**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)