WEBINAR

Pragmatic MSK Ultrasound: Scanning the Rotator Interval, Common Extensor Tendon and Patellar Tendon

June 2021





Your Host



Dr. Oron Frenkel, MD, MS

Emergency Physician & POCUS Educator Chairman, Clarius Medical Advisory Board



Ultrasound Imaging of Orthopedic Injuries



"With the high cost and limited availability of gold standard imaging modalities, ultrasound has become an alternative in many musculoskeletal (MSK) injuries. Ultrasound has become increasingly portable and readily available in many acute care settings."

Simard R. Ultrasound Imaging of Orthopedic Injuries. Emerg Med Clin North Am. 2020 Feb;38(1):243–265. doi: 10.1016/j.emc.2019.09.009. PMID: 31757253. Source: https://pubmed.ncbi.nlm.nih.gov/31757253/

Ultrasound Imaging of Orthopedic Injuries



"Ultrasound has been shown to diagnose fractures, dislocations, and tendon and ligament injuries. It helps guide fracture and dislocation reductions and aids in regional anesthesia for pain management."

Simard R. Ultrasound Imaging of Orthopedic Injuries. Emerg Med Clin North Am. 2020 Feb;38(1):243–265. doi: 10.1016/j.emc.2019.09.009. PMID: 31757253. Source: https://pubmed.ncbi.nlm.nih.gov/31757253/

Standards for Musculoskeletal Ultrasound



"Ultrasound has become the primary diagnostic tool in traumatic, inflammatory and degenerative soft tissue conditions. It is also used to monitor the condition of joints, ligaments, cartilage and muscles.

Czyrny Z. Standards for musculoskeletal ultrasound. J Ultrason. 2017 Sep;17(70):182-187. doi: 10.15557/JoU.2017.0027. Epub 2017 Sep 29. PMID: 29075523; PMCID: PMC5647613. Source: https://pubmed.ncbi.nlm.nih.gov/29075523/

Ultrasound Imaging in MSK Injuries-What the Orthopaedic Surgeon Needs to Know

"Patients with musculoskeletal complaints have either been ignored or advised investigations far beyond their means or comfort. Focusing attention only on spine and head restricted the evaluation in cases of trauma ... the extremities often got overlooked ...

Shah AB, Bhatnagar N. Ultrasound imaging in musculoskeletal injuries–What the Orthopaedic surgeon needs to know. J Clin Orthop Trauma. 2019 Jul–Aug;10(4):659–665. doi: 10.1016/j.jcot.2019.05.010. Epub 2019 May 20. Erratum in: J Clin Orthop Trauma. 2020 Nov–Dec;11(6):1169–1171. PMID: 31316235; PMCID: PMC6611988. Source: https://pubmed.ncbi.nlm.nih.gov/31316235/



Ultrasound Imaging in MSK Injuries-What the Orthopaedic Surgeon Needs to Know

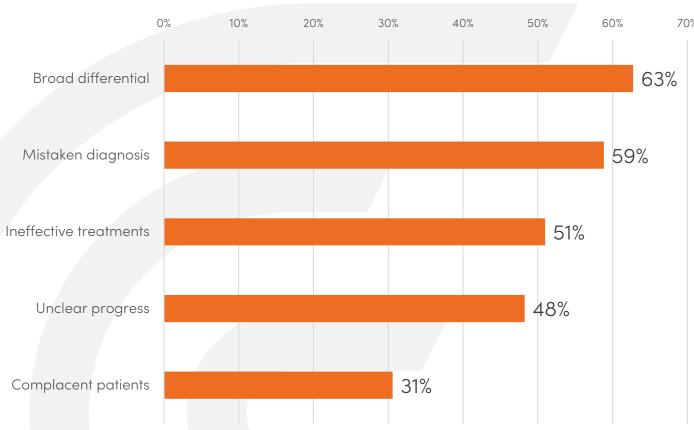
"Recent exponential improvement in medical ultrasound technology has revolutionised the field of musculoskeletal imaging ... MSK ultrasound has far reaching results allowing for detailed evaluation of soft tissues including nerves, ligaments and tendons."

Shah AB, Bhatnagar N. Ultrasound imaging in musculoskeletal injuries–What the Orthopaedic surgeon needs to know. J Clin Orthop Trauma. 2019 Jul–Aug;10(4):659–665. doi: 10.1016/j.jcot.2019.05.010. Epub 2019 May 20. Erratum in: J Clin Orthop Trauma. 2020 Nov–Dec;11(6):1169–1171. PMID: 31316235; PMCID: PMC6611988. Source: https://pubmed.ncbi.nlm.nih.gov/31316235/





Which of these challenges have you encountered in treating musculoskeletal concerns?



Your Expert Guest Speaker



Marc Schmitz, MSc
Founder & CEO of SonoSkills





Musculoskeletal ultrasound of rotator interval, common extensor tendon and patellar tendon.





Founder / Trainer marc@sonoskills.com Linkedin.com/in/marcsonoskills sonoskills.com



Laurentius Hospital Radiology / orthopedic department Roermond, The Netherlands



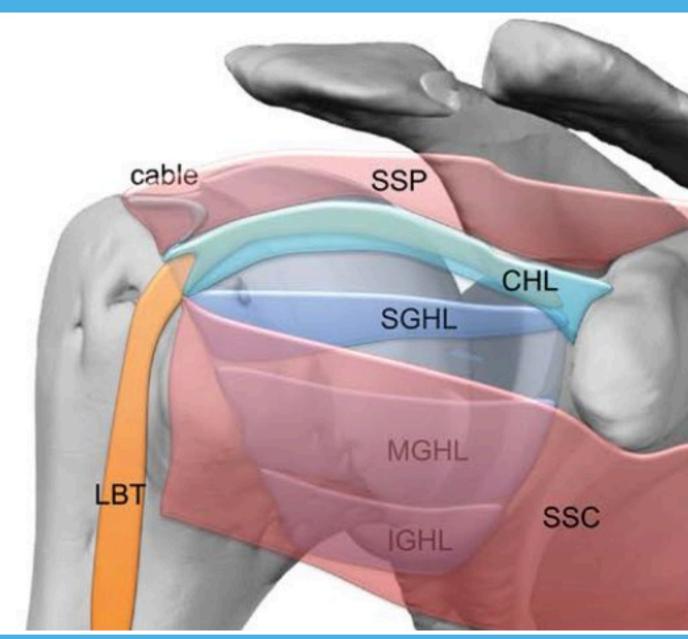
+7.000 ultrasound pathology cases Regular contributor ultrasoundcases.info free access!!



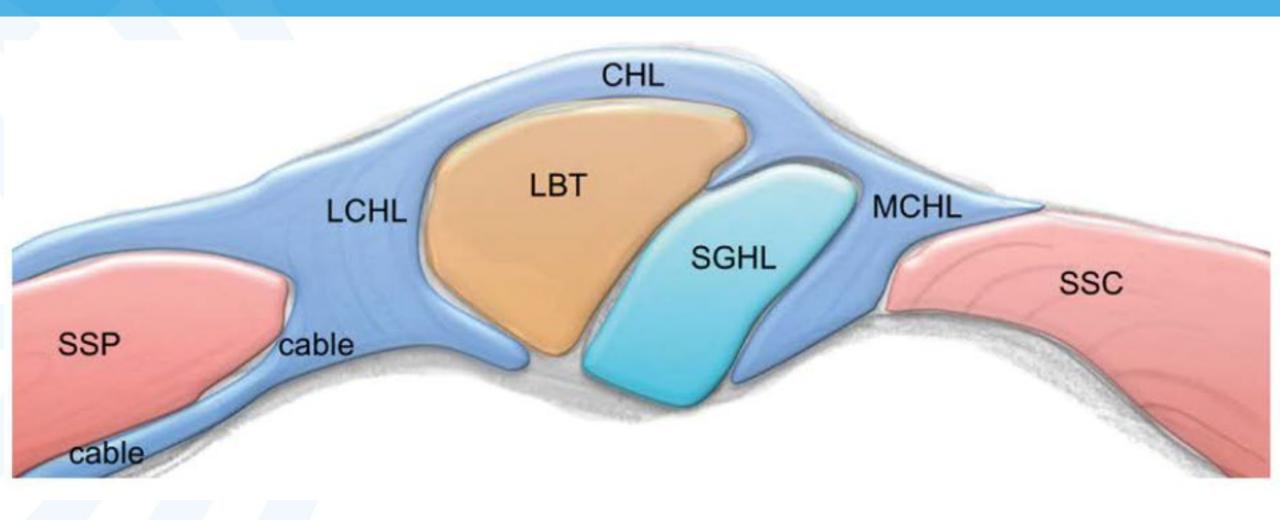
Rotator interval

(Sono)anatomy

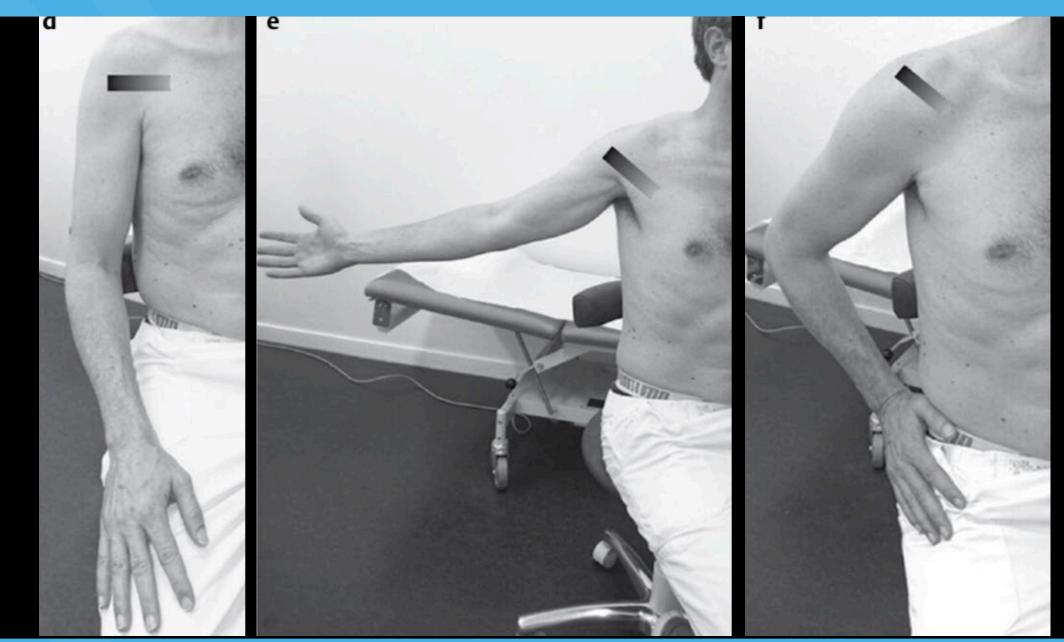












Tamborrini et al. 2017



Demo

Rotator interval <u>clarius.com/classroom/rotator-interval</u>



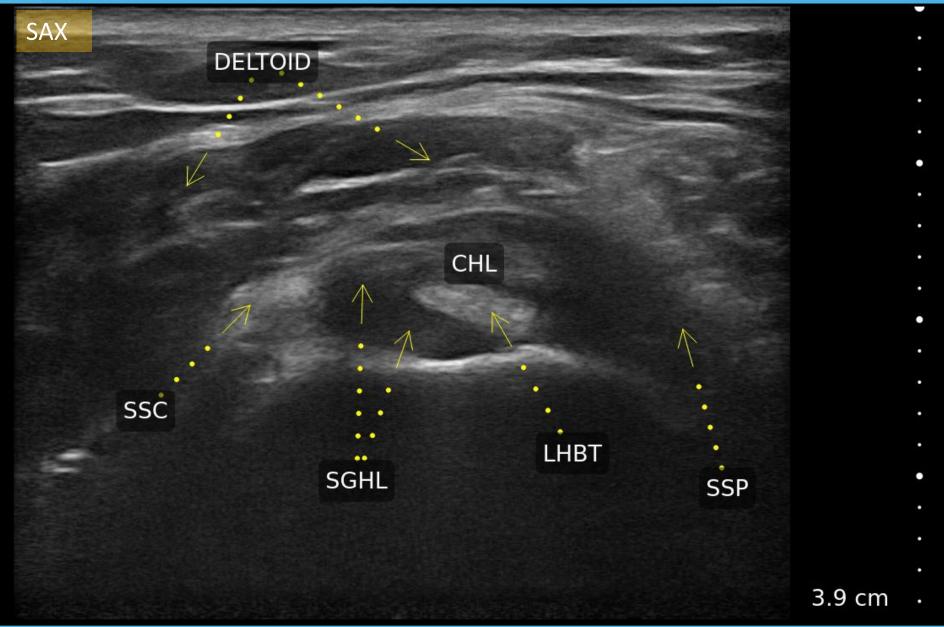
Rotator interval

Sonopathology

Thickening SGHL & CHL

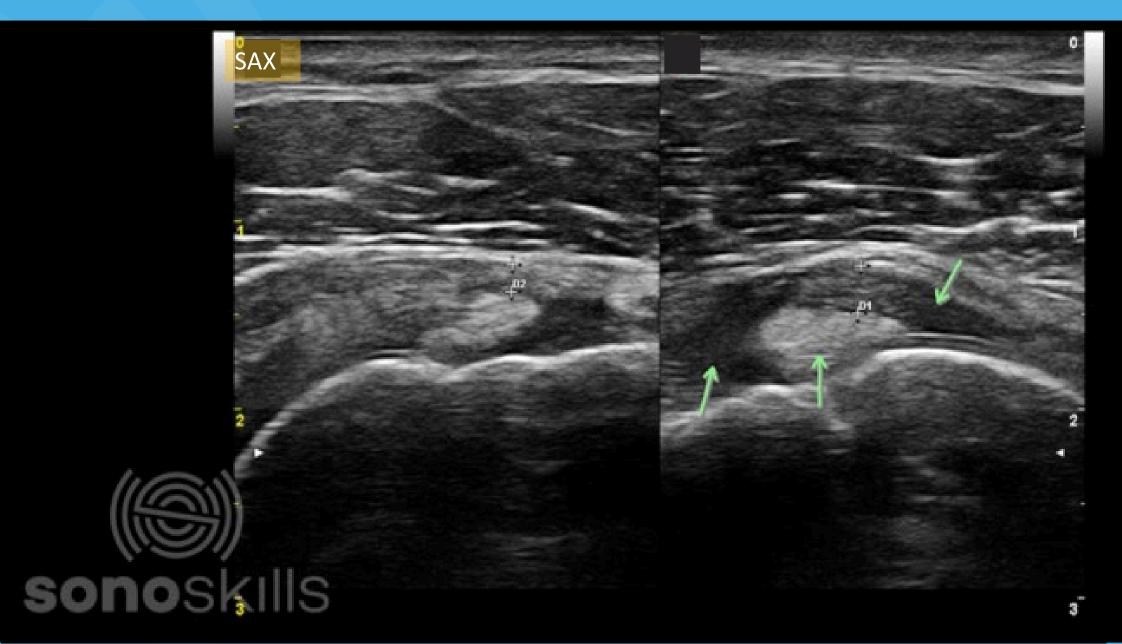






Thickening SGHL & CHL







Tear coracohumeral ligament

- Biceps instability
 - "Chondral print sign"
 - Intracapsular instability

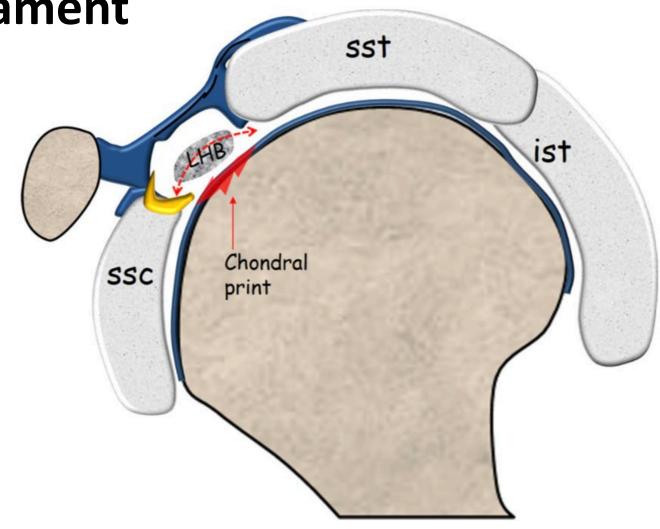




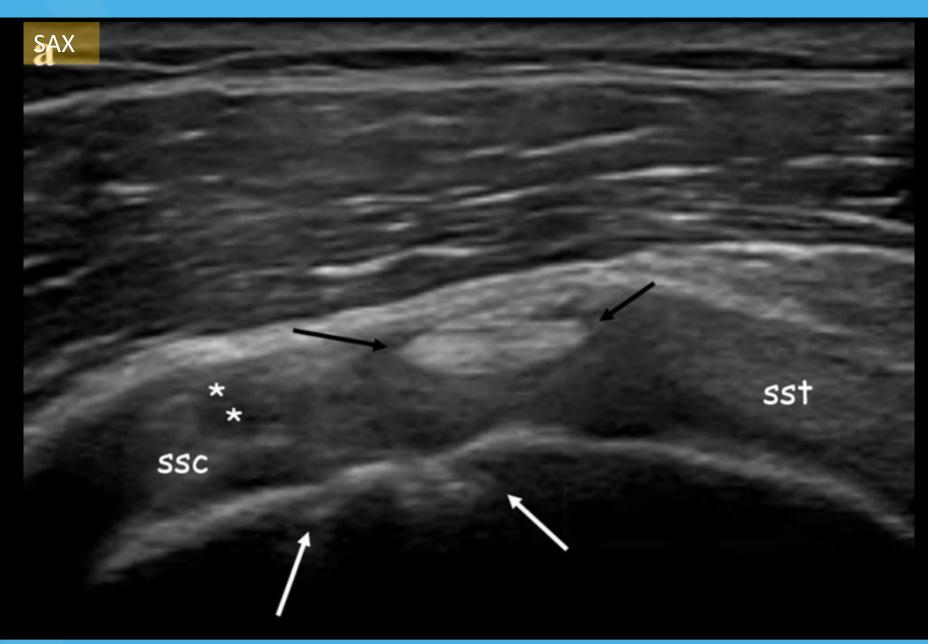
Table 1 Bennett classification of long head of biceps tendon instability 11,45,46

Туре	Direction of instability	Underlying structural lesion
1	Intrasheath subluxation	Isolated SSC tendon tear
2	Intrasheath subluxation	Medial CHL (CHL/SGHL) tear
3	Intra-articular dislocation	SSC tendon tear + medial CHL (CHL/SGHL) tear
4	Medial dislocation superficial to SSC tendon (extra-articular)	Anterior SSP tendon tear + lateral CHL tear
5	Intra-articular dislocation	SSC tendon tear $+$ anterior SSP tendon tear $+$ medial and lateral CHL tear

Abbreviations: CHL, coracohumeral ligament; LHBT, long head of biceps tendon; SGHL, superior glenohumeral ligament; SSC, subscapularis; SSP, supraspinatus.

Tear subscapularis





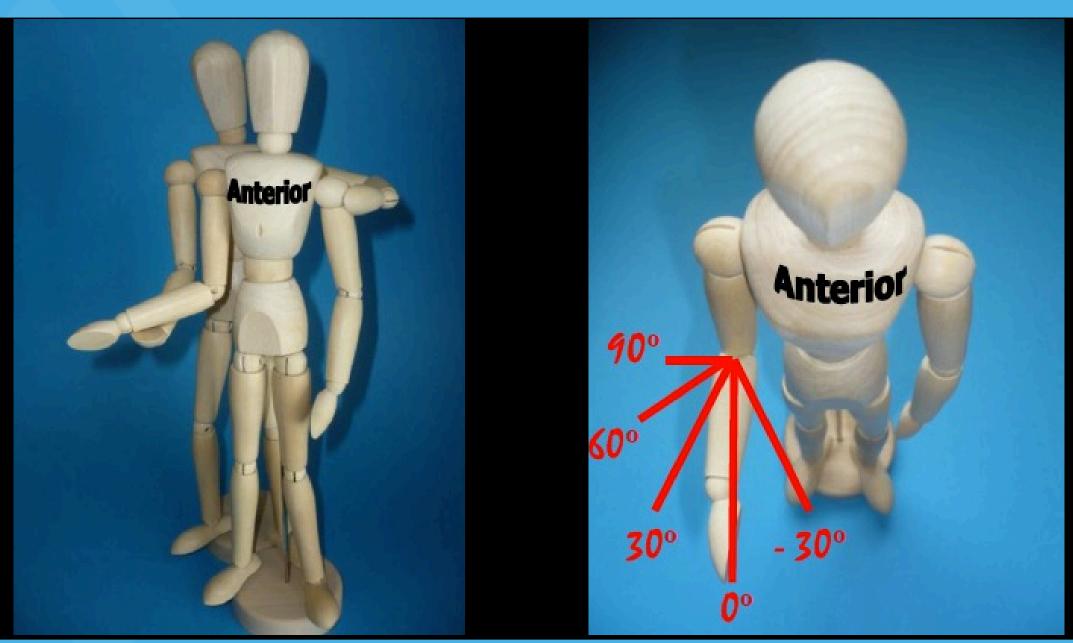


Clinical indications for musculoskeletal ultrasound updated in 2017 by European Society of Musculoskeletal Radiology (ESSR) consensus

Table 1 Shoulder: Detailed results for evidence levels and final consensus, a comparison between 2012 and 2017

Clinical indication	Evidence level 2012	Final consensus 2012	Evidence level 2017	Final consensus 2017
Adhesive capsulitis	В	0	Unchanged	1





Hanchard et al. 2011

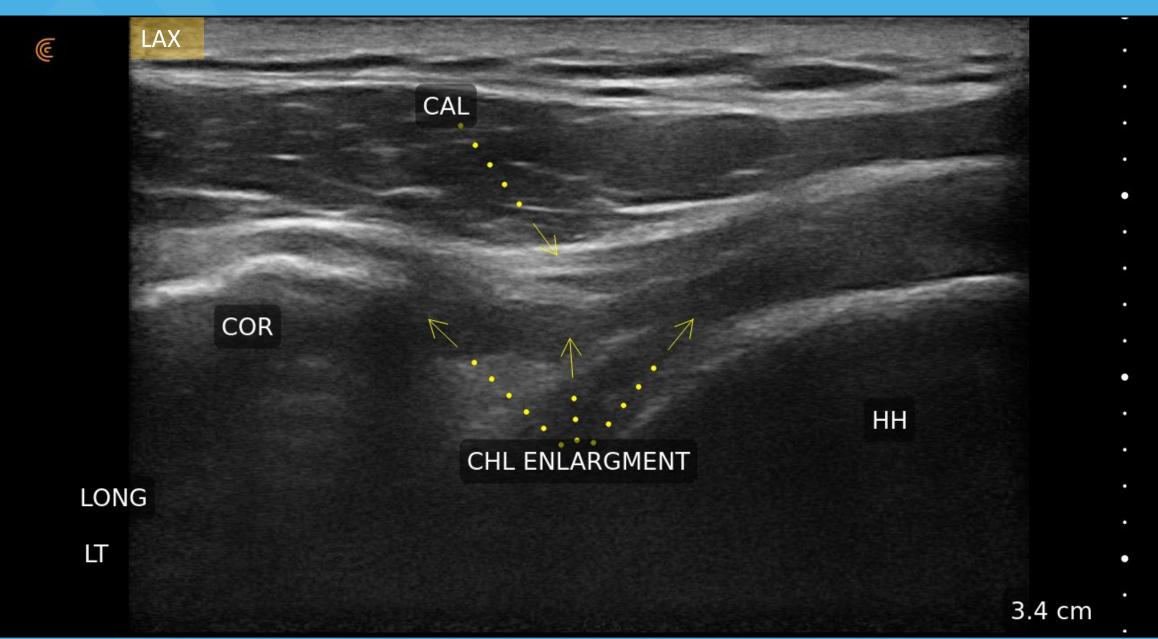


Adhesive capsulitis: potential MSKUS features

- LHB tendon sheath effusion
- Thickening coracohumeral ligament
- Rotator interval: hypoechoic and increased power Doppler
- Coracohumeral ligament near coracoid process
- Subcoracoidal fat triangle: increased microflow
- Posterior recess
- Axillary recess

CHL enlargement





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Assessment Frozen Shoulder

Passive / active ROM: external rotation and abduction (both sides):

- I. Exclude Arthritis
- II. Exclude Luxation
- III. Exclude massive Rotator Cuff tear

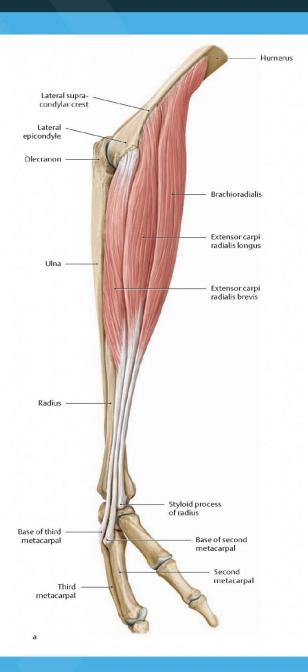
Frozen Shoulder is mostly a clinical diagnosis.

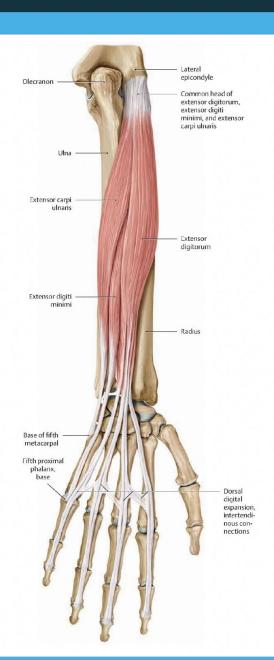


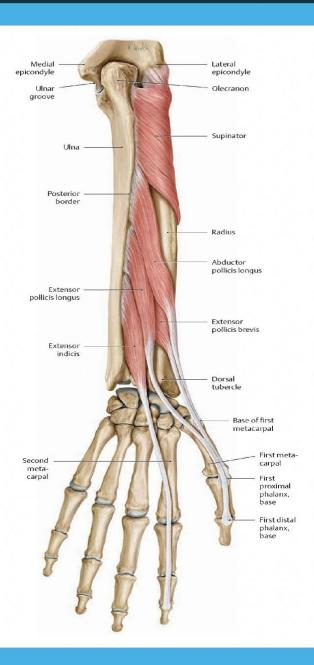
Common extensor tendon

(Sono)anatomy

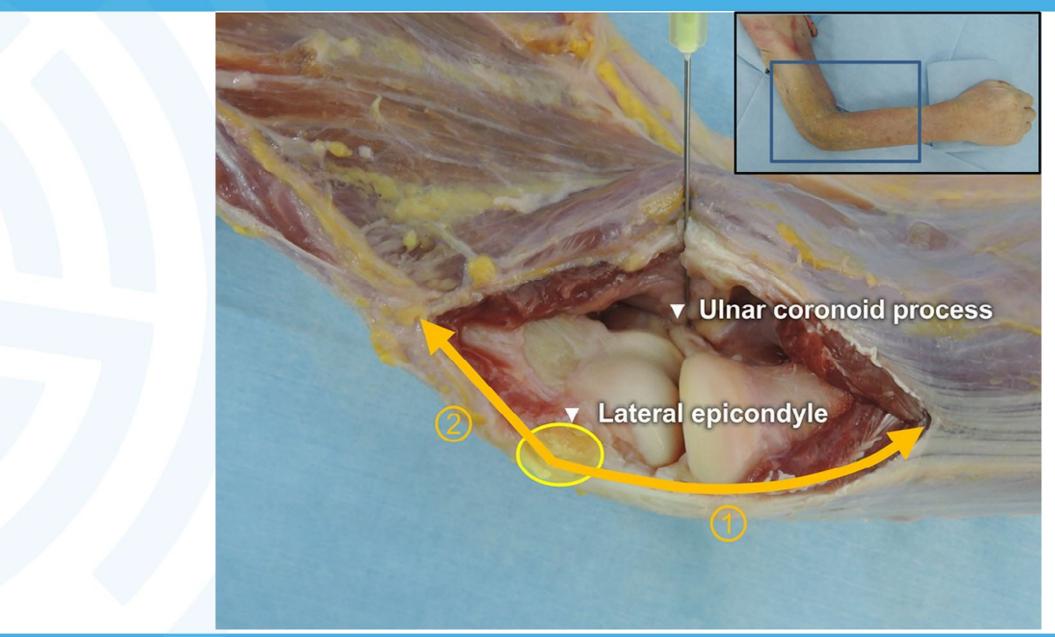














Demo

Common extensor tendon classroom/common-extensor-tendon/



Common extensor tendon

Sonopathology

Causes of lateral elbow pain





Kotnis et al. 2012

Causes of lateral elbow pain





Kotnis et al. 2012

Causes of lateral elbow pain





Kotnis et al. 2012



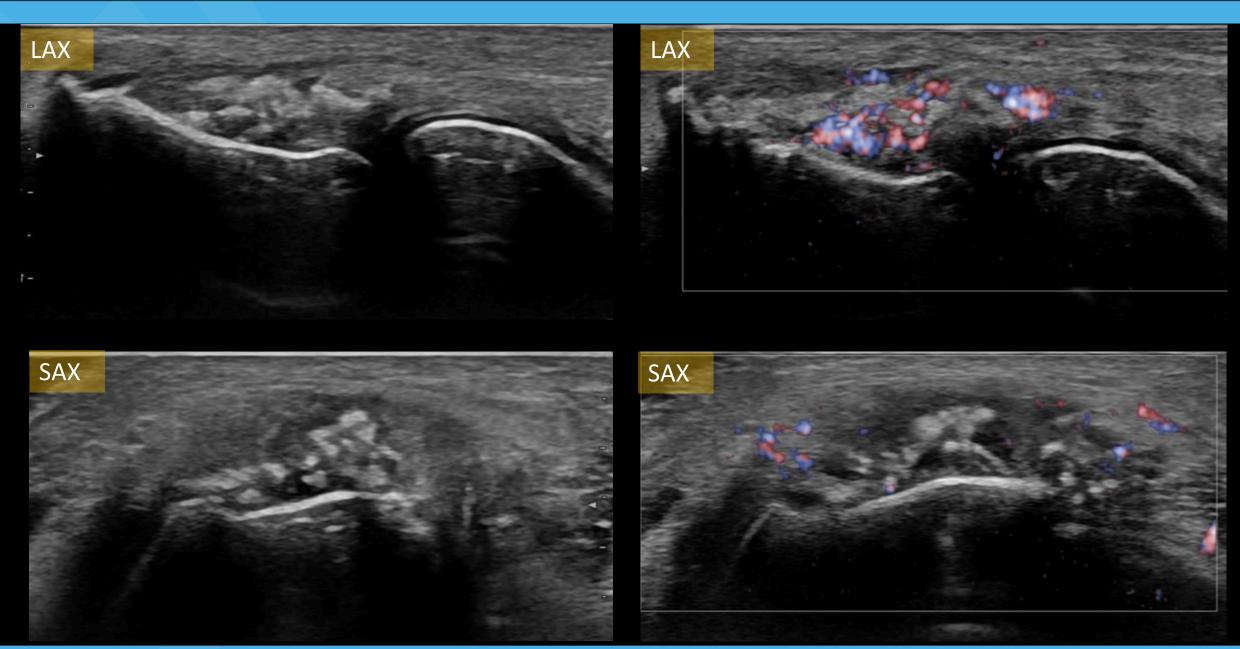
Clinical indications for musculoskeletal ultrasound updated in 2017 by European Society of Musculoskeletal Radiology (ESSR) consensus

Table 2 Elbow: Detailed results for evidence levels and final consensus, a comparison between 2012 and 2017

Clinical indication	Evidence level 2012	Final consensus 2012	Evidence level 2017	Final consensus 2017
Tendons and soft tissues				
Lateral epicondylitis	A	3	Unchanged	Unchanged

Calcific tendinosis

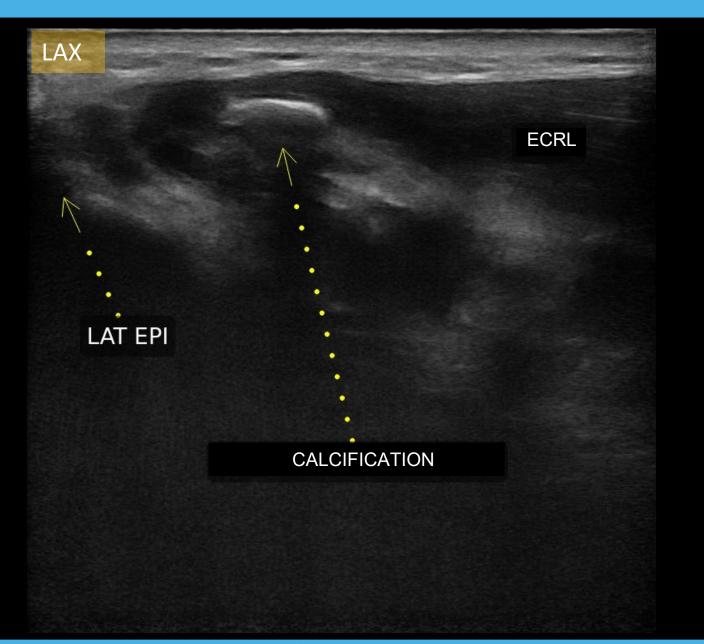




Calcification ECRL







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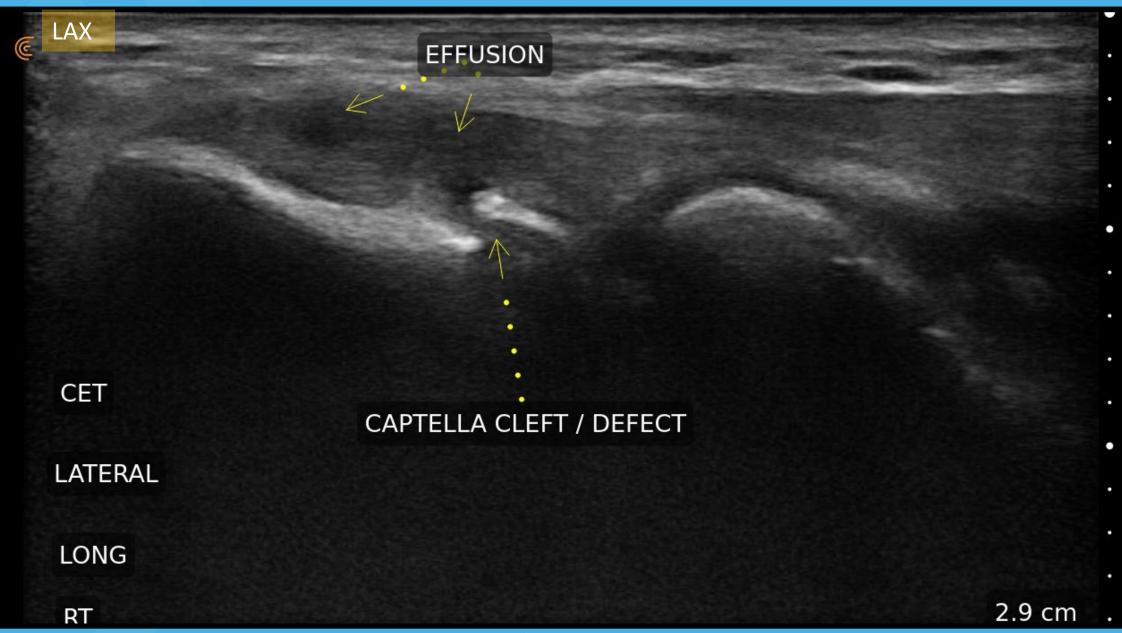
4.8 cm

LONG

RIGHT

Small tendinosis

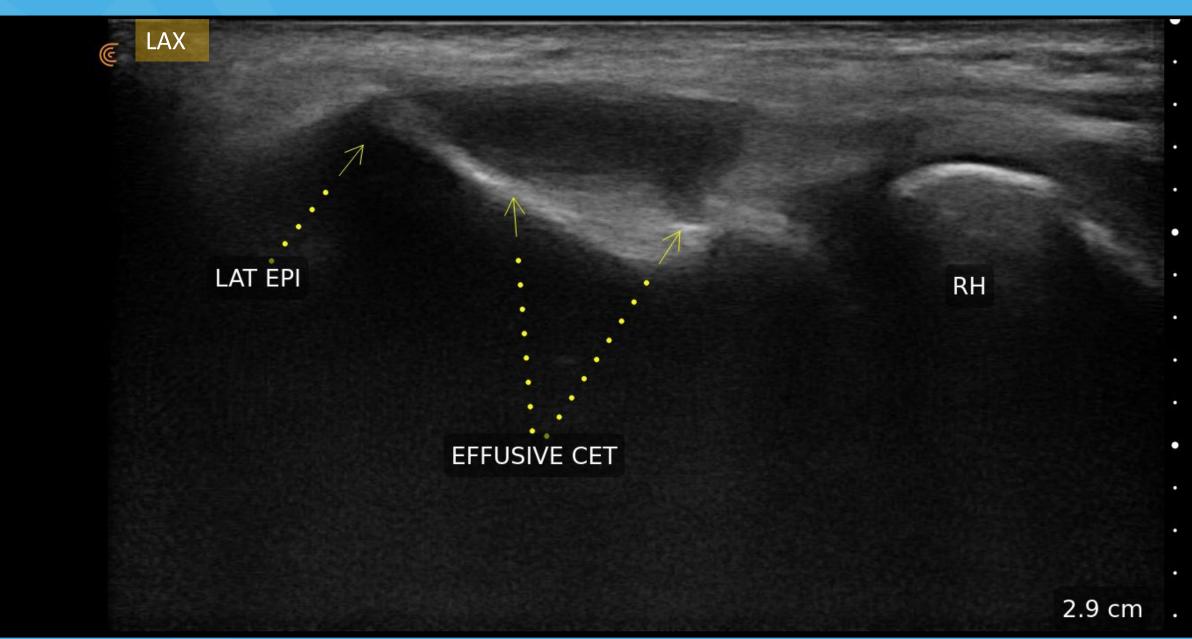




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Severe tendinosis

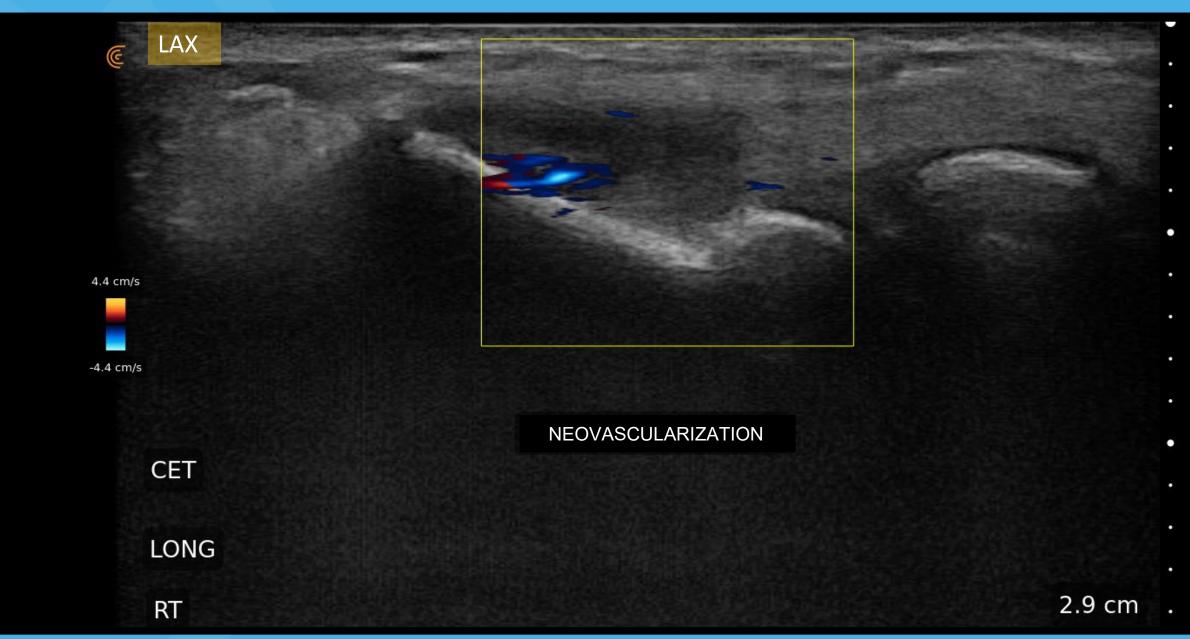




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Neovascularization, tendinosis, partial tear





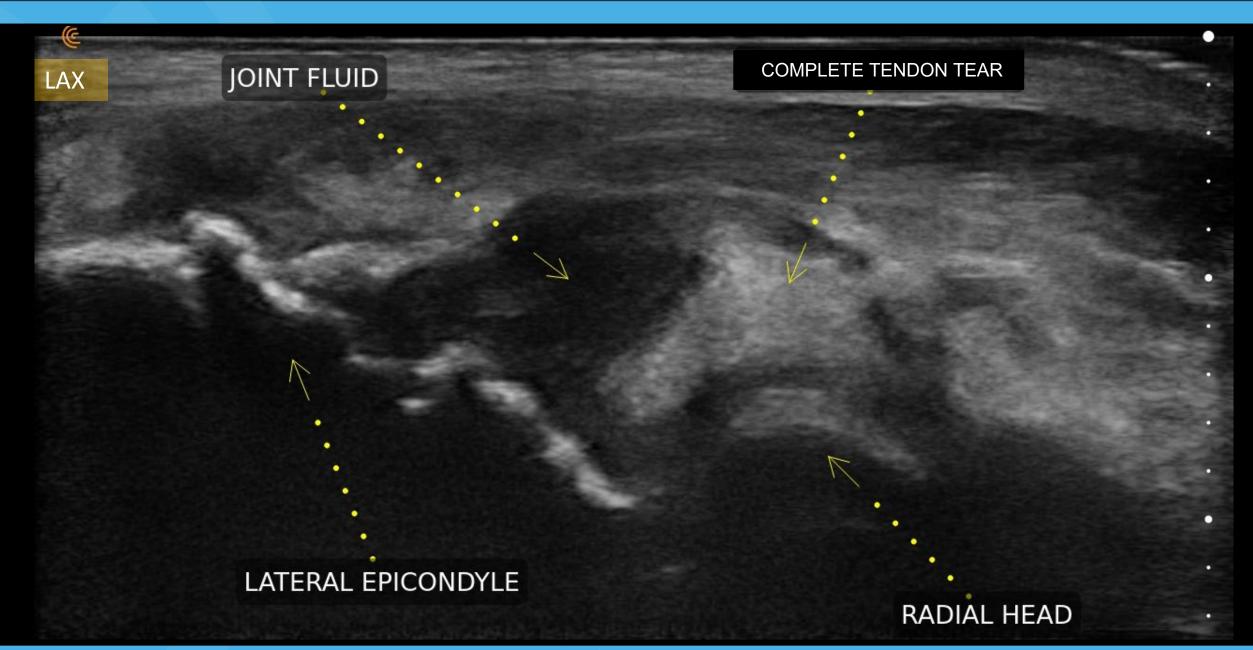
Severe partial tear





Full thickness tear

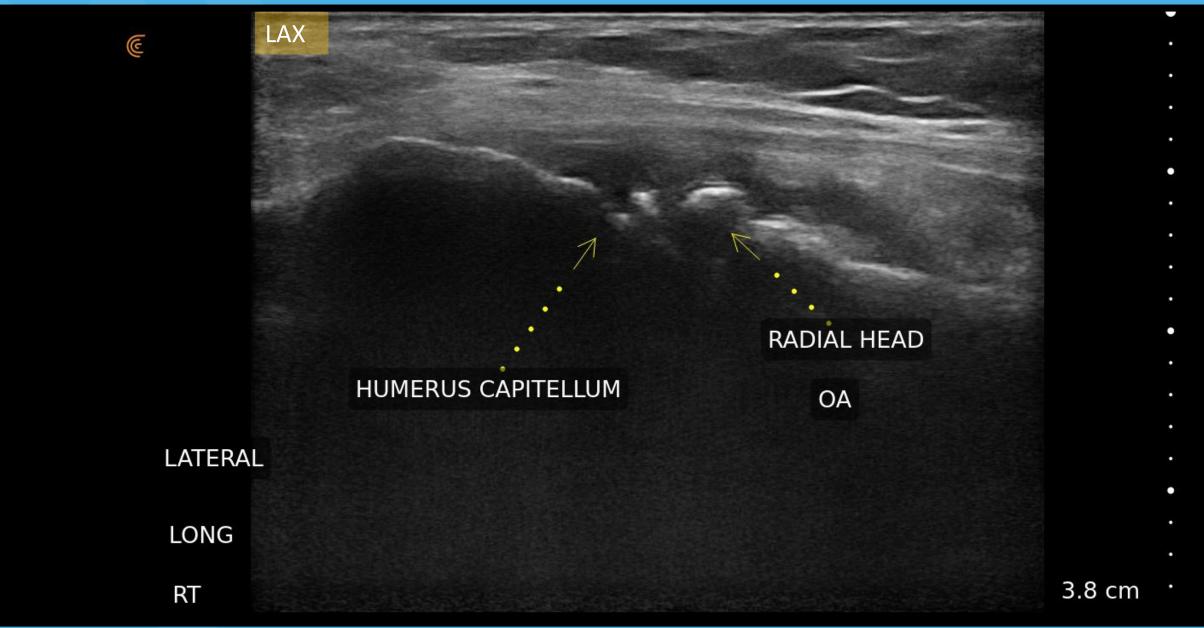




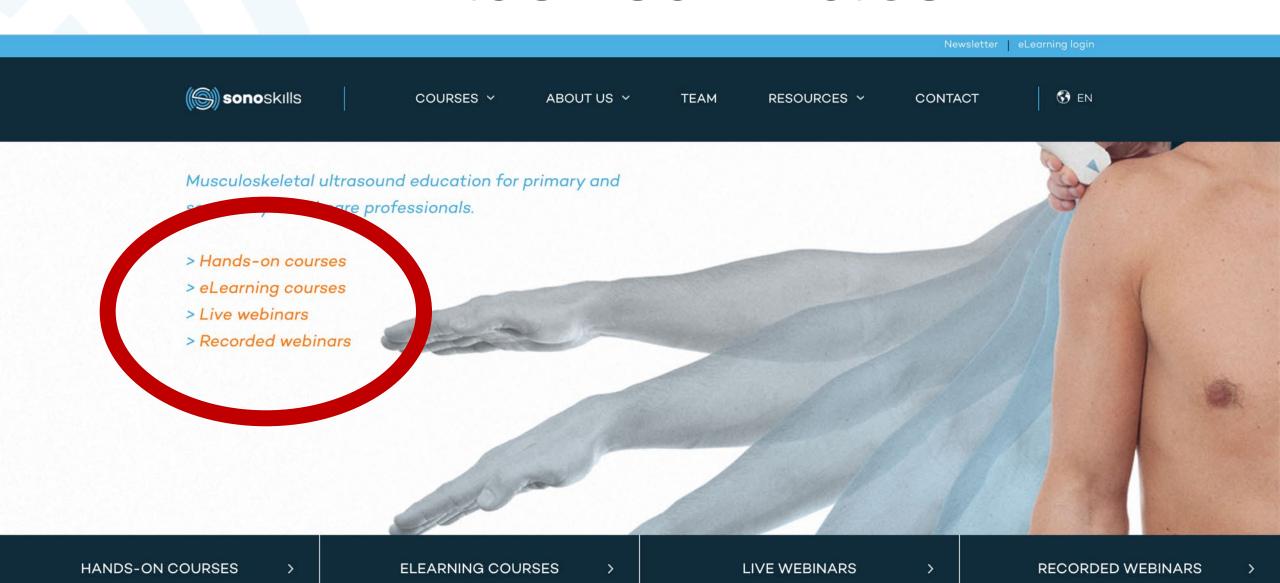
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Osteoarthritis / RA





WWW.SONOSKILLS.COM



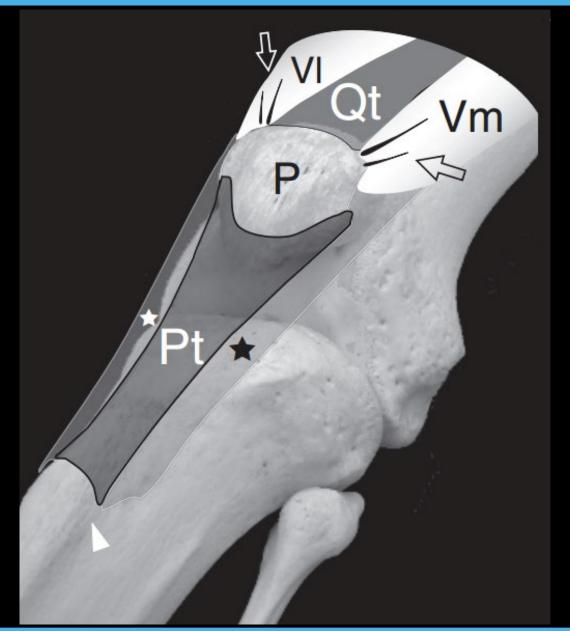
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Infrapatellar

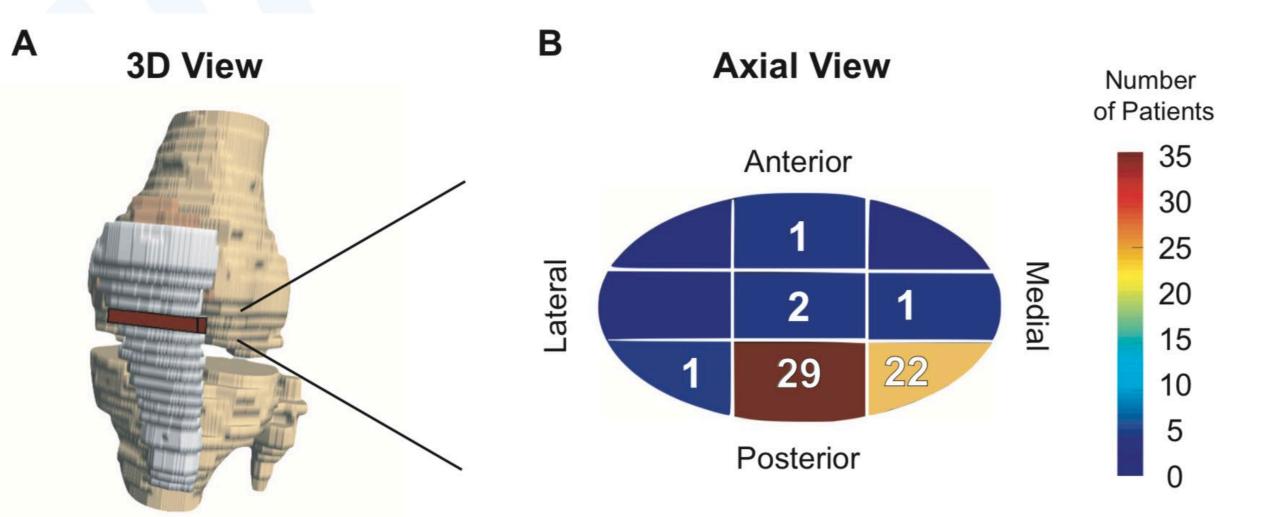
(Sono)anatomy



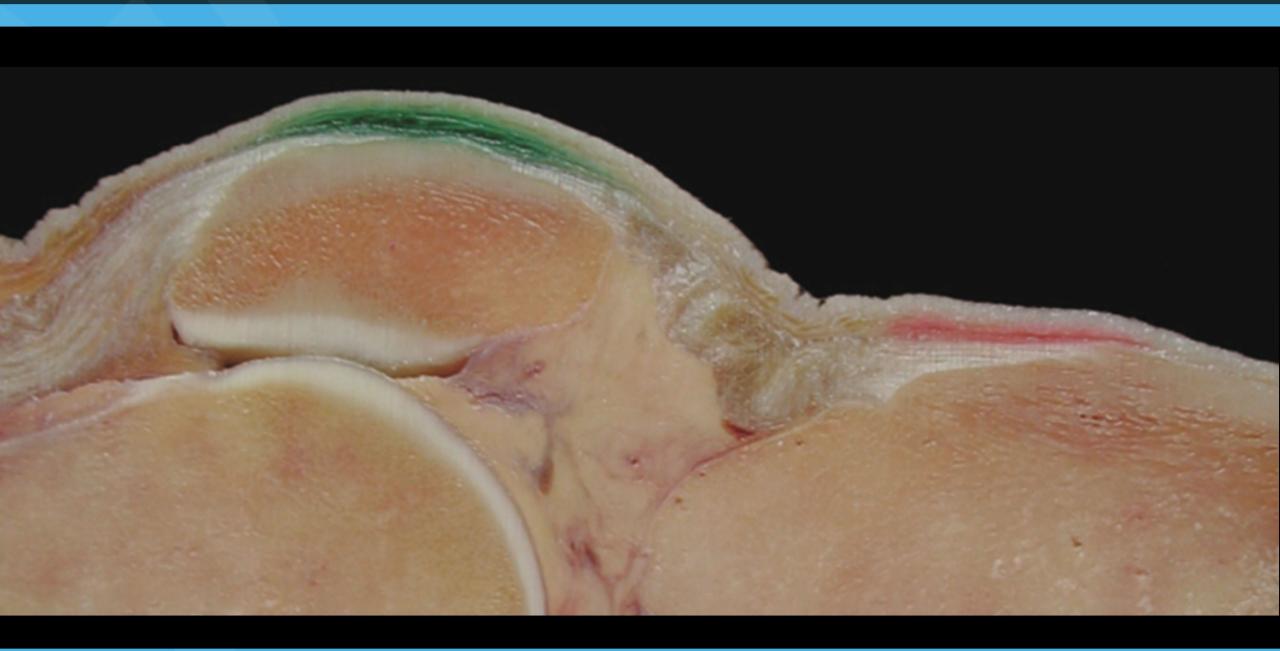


Bianchi et al. 2007









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Demo

Patella tendon clarius.com/classroom/patellar-tendon



Infrapatellar

Sonopathology



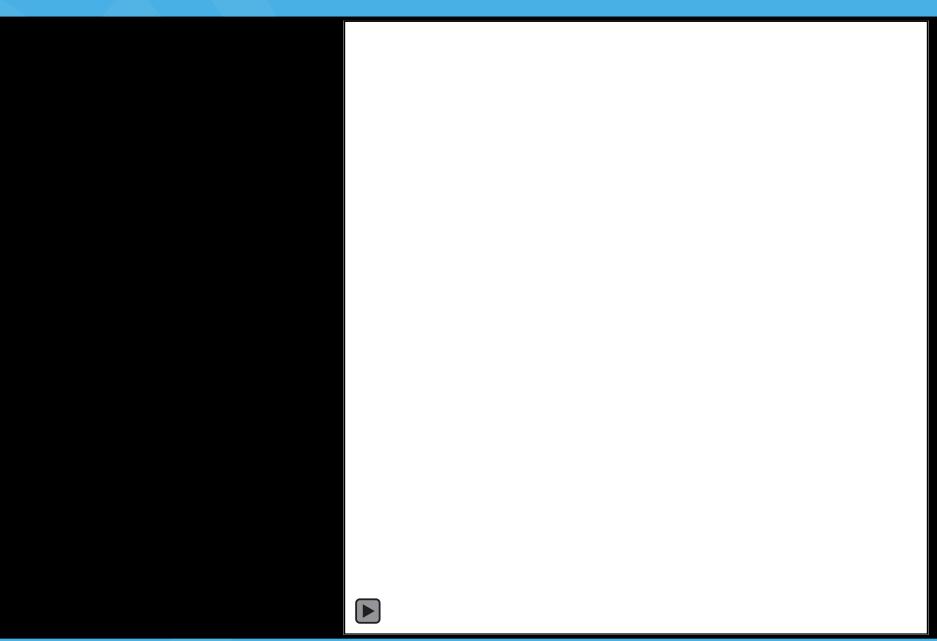
Clinical indications for musculoskeletal ultrasound updated in 2017 by European Society of Musculoskeletal Radiology (ESSR) consensus

Table 5 Knee: Detailed results for evidence levels and final consensus, a comparison between 2012 and 2017

Clinical indication	Evidence level 2012	Final consensus 2012	Evidence level 2017	Final consensus 2017
Tendons and soft tissues				
Patellar tendinopathy/tear	A	3	Unchanged	Unchanged
Osgood-Schlatter, Sinding-Larsen	A	3	Unchanged	Unchanged
Periarticular bursitis	A	3	Unchanged	Unchanged
Hoffa's fat pad syndrome	D	1	Unchanged	Unchanged

Proximal patellar tendinosis





Copyright © = 2018 **sono**SKILLS Bakker 2015

Distal patellar tendinosis







Rethinking Patellar Tendinopathy and Partial Patellar Tendon Tears

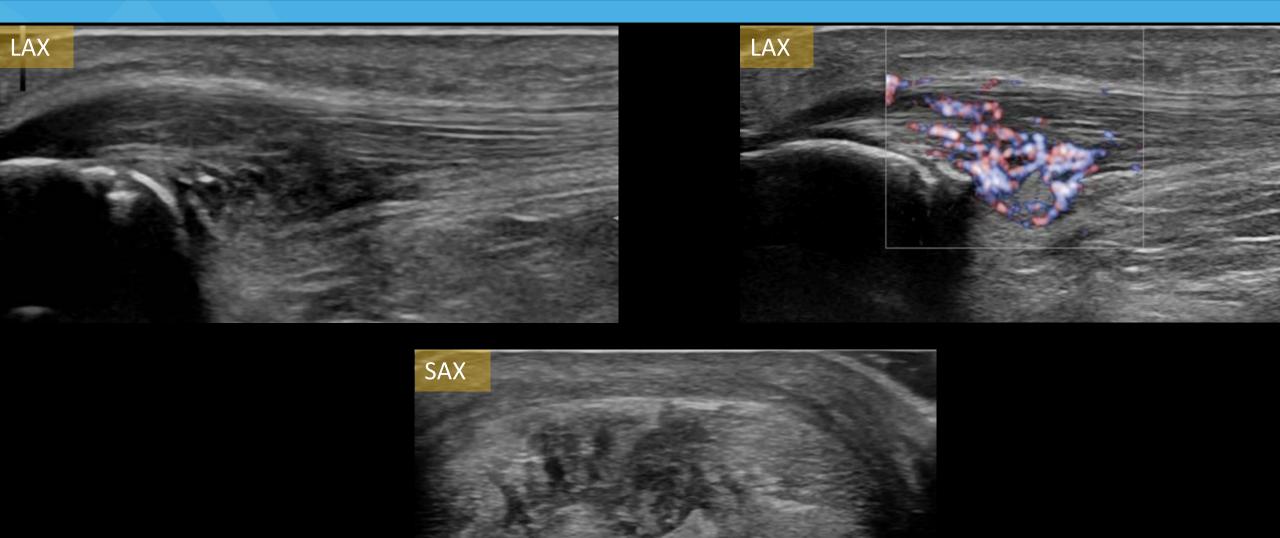
A Novel Classification System

Mikhail Golman,*† MS, Margaret L. Wright,‡ MD, Tony T. Wong,§ MD, T. Sean Lynch,‡ MD, Christopher S. Ahmad,‡ MD, Stavros Thomopoulos,*† PhD, and Charles A. Popkin,‡ MD Investigation performed at Columbia University Center for Shoulder, Elbow and Sports Medicine, New York, New York, USA

- Mostly found in posterior and posteromedial portion of the tendon
- Most sensitive predictor for partial tendon tear: tendon thickness (>8.8 mm)
- Athletes patellar tendon thickness >11.5 mm and/or >50% tear thickness were less likely to improve with nonoperative treatment

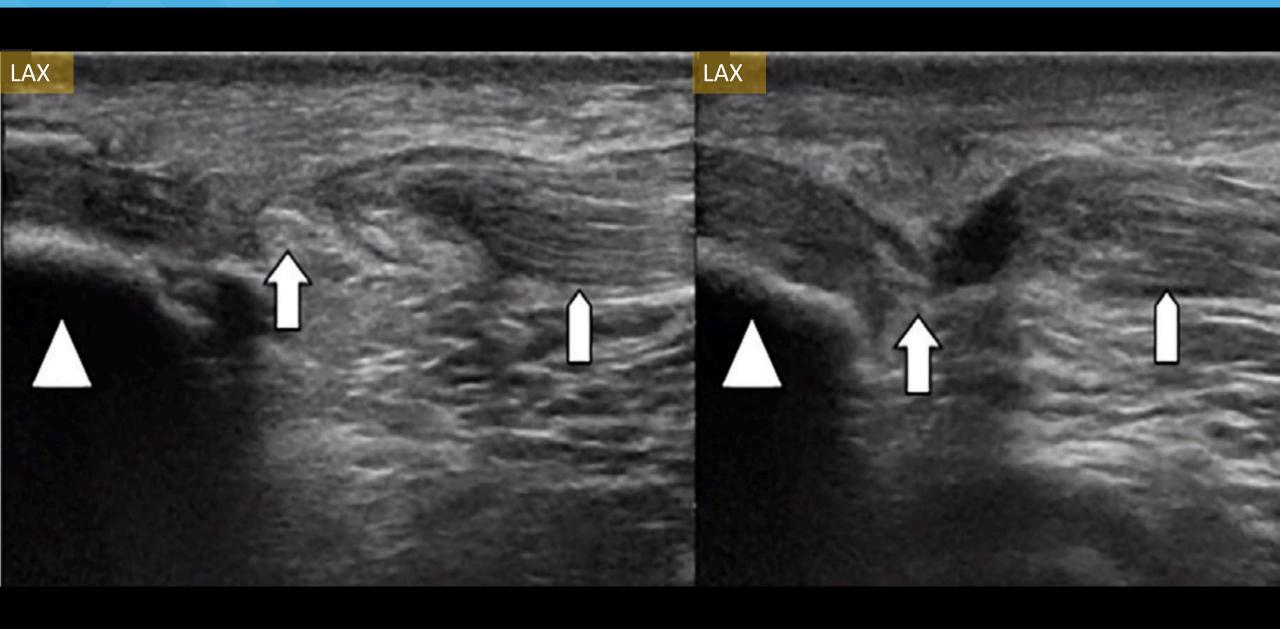
Partial tear, tendinosis





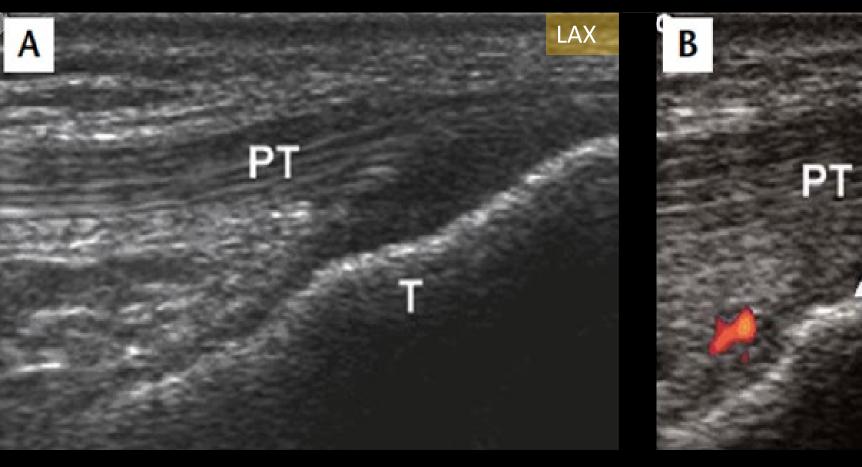
Complete tear patellar tendon

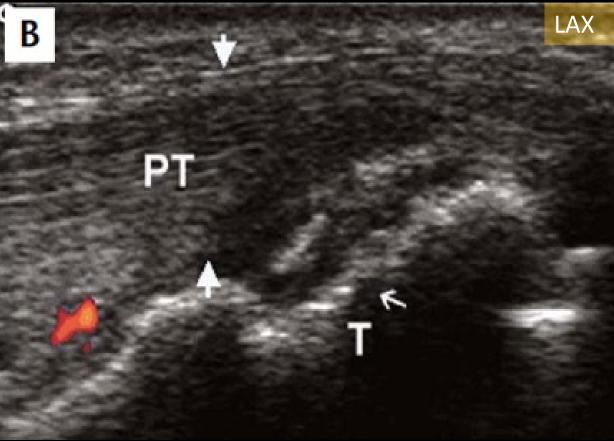




Osgood Schlatter

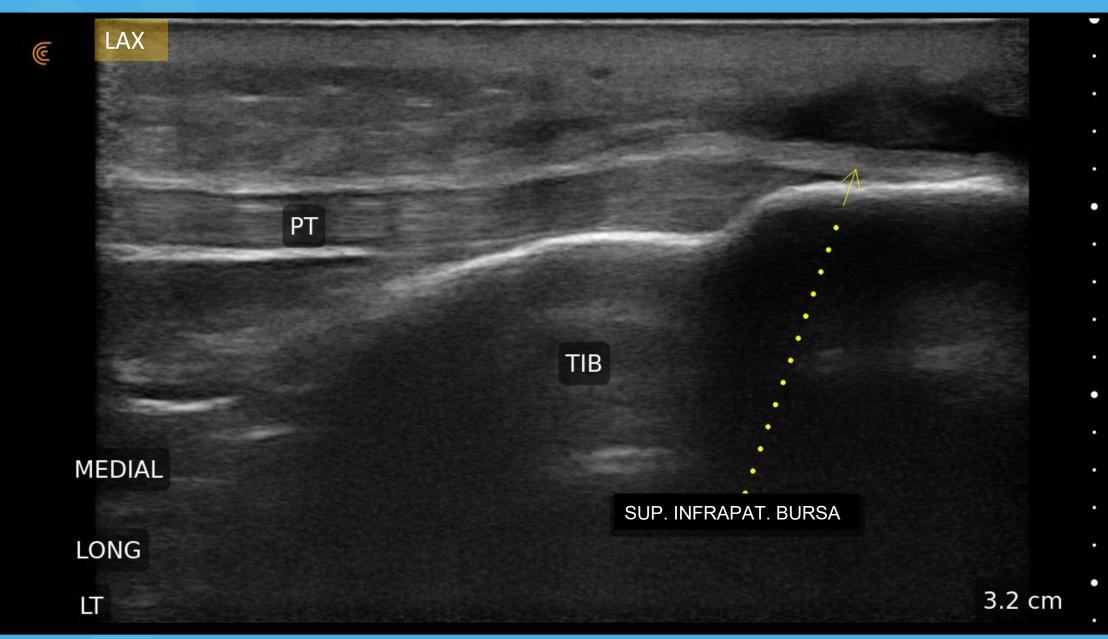






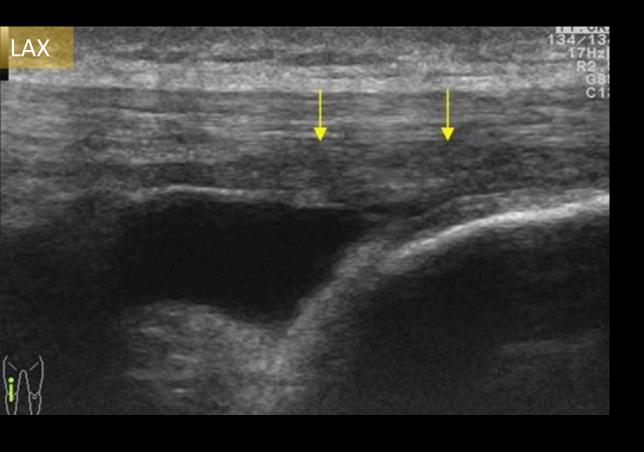
Superficial infrapatellar bursitis

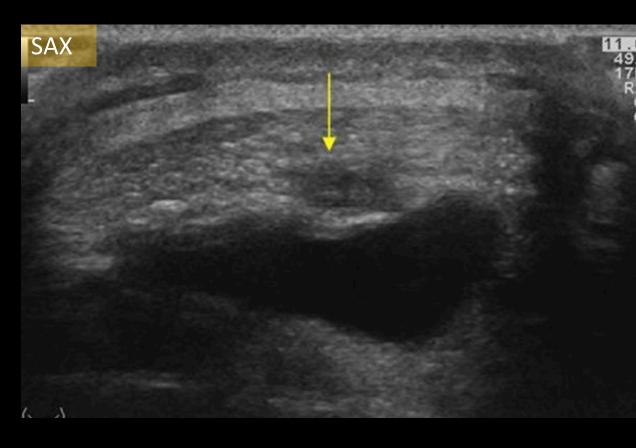




Deep infrapatellar bursitis

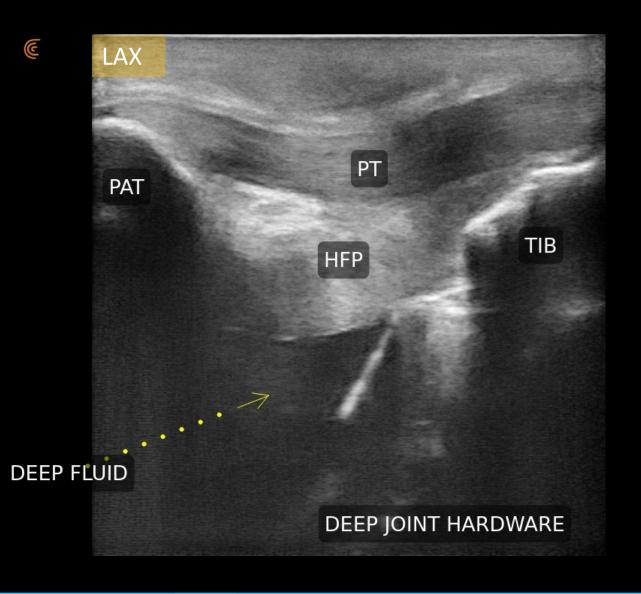


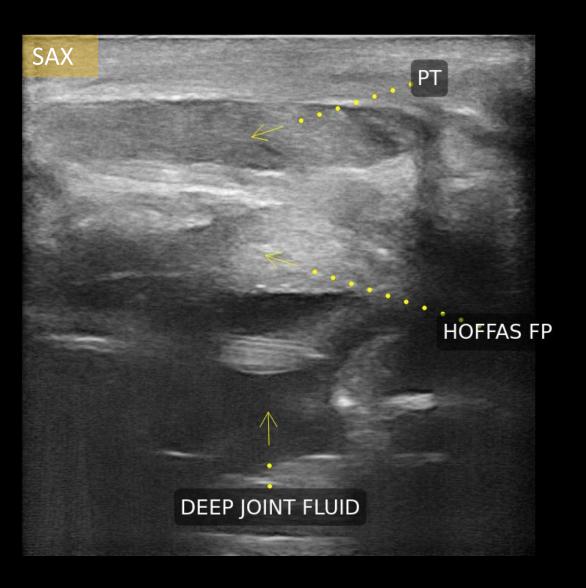




Effusion of the joint









Thank you

5 Ways Ultrasound Can Help Your Practice

- 1. Narrow the differential by looking under the skin.
- 2. Make a confident diagnosis in real-time.
- 3. Target the treatment effectively on the first visit.
- 4. Capture and document progress during treatment.
- 5. Motivate patient by sharing ultrasound imaging.

"An accurate on-the-spot diagnosis means we can prescribe the right treatment for rehabilitation immediately. Patients save time and money, and they are more satisfied with the results." - Greg Fritz, PT, DPT, RMSK





Greg Fritz, PT, DPT, RMSK Anacortes Physical Therapy

level of advanced quality imaging to an ultrasound device that is affordable for clinicians like me. Here's to a future with greater, more relevant tissue diagnostic information to the fingertips of more and more POC clinicians.



Live Demo Clarius L15 HD Linear





Clarius HD

Wireless Freedom High-Definition Image Easy & Affordable No Subscription Fees Free Clarius Cloud Works on iOS & Android **Unlimited Users**



Poll

What additional information would you like?

www.clarius.com/msk
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www.clarius.com/classroom

Questions?



Marc Schmitz



Dr. Oron Frenkel





Thank you!



