**Appendix 1. SPORTS US SCANNING PROTOCOLS**

**The following document provides scanning protocols for each body region and is adopted from the AIUM Guidelines for Performance of the MSK US Examination 2012 (**[**www.aium.org**](http://www.aium.org)**). Please consider this document as a reference when learning and performing SPORTS US examinations. Additional structures or regions should be examined as clinically indicated or based on practice needs.**

**Shoulder**

A complete shoulder examination is performed in most cases, including the structures indicated below. In specific circumstances, a targeted examination of a specific anatomic structure may be performed (e.g., follow-up scan of the supraspinatus tendon to assess for tear progression)

[ ]  Biceps tendon and muscle

[ ]  Subscapularis muscle and tendon

[ ]  Dynamic exam for biceps subluxation & subcoracoid impingement (as indicated)

[ ]  Acromioclavicular joint

[ ]  Infraspinatus tendon and muscle

[ ]  Teres minor tendon and muscle

[ ]  Posterior glenohumeral joint (including dynamic imaging as indicated)

[ ]  Spinoglenoid notch (as indicated, region of suprascapular nerve)

[ ]  Supraspinatus tendon and muscle, with subacromial-subdeltoid bursa

[ ]  Dynamic rotator cuff evaluation and impingement testing

[ ]  Suprascapular notch (as indicated, region of suprascapular nerve)

[ ]  Extended field of view – supraspinatus & infraspinatus muscle bellies (as indicated*)*

**Elbow**

Examination may involve a complete assessment of 1 or more quadrants or may be focused on a specific structure.

**Anterior:**

[ ]  Anterior humeroradial joint

[ ]  Radial fossa

[ ]  Dynamic scan of annular recess of radial neck (supination/pronation, as indicated)

[ ]  Anterior humeroulnar joint

[ ]  Coronoid fossa

[ ]  Biceps tendon and muscle, including dynamic scanning

[ ]  Brachialis muscle (as indicated)

[ ]  Brachial artery and vein (as indicated)

[ ]  Median nerve (as indicated)

[ ]  Pronator teres muscle and tendon (as indicated)

[ ]  Radial nerve (as indicated)

[ ]  Brachioradialis muscle (as indicated)

**Lateral:**

[ ]  Lateral epicondyle, common extensor tendon and muscles

[ ]  Lateral collateral ligament complex

[ ]  Lateral humeroradial joint (including dynamic imaging as indicated)

[ ]  Radial nerve bifurcation and course through supinator muscle

[ ]  Proximal attachment of brachioradialis

[ ]  Proximal attachment of extensor carpi radialis longus

**Medial:**

[ ]  Medial epicondyle, common flexor-pronator tendon and muscles

[ ]  Ulnar collateral ligament

[ ]  Dynamic valgus stress of ulnar collateral ligament (as indicated)

[ ]  Humeroulnar joint

[ ]  Ulnar nerve (also included in posterior region scan)

[ ]  Dynamic flexion-extension (as indicated)

 -evaluate for ulnar nerve subluxation

 -evaluate for snapping triceps tendon

**Posterior:**

[ ]  Triceps tendon muscles

[ ]  Olecranon fossa and posterior joint space

[ ]  Olecranon process

[ ]  Olecranon bursa

[ ]  Ulnar nerve (also included in medial region scan)

[ ]  Dynamic flexion-extension (as indicated) (also included in medial region scan)

 -evaluate for ulnar nerve subluxation

 -evaluate for snapping triceps tendon

**Wrist and Hand**

Examination may involve a complete assessment of 1 or more of the 3 anatomic regions or may be focused on a specific structure.

**Volar:**

[ ]  Carpal tunnel contents

 [ ]  Flexor retinaculum

 [ ]  Median nerve

 [ ]  Flexor pollicis longus tendon

 [ ]  Flexor digitorum profundus and superficialis tendons

 [ ]  Dynamic examination with flexion & extension – tendon & nerve motion

[ ]  Palmaris longus tendon

[ ]  Flexor carpi radialis longus tendon and radial artery

[ ]  Ulnar nerve and ulnar artery within Guyon’s canal

[ ]  Flexor carpi ulnaris tendon

[ ]  Joints as clinically indicated (e.g. volar radiocarpal joint)

**Ulnar/Medial:**

[ ]  Extensor carpi ulnaris tendon and muscle

[ ]  Dynamic examination for extensor carpi ulnaris subluxation

[ ]  Triangular fibrocartilage complex

[ ]  Ulnocarpal joint

**Dorsal:**

**[ ]**  Extensor retinaculum, 6 compartments, 9 tendons and muscles

[ ]  Dynamic tendon examination – flexion/extension of the fingers (as indicated)

[ ]  Dorsal scapholunate ligament

*[ ]* Joints (as clinically indicated)

 -Radiocarpal (RC), metacarpophalangeal (MCP), proximal interphalangeal (PIP), distal interphalangeal (DIP)

 -Dorsal and volar

*[ ]* Superficial radial nerve (as indicated)

**Hip**

Examination may involve a complete assessment of 1 or more of the 4 anatomic regions or may be focused on a specific anatomic structure.

**Anterior Region (patient supine):**

Sagittal oblique, parallel to long axis of femoral neck

[ ]  Femoral head, neck, capsule, and anterior synovial recess

[ ]  Hip joint assessment for effusion

Sagittal plane

[ ]  Anterior labrum

Transverse

[ ]  Femoral vessels and nerve

[ ]  Iliopsoas muscle, tendon and bursa

[ ]  Sartorius and tensor fascia lata tendons and muscles

[ ]  Lateral femoral cutaneous nerve

[ ]  Rectus femoris tendon(s) and muscles

*[ ]*  Dynamic scanning if snapping hip (as indicated).

**Lateral Region (side lying with hip flexed 20-30 degrees)**

[ ]  Gluteus maximus – fascia lata – tensor fascia lata

[ ]  Gluteus minimus tendon and muscle

[ ]  Gluteus medius tendon and muscle

[ ]  Greater trochanteric bursa (subgluteus maximus bursa)

[ ]  Dynamic scanning for snapping hip (as indicated)

**Medial Region**

***Supine neutral***

[ ]  Femoral vessels and nerve (unless already examined with anterior region)

***Abducted-Externally rotated (frog leg)***

*[ ]* Adductor muscles (A. longus and gracilis 🡺 A. brevis 🡺 A. magnus) and tendons

[ ]  Distal iliopsoas tendon

[ ]  Pubic bone and symphysis (joint)

[ ]  Distal rectus abdominis muscle and tendon

**Posterior (prone w/wo pillow under hips)**

[ ]  Gluteus maximus muscle and tendon

[ ]  Gluteus medius muscle and tendon

[ ]  Deep short external rotators (as indicated)

[ ]  Hamstring tendon and muscles

[ ]  Ischial tuberosity and bursal region

[ ]  Sciatic nerve

[ ]  Posterior hip joint (as indicated)

***Prosthetic Hip***

[ ]  Assess for joint effusions and extra-articular fluid collections

[ ]  Greater trochanter and integrity of gluteal attachments

[ ]  Iliopsoas tendon and bursa

[ ]  Impingement on acetabular component

**Knee**

Examination may involve a complete assessment of 1 or more of the 4 quadrants of may be focused on a specific anatomic structure.

**Anterior:**

[ ]  Quadriceps tendon and muscles

[ ]  Suprapatellar recess of knee joint

[ ]  Patella and prepatellar bursa

[ ]  Patellar tendon and tibial tubercle

[ ]  Superficial infrapatellar bursa

[ ]  Deep infrapatellar bursa

[ ]  Vastus medialis and medial retinaculum (also with medial region scan)

[ ]  Vastus lateralis and lateral retinaculum (also with lateral regional scan)

[ ]  Distal femoral cartilage (as indicated)

**Medial:**

[ ]  MCL/tibial collateral ligament

*[ ]* Valgus stress testing (as indicated)

[ ]  Medial meniscus and tibiofemoral joint space

[ ]  Pes anserine tendons and bursa

[ ]  Medial patellar retinaculum and patellofemoral joint (also with anterior region scan)

**Lateral:**

[ ]  Iliotibial band

[ ]  Lateral meniscus and tibiofemoral joint space

**[ ]** LCL/fibular collateral ligament

*[ ]* Varus stress test (as indicated)

[ ]  Biceps femoris tendon and muscles

[ ]  Popliteus tendon and muscle

[ ]  Lateral patellar retinaculum and patellofemoral joint (also with anterior region scan)

[ ]  Proximal tibiofibular joint (as indicated)

**Posterior:**

[ ]  Popliteal fossa

[ ]  Popliteal artery and vein

[ ]  Semimembranosus tendon and muscle

[ ]  Medial & lateral gastrocnemius muscles, tendons, and bursae

[ ]  Sciatic, tibial, and common fibular nerves

[ ]  Posterior horns of both menisci (as indicated) and tibiofemoral joint

[ ]  PCL (as indicated) (may be seen in sagittal oblique plane)

**Ankle /Foot**

Examination may involve a complete assessment of 1 of the 4 quadrants or may be focused on a specific structure.

**Anterior:**

**[ ]**  Tibialis anterior (from musculotendinous junction to insertion)

[ ]  Extensor hallucis longus tendon and muscle

[ ]  Extensor digitorum longus tendon and muscle

[ ]  Peroneus tertius (congenitally absent in some patients)

[ ]  Deep fibular/peroneal nerve and dorsalis pedis artery

[ ]  Anterior joint recess (effusion, loose bodies, and synovial thickening)

[ ]  Anterior joint capsule

[ ]  Anterior inferior tibiofibular ligament

**Medial:**

[ ]  Posterior tibialis tendon and muscle

[ ]  Flexor digitorum longus tendon and muscle

[ ]  Posterior tibial nerve

[ ]  Medial and lateral plantar nerves (as indicated)

[ ]  Tibial artery and veins

[ ]  Flexor hallucis longus tendon and muscle

[ ]  Deltoid ligament and medial tibiotalar joint

**Lateral:**

[ ]  Fibularis (peroneus) longus & brevis tendons and muscles

[ ]  Superior fibular (peroneal) retinaculum

[ ]  Dynamic assessment for fibular (peroneal) subluxation (as indicated)

[ ]  Anterior talofibular ligament

[ ]  Calcaneofibular ligament (incl. lateral tibiotalar joint and posterior subtalar joint)

[ ]  Posterior talofibular ligament (as able and indicated)

[ ]  Sural nerve (as indicated)

**Posterior:**

[ ]  Achilles tendon and paratenon

[ ]  Dynamic scanning in of Achilles (as indicated to assist with tear evaluation)

[ ]  Retrocalcaneal bursa

[ ]  Retro-Achilles/Superficial Achilles bursa

[ ]  Plantaris tendon (may be absent) (as indicated)

[ ]  Posterior tibiotalar and subtalar joints

[ ]  Plantar fascia

[ ]  Plantar fat pad

**Digital:**

 Assess for synovitis, dorsal and/or plantar

*[ ]* Metatarsophalangeal (MTP) joints

[ ]  Interphalangeal (IP) joints

**Interdigital:**

 Dorsal or plantar approach can be used

*[ ]* Longitudinal and transverse views

[ ]  Intermetatarsal bursa (on the dorsal aspect of the interdigital nerve)

[ ]  Dynamic scanning, applying pressure for Morton’s neuroma, and/or ultrasonographic Mulder’s click (as indicated)