

# Musculoskeletal Ultrasound

The Good, The Bad and The Ugly

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# Disclaimer



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I have no financial interests in the devices or equipment that may be discussed.

# What is it Good for?

- Superficial Structures – Ligaments, Tendons, joint capsules,  
Non deep Muscle assessment
- Solid v Cystic
- Rotator Cuff
- Dynamic Evaluation
- Assess hyperaemia (this is not same as Doppler study)
- Guided Therapy

# Motives for Poor U\$ ?

The clue is on this slide

# Not a Primary Test for:

- Intra-articular structures eg Labrum, intra-articular ligaments
- Pan scan of a large area of non specific or non localised pain
- Deep muscles

# When to be Sceptical?

- Detailed descriptions of intra-articular structures
- Grading (G1) of multiple small deep muscle tears
- Offer of muscle PRP immediately after above US
- Detailed description of small tears in deep pelvic muscles
- Frequent suggestions to perform MRI “if it would help clinical management”

# Injections

- All peripheral tendon sheath/soft tissue injections should be US guided.
  - eg. Biceps, Elbow Common flexor and extensor, Wrist, Carpel tunnel, Fingers, Knee, Ankle, foot.
- Sending your patients for fluoroscopically guided tendon sheath injections in these locations should be avoided.

# Injections

- Examples of Fluoroscopy guided intra-tendinous injections with subsequent tendon rupture.
- Why are they being performed with Fluoroscopy?

- \$\$\$\$





# Appropriateness

- Non appropriate MSK US is a waste of money
- Poor MSK US is a waste of money
- Delays Diagnosis and definitive management
- Clogs the system
- Who pays??



# MRI – contra-indications

- Cardiac pacemakers
- Cerebral aneurysm clips
- Claustrophobia
- Unable to keep still
- Delicate prostheses – cochlear
  
- Any doubts – just ask

# Clinical Indications

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

European Radiology (2018) 28:5338–5351  
<https://doi.org/10.1007/s00330-018-5474-3>

# Grading of Evidence

Code	Quality of Evidence	Definition
A	High	<p>Further research is very unlikely to change our confidence in the estimate of effect.</p> <ul style="list-style-type: none"><li>•Several high-quality studies with consistent results</li><li>•In special cases: one large, high-quality multi-centre trial</li></ul>
B	Moderate	<p>Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.</p> <ul style="list-style-type: none"><li>•One high-quality study</li><li>•Several studies with some limitations</li></ul>
C	Low	<p>Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.</p> <ul style="list-style-type: none"><li>•One or more studies with severe limitations</li></ul>
D	Very Low	<p>Any estimate of effect is very uncertain.</p> <ul style="list-style-type: none"><li>•Expert opinion</li><li>•No direct research evidence</li><li>•One or more studies with very severe limitations</li></ul>

Centre for Evidence-Based Medicine in Oxford in the UK (2017)  
Available via <http://www.cebm.net/93452> accessed on 4 Apr 2017

# Strength of Indication

3: ultrasound examination is the first-choice level technique (other imaging rarely provides more information)

2: ultrasound examination indication is equivalent to other imaging modalities (other imaging might provide significant information)

1: ultrasound examination indicated if other imaging techniques are not appropriate

0: ultrasound examination not indicated

<b>Grade of Recommendation/ Quality of Evidence</b>	<b>Strength of Indication</b>
A B C D	0 1 2 3

# Shoulder

	Evid	Indic
Full thickness cuff tear	A	3
Calcific tendonitis	B	3
Long head biceps tendon: rupture	B	3
Long head biceps tendon: dislocation	B	3
Bursitis	C	3
Partial thickness cuff tear	A	2
Long head biceps tendon: tendinopathy	B	2
Postoperative cuff failure	B	2
Rotator cuff muscle atrophy	B	1

# Shoulder

Loose bodies	C	1
Quadrilateral space syndrome	C	1
Thoracic outlet syndrome	C	1
Adhesive capsulitis	B	0
Parsonage-Turner syndrome	C	0



# Elbow

Lateral epicondylitis	A	3
Synovitis	B	3
Septic arthritis/effusion	B	3
Triceps tendon injury	C	3
Snapping triceps injury	C	3
Olecranon bursitis	D	3
Medial epicondylitis	No	3
Medial collateral ligament	B	2
Lateral collateral ligament	C	2
Biceps tendon insertion	No	2
Bicipito-radial bursitis	No	2

# Wrist Hand

Tenosynovitis/rupture	B	3
Joint synovitis	B	3
Extensor carpi ulnaris/radialis tendinopathy	B	3
Carpal tunnel syndrome	B	3
Guyons canal	C	3
Mass	C	3
Pulley/sagittal band/central slip injury-ruptures	C	3
Central slip injury	C	3
Gamekeeper's thumb and Stener lesion	C	3
Trigger finger	C	3
Ganglion	C	3
Rugby/jersey finger	C	3

# Wrist Hand

Rugby/jersey finger	C	3
Foreign body	C	3
De Quervain disease	C	3
Volar plate avulsion (X-ray negative)	C	3
Flexor carpi ulnaris/flexor carpi radialis tendinopathy	D	3
Finger collateral ligament injury(not thumb)	C	2
Intersection	C	2
Scapho-lunate ligament	C	1
Muscle	C	1
Triangular fibrocartilage complex lesions	C	0

# Hip

Tendons and soft tissue	Fluid detection	A	3
Snapping hip: Extra-articular		A	3
Synovitis/effusion/synovial or labral cysts		A	3
Muscle injuries high grade		B	3
Morel-Lavallee lesions		C	3
Lateral femoral cutaneous nerve		C	3
Sciatic nerve - thigh		D	3
Femoral nerve		D	3
Gluteal tendon tears		A	2
Hamstrings		B	2
Psoas tendon pathology		C	2

# Knee

Patellar tendinopathy/tear	A	3
Quadriceps tendinosis/tear	A	3
Osgood-Schlatter, Sinding-Larsen	A	3
Synovitis, effusion	A	3
Baker's cyst	A	3
Periarticular bursitis	A	3
Extra-articular ganglion	A	3
Pes anserinus tendinobursitis	C	3
Semitendinosus tendon	C	3
Semimembranosus tendon	C	3
Medial collateral ligament	A	2
Meniscal cysts	A	2
Retinacula pathology	B	2
Iliotibial band friction	C	2

# Hip

Sports hernias	D	2
Anterior tendinopathy	D	2
Bursitis	D	2
Trochanteric pain	C	1
Muscle injuries low grade	B	1
Osteoarthritis	A	0
Labral tears	B	0
Septic effusion	D	0
Snapping hip: Intra-articular	D	0
Sciatic nerve-intrapelvic course	D	0

# Knee

Intra-articular ganglion	A	1
Loose bodies	B	1
Posterolateral corner (bf tendon, LCL, popl tendon)	B-C	1
Hoffa's fat pad syndrome	D	1
Anterior cruciate ligament tears	A	0
Meniscal tears	A	0
Synovial tumours	B	0
Posterior cruciate ligament tears	B-C	0
Plica syndrome	C	0

# Ankle Foot

Tendon Tears	A	3
Tendon Sheath effusions	A	3
Peroneal dislocation	A	3
Calcific tendinitis	A	3
Retrocalcaneal bursitis	A	3
Calcaneo-fibular ligament	A	3
Morton neuroma	A	3
Anterior talo-fibular ligament	A	3
Synovitis	A	3
Ganglion cysts	A	3
Plantar fasciitis	A	3
Postoperative tendon tear	B	3



# Ankle Foot

Tendinopathy	C	3
Joint effusions	C-D	3
Retinacula	D	3
Plantar plate	A	2
Ankle joint instability	A	2
Deltoid ligament	A-B	2
Haglund disease	A-B	2
Deltoid ligament	A-B	2
Spring ligament	D	2
Posterior talo-fibular ligament	D	0
Intra-articular disease	D	0
Cartilage lesions	D	0