ACUPUNCTURE Today

When to Order Advanced Imaging

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For musculoskeletal imaging, the most commonly ordered studies are plain film radiographs. Under certain circumstances, computerized tomography (CT) or magnetic resonance imaging (MRI) may be required to differentiate a simple strain from a more complex problem such as a tumor, infection or degenerative disorder. There are symptoms and signs that can signify an injury or disease that may require advanced imaging or a referral to a specialist. These may include severe unrelenting pain at night; marked weakness; significant loss of range of motion; claudication; and systemic symptoms.

The use of CT or MRI should be based on your clinical findings. When a diagnosis cannot be determined, the CT or MRI should be considered only if the results will affect your treatment plan. You also need to consider the fact that these special studies are more sensitive than specific, and you will often have false positives.

The general rule of thumb is that CT is preferred for evaluating the cortex, trabecular structure and fractures. MRIs, on the other hand, are preferred for assessing soft tissue, bone marrow, ligaments, muscles, tendons and fat. MRIs are also useful in evaluating internal derangements of joints, metastatic diseases and primary tumors of the soft tissue.

Non-complex injuries such as a sprain/strain generally do not facilitate the need for advanced imaging. However, when plain film radiographs are inconclusive and conservative treatment has not helped, a CT or MRI will provide further evaluation.

When deciding to order an MRI or CT scan, a CT might be preferred because of price. However, you must consider that CT will expose your patient to ionizing radiation. A CT is also limited to scans of the axial plane, whereas MRI has the ability to image directly in a variety of planes without reconstruction. MRIs with the contrast agent Gd-DTPA (gadolinium diethylene-triamine penta-acetic acid) provide both physiologic and anatomic information. MRIs also have fewer occurrences of false negative results than CT scans.

When ordering advance imaging, we must also consider contraindications for CT and MRI. A CT is contraindicated in pregnancy and for use on children unless appropriate. MRIs are contraindicated with patients that have cardiac pacemakers or other ferromagnetic materials in their bodies such as transplants or clips.

Below is a non-exclusive list of selected indications for ordering a CT or MRI.

Indication	Study Usually Performed
Bone	
Fractures, trauma, deformity	CT
Stress, occult, or minimally displaced fractures	MRI

Bone marrow (including lymphoma, myeloma)	MRI
Soft Tissues/Tumors and Masses	
Benign (bone)	CT
Benign (soft tissue)	MRI
Malignant (soft tissue or bone)	MRI
Metastases	MRI or contrast MRI, bone scan
Metastases, lung	CT
Hematoma	
Hematoma, bleeding into tissue	MRI
Epidural hematoma	MRI (CT if patient is traumatized)
Hip	
Avascular necrosis	MRI
Osteonecrosis	MRI
Transient osteoporosis	MRI
Infection, Inflammation, Abscesses, Osteomyelitis	MRI or contrast MRI
Intra-Articular	
Intra-articular structures	MR arthrography
Loose bodies in a joint	CT arthrography or MR arthrography
Spine	
Cauda equina syndrome	Emergent MRI
Degenerative disk disease	MRI or CT
Herniated disk, spinal stenosis	CT or MRI (possibly with myelography)
Low back pain w/ neurological signs	MRI or CT
Spondylolisthesis	Plain x-ray films are best
Labrum	
Tears and degeneration	MRI, MR arthrography
Rotator Cuff	
Full thickness tear	Arthrography, MRI
Partial thickness tear	MRI with contrast; MR arthrography preferred to arthrography alone and is better than conventional MRI
Shoulder impingement syndrome	MRI, MR arthrography, or plain x-ray films
Meniscus	
Meniscal injuries	MRI

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More reference are available upon request.

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