

# Ultrasound-guided interventions in sports and regenerative medicine



*The Konica Minolta SONIMAGE® HS1 Compact Ultrasound System is optimized for performing image-guided injections.*

Ultrasound is increasingly being used by sports and regenerative medicine physicians to supplement a diagnostic musculoskeletal (MSK) evaluation. With ultrasound, point-of-care (POC) healthcare providers can visualize soft tissue tears in muscles, tendons, ligaments and joint spaces at a high spatial resolution. Along with growth in diagnostic procedures, ultrasound is also increasingly being used to guide injections especially in pain management and regenerative medicine.

The American Academy of Physical Medicine and Rehabilitation (AAPM&R) has published a position statement on the appropriate use of ultrasound in clinical practice. It stipulates that diagnostic ultrasound is highly sensitive and specific<sup>1</sup>, it costs less than other imaging modalities and its dynamic motion imaging capabilities can provide additional information beyond static imaging to assist with patient diagnoses. Ultrasound-guided interventions may enable avoidance of more invasive, surgical procedures and evidence supports that it is more accurate than palpation alone.

In a comprehensive review of literature evaluating ultrasound-guided injections in sports medicine, Daniels et al found that in most anatomic locations ultrasound guidance improves clinical efficacy.<sup>2</sup> The authors found that upper extremity ultrasound-guided injections provide superior benefit to landmark-guided injections at the subacromial space, the glenohumeral joint, the biceps tendon sheath and the joints of the hand and wrist. They also reported superior efficacy in lower-extremity ultrasound-guided injections involving the knee, ankle and foot compared to landmark-based injections. Further evidence demonstrates that less experienced clinicians can be more accurate with ultrasound guidance. With improvements in accuracy, the authors also concluded that ultrasound guidance can assist with deeper anatomic structures, in injecting targets near large vascular structures and in patients where non-guided injections have failed.<sup>2</sup>

Joshua B. Rothenberg, DO, is the Director of Regenerative Medicine and Orthopedic Biologics for BocaCare Orthopedics and treats all musculoskeletal issues including the neck and spine. He completed an ACGME fellowship at the University of Pittsburgh Medical Center under Dr. Jose Ramirez-Del Toro and Dr. Kentaro Onishi, where nearly all injections were performed using sonographic guidance.

“Whether the injectate is corticosteroid or a biologic such as platelet-rich plasma, being as precise and accurate as possible will only lead to better outcomes,” Dr. Rothenberg says. “There is a clear advantage to using ultrasound guidance for any type of injection.”

He adds that during his fellowship, he had access to a portable ultrasound system that he could take home to practice appropriate needle visualization, hand-eye coordination and in-plane and out-of-plane injections using a phantom.

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“Repetition is extraordinarily important, and you cannot learn ultrasound by picking up a probe once in a while,” Dr. Rothenberg says. “Beginning with easier structures, such as a suprapatellar recess with joint effusion, can help build confidence rapidly.”

Education, such as an approved accredited sports medicine fellowship as well as courses at the American Medical Society of Sports Medicine (AMSSM), AAPM&R or American College of Sports Medicine (ACSM), are paramount to obtaining the skills needed for ultrasound guidance. Dr. Rothenberg recommends the American Institute of Ultrasound in Medicine (AIUM) as a resource for education and accreditation. Konica Minolta Healthcare offers educational courses through the UGPLearningHub™, which leverages the deep technical and clinical knowledge of MSK ultrasound key opinion leaders. With Konica Minolta experts at dedicated learning centers throughout the country, the UGPro™ Solution unites the latest ultrasound and minimally invasive procedural innovations with hands-on education.

Ultrasound is utilized in Dr. Rothenberg’s practice nearly every day. It allows for point-of-care, highly specific clinical evaluations and dynamic examination of anatomic areas. Although more research is needed to conclusively demonstrate the cost-effectiveness of ultrasound-guided injections, Dr. Rothenberg believes the modality helps save overall healthcare costs, based on his experience.

“It allows for precise and accurate interventions with appropriate needle placement into areas of pathology,” he adds. “Ultrasound also helps me to know accurately whether a patient has truly failed an injection, rather than assuming the intervention was done in the right place with anatomic guidance.”

In addition to ultrasound delivering more precise and accurate interventions, it often leads to more patient tolerable procedures as the clinician can visualize the target tissue rather than estimate where the needle is going. Dr. Rothenberg believes that ultrasound allows for increased interaction between the practitioner and the patient. This interaction may also allow an opportunity for the clinician to provide the patient with greater understanding of the injury and intervention.

Optimizing ultrasound workflow can take some time, however, Dr. Rothenberg believes that that the HS1 System assists in this regard.

“The most useful technology in my practice is the ease of use with quick workflow tools on the Konica Minolta SONIMAGE HS1 Compact Ultrasound System. There is a simplicity that allows for quick workflow without sacrificing image quality,” Dr. Rothenberg explains.

The use of ultrasound for diagnosis and intervention in sports medicine, pain management and regenerative medicine is becoming a standard of quality care supported by clinical evidence and recommended by several medical associations. Ultrasound increases the accuracy of targeted injections that may lead to better patient outcomes. It is a cost-effective imaging technology ideal for use at the point of care.



Konica Minolta SONIMAGE HS1, SNV image on screen

## References

1. AAPM&R position statement. *Diagnostic Musculoskeletal Ultrasound or Musculoskeletal Ultrasound-Guided Procedures*. Available at: [https://www.aapmr.org/docs/default-source/protected-advocacy/Position-Statements/final\\_aapmr\\_ultrasound\\_position\\_statement.pdf?sfvrsn=b8c5537c\\_2](https://www.aapmr.org/docs/default-source/protected-advocacy/Position-Statements/final_aapmr_ultrasound_position_statement.pdf?sfvrsn=b8c5537c_2).
2. Daniels EW, Cole D, Jacobs B, Phillips SF. Existing Evidence on Ultrasound-Guided Injections in Sports Medicine. *Orthop J Sports Med*. 2018 Feb 22;6(2):2325967118756576.