carpal_tunnel/detail_carpal_tunnel.htm)
  Accessed November 28, 2006

- **Ligament Injuries**
  - Plain x-rays should be performed initially.
  - Since ligament injuries of the wrist are generally difficult to diagnose, a noncontrast wrist MRI (CPT 73221) can be approved if requested.
  - Surgery is indicated for most complete ligament injuries,* therefore the request will often be from an orthopedic or hand surgeon and their input is helpful prior to advanced imaging.

  *American Academy of Orthopedic Surgeons- Clinical Guideline on Wrist Pain
See Disease/Injury Categories (MS-4 through MS-15)
  o Studies can be approved as above if applicable to the pelvis.

Complex Fracture
  o Orthopedic evaluation is helpful in determining the need for advanced imaging.
  o Pelvic CT without contrast (CPT 72192) can be performed to evaluate complex pelvic ring/acetabular fractures.*

Sacro-iliac Joints (SI Joints)
  o Also see SP-7 Sacro-iliac Joint Pain in the Spine guidelines.
  o The diagnosis of ankylosing spondylitis is determined clinically, by laboratory tests, and by typical x-ray findings in established disease.
  o MRI has shown inflammatory changes in the SI joints prior to visible x-ray changes in several small studies. However, further data is needed to establish the ability of MRI to characterize inflammation in early ankylosing spondylitis, the ability of MRI to predict destructive changes, and the value of monitoring treatment effects.*
    *Rheumatology 2004;43:234-237
  o Pelvic MRI without and with contrast (CPT 72197) may be indicated in difficult diagnostic situations such as rheumatoid arthritis.
  o Rheumatology evaluation is helpful in assessing the need for advanced imaging.

MS-20 ~ HIP

MS-20.1 See Disease/Injury Categories (MS-4 through MS-15)
  o Studies can be approved as above if applicable to the hip.

MS-20.2 Osteoarthritis
  o The diagnosis is based on history and physical exam and confirmed by x-ray.*
    X-ray also helps to rule out other significant causes of hip pain such as AVN and tumor.
    *ACR Appropriateness Criteria, Chronic Hip Pain 2005
    Brigham and Women's Hospital. http://www.brighamandwomens.org
    Accessed November 28, 2006
Advanced imaging is rarely needed in osteoarthritis. **Exception:** noncontrast hip CT (CPT 73700) or MRI (73721) as requested by the operating surgeon for preoperative planning in patients undergoing total hip replacement.

- **MS-20.3 Avascular Necrosis (AVN)**
  - Occurs when the femoral head loses its blood supply.
  - Common causes include femoral neck fracture, cortisone therapy (usually long term), alcoholism, collagen disease, and gout.
  - Less common causes include deep sea diving and Gaucher’s disease.
  - Pain is generally severe and there is significant pain with hip motion.
  - Plain x-rays should be done initially. If positive, no further imaging is necessary.*

  *Major N. Pitfalls in Musculoskeletal Imaging—the Hip. Presented at: 33rd Annual Radiology Refresher Course of the International Skeletal Society, September 13-16, 2006; Vancouver, British Columbia, Canada

  - Noncontrast hip MRI (CPT 73721) if unilateral imaging is requested, or of the pelvis (CPT 72195) if bilateral hip imaging is requested, is the modality of choice to evaluate suspected AVN with negative x-rays.* If the differential diagnosis is AVN vs labral tear, then MRI (CPT 73721) of the more symptomatic hip should be performed initially. If that hip is positive for AVN, then MRI (CPT 73721) of the other hip can be imaged if requested.

    *ACR Appropriateness Criteria, Chronic Hip Pain 2005

  - Treatment is symptomatic (NSAIDS and partial weight bearing) in mild cases, but often total hip replacement is necessary.

- **Legg-Perthe’s Disease** (AVN of the hip in children):
  - Affects children between the ages of 4 and 8 (occasionally younger and older).
  - Clinically is quite different than adult AVN since there is good healing potential of the femoral head (especially in younger children).
  - Plain x-ray is the initial imaging study and may be all that is necessary for follow-up.
  - If the diagnosis is uncertain on plain x-ray, hip MRI without contrast (either unilateral CPT 73721 or pelvis CPT 72195) can be approved.
  - Treatment is observation in mild cases and containment of the head within the acetabulum by abduction bracing in more severe cases.*


- **MS-20.4 Labral Tear**
  - The acetabular (hip socket) labrum is similar to the glenoid labrum, but is less frequently torn. Often, no history of trauma can be elicited.
  - Symptoms include hip pain and mechanical signs such as clicking/popping and painful catching.
MRI with contrast (MR arthrogram CPT 73722) is the appropriate imaging study.*


- **MS-20.5 Impingement**
  - There are two types of femoral/acetabular impingement:
    - cam type: caused by the loss of the normal “waist” (indentation) at the head/neck junction (usually superior) causing incongruity with abduction.
    - pincer type: caused by an overcoverage/protrusion of the acetabulum causing incongruity with motion.
  - The diagnosis in both types is by plain x-ray.
  - Hip MRI without contrast (CPT 73721) can be approved as a preoperative study.

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**MS-21 ~ KNEE**

- **MS-21.1 See Disease/Injury Categories (MS-4 through MS-15)**
  - Studies can be approved as above if applicable to the knee.

- **MS-21.2 General (History, Physical exam, Mechanism of injury)**
  - History of mechanism of injury is very important.
    - Most meniscal and ligament tears are sustained due to twisting type injuries.
  - Physical exam is very important.
    - Almost all significant meniscal injuries will be associated with swelling.
    - Signs of ligamentous disruption:
      - Valgus (medial) instability
      - Varus (lateral) instability
      - Anterior drawer (pulling tibia forward with knee flexed 90 degrees)
      - Posterior drawer (pushing tibia backward with the knee flexed 90 degrees)
      - Lachman (modified anterior drawer with knee at 20 degrees of flexion).
  - McMurray’s test (rotating the foot while flexing/extending the knee).
    - When positive (a deep clunk or shift, not a snap or click), McMurray’s test is strong evidence of a meniscal tear.
  - Particular attention to knee extension is important, as displaced meniscal tears and other causes of internal derangement, (e.g. loose body, etc.) will often cause a limitation of full extension-- the so called “locked knee.”
  - Soft signs/symptoms of meniscal tear include:
    - Giving way (which can also be due to pain or weakness).
    - Joint line tenderness.
    - Inability to bear weight.

- **MS-21.3 Meniscus Tear**
  - Plain x-rays should be performed initially¹, ² to rule out other problems such as osteochondral fractures or joint mice (loose bodies) that can mimic meniscus tear. If these are present, Orthopedic evaluation is helpful to determine further treatment and need for advanced imaging.
If plain x-rays are negative, the knee is stable and extends fully, and McMurray’s test is negative, a 6 to 8 week period of conservative care, including NSAIDS and aggressive quadriceps strengthening exercises is appropriate prior to considering advanced imaging.

If conservative therapy fails, Orthopedic evaluation is helpful in deciding the need for further advanced imaging and treatment.

Knee MRI without contrast (CPT 73721) is the study of choice when advanced imaging is indicated.

MS-21.4 Ligament Tear

Complete ligament tears are usually diagnosed clinically; however, the exam can be quite difficult in a large person who has pain and guarding. This is not an indication for immediate advanced imaging, since surgical repair of a torn knee ligament is rarely an emergent procedure.

If physical exam indicates a torn ligament (e.g. positive anterior drawer, posterior drawer, Lachman, medial (valgus) or lateral (varus) stress test), Orthopedic consultation is helpful in delineating further treatment and/or need for advanced imaging.

If the physical exam is negative or equivocal, a period of conservative therapy, including brief splinting with protected weight bearing followed by aggressive physical therapy for at least four weeks, is indicated prior to advanced imaging.

Noncontrast knee MRI (CPT 73721) is the study of choice if conservative therapy fails.

MS-21.5 Osteoarthritis

Advanced imaging is not recommended in known arthritis of the knee. Exception: If signs of internal derangement are present or there is concern for malignancy, noncontrast knee MRI (CPT 73721) can be approved.

Noncontrast knee CT (CPT 73700) with 3-D reconstruction (CPT 76377) can be approved for preoperative planning of total knee replacement if requested by the operating surgeon.

MS-21.6 Patellar Dislocation/Subluxation

Dislocation/subluxation of the patella is largely a clinical diagnosis.

Plain x-rays should be performed initially to rule out resulting osteochondral fractures.
Treatment is conservative with splinting followed by aggressive quadriceps exercises.

Most patients respond to this regimen, but if continued dislocation/subluxation occurs, surgery (lateral release or formal extensor realignment) may be indicated.¹

Some studies have shown that most common surgical procedures for patellar tracking problems result in medial displacement of the patella.²

Currently, some centers (mainly academic) are doing dynamic MRI and CT imaging for assessment of patellar tracking, which is abnormal in patellar subluxation.

- Insufficient information is available at this time to routinely approve these studies and requests should be sent for Medical Director review.


² Radiology 1989 Sept:172;799-804

- **MS-21.7 Baker’s Cyst**
  - Definition: Cyst posterior to the knee which is almost always associated, in adults, with intra-articular knee pathology.
  - Ultrasound is the indicated initial imaging study.¹
  - It is generally accepted that Baker’s cysts in adults are not amenable to surgical excision because they will almost always recur.²
  - Noncontrast knee MRI (CPT 73721) is only indicated if surgical excision is being considered.
  - **Baker’s cyst in children is a different clinical situation and is almost never due to intra-articular pathology.**
    - Usually treated conservatively and rarely requires surgery.
    - Ultrasound is the appropriate imaging study.²

¹ University of Michigan Health System Knee Pain Guideline- 2005


### MS-22 ~ANKLE

- **MS-22.1 See Disease/Injury Categories (MS-4 through MS-15)**
  - Studies can be approved as above if applicable to the ankle.

- **MS-22.2 One study/area only**
  - In foot and ankle imaging, studies are frequently ordered of both areas. This is unnecessary since ankle MRI will image from above the ankle to the mid-metatarsal area. **Only one CPT code should be approved.**

- **MS-22.3 Sprain (including Avulsion Fracture)**
  - Plain x-rays should be performed initially to rule out fracture.¹
  - If plain x-rays are negative, a 6 to 8 week trial of conservative therapy is warranted prior to considering advanced imaging.²
Noncontrast ankle MRI (CPT 73721) can diagnose pathology, including osteochondral fracture of the talar dome, occult fracture, peroneal tendon rupture and “high ankle sprain,” and is the study of choice.\(^1,2\)

Alternatively, noncontrast ankle CT (CPT 73700) can be approved, especially if requested by the Orthopedic or Podiatry specialist.

High ankle sprain refers to injury to the ligaments of the tibiofibular syndesmosis (the ligaments that attach the distal ends of the tibia and fibula to each other).

- Examination reveals tenderness and swelling in the syndesmosis, positive squeeze test (squeezing the tibia and fibula together at mid calf), and external rotation (of the foot) test.
- Treatment is conservative (RICE, partial weight bearing and range of motion exercises).\(^2,3\)

\(^1\) ACR Appropriateness Criteria, Chronic Ankle Pain 2005
\(^2\) Am Fam Physician 2001 Jan;63(1):93-104
\(^3\) Greene WB (Ed.). Essentials of Musculoskeletal Care. 2nd Ed. Rosemont,IL, American Academy of Orthopaedic Surgeons, 2001, pp.422-424

- MS-22.4 Impingement
  - Impingement can be anterior. Diagnosis is by plain x-ray with the ankle in maximum dorsiflexion. It is a bony impingement characterized by anterior tibial and talar neck spurs.
  - In anterior-lateral impingement, which often occurs after sprains, a scar tissue mass in the area of the anterior talofibular ligament (one of the three lateral ankle ligaments) is usually the cause of the impingement.\(^1\)
    - If anterior-lateral impingement is suspected, MR or CT arthrography (CPT 73722 or 73701) can be approved.\(^2\)
  - Posterior impingement often involves an os trigonum (accessory foot bone). Ankle MRI without contrast (CPT 73721) can be approved.

\(^1\) Greene WB (Ed.). Essentials of Musculoskeletal Care. 2nd Ed. Rosemont,IL, American Academy of Orthopaedic Surgeons, 2001, p.435
\(^2\) ACR Appropriateness Criteria, Chronic Ankle Pain 2005

- MS-22.5 Ruptured Achilles Tendon (Partial/Complete)
  - Complete rupture of the Achilles tendon is most often a clinical diagnosis.\(^1\)
    - Patients present with swelling, point tenderness, and often a palpable defect.
    - Not all plantar flexion is lost because of the intact toe flexors, but the Thompson’s test is positive for rupture.
      - Thompson’s test is done by having the patient kneel in a chair then squeezing the calf muscle. If the Achilles is ruptured, the foot will not plantar flex.\(^1\)
    - In complete rupture of the Achilles’ tendon, surgery is the usual treatment and prompt referral to Orthopedics is helpful.\(^1\)
      - Advanced imaging is infrequently indicated as a preoperative test.
      - MRI without contrast (CPT 73721) can be approved if requested by the operating surgeon.
In suspected partial acute ruptures, (should have point tenderness over the Achilles tendon), ankle MRI without contrast (CPT 73721) can be approved. Orthopedic/podiatry evaluation is helpful in differentiating partial Achilles tendon rupture from plantaris tendon or gastrocnemius muscle rupture.

Chronic partial tendon ruptures are characterized by intermittent soreness and often by a knot/mass palpable or visible in the tendon. Imaging is usually not necessary unless surgery is planned.

1. Lower Extremity Musculoskeletal Disorders-A Guide to Diagnosis and Treatment. 2003
   Brigham and Women’s Hospital. [http://www.brighamandwomens.org](http://www.brighamandwomens.org)
   Accessed November 28, 2006

2. ACR Appropriateness Criteria, Chronic Ankle Pain 2005

**MS-22.6 Lateral Instability**

- Chronic lateral instability can occur after single or multiple ankle sprains. It is manifested by recurrent ankle sprains sometimes with minimal trauma.
- Plain x-rays should be performed initially.¹
- Conservative treatment is generally done first with physical therapy.²
- A lateral heel/sole wedge may be prescribed.
- Ankle MRI without contrast (CPT 73721) or MR arthrography (CPT 73722)¹ can be approved if there is no improvement after 6 weeks of conservative treatment,² particularly if surgery to reconstruct the lateral ankle ligament complex is contemplated.

¹. ACR Appropriateness Criteria, Chronic Ankle Pain 2005
². Greene WB (Ed.). Essentials of Musculoskeletal Care. 2nd Ed.
   Rosemont,IL, American Academy of Orthopaedic Surgeons, 2001,
   p.435

**MS-23 ~FOOT**

- **MS-23.1 See Disease/Injury Categories (MS-4 through MS-15)**
  - Studies can be approved as above if applicable to the foot.

- **MS-23.2 Sprain/Fracture/Dislocation/Subluxation (Lisfranc tarsometatarsal fracture)**
  - Injuries to the mid foot should have plain x-rays performed initially to rule out fracture or frank dislocation.
    - Subtle tarsometatarsal dislocation of the foot (Lisfranc fracture) can be difficult to see on plain x-ray, and noncontrast CT (CPT 73700) or MRI (CPT 73718) is indicated when this injury is suspected even though plain x-rays are negative.∗
    - Orthopedic evaluation is helpful if a tarsometatarsal dislocation/subluxation is suspected since treatment is usually operative.∗
  - All other sprains with negative x-rays should be treated conservatively for a 4 to 6 week period prior to considering advanced imaging.
• **MS-23.3 Congenital Anomalies**
  o **Tarsal Coalition** (Calcaneonavicular Bar/Rigid Flat Foot)
    ➢ 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.
    ➢ If tarsal coalition is suspected (because of restricted hindfoot motion on physical exam), and plain x-rays are negative, CT or MRI without contrast (CPT 73700 or 73718) can be approved.*
    *ACR Appropriateness Criteria, Chronic Foot Pain 2005
  o **Club Foot**
    ➢ Definition: 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.
    ➢ Treatment consists of serial casting; surgery is reserved for the difficult cases.*
    ➢ MRI or CT without contrast (CPT 73700 or 73718) can be approved if requested by the treating specialist, usually as a preoperative evaluation.
    *Greene WB (Ed.). *Essentials of Musculoskeletal Care. 2nd Ed.* Rosemont, IL, American Academy of Orthopaedic Surgeons, 2001, pp.613-615

• **MS-23.4 Tendon Rupture**
  o Posterior tibial and peroneal tendon rupture are the most commonly ruptured foot/ankle tendons after the Achilles tendon.
  o With posterior tibial tendon rupture, there is usually flattening of the longitudinal arch and often valgus of the heel.
  o With this scenario, particularly if unilateral and accompanied by medial foot and/or ankle pain, noncontrast ankle MRI (CPT 73721) can be approved. MRI can differentiate between tendonitis and rupture of the posterior tibial tendon.¹
  o Peroneal tendon rupture/subluxation can occur, particularly with lateral ankle sprains.
    ➢ Noncontrast ankle MRI (CPT 73721) is indicated ² after a 4 week period of conservative therapy if disability and lateral pain persist.

• **MS-23.5 Morton’s Neuroma**
  o Usually a clinical diagnosis,¹ but if surgery is being planned, foot MRI without and with contrast (CPT 73720)² can be approved as a preoperative test for diagnosis confirmation.
  ¹ *Lower Extremity Musculoskeletal Disorders-A Guide to Diagnosis and Treatment. 2003*
  ² Brigham and Women’s Hospital. *http://www.brighamandwomens.org*
  Accesses November 28, 2006
  ² ACR Appropriateness Criteria, Chronic Foot Pain 2005
• **MS-23.6 Plantar Fasciitis**
  - Definition: Inflammation of plantar fascia at its insertion into the calcaneus (at bottom of heel). Often, but not always, associated with heel spur.
  - Diagnosis is made clinically and no advanced imaging is necessary.
  - Treatment is conservative with heel pads, stretching, NSAIDS, and steroid injections.
  - Surgery is considered only in longstanding cases that have been unresponsive to conservative therapy.
  - Reference:

• **MS-23.7 Diabetic Foot Infection**
  - Foot infections are quite common in diabetes and range from mild cellulitis to osteomyelitis and usually involve multiple organisms.
  - Treatment ranges from oral antibiotics in mild cases to intravenous antibiotics and even amputation in severe cases of osteomyelitis with gangrene.
  - Plain x-rays should be performed initially.¹ If positive for osteomyelitis, no further advanced imaging is necessary. If negative, foot MRI without and with contrast (CPT 73720) can be approved.²
    - Greene WB (Ed.). *Essentials of Musculoskeletal Care. 2nd Ed.* Rosemont,IL, American Academy of Orthopaedic Surgeons, 2001, p.211
    - Greene WB (Ed.). *Essentials of Musculoskeletal Care. 2nd Ed.* Rosemont,IL, American Academy of Orthopaedic Surgeons, 2001, p.687

• **MS-23.8 Tarsal Tunnel Syndrome**
  - Definition: Nerve entrapment of the posterior tibial nerve in the area of the medial malleolus akin to carpal tunnel syndrome in the wrist.
  - Diagnosis is usually made clinically but can be difficult.
  - Ankle MRI without contrast (CPT 73721) can be approved if mass/lesion is suspected as etiology of the entrapment.*
  - Also see PN-2.3 Tarsal tunnel syndrome in the Peripheral Nerve Disorders guidelines

• **MS-23.9 Sinus Tarsi Syndrome**
  - Characterized by chronic lateral ankle pain after lateral ankle sprain.
  - Etiology is strain/sprain of the intertarsal ligaments of the subtalar joint.
  - Diagnosis is made clinically and confirmed by injection of lidocaine into the sinus tarsi.
  - Treatment is conservative. Surgery (excision of sinus tarsi contents or even subtalar fusion in severe cases) is reserved for conservative treatment failures.*
  - Ankle MRI without contrast (CPT 73721) is the most appropriate imaging study, but should be reserved for patients in whom the diagnosis is unclear or for patients in whom surgery is being considered.*
    - *The Physician and Sportsmedicine 2000 May;28(5)*
• **MS-23.10 Chronic Lateral Ankle/Foot Pain**
  
  o See MS-22.4 Ankle Impingement, MS-22.6 Lateral Instability of the ankle, and MS-23.9 Sinus Tarsi Syndrome
  
  o Another less common entity seen as a cause of chronic ankle pain is a split tear of the peroneus brevis tendon after lateral ankle sprain.
  
  o Treatment of chronic lateral ankle pain initially is conservative, but ankle MRI without contrast (CPT 73721) can be approved after 6 to 8 weeks of failed conservative therapy.
MS-2~Imaging Techniques
  ➢ ACR Appropriateness Criteria 2005

MS-3~3-D Rendering
  ➢ ACR 2006 Coding Update Sept/Oct 2005

MS-4~Mass
  ➢ ACR Appropriateness Criteria, Soft tissue masses 2005
  ➢ ACR Appropriateness Criteria, Bone tumors 2005

MS-5~Infection

MS-6~Fracture and Dislocation
  ➢ ACR Appropriateness Criteria, Acute hand and wrist trauma 2005
  ➢ ACR Appropriateness Criteria, Chronic ankle pain 2005
  ➢ ACR Appropriateness Criteria, Stress/insufficiency fractures 2005

MS-7~Muscle/Tendon Unit Injuries/Diseases
  ➢ ACR Appropriateness Criteria, Chronic ankle pain 2005

MS-8~Tendonitis/Bursitis
MS-9~Foreign Body

MS-10~Osteoarthritis
- ACR Appropriateness Criteria, Chronic hip pain 2005

MS-11~Osteochondritis Dissecans
- ACR Appropriateness Criteria, Non traumatic knee pain 2005

MS-12~Avascular Necrosis (AVN)
- ACR Appropriateness Criteria, Chronic hip pain 2005

MS-13~Rheumatoid Arthritis (RA)

MS-14~Osteoporosis
MS-16~Shoulder

MS-16.2~Impingement

MS-16.3~Tendinitis

MS-16.4~Tendon (Biceps Long Head) Rupture

MS-16.5~Rotator Cuff Tear

MS-16.6~Dislocation/Subluxation/Labral Tear

MS-16.7~Frozen Shoulder/Adhesive Capsulitis
MS-16.8~Osteoarthritis

MS-17~Elbow

MS-18~Wrist

MS-19~Pelvis

MS-20~Hip
MS-20.2~Osteoarthritis
- ACR Appropriateness Criteria, Chronic hip pain 2005

MS-20.3~Avascular Necrosis (AVN)
- ACR Appropriateness Criteria, Chronic hip pain 2005
- Greene WB (Ed.). Essentials of Musculoskeletal Care. 2nd Ed. Rosemont, IL, American Academy of Orthopaedic Surgeons,

**MS-20.4~Labral Tear**

**MS-21~Knee**

**MS-21.3~Meniscus Tear**
- ACR Appropriateness Criteria, Non traumatic knee pain 2005

**MS-21.4~Ligament Tear**
- ACR Appropriateness Criteria, Non traumatic knee pain 2005

**MS-21.5~Osteoarthritis**

**MS-21.6~Patellar Dislocation/Subluxation**

**MS-21.7~Baker’s Cyst**

**MS-22~Ankle**

**MS-22.3~Sprain (including Avulsion Fracture)**
- ACR Appropriateness Criteria, Chronic ankle pain 2005

**MS-22.4~Impingement**

**MS-22.5~Ruptured Achilles Tendon (Partial/Complete)**

- ACR Appropriateness Criteria, Chronic ankle pain 2005

**MS-22.6~Lateral Instability**
- ACR Appropriateness Criteria, Chronic ankle pain 2005

**MS-23~Foot**

**MS- 23.2~Sprain/Fracture/Dislocation/Subluxation**

**MS-23.3~Congenital Anomalies**
- ACR Appropriateness Criteria, Chronic foot pain 2005

**MS-23.4~Tendon Rupture**

**MS-23.5~Morton’s Neuroma**
- ACR Appropriateness Criteria, Chronic foot pain 2005

**MS-23.6~Plantar Fasciitis**

**MS-23.7~Diabetic Foot Infection**

**MS-23.8~Tarsal Tunnel Syndrome**

**MS-23.9~Sinus Tarsi Syndrome**