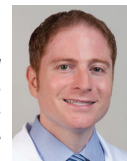


# Musculoskeletal Ultrasound Offers Unique Advantages

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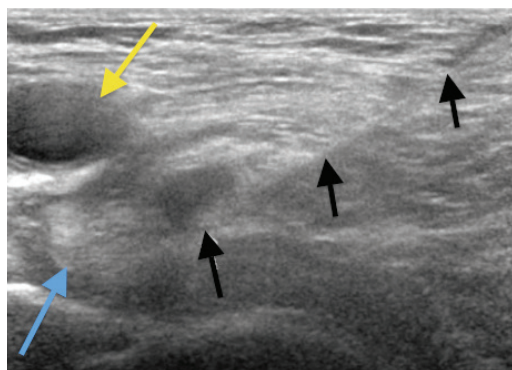
Each of the imaging modalities available to radiologists providing care for patients with musculoskeletal pathologies has its own strengths and limitations. In the United States, musculoskeletal ultrasound is currently seeing increased utilization and it is likely to continue to grow as physicians become more familiar with its unique capabilities and advantages.

Musculoskeletal disorders include a large and varied group of pathologies that contribute significantly to the cost burden of health care. Health care systems are constantly being challenged to find cost effective ways to provide evidence-based care to patients, and ultrasound is emerging as such a modality in musculoskeletal imaging.

## High spatial resolution and dynamic imaging

Technological improvements have led to ultrasound transducers that now produce better quality images at significantly higher resolution. In fact, current ultrasound transducers offer a higher spatial resolution — measured in the number of pixels used to make up a digital image — than does magnetic resonance imaging (MRI). This has led to increased utilization of ultrasound for many musculoskeletal diagnoses where MRI was previously considered the imaging modality of choice.

“Studies have shown that ultrasound has accuracies equivalent to MRI for many musculoskeletal diagnoses,” states Benjamin Levine, MD, associate professor of radiology, “one in particular being rotator cuff tears of the shoulder.” The current medical literature supports ultrasound and MRI being equally accurate in diagnosing full- and partial-thickness tears of the rotator cuff. In fact, the Society of Radiology and Ultrasound published a consensus statement at their 2013 conference that musculoskeletal ultrasound should be the primary examination performed for patients with suspected rotator cuff tears.



*Transverse ultrasound image over the anterior hip shows real time ultrasound guidance of the needle (black arrows) to the iliopsoas bursa around the tendon (blue arrow). The use of ultrasound guidance allows accurate placement of the needle to the desired location, while safely avoiding critical structures, such as in this case the femoral artery (yellow arrow).*

In addition to offering high resolution, the dynamic capabilities of ultrasound imaging make it more suitable than other imaging modalities for a number of uses. For example, some pathologies are elicited only when performing certain dynamic maneuvers, such as with flexion of the hip or abduction of the arm. Unlike other modalities, ultrasound enables real-time imaging as a patient performs certain maneuvers or positions. “Dynamic imaging capabilities coupled with greater spatial resolution have contributed to increased ultrasound utilization at UCLA for musculoskeletal disorders,” says Dr. Levine.

The dynamic imaging capability of ultrasound also makes it ideally suited for performing image-guided procedures, including aspirations and injections. Fluid can be aspirated from a joint, tendon sheath or bursa, for example, in cases of suspected infection or inflammatory processes such as gout or rheumatoid arthritis. Ultrasound-guided injections can also be performed for introducing contrast for an MRI arthrogram, or injecting platelet-rich plasma or stem cells.

## Novel procedures using musculoskeletal ultrasound

UCLA radiologists are also using musculoskeletal ultrasound in more innovative ways that take advantage of its high spatial resolution and dynamic capabilities. For patients with calcific tendinosis — particularly in the shoulder — musculoskeletal ultrasound is being used in an irrigation and lavage procedure to remove the calcium and alleviate pain. The procedure is used as a minimally invasive treatment alternative to surgery. Ultrasound guided techniques enable the musculoskeletal radiologist to be highly accurate in targeting calcium deposits for treatment.

Another unique use of musculoskeletal ultrasound at UCLA is in the diagnosis and management of snapping hip syndrome, which involves abnormal and abrupt movement of the iliopsoas tendon, iliotibial band or gluteus muscle around the hip. “The exact cause of someone’s hip pain can be quite an elusive diagnose to make,” says Dr. Levine. “There are many different causes of hip pain, and snapping hip is one that is often not thought of.” UCLA radiologists employ dynamic ultrasound visualization of the abnormal movement of the iliopsoas tendon during hip motion followed by an injection into the bursa surrounding the tendon. This procedure has been shown to be safe and effective in determining if the hip pain is being caused by tendon snapping, allowing treatment management to be tailored accordingly. 