Raising The Bar In Imaging Stewardship: Electronic Determination Of Appropriate Patient And Exam Selection

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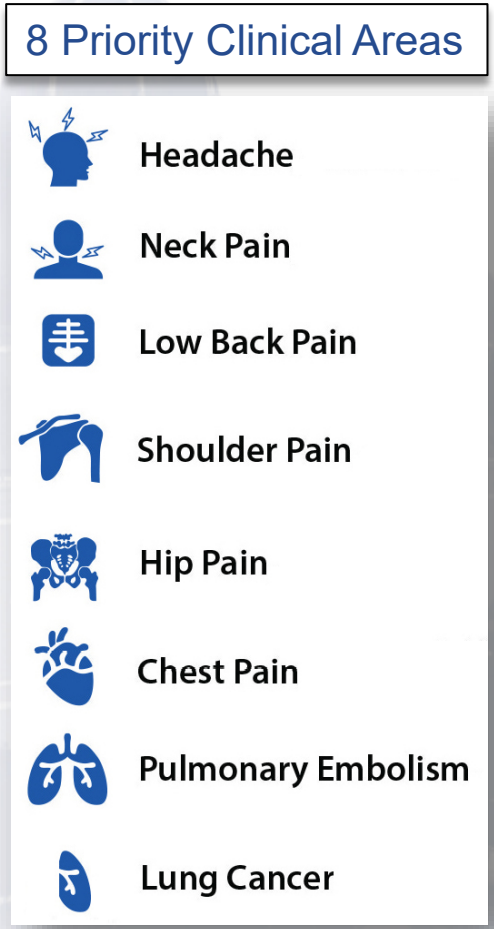
PAMA: Appropriate Use Criteria Advanced Imaging Mandate

- The Protecting Access to Medicare Act (PAMA) requires emergency medicine and ambulatory providers to **consult appropriate use criteria (AUCs)** delivered by a **CMS-approved clinical decision support mechanism (CDSM)** in the electronic medical record (EMR) when ordering **advanced imaging (CT, MRI, Nuclear Medicine)** in **8 Priority Clinical Areas (PCA)**. AUCs can only be created by **CMS approved Qualified Led Provider Entities (QPLEs).**
- CMS-approved CDSMs obviate advanced imaging prior authorization for Medicare patients; however, **many commercial payers use traditional prior authorization processes,** which include eligibility and benefits, site of service, appropriate exam selection, and confirmation of medical necessity.
- Ordering providers are burdened by prior authorization, so our aim is to facilitate best practice and work toward reducing the prior authorization burden by leveraging the CDSM to guide **both patient selection and ordering of the appropriate advanced imaging test.**



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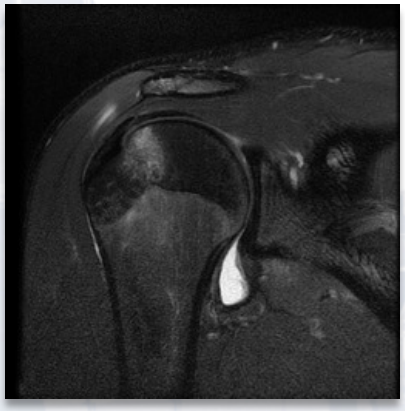
Objective & Methods

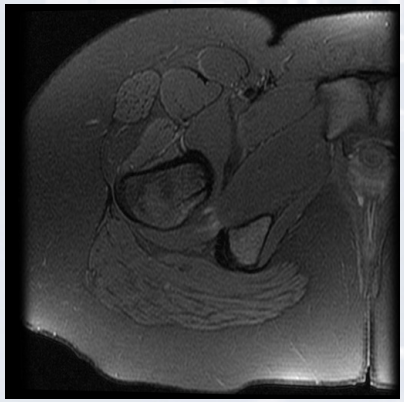
Objective

- Research imaging appropriateness and medical necessity criteria for MRI in patients with shoulder and hip pain
- Use cases: common indications in the ambulatory setting:
  - suspected rotator cuff or SLAP injury in patients with shoulder pain
  - suspected labral tear, femoral acetabular impingement (FAI) or ischiofemoral impingement in patients with hip pain

Method:

- Collaboration of orthopedic surgery specialists, radiologists and informationist in large academic center
- Multiple literature reviews from 1990 to present
- Results screened in duplicate followed by full text review
- Level of evidence graded according to Oxford Centre for EBM





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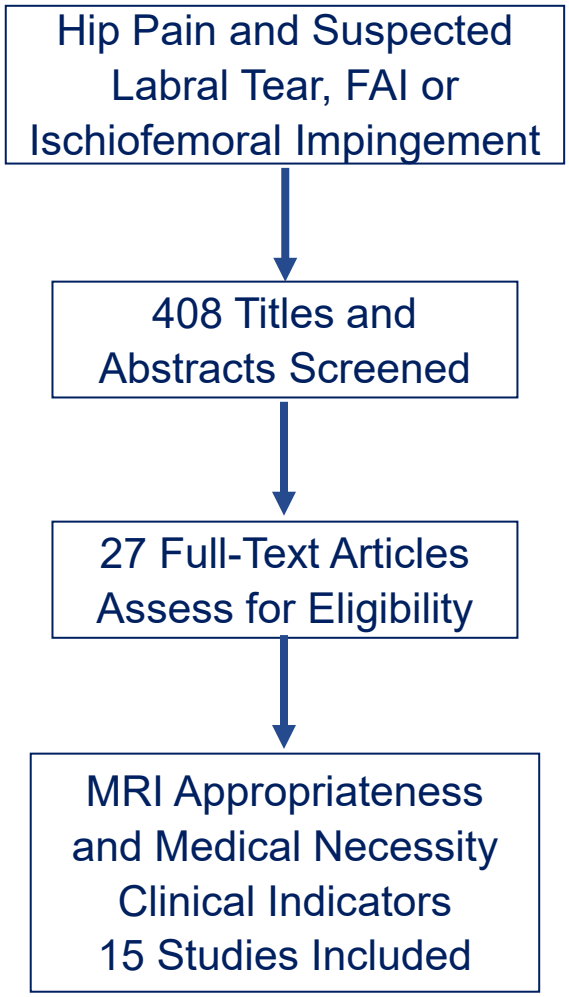
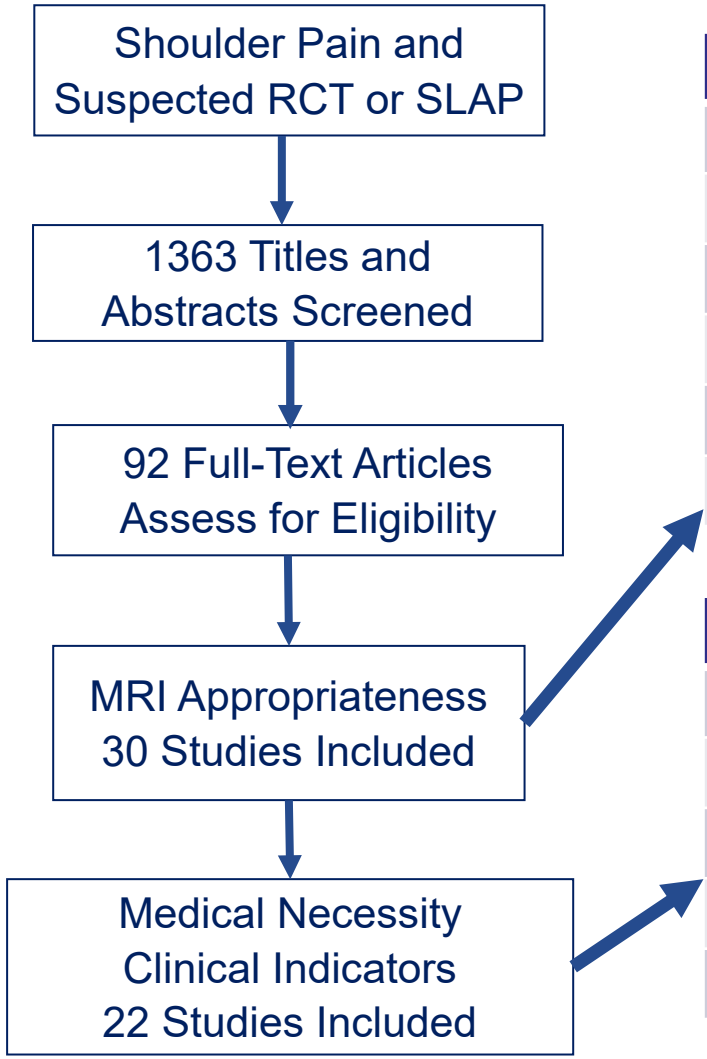
Literature Search: Hip Pain MRI



Study Type	N	Evidence Level
Meta-analysis	1	1
Systematic Review	2	2
Cohort Study	4	2
Retrospective Case-Control	2	3
Case Series	5	4
Economic Analysis	1	4

Literature Search: Shoulder Pain MRI



Study Type	N	Evidence Level
Meta-analysis	1	1
RCT	1	1
Systematic Review	4	1 (1) & 2 (3)
Prospective Investigations	12	1 (1) & 2 (11)
Retrospective Investigations	10	1 (3) & 2 (7)
Case Controls	2	2 & 3

Study Type	N	Evidence Level
Prospective study (SnNout)	1	1
Meta-Analyses	6	2
Systematic Reviews	12	2
Review Article	2	5
Guideline	1	5

Hip Pain & Suspected Labral Tear, FAI or Ischiofemoral Impingement

Diagnostic Test Appropriate Use Rules

1. Hip radiographs should be undertaken prior to MRI (ideally with modified Dunn)
2. MRI is highly effective for diagnosing ischiofemoral impingement
3. MRA is highly effective for diagnosing labral pathology and cartilage lesion
4. Imaging with a 3T MR is better than 1.5T MR for evaluating labral and chondral pathology
5. Consider diagnostic injection in suspected FAI, especially for low sensitivity, low prevalence situations
6. Diagnostic arthroscopy may still have a role in the absence of MRI diagnosis for hip pathology

MRI Medical Necessity Rules

In addition to groin or buttock pain, patients must be <50 years of age and have **2 of the following indicators:**

Radiographic indicators

1. absence of joint space narrowing
2. Cam or Pincer
3. crossover sign or ischial spine sign
4. OS acetabulae

Clinical indicators

1. pain at the end of hip range of motion
2. reproducible groin pain on hip flexion/adduction/internal rotation
3. “positive” response to intra-articular injection
4. prior hip arthroscopy or open hip procedure

Shoulder Pain & Suspected Rotator Cuff Tear or SLAP Lesion

Diagnostic Test Appropriate Use Rules

1. Radiographs should be performed as the initial imaging test in shoulder pain, as a range of conditions can be identified and subsequently treated (e.g. calcific tendinosis).
2. For suspected rotator cuff tears, US and MRI are equivalent; while US is less expensive, it is highly operator dependent.
3. MRI is superior for looking at intra-articular pathology, such as labral tears.
4. MRI and MRA are similar in efficacy, but a few studies suggested higher sensitivity and specificity in identifying intra-articular pathology with MRA, such as labral tear.

MRI Medical Necessity Rules

In addition to pain, patients must have **2 of the following clinical indicators:**

1. traumatic event by history or overuse syndrome (eg pitcher)
2. history of limited function or described weakness
3. physical exam finding of shoulder tenderness
4. painful or limited motion
5. weakness on muscle testing
6. clicking or popping perceived by patient or on physical exam during rotation or shoulder elevation
7. pain with manual shoulder elevation

Hip Pain Rule Integration Into Evidence Base Guideline in EMR

Suspected Bursitis / Labral Tear / Inflammatory Joint Disease

- For bursitis, myofacial pain, or suspected radiculopathy, then no advanced hip imaging necessary and consider AMB referral to PM&R.
- For labral tear:
  - AMB Referral to PM&R
  - MRI appropriate use criteria and order
- For femoracetabular impingement:
  - MRI appropriate use criteria

MRI Appropriate Use Criteria for Labral Tear

Recent x-ray and at least 2 of the following:

- Hip or groin pain
- Giving way by history
- Clicking
- Pain with ROM
- Limited ROM

If above criteria are met, order:

- MRI WO Contrast (Left vs Right vs Bilateral)

MRI Appropriate Use Criteria for Femoracetabular Impingement

Nondiagnostic x-ray and at least 2 of the following:

- Hip or groin pain
- Giving way by history
- Clicking
- Pain with ROM
- Limited ROM
- Positive impingment test

If above criteria are met, order:

- MRI WO Contrast (Left vs Right vs Bilateral)

Conclusion

- Appropriate use of imaging resources is critical to improving patient outcomes & reducing total cost of care.
- Ensuring radiology value goes beyond the determination of best test and should include an assessment of clinical signs and symptoms that support a reasonable likelihood of the presence of the pathology in question.
- Clinical decision supports tools can be enhanced to guide advanced imaging exams and patient selection, but this requires collaboration with specialists in other fields as clinical assessment is their area of expertise.

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