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## The 2017 EULAR standardised procedures for ultrasound imaging in rheumatology

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**Online Supplementary Table 1. Synonyms used for the literature search**

Body parts synonyms			Ultrasound synonyms	Target/scanning method synonyms
"acetabulofemoral"	"submandibular gland"	"tendons"	"Ultrasonography"	"procedure"
"acromioclavicular joint"	"submandibular gland"	"tendons"	"Ultrasonography, Doppler, Duplex"	"procedures"
"acromioclavicular"	"submandibular glands"	"perineurium"	"Ultrasonography, Doppler, Color"	"examination"
"ankle joint"	"submaxillary gland"	"perineuriums"	"color doppler ultrasonography"	"examinations"
"ankle"	"submaxillary glands"	"peripheral nerve"	"computer echotomography"	"scanning"
"arteries"	"glenohumeral"	"peripheral nerves"	"doppler color ultrasonography"	"technique"
"arteries"	"hand joints"	"shoulder joint"	"doppler colour ultrasonography"	"techniques"
"articular ligament"	"hand"	"shoulder"	"doppler ultrasonography"	"guideline"
"articular ligaments"	"hip joint"	"subtalar joint"	"doppler ultrasound imaging"	"guidelines"
"articulatio talocruralis"	"hip"	"subtalar"	"echography"	"recommendation"
"blood vessel"	"inferior tibiofibular"	"synovial membrane"	"echotomography"	"recommendations"
"blood vessels"	"superior tibiofibular"	"synovial membrane"	"medical sonography"	"approach"
"carpal joints"	"intercarpal"	"synovitis"	"ultrasonic diagnoses"	"validation"
"carpal"	"intermetacarpal"	"synovium"	"ultrasonic diagnosis"	
"carpometacarpal joints"	"intermetatarsal "	"talocalcaneal"	"ultrasonic imaging"	
"carpometacarpal"	"interphalangeal"	"tarsal joints"	"ultrasonic tomography"	
"elbow joint"	"toe interphalangeal"	"tarsal"	"ultrasonography"	
"elbow"	"intertarsal"	"tendons"	"ultrasound imaging"	
"endoneurium"	"knee joint"	"tendons"	"ultrasound imagings"	

"endoneuriums"	"knee"	"tendon"		
"epineurium"	"ligaments"	"tenosynovitis"		
"epineuriums"	"ligaments"	"tibiofibular"		
"finger joint"	"ligaments, articular"	"toe joint"		
"finger"	"metacarpophalangeal joint"	"toe"		
"foot joints"	"metacarpophalangeal"	"veins"		
"foot"	"metatarsophalangeal"	"veins"		
"parotid gland"	"para articular tendons"	"wrist joint"		
"parotid gland"		"wrist"		
"salivary gland"				
"salivary glands"				

## Online Supplementary Table 2. Search strategy for Medline and Embase

### Medline – joints:

((procedure[Title] OR anatomy[Title/Abstract] OR position[Title/Abstract] OR procedures[Title] OR examination[Title] OR scanning[Title] OR technique[Title] OR techniques[Title] OR guideline[Title] OR guidelines[Title] OR recommendation[Title] OR recommendations[Title] OR approach[Title] OR validation[Title]))) AND (((((((acetabulofemoral[Title/Abstract] OR "hip joint"[MeSH Terms] OR hip[Title] OR "acromioclavicular joint"[MeSH Terms] OR "shoulder joint"[MeSH Major Topic] OR acromioclavicular[Title/Abstract] OR glenohumeral[Title/Abstract] OR shoulder[Title] OR "toe joint"[MeSH Terms] OR toe[Title/Abstract] OR tibiofibular[Title/Abstract] OR tarsal[Title/Abstract] OR "tarsal joints"[MeSH Terms] OR talocalcaneal[Title/Abstract] OR subtalar[Title/Abstract] OR "subtalar joint"[MeSH Terms] OR metatarsophalangeal[Title/Abstract] OR intertarsal[Title/Abstract] OR (toe[Title/Abstract] AND interphalangeal[Title/Abstract]) OR interphalangeal[Title/Abstract] OR (tibiofibular[Title/Abstract] AND syndesmosis[Title/Abstract]) OR (tibiofibular[Title/Abstract] AND syndesmoses[Title/Abstract]) OR (syndesmosis[Title/Abstract] AND tibiofibular[Title/Abstract]) OR (inferior[Title/Abstract] AND tibiofibular[Title/Abstract]) OR (foot[Title/Abstract] AND interphalangeal[Title/Abstract]) OR foot[Title] OR "foot joints"[MeSH Major Topic] OR (articulatio[Title/Abstract] AND talocruralis[Title/Abstract]) OR (ankle[Title/Abstract] AND syndesmosis[Title/Abstract]) OR (ankle[Title/Abstract] AND syndesmoses[Title/Abstract]) OR (ankle[Title/Abstract] AND syndesmoses[Title/Abstract]) AND tibiofibular[Title/Abstract]) OR (ankle[Title/Abstract] AND syndesmosis[Title/Abstract]) AND tibiofibular[Title/Abstract]) OR ankle[Title] OR "ankle joint"[MeSH Major Topic] OR "articular ligaments"[Title/Abstract] OR ligaments[Title/Abstract] AND articular[Title/Abstract] OR "ligaments, articular"[MeSH Major Topic] OR ligaments[Title/Abstract] OR "ligaments"[MeSH Major Topic]

OR wrist[Title/Abstract] OR "wrist joint"[MeSH Terms] OR metacarpophalangeal[Title/Abstract] OR "metacarpophalangeal joint"[MeSH Terms] OR intermetacarpal[Title/Abstract] OR intercarpal[Title/Abstract] OR hand[Title/Abstract] AND interphalangeal[Title/Abstract] OR hand[Title/Abstract] OR "hand joints"[MeSH Major Topic] OR carpometacarpal[Title/Abstract] OR "carpometacarpal joints"[MeSH Terms] OR carpal[Title/Abstract] OR "carpal joints"[MeSH Terms] OR elbow[Title/Abstract] OR "elbow joint"[MeSH Terms] OR (finger[Title/Abstract] AND interphalangeal[Title/Abstract]) OR "finger joint"[MeSH Terms] OR finger[Title/Abstract] OR (superior[Title/Abstract] AND tibiofibular[Title/Abstract]) OR knee[Title] OR "knee joint"[MeSH Major Topic] OR "tenosynovitis"[MeSH Terms] OR "tendons"[MeSH Major Topic] OR tendons[Title/Abstract] OR tendon[Title/Abstract] OR synovium[Title/Abstract] OR "synovitis"[MeSH Terms] OR (synovial[Title/Abstract] AND membrane[Title/Abstract]) OR (membranes[Title/Abstract] AND synovial[Title/Abstract]) OR "synovial membrane"[Title/Abstract] OR "synovial membrane"[MeSH Major Topic] OR Meniscus[Title/Abstract] OR Menisci[Title/Abstract] OR musculoskeletal[Text Word] OR "Musculoskeletal System"[MeSH Major Topic] OR Cartilage[Title] OR "fibrocartilage"[MeSH Terms] OR "cartilage"[MeSH Terms] OR "Cartilage, Articular"[MeSH Major Topic] OR joint[Title/Abstract] AND (("Ultrasonography"[Majr:noexp] OR "Ultrasonography, Doppler, Duplex"[Mesh:noexp]) OR "Ultrasonography, Doppler, Color"[Majr] OR "color doppler ultrasonography"[Title/Abstract] OR "computer echotomography"[Title/Abstract] OR "doppler color ultrasonography"[Title/Abstract] OR "doppler ultrasonography"[Title/Abstract] OR "doppler ultrasound imaging"[Title/Abstract] OR "echography"[Title/Abstract] OR "echotomography"[Title/Abstract] OR sonography[Title/Abstract] OR ultrasound[Title/Abstract] OR ultrasonography[Title/Abstract] OR "medical sonography"[Title/Abstract] OR "ultrasonic diagnoses"[Title/Abstract] OR "ultrasonic diagnosis"[Title/Abstract] OR "ultrasonic imaging"[Title/Abstract] OR "ultrasonic tomography"[Title/Abstract] OR "ultrasonography"[Title/Abstract] OR "ultrasound imaging"[Title/Abstract] OR "ultrasound imagings"[Title/Abstract] OR ("color"[Title/Abstract] AND "doppler"[Title/Abstract] AND "ultrasonography"[Title/Abstract]) OR ("computer"[Title/Abstract] AND "echotomography"[Title/Abstract]) OR ("diagnoses"[Title/Abstract] AND "ultrasonic"[Title/Abstract]) OR ("diagnosis"[Title/Abstract] AND "ultrasonic"[Title/Abstract]) OR ("doppler"[Title/Abstract] AND "ultrasonography"[Title/Abstract]) OR ("doppler"[Title/Abstract] AND "ultrasound"[Title/Abstract]) OR ("doppler"[Title/Abstract] AND "ultrasound"[Title/Abstract]) OR ("imaging"[Title/Abstract] AND "doppler"[Title/Abstract] AND "ultrasound"[Title/Abstract]) OR ("imaging"[Title/Abstract] AND "ultrasonic"[Title/Abstract]) OR ("imaging"[Title/Abstract] AND "ultrasound"[Title/Abstract]) OR ("imagings"[Title/Abstract] AND "ultrasound"[Title/Abstract]) OR ("tomography"[Title/Abstract] AND "ultrasonic"[Title/Abstract]) OR ("ultrasonic"[Title/Abstract] AND "tomography"[Title/Abstract]) OR ("ultrasonography"[Title/Abstract] AND "color"[Title/Abstract]) OR ("ultrasonography"[Title/Abstract] AND "doppler"[Title/Abstract]))

**Medline – extra-joints:**

((((procedure[Title] OR anatomy[Title/Abstract] OR position[Title/Abstract] OR procedures[Title] OR examination[Title] OR scanning[Title] OR technique[Title] OR techniques[Title] OR guideline[Title] OR guidelines[Title] OR recommendation[Title] OR recommendations[Title] OR approach[Title] OR validation[Title])))) AND vein[Title] OR veins[Title] OR veins[MeSH Major Topic] OR (peripheral[Title/Abstract] AND nerves[Title/Abstract]) OR (nerve[Title/Abstract] AND peripheral[Title/Abstract]) OR "peripheral

nerves"[MeSH Major Topic] OR "peripheral nerve"[Title/Abstract] OR perineuriums[Title/Abstract] OR perineurium[Title/Abstract] OR epineuriums[Title/Abstract] OR epineurium[Title/Abstract] OR endoneuriums[Title/Abstract] OR endoneurium[Title/Abstract] OR (vessels[Title/Abstract]) AND blood[Title/Abstract]) OR (blood[Title/Abstract]) AND vessel[Title/Abstract]) OR "blood vessels"[MeSH Major Topic] OR "blood vessel"[Title/Abstract] OR arteries[Title/Abstract] OR arteries[MeSH Major Topic] OR (submandibular[Title/Abstract]) AND glands[Title/Abstract]) OR (submandibular[Title/Abstract]) AND gland[Title/Abstract]) OR "submandibular glands"[Title/Abstract] OR "submandibular gland"[ Title/Abstract] OR "submandibular gland"[MeSH Terms] OR "salivary glands"[MeSH Major Topic] OR "salivary gland"[Title/Abstract] OR (glands[Title/Abstract]) AND salivary[Title/Abstract]) OR (gland[Title/Abstract]) AND salivary[Title/Abstract]) OR (glands[Title/Abstract]) AND parotid[Title/Abstract]) OR (gland[Title/Abstract]) AND parotid[Title/Abstract]) OR "parotid gland"[Title/Abstract] OR "parotid gland"[MeSH Terms]) AND (("Ultrasonography"[Majr:noexp] OR "Ultrasonography, Doppler, Duplex"[Mesh:noexp]) OR "Ultrasonography, Doppler, Color"[Majr] OR "color doppler ultrasonography"[Title/Abstract] OR "computer echotomography"[Title/Abstract] OR "doppler color ultrasonography"[Title/Abstract] OR "doppler ultrasonography"[Title/Abstract] OR "doppler ultrasound imaging"[Title/Abstract] OR "echography"[Title/Abstract] OR "echotomography"[Title/Abstract] OR sonography[Title/Abstract] OR ultrasound[Title/Abstract] or ultrasonography[Title/Abstract] OR "medical sonography"[Title/Abstract] OR "ultrasonic diagnoses"[Title/Abstract] OR "ultrasonic diagnosis"[Title/Abstract] OR "ultrasonic imaging"[Title/Abstract] OR "ultrasonic tomography"[Title/Abstract] OR "ultrasonography"[Title/Abstract] OR "ultrasound imaging"[Title/Abstract] OR "ultrasound imagings"[Title/Abstract] OR ("color"[Title/Abstract] AND "doppler"[Title/Abstract] AND "ultrasonography"[Title/Abstract]) OR ("computer"[Title/Abstract] AND "echotomography"[Title/Abstract]) OR ("diagnoses"[Title/Abstract] AND "ultrasonic"[Title/Abstract]) OR ("diagnosis"[Title/Abstract] AND "ultrasonic"[Title/Abstract]) OR ("doppler"[Title/Abstract] AND "ultrasonography"[Title/Abstract]) OR ("doppler"[Title/Abstract] AND "ultrasound"[Title/Abstract]) OR ("doppler"[Title/Abstract] AND "ultrasound"[Title/Abstract]) OR ("imaging"[Title/Abstract] AND "doppler"[Title/Abstract] AND "ultrasound"[Title/Abstract]) OR ("imaging"[Title/Abstract] AND "ultrasonic"[Title/Abstract]) OR ("imaging"[Title/Abstract] AND "ultrasound"[Title/Abstract]) OR ("imagings"[Title/Abstract] AND "ultrasound"[Title/Abstract]) OR ("tomography"[Title/Abstract] AND "ultrasonic"[Title/Abstract]) OR ("ultrasonic"[Title/Abstract] AND "tomography"[Title/Abstract]) OR ("ultrasonography"[Title/Abstract] AND "color"[Title/Abstract]) OR ("ultrasonography"[Title/Abstract] AND "doppler"[Title/Abstract]))

#### **Embase – joints:**

joint:ab,ti OR acetabulofemoral:ab,ti OR hip:ti OR 'hip'/exp OR 'hip' OR 'acromioclavicular joint'/exp OR 'acromioclavicular joint' OR 'shoulder'/exp OR 'shoulder' OR acromioclavicular:ab,ti OR glenohumeral:ab,ti OR shoulder:ti OR 'toe joint'/exp OR 'toe joint' OR toe:ab,ti OR tibiofibular:ab,ti OR tarsal:ab,ti OR 'tarsal joints'/exp OR 'tarsal joints' OR subtalar:ab,ti OR 'subtalar joint'/exp OR 'subtalar joint' OR metatarsophalangeal:ab,ti OR intertarsal:ab,ti OR interphalangeal:ab,ti OR foot:ti OR 'foot'/exp OR 'foot' OR ankle:ti OR 'ankle joint'/exp OR 'ankle joint' OR 'articular ligaments':ab,ti OR 'ligaments':ab,ti OR 'ligament'/exp OR 'ligament' OR 'wrist'/exp OR 'wrist' OR 'wrist':ab,ti OR metacarpophalangeal:ab,ti OR 'metacarpophalangeal joint'/exp OR 'metacarpophalangeal joint' OR intermetacarpal:ab,ti OR intercarpal:ab,ti OR hand:ab,ti OR 'hand'/exp OR 'hand' OR carpometacarpal:ab,ti OR 'carpometacarpal

joint'/exp OR 'carpometacarpal joint' OR carpal:ab,ti OR 'carpal joint'/exp OR 'carpal joint' OR elbow:ab,ti OR 'elbow'/exp OR 'elbow' OR 'finger joint'/exp OR 'finger joint' OR finger:ab,ti OR knee:ab,ti OR 'knee'/exp OR 'knee' OR 'tenosynovitis'/exp OR 'tenosynovitis' OR 'tendon'/exp OR 'tendon' OR tendons:ab,ti OR tendon:ab,ti OR synovium:ab,ti OR 'synovitis'/exp OR 'synovitis' OR 'synovial membrane':ab,ti OR 'synovium'/exp OR 'synovium' OR meniscus:ab,ti OR menisci:ab,ti OR musculoskeletal:ab,ti OR 'musculoskeletal system'/exp OR 'musculoskeletal system' OR cartilage:ti OR 'fibrocartilage'/exp OR 'fibrocartilage' OR 'cartilage'/exp OR 'cartilage' OR 'articular cartilage'/exp OR 'articular cartilage' AND ('echography'/exp OR 'echography' OR ultrasonography:ab,ti OR echography:ab,ti OR sonography:ab,ti OR ultrasound:ab,ti OR 'ultrasound'/exp OR 'ultrasound' OR 'doppler flowmetry'/exp OR 'doppler flowmetry' OR 'doppler echography'/exp OR 'doppler echography' OR 'doppler echography':ab,ti OR 'color ultrasound flowmetry'/exp OR 'color ultrasound flowmetry') AND (procedure:ti OR procedures:ti OR examination:ti OR technique:ti OR guideline:ti OR guidelines:ti OR recommendation:ti OR anatomy:ab,ti OR position:ti OR recommendations:ti OR approach:ti OR validation:ti) AND [humans]/lim AND [embase]/

**Embase – extra-joints:**

'vein'/exp/mj OR 'peripheral nerve'/exp/mj OR 'blood vessel'/exp/mj OR 'artery'/exp/mj OR 'submandibular glands':ab,ti OR 'submandibular gland':ab,ti OR 'submandibular gland'/exp OR 'salivary gland'/exp OR 'salivary gland':ab,ti OR 'parotid gland':ab,ti OR 'parotid gland'/exp AND ('echography'/exp OR ultrasonography:ab,ti OR echography:ab,ti OR sonography:ab,ti OR ultrasound:ab,ti OR 'ultrasound'/exp OR 'doppler flowmetry'/exp OR 'doppler echography'/exp OR 'doppler echography':ab,ti OR 'color ultrasound flowmetry'/exp) AND (procedure:ti OR procedures:ti OR examination:ti OR technique:ti OR guideline:ti OR guidelines:ti OR anatomy:ab,ti OR recommendation:ti OR recommendations:ti OR anatomy:ab,ti OR position:ti OR approach:ti OR validation:ti) AND [humans]/lim AND [embase]

**Online Supplementary Table 3. Shoulder. US scanning procedures**

Alternative patient positions

Three patient positions are acceptable. However, the 3<sup>rd</sup> position is recommended for examining the following structures: glenohumeral joint-subscapularis recess; glenohumeral joint-anterior recess; coracohumeral ligament; coracoacromial ligament. Glenohumeral joint-axillary recess should be scanned in sitting position to facilitate effusion detection (gravity)

1. Patient sits on a (revolving) stool facing the examiner.
2. Patient sits on a (revolving) stool facing the screen with the examiner positioned behind the patient.
3. Patient supine with arm to be examined over the side of the examination table.

Location	Structure	Components	Patient (area) position	Probe placement-starting point	Scanning	Bony/other landmarks
Anterior	Joints	Glenohumeral joint-subscapularis recess	Shoulder externally rotated, elbow 90° flexed and maintained against the patient's body	Longitudinal – between the subscapularis tendon and the coracoid process	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Coracoid process
		Glenohumeral joint-anterior recess	Shoulder externally rotated, elbow 90° flexed and maintained against the patient's body	Longitudinal – between the humeral head and the glenoid rim	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Subscapularis tendon
		Acromioclavicular joint	Shoulder in neutral position	Longitudinal – between the acromion and the clavicle	Longitudinal and transverse Sweeping from medial to lateral Sweeping from anterior to posterior Dynamic: moving the arm across the anterior body	Acromion Clavicle
		Sternoclavicular joint	Shoulder in neutral position	Longitudinal – between the clavicular notch of the sternal manubrium and the clavicle	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Sternum Clavicle
		Manubriosternal joint	Shoulder relaxed on patient's side	Longitudinal – between the manubrium and the sternal body	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Manubrium Sternal body
	Tendons	Proximal biceps tendon (long head)	Shoulder in slight external rotation, elbow 90° flexed, forearm and hand supinated and resting on the patient's thigh	Transverse– over the bicipital groove of the humerus	Transverse and longitudinal Sweeping from medial to lateral Sweeping from proximal to distal For longitudinal scanning tilt probe distally (heel-toe movement) Dynamic: active and passive external rotation of the shoulder with the elbow flexed at 90°	Bicipital groove
		Pectoralis major tendon	Shoulder in external rotation, elbow 90° flexed and maintained against the patient's body	Longitudinal– distal to the bicipital groove	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Distal bicipital groove
		Deltoid muscle	Shoulder in slight external rotation, elbow 90° flexed, forearm and hand supinated and resting on the patient's thigh	Longitudinal – over the acromion	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Acromion
		Subscapularis tendon	Shoulder in external rotation, elbow 90° flexed and maintained against the patient's body	Longitudinal – over the lesser tuberosity	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Lesser tuberosity Coracoid process
		Supraspinatus tendon	1. Crass position. Modified Crass position <u>Alternative position:</u>	1. Longitudinal -over the greater tuberosity 2. Transverse -between the coracoid process and humeral head	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	1.Greater tuberosity. 2. Coracoid process Biceps tendon at the



			2. Patient supine with arm to be examined over the side of the examination table	(both starting points are equally recommended)	Dynamic: in Crass/modified Crass position: gentle pressure over the patient's flexed elbow in medial direction In supine position: pendular movement of the examined arm	interval Humeral head
	Other	Subacromial-subdeltoid bursa	Crass position. Modified Crass position In most cases it can be detected in the anterior proximal scan of the biceps tendon	Over the bicipital groove, transverse to the humeral shaft	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Bicipital groove
		Subcoracoid bursa	Shoulder in external rotation, elbow 90° flexed and maintained against the patient's body	Between the subscapularis tendon and the coracoid process	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Subscapularis tendon Coracoid process
		Coracohumeral ligament	Shoulder in neutral position, elbow 90° flexed and maintained against the patient's body	Longitudinal – from the coracoid process towards the humeral head	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Coracoid process Humeral head
		Coracoacromial ligament	Shoulder in neutral position	Longitudinal to ligament – between the coracoid process and the acromion	Probe between the coracoid process and the anterior aspect of the acromion Dynamic: shoulder abducted, elbow 90° flexed, internal-external shoulder rotation	Coracoid process Acromion
Posterior	Joint	Glenohumeral joint-posterior recess Posterior labrum Humeral hyaline cartilage	Arm across the front of the chest and the hand on the opposite shoulder	Longitudinal to and below the scapular spine – between the humeral head and the glenoid	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal Dynamic: internal-external rotation	Scapular glenoid Humeral head
	Tendons	Infraspinatus tendon	Arm across the front of the chest and the hand on the opposite shoulder	Longitudinal – over the middle facet of the greater tuberosity	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Middle facet of the greater tubercle
		Teres minor tendon	Arm across the front of the chest and the hand on the opposite shoulder	Transverse – from the scapular spine towards the infraspinatus muscle	Transverse and longitudinal Sweeping from medial to lateral Sweeping from proximal to distal	Scapular spine Axillary nerve Posterior circumflex artery
		Long head of the triceps tendon	Arm across the front of the chest and the hand on the opposite shoulder	Longitudinal – over the infraglenoid tubercle of the scapula towards the distal humerus	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Infraglenoid tubercle of the scapula
	Other	Suprascapular notch	Arm in slight external rotation, elbow 90° flexed, forearm and hand supinated and resting on the patient's thigh	Suprascapular border between the spine of the scapula and the acromion	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	

		Spinoglenoid notch	Arm across the front of their chest and the hand on the opposite shoulder	Over the medial aspect of the posterior glenohumeral joint	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Posterior scapula
		Glenohumeral joint-axillary recess	Arm 90° abducted elbow flexed with palm on top of head.	Longitudinal – in the axilla at the junction of the humeral head and neck (surgical neck)	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Humeral head Humeral neck Surgical neck

**Crass position:** shoulder in extension, adduction and internal rotation; elbow 90° flexed with hand in opposite “back pocket” and palm facing out.

**Modified Crass position:** shoulder in extension, adduction and internal rotation; elbow flexed and directed medially with palm of hand placed over ipsilateral “back pocket”.

#### Online Supplementary Table 4. Elbow. US scanning procedures

Alternative patient positions

1. Patient seated in front of the examiner with the elbow resting on an examination table.
2. Patient supine with the elbow resting at the patient’s side.

Location	Structure	Components	Patient (area) position	Probe placement-starting point	Scanning	Bony/other landmarks
Anterior	Joint	Radial recess	Patient seated facing examiner. Elbow extended, supported by a pillow, resting on the examination table, forearm supinated	Longitudinal – over the humeral capitulum	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Humeral capitulum
		Coronoid recess	Patient seated facing examiner. Elbow extended, supported by a pillow, resting on the examination table, forearm supinated	Longitudinal – over the humeral trochlea	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Humeral trochlea Coronoid process of the ulna
		Annular recess	Patient seated facing examiner. Elbow extended, supported by a pillow, resting on the examination table, forearm supinated	Longitudinal – over the radial head	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Radial head and neck
	Tendons	Distal biceps brachii tendon	Medial approach: Patient seated facing examiner. Elbow flexed at 90° and resting on the table	Medial approach: longitudinal parallel to distal humerus with the proximal aspect of the probe over the medial epicondyle	Medial approach: the probe is moved distally along the inner aspect of the forearm (over pronator teres muscle) until	Medial approach: Medial epicondyle Radial head and tubercle

			and forearm supinated while examiner holds the patient's wrist with her/his free (non-probe) hand		the radial head and, slightly more distally, the radial tuberosity with the tendon insertion are found. This last movement is done while the examiner is gently supinating and pronating the patient's forearm to aid in maintaining the probe over the bony acoustic landmark of the radius	
			Anterior approach: Patient seated facing examiner. Elbow extended resting on the examination table, forearm supinated	Anterior approach: longitudinal slightly oblique at the midline superficial to the elbow joint over the brachialis muscle with the distal aspect of probe over the radial tubercle	Anterior approach: for longitudinal scanning put slight more pressure on the distal edge of the probe (heel-toe movement)	Anterior approach: Brachialis muscle Radial tubercle
			Posterior approach: elbow flexed 90°; resting on the examination table; forearm elevated; hand in neutral position	Posterior approach: transverse over the olecranon	Posterior approach: the probe is shifted distally from the olecranon, along the posterior aspect of the forearm, while doing dynamic prono-supination of the arm	Posterior approach: Olecranon
		Distal brachialis tendon	Patient seated facing examiner. Elbow extended resting on the examination table, forearm supinated	Longitudinal – over the ulnar tuberosity, just distal to the elbow joint	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Coronoid process Ulnar tuberosity
Medial	Tendon	Common flexor tendon	Patient seated facing examiner. Elbow slightly flexed resting on the examination table, arm in external rotation with forearm supinated	Longitudinal – proximal aspect of probe over the medial epicondyle and the distal probe over the bony acoustic landmark of the proximal ulna	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Medial epicondyle
	Other	Ulnar (medial) collateral ligament	Patient seated facing examiner. Elbow in slight flexion resting on examination table, forearm pronated	Longitudinal – proximal aspect of probe over the medial epicondyle and the distal probe over the bony acoustic landmark of the proximal ulna	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Medial epicondyle for the anterior band Olecranon and medial epicondyle for the posterior band
Lateral	Tendon	Common extensor tendon	Patient seated facing examiner. Elbow in slight flexion resting on examination table, shoulder in internal rotation	Longitudinal – proximal aspect of probe over the lateral epicondyle and the distal end over the bony acoustic landmark of the proximal radius	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Lateral epicondyle.
	Other	Radial (i.e. lateral) collateral ligament	Patient seated facing examiner. Elbow in slight flexion resting on examination table, hand pronated	Longitudinal – proximal aspect of probe over the lateral epicondyle and the distal end over the bony acoustic landmark of the radial head	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Lateral epicondyle Radial head

		Lateral ulnar collateral ligament	Patient seated facing examiner. Elbow flexed resting on examination table, hand pronated and palmar flexed (“cobra”)	Longitudinal oblique– between the lateral epicondyle and the ulna	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Lateral epicondyle
		Annular ligament	Patient seated facing examiner. Elbow flexed resting on examination table, hand pronated and palmar flexed (“cobra”)	Transverse to the radial shaft over the radial head (longitudinal to the fibers of the ligament)	Transverse and longitudinal Sweeping from medial to lateral Sweeping from proximal to distal	Radial head
Posterior	Joint	Posterior joint recess	Patient supine or seated. Elbow flexed and arm internally rotated with forearm and palm resting on patient’s chest or on the examination table	Longitudinal – at the midline of the posterior proximal elbow	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Olecranon
	Tendon	Triceps brachii tendon	Patient supine or seated. Elbow flexed and arm internally rotated with forearm and palm resting on patient’s chest or on the examination table	Longitudinal – at the midline of the posterior proximal elbow	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Olecranon
	Other	Triceps brachii muscle Olecranon bursa	Patient supine or seated. Elbow flexed and arm internally rotated with forearm and palm resting on patient’s chest or on the examination table	Longitudinal – over the posterior proximal elbow	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Olecranon
		Osborne’s retinaculum	Patient supine or seated. Elbow flexed and arm internally rotated with forearm and palm resting on patient’s chest or on the examination table	Between the olecranon and the medial epicondyle	Longitudinal and transverse Sweeping from lateral to distal Sweeping from proximal to distal	Olecranon Medial epicondyle
		Ulnar nerve	Patient supine, shoulder externally rotated, elbow 90° flexed	Transverse – between the olecranon and the medial epicondyle	Transverse and longitudinal Sweeping from proximal to distal For longitudinal view, elbow extended Dynamic: flexion-extension of the elbow	Medial epicondyle

### Online Supplementary Table 5. Wrist and Hand. US scanning procedures

#### Alternative patient positions

3. Patient sits in front of the examiner with the hand resting on an examination table.
4. Patient lies supine with the hand resting at the patient’s side.

Location	Structure	Components	Patient (area) position	Probe placement-starting point	Scanning	Bony/other landmarks
Dorsal	Joint	Radiocarpal, midcarpal, carpometacarpal joints	Palm down, elbow flexed with MCP, PIP and DIP joints in slight flexion	Longitudinal – over the midline of the wrist, aligned with the third finger	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Radius Lunate Capitate
		Dorsa extrinsic (dorsal radio-carpal) ligaments	Forearm pronated, elbow flexed with MCP, PIP and DIP joints in slight flexion <u>Alternative position:</u> Forearm pronated, elbow flexed with joints in neutral position	Longitudinal – between the distal radioulnar joint and the first row of the carpal bones	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Fourth extensor compartment
		Distal radioulnar joint	Forearm pronated, elbow flexed with MCP, PIP and DIP joints in slight flexion <u>Alternative position:</u> Forearm pronated, elbow flexed with joints in neutral position	Transverse – between the distal radius and the distal ulna	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	Distal radius Distal ulna
		Dorsal MCP, PIP, and DIP joints	Forearm pronated, elbow flexed with MCP, PIP and DIP joints in slight flexion <u>Alternative position:</u> Forearm pronated, elbow flexed with joints in neutral position	Longitudinal – over the distal MC bones and the dorsal aspect of the finger	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	MC heads Phalanges
		MCP cartilage PIP cartilage	Forearm pronated, elbow flexed with MCP, PIP and DIP joints in maximum flexion	Transverse – over the mid-portion of the MC heads/ proximal phalangeal heads	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	MC heads Proximal phalangeal heads
	Tendon	Extensor tendons (2 <sup>nd</sup> -5 <sup>th</sup> extensor compartments) of hand	Forearm pronated, elbow flexed	Transverse – at the level of the Lister's tubercle and the styloid process of the ulna	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	Lister's tubercle
	Other	Extensor retinaculum	Forearm pronated, elbow flexed with slight palmar flexion of wrist	Transverse to the compartments at Lister's tubercle	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	Lister's tubercle
		Radial collateral ligament	Hand midway between supination and pronation, elbow flexed with wrist in ulnar deviation	Longitudinal- between the distal radius and the scaphoid	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Scaphoid Distal radius

		Sagittal bands at the distal MC bones	Forearm pronated, elbow flexed with hand placed on a rolled towel, joints in slight flexion	Transverse to the MC head- (longitudinal to band)	Dynamic: transverse during active flexion to visualise lateral deviation of extensor tendon	MC head
		Finger extensor tendons	Forearm pronated, elbow flexed with hand placed on a rolled towel, joints in slight flexion	Longitudinal – over the dorsal aspect of the finger	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Phalanges
		Scapho-lunate ligament	Forearm pronated, elbow flexed with hand placed on a rolled towel, joints in slight flexion	Transverse– between the scaphoid and the lunate	Dynamic patient makes fist while flexing wrist	Fourth extensor compartment Scaphoid Lunate
		Finger collateral ligaments at MCP level	Hand resting on the radial/ulnar side (according to the ligament)	Longitudinal – between the MC heads and proximal phalanges	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal Scanning accessible only for second radial and fifth ulnar MCP ligaments	MC heads Proximal phalanges Volar plate
		Finger collateral ligaments at PIP level	Forearm pronated, elbow flexed	Longitudinal – between the proximal and middle phalanges (both for radial and ulnar sides)	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Proximal phalanges, radial and ulnar side. Middle phalanges, radial and ulnar side.
		Thumb ulnar collateral ligament	Forearm midway between pronation and supination with elbow flexed and thumb abducted	Longitudinal – between the MC and proximal phalanx	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal Dynamic: passive interphalangeal flexion and extension (to visualise tear). Slight valgus (in non-displaced injuries) stress may be used with extreme caution	First MC head First proximal phalanx base
Palmar	Joint	Radiocarpal, midcarpal, carpometacarpal joints	Forearm supinated, elbow flexed with slight dorsiflexion of the wrist	Longitudinal –over the midline of the wrist	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Radius Lunate Capitate
		First carpo-metacarpal joint	Forearm supinated, wrist in slight dorsiflexion	Longitudinal – between the base of the first MC bone and the trapezium	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Base of the first MC bone, Trapezium
		MCP, PIP, DIP joints	Forearm supinated, wrist in slight dorsiflexion with joints extended	Longitudinal	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	MC bones Phalanges

	Tendon	Flexor tendons (wrist level): Flexor carpi radialis, Palmaris longus, flexor carpi ulnaris, flexor pollicis longus, flexor digitorum superficialis and profundus.	Forearm supinated, wrist in slight dorsiflexion with joints extended	Transverse – over the flexor retinaculum, between the scaphoid tubercle and pisiform	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	Scaphoid Pisiform Flexor retinaculum
		Finger flexor tendons (finger level): flexor pollicis longus, flexor digitorum superficialis and profundus.	Forearm supinated, wrist in slight dorsiflexion with joints extended	Transverse – over the MC head	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal Dynamic: finger flexion-extension	MC bones Phalanges
	Other	Flexor retinaculum	Forearm supinated, wrist in slight dorsiflexion	Transverse between the scaphoid and pisiform (longitudinal to retinaculum)	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	Scaphoid Pisiform
		Radio-scapho-capitate ligament	Forearm supinated, wrist in slight dorsiflexion with ulnar deviation	Longitudinal oblique– between radial styloid and scaphoid (over long axis of scaphoid)	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Radius Scaphoid Capitate
		Short radio-lunate ligament	Forearm supinated, wrist in slight dorsiflexion with ulnar deviation	Longitudinal – between the ulnar side of the distal radius and the lunate	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Radius Lunate
		Long radio-lunate ligament	Forearm supinated, wrist in slight dorsiflexion with ulnar deviation	Longitudinal oblique– between the radial side of the distal radius and the palmar horn of the lunate	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Radius Lunate
		Median Nerve	Forearm supinated, wrist in slight dorsiflexion	Transverse – between the scaphoid tubercle and the pisiform over flexor retinaculum	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	Scaphoid tubercle and pisiform proximally; Trapezium and hook of the hamate distally
		Annular pulleys, A1-A5	Forearm supinated, elbow flexed with wrist in slight dorsiflexion and hand resting on the examination table, fingers in slight extension	Longitudinal – over the MC heads and phalanges	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal Compare with the adjacent finger with gel between both fingers. Dynamic: movement of the tendon(s) beneath the pulley during passive and active movements of the fingers and resisted flexion of the DIP joints	MC bones, Phalanges
		Interosseous and lumbrical muscles	Forearm supinated, elbow flexed with wrist in slight dorsiflexion and hand resting	Transverse to the distal portion of the MC bones. Note. Dorsal interossei best	Transverse and longitudinal Sweeping from lateral to medial	MC bones

			on the examination table, fingers in slight extension	visualized over dorsum of hand in axis transverse to the long axis of MC bones	Sweeping from proximal to distal Note: knowledge of their origins and insertions and range of motion is essential to evaluate these muscles individually and dynamically	
		Thenar muscles: abductor pollicis, flexor pollicis brevis (deep and superficial heads), opponens pollicis and adductor pollicis (oblique and transverse heads).	Forearm supinated, elbow flexed with wrist in slight dorsiflexion and hand resting on the examination table, fingers in slight extension	Longitudinal or transverse to the flexor pollicis longus tendon except for adductor pollicis whose heads are oriented transverse and transverse oblique to long axis of metacarpal bones	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal Note: Knowledge of their origins and insertions and range of motion is essential to evaluate these muscles individually and dynamically.	Flexor pollicis longus tendon.
Radial		First extensor compartment	Hand midway between supination and pronation	Transverse – over the radial styloid	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	Radial styloid Scaphoid tubercle
Ulnar		Sixth extensor compartment	Forearm pronated, elbow flexed with wrist in radial deviation	Transverse – at the level of the ulnar groove	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	Distal ulna Triquetrum
		Triangular fibrocartilage complex (peripheral aspect)	Forearm pronated, elbow flexed with wrist in radial deviation	Transverse- between the ulnar styloid and the triquetrum	Decrease frequency Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	Ulnar styloid Triquetrum Extensor carpi ulnaris

MC, metacarpal; MCP, metacarpophalangeal; PIP, proximal interphalangeal; DIP, distal interphalangeal

### Online Supplementary Table 6. Hip. US scanning procedures

Location	Structure	Components	Patient (area) position	Probe placement-starting point	Scanning	Bony/other landmarks
Anterior	Joint	Anterior recess of the hip Capsule/iliofemoral ligament Femoral head Anterior labrum	Patient supine, leg extended with hip in slight external rotation	Longitudinal oblique– parallel to the femoral neck	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Acetabulum Femoral head Femoral neck
	Tendon	Iliopsoas tendon	Patient supine, hip flexed, abducted, externally rotated (FABER)	Longitudinal oblique– over the lesser tuberosity	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal Dynamic: bring the hip into flexion-abduction-external rotation and then into full extension	Superior ramus of the pubic bone. Lesser tuberosity



		Rectus femoris tendons: direct and indirect	Patient supine, leg extended with hip in slight external rotation	Longitudinal – over the anterior inferior iliac spine towards the anterior thigh	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Anterior inferior iliac spine Acetabulum
	Other	Iliopsoas bursa	Patient supine, leg extended with hip in slight external rotation	Between the anterior hip capsule and the iliopsoas muscle	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Iliopsoas muscle
		Inguinal ligament	Patient supine, hip and knee in neutral position	Longitudinal oblique– from the anterior superior iliac spine to the symphysis pubis	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Anterior superior iliac spine
		Neurovascular bundle (femoral nerve, artery and vein)	Patient supine, hip and knee in neutral position	Transverse –parallel and just distal to the inguinal ligament	Transverse and longitudinal Sweeping from lateral to medial Sweeping from proximal to distal	Inguinal ligament
Medial	Other	Adductor muscles (adductor longus, brevis, magnus and gracilis)	Patient supine, hip in abduction and external rotation, knee flexed (FABER)	Transverse – just distal to the symphysis pubis (transverse to the femoral shaft)	Transverse and longitudinal Sweeping from medial to lateral Sweeping from proximal to distal	Gracilis muscle
Lateral	Tendon	Gluteus minimus and medius tendons	Patient lateral decubitus	Transverse – begin over the most prominent superior point of the greater trochanter; slide probe anteriorly towards the concave anterior facet of the gluteus minimus and then posteriorly towards the convex lateral facet and also postero-superiorly toward the postero-superior facet for the insertions of the gluteus medius	Longitudinal and transverse Sweeping from anterior to posterior Sweeping from proximal to distal	Greater trochanter
	Other	Fasciae latae	Patient lateral decubitus, hip extended	Longitudinal – over the greater trochanter	Longitudinal and transverse Sweeping from anterior to posterior Sweeping from proximal to distal	Greater trochanter
		Trochanteric bursae	Patient lateral decubitus	Same as gluteal tendons with addition of further posterior displacement for the greater trochanteric bursa over the posterior facet	Longitudinal and transverse Sweeping from anterior to posterior Sweeping from proximal to distal	Greater trochanter
Posterior	Tendon	Common tendon of the biceps femoris and semitendinosus Semimembranosus tendon	Patient prone, hip and knee extended, feet hanging over the edge of the examination table	Transverse – 2 cm distally to the gluteal fold (transverse to the femoral shaft, slightly more medial)	Longitudinal and transverse Sweeping from medial to lateral Sweeping from distal to proximal	Sciatic nerve Ischial tuberosity

**Online Supplementary Table 7. Knee. US scanning procedures**

Location	Structure	Components	Patient (area) position	Probe placement-starting point	Scanning	Bony/other landmarks
Anterior	Joint	Suprapatellar recess Suprapatellar fat pad Prefemoral fat pad	<u>Alternative positions:</u> 1. Patient supine, knee slightly (30°) flexed 2. Patient supine, knee in neutral position with quadriceps muscle contraction	Longitudinal – with the distal end of the probe over the proximal pole of the patella	Longitudinal and transverse Sweeping from lateral to medial Sweeping from distal to proximal	Femur Proximal pole of patella
		Femoral cartilage	Patient supine, knee fully flexed	Longitudinal (respective to the femora trochlea) – over the femoral trochlea proximal to the patella	Longitudinal and transverse Sweeping from lateral to medial Sweeping from distal to proximal	Femoral trochlea
		Hoffa's fat pad	Patient supine, knee 30° flexed	Proximal end of the probe over the distal pole of the patella, parallel to the patellar tendon	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Distal pole of the patellar Anterior tibial tubercle
	Tendon	Quadriceps tendon	Patient supine, knee 30° flexed	Longitudinal – with the distal end of the probe over the proximal pole of the patella	Longitudinal and transverse Sweeping from lateral to medial Sweeping from distal to proximal	Proximal pole of patella
		Patellar tendon	Patient supine, knee 30° flexed	Longitudinal – with the proximal end of the probe over the distal pole of the patella	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Distal pole of the patella Anterior tibial tubercle
	Other	Prepatellar bursa	Patient supine, knee in neutral position	Midline longitudinal over the patella	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Patella
		Superficial infrapatellar bursa, Deep infrapatellar bursa	Patient supine, knee 30° flexed	Proximal end of the probe over the distal pole of the patella and distal end of the probe over the tibial tubercle	Longitudinal and transverse Sweeping from lateral to medial Sweeping from proximal to distal	Anterior tibial tubercle Patellar tendon
Medial	Joint	Medial (parapatellar) joint recesses	Patient supine, knee in neutral position	One end of the probe over the patella and the other one over the femoral condyle	Longitudinal and transverse Sweeping from midline to medial Sweeping from proximal to distal	Patella Medial femoral condyle
		Tibiofemoral medial joint space	Patient supine, hip slightly flexed and externally rotated, knee slightly flexed	Longitudinal – with the proximal end of the probe on the medial femoral condyle and the distal one on the medial tibial condyle	Longitudinal and transverse Start on the anterior part, longitudinal over the patellar tendon and then move the probe medially and posteriorly	Medial femoral condyle Medial tibial condyle
	Tendon	Pes anserinus tendons (gracilis, sartorius and semitendinosus tendons)	Patient supine, hip slightly flexed and externally rotated, knee slightly flexed	Longitudinal –midline medial joint space	Longitudinal and transverse Sweeping from medial to anterior and from proximal to distal over bony acoustic landmark of the proximal medial tibia. The inferior medial geniculate artery may be visualized	Medial femoral condyle Medial tibial condyle Inferior medial genicular artery

					between the bony cortex and the medial collateral ligament	
	Other	Medial retinaculum	Patient supine, knee 30° flexed	One end of the probe over the patella and the other one over the medial femoral condyle	Transverse and longitudinal Sweeping from midline to medial Sweeping from proximal to distal Dynamic: flexion of the knee (to visualize tear)	Patella Medial femoral condyle
		Medial collateral ligament	Patient supine, hip slightly flexed and externally rotated, knee slightly flexed	Longitudinal – with the proximal end of the probe on the medial femoral condyle and the distal one on the medial tibial condyle	Longitudinal and transverse Start on the anterior part, longitudinal over the patellar tendon and then move the probe medially and posteriorly	Medial femoral condyle Medial tibial condyle/ Inferior medial genicular artery
Lateral	Joint	Lateral (parapatellar) joint recesses	Patient supine, knee 30° flexed	One end of the probe over the patella and the other one over the lateral femoral condyle	Longitudinal and transverse Sweeping from midline to lateral Sweeping from proximal to distal	Patella Lateral femoral condyle
		Tibiofemoral lateral joint space	Patient supine, knee internally rotated	Longitudinal- with the proximal end of the probe over the lateral femoral condyle and the distal one over the lateral tibial condyle	Longitudinal and transverse Start on the anterior part, longitudinal over the patellar tendon and then move the probe laterally and posteriorly	Lateral femoral condyle Lateral tibial condyle
		Proximal tibio-fibular joint	Patient supine, knee 30° flexed	One end of the probe over the fibular head and the other one over the proximal tibia	The fibular head is palpated, and the lateral end of the transducer is placed over the fibular head. The medial end of the transducer is oriented toward the inferior patellar pole and placed over the proximal tibia	Tibia Fibular head
	Tendon	Iliotibial band	Patient supine, hip in internal rotation	Longitudinal – with the proximal end of the probe over the lateral aspect of the lateral femoral condyle and the distal end of the probe over Gerdy's tubercle, parallel to the examination table	Longitudinal and transverse Sweeping from proximal to distal	Lateral femoral condyle Gerdy's tubercle
		Biceps femoris tendon	Patient supine, hip in internal rotation	Longitudinal – with the distal end of the probe over the fibular head, and the proximal end towards the posterolateral aspect of the thigh	Longitudinal and transverse Sweeping from lateral to posterior Sweeping from proximal to distal	Popliteal groove of the femur Fibular head
		Popliteus tendon	Patient supine, hip in internal rotation	Longitudinal to the femur –over the popliteal groove of the femur (short axis oblique view of tendon)	Longitudinal and transverse Sweeping from lateral to posterior	Popliteal groove of the femur
	Others	Lateral retinaculum	Patient supine, knee 30° flexed	One end of the probe over the patella and the other one over the lateral femoral condyle	Longitudinal and transverse Sweeping from midline to lateral Sweeping from proximal to distal	Patella Lateral femoral condyle

					Dynamic: flexion of the knee (to visualize tear)	
		Lateral collateral ligament	Patient supine, knee 30° flexed	Longitudinal - with the proximal end of the probe on the femoral lateral condyle over popliteal groove and the distal end over the fibular head	Longitudinal and transverse Sweeping from distal to proximal	Lateral femoral condyle Popliteal groove Fibular head
Posterior	Tendon	Semimembranosus tendon	Patient prone, knee extended, leg resting on the examination table, foot free	Longitudinal- posteromedial aspect of the medial femoral condyle parallel to the medial collateral ligament	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Postero-medial femoral condyle Postero-medial tibial condyle.
	Other	Semimembranosus-gastrocnemius bursa	Patient prone, knee extended, leg resting on the examination table, foot free	Transverse to the femoral shaft, over the medial head of the gastrocnemius muscle and semimembranosus tendon	Transverse and longitudinal Sweeping from medial to lateral Sweeping from proximal to distal	Medial femoral condyle

**Online Supplementary Table 8. Ankle and foot. US scanning procedures**

Location	Structure	Components	Patient (area) position	Probe placement – starting point	Scanning	Bony/other landmarks
Anterior	Joint	Tibiotalar joint, anterior recess, cartilage, anterior fat pad	Patient supine, knee flexed, plantar aspect of the foot resting on the examination table	Longitudinal – midline at the dorsal aspect of the ankle	Longitudinal and transverse. Sweeping from medial to lateral. Sweeping from proximal to distal	Distal tibia Talus
		Talonavicular and calcaneocuboid joints (Chopart joint) Tarsometatarsal joints (Lisfranc joint)	Patient supine, knee flexed, plantar aspect of the foot resting on the examination table	Longitudinal –dorsal aspect of the midfoot parallel to the metatarsal bones	Longitudinal and transverse. Sweeping from medial to lateral. Sweeping from proximal to distal	Bony acoustic landmarks of bones of midfoot
		Dorsal MTP joints Dorsal IP joints	Patient supine, knee flexed, plantar aspect of the foot resting on the examination table	Longitudinal – dorsal aspect of the forefoot, parallel to the metatarsal bones	Longitudinal and transverse. Sweeping from medial to lateral. Sweeping from proximal to distal Scan also the medial aspect of the first MTP and the lateral aspect of the fifth MTP	Metatarsal heads Phalanges
		MTP cartilage	Patient supine, knee slightly flexed, heel resting on table, toes flexed passively	Transverse – dorsal aspect of the foot, perpendicular to the metatarsal bones	Transverse and longitudinal Sweeping from medial to lateral Sweeping from proximal to distal	Metatarsal heads
	Tendon	Tibialis anterior, extensor hallucis longus and extensor digitorum longus tendons	Patient supine, knee flexed, plantar aspect of the foot resting on the examination table	Transverse –over the talus	Transverse and longitudinal Sweeping from medial to lateral Sweeping from proximal to distal	Talus

	Other	Superior and inferior extensor retinacula	Patient supine, knee flexed, plantar aspect of the foot resting on the examination table	Superior: over distal tibia; inferior: over distal tibia/talus; transverse to the tibia	Just identify Sweeping from medial to lateral. Sweeping from proximal to distal	Distal tibia Talus
		Anterior tibio-fibular ligament	Patient supine, knee flexed, plantar aspect of the foot resting on the examination table <u>Alternative position:</u> Patient lateral decubitus, hip flexed and adducted, knee flexed, foot free	Oblique– from distal tibia to fibula (lateral malleolus)	Longitudinal and transverse Dynamic: active dorsiflexion of the ankle	Distal tibia Lateral malleolus
		Metatarsal bone	Patient supine, knee flexed, plantar aspect of the foot resting on the examination table	Longitudinal – dorsal aspect of the foot, parallel to the MT bones	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	MT bones
		Intermetatarsal spaces	Patient supine, knee flexed, ankle neutral	1. Transverse to the dorsal aspect of MT bones 2. Transverse to the plantar aspect of MT bones	Transverse and longitudinal Sweeping from medial to lateral Sweeping from proximal to distal Using the non-imaging fingers to press from the plantar aspect	MT bones Deep inter-metatarsal ligament
Medial	Joints	Talocalcaneal joint (anterior subtalar joint)	Patient supine, hip abducted, knee flexed, foot in slight eversion	Proximal pole of the transducer is placed on the medial malleolus and the distal pole placed on the sustentaculum tali with the opening of tarsal canal clearly visible	1. The probe is shifted slightly anteriorly until the anterior subtalar joint is visualized, or 2. While the distal pole remains fixed on the sustentaculum tali, the proximal pole is rotated anteriorly towards the navicular bone until the spring ligament overlying the talar cartilage is visualized, along with the anterior subtalar joint	Sustentaculum tali Medial malleolus Navicular bone
		Posterior subtalar joint	Patient supine, hip abducted, knee flexed, foot in slight eversion	Proximal pole of the transducer is placed on the medial malleolus and the distal pole placed on the sustentaculum tali with the opening of tarsal canal clearly visible	The probe is shifted behind the medial malleolus to visualize the flexor hallucis longus tendon in long axis and the posterior subtalar joint beneath the tendon	Sustentaculum tali Medial malleolus Flexor hallucis longus tendon
	Tendon	Tibialis posterior, flexor digitorum longus and flexor hallucis longus tendons	Patient supine, hip abducted, knee flexed, foot in slight eversion	Transverse – posterior to the medial malleolus	Transverse and longitudinal Sweeping from medial to posterior Sweeping from proximal to distal	Medial malleolus

	Other	Tibial nerve	Patient supine, hip abducted, knee flexed, foot in slight eversion	Transverse – posterior to the medial malleolus	Transverse and longitudinal Sweeping from proximal to distal	Medial malleolus
		Flexor retinaculum	Patient supine, hip abducted, knee flexed, foot in slight eversion	Posterior to the medial malleolus, transverse to the tibia	Just identify Sweeping from proximal to distal	Medial malleolus
		Deltoid ligament	Patient supine, hip abducted, knee flexed, foot in slight eversion	Oblique- from the medial malleolus towards the talus	Longitudinal and transverse In a fan-shape fashion, longitudinally from its attachment on the medial malleolus to the talus, calcaneus and navicular	Medial malleolus Talus Navicular Calcaneus Tibialis posterior tendon
		Calcaneo-navicular ligament (spring ligament)	Patient supine, hip abducted, knee flexed, foot in slight eversion	One end of the probe over the sustentaculum tali of the calcaneus and the other one towards the supero-medial aspect of the navicular bone	Longitudinal and transverse Placing one end of the probe over the sustentaculum tali and sliding the other end slightly superiorly toward the supero-medial aspect of the navicular bone	Sustentaculum tali Talus Navicular bone Tibialis posterior tendon
Lateral	Joint	Tibiotalar joint, lateral recess	Patient supine, knee flexed, plantar aspect of the foot resting on the examination table	Longitudinal – at the lateral aspect of the ankle	Longitudinal and transverse Sweeping from proximal to distal	Lateral malleolus Talus
		Posterior subtalar joint	Patient supine, knee flexed, plantar aspect of the foot resting on the examination table	The proximal pole of the transducer is placed on the lateral malleolus with the distal pole pointing to the sole of the foot	The probe is shifted slightly anteriorly to visualize the posterior subtalar joint between the talus and the calcaneus	Talus Calcaneus
	Tendons	Peroneus brevis, Peroneus longus	Patient supine, hip in slight flexion and internal rotation, knee in slight flexion, foot in slight inversion <u>Alternative positions:</u> 1. Patient supine, knee flexed, plantar aspect of the foot resting on the examination table 2. Patient lateral decubitus, hip flexed and adducted, knee flexed, foot free	Transverse – posterior to the lateral malleolus over the retrofibular groove	Transverse and longitudinal Sweeping from lateral to posterior Sweeping from proximal to distal In the supramalleolar region, the peroneal tendons are examined together; in the inframalleolar region the transducer must be toggled to exam each tendon separately Dynamic: retromalleolar and transverse to the tendons during active dorsiflexion and eversion of the ankle to visualize subluxation of the tendons over the fibula	Lateral malleolus Cuboid
	Others	Superior peroneal retinaculum	Patient supine, hip in slight flexion and internal rotation,	Posterior to the lateral malleolus, transverse to the tibia	Just identify Sweeping from proximal to distal	Lateral malleolus Calcaneus

			knee in slight flexion, foot in slight inversion			
		Anterior talo-fibular ligament	Patient lateral decubitus, hip flexed and adducted, knee flexed, ankle in slight plantar flexion and inversion	Longitudinal – from the lateral malleolus to the talus, almost parallel to the sole of the foot	Longitudinal and transverse Dynamic: forced inversion of the foot	Lateral malleolus Talus
		Calcaneo-fibular ligament	Patient lateral decubitus, hip flexed and adducted, knee flexed, ankle dorsiflexed	Longitudinal – from the lateral malleolus to the upper lateral surface of the calcaneus	Longitudinal and transverse Dynamic: active dorsiflexion of the ankle	Lateral malleolus Calcaneus
Posterior	Joint	Tibiotalar joint posterior recess Posterior subtalar joint recess, Kager's fat pad	Patient prone, knee extended, leg resting on the examination table, foot dorsiflexed ( $\geq 90^\circ$ )	1. Longitudinal to the distal part of the Achilles tendon 2. Longitudinal and medial to Achilles with slight tilt of probe toward posterior recesses	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	Distal tibia Talus Calcaneus
	Tendon	Achilles tendon and insertion	Patient prone, knee extended, leg resting on the examination table, foot neutral	Longitudinal – over the distal part of the tendon at the level of the calcaneus	Longitudinal and transverse Sweeping from medial to lateral Sweeping from the enthesis to the myotendinosus junction Dynamic: foot dorsiflexed and plantar flexed to evaluate for tear. Thompson test (when plantar flexion is too painful): the calf is gently squeezed to allow visualization of tendon movement	Calcaneus
	Other	Retroachillean bursa Retrolcalcaneal bursa	Patient prone, knee extended, leg resting on the examination table, foot neutral	Longitudinal to the distal part of the Achilles tendon at the level of the calcaneus	Longitudinal and transverse Sweeping from medial to lateral Sweeping from distal to proximal	Calcaneus
Plantar	Joint	MTP joints IP joints Plantar plate MTP cartilage	Patient prone, knee extended, leg resting on the examination table, foot dorsiflexed	Longitudinal – plantar aspect of the foot, parallel to the MT bones	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	MT head Proximal, middle, and distal phalanges
	Tendons	Plantar fascia	Patient prone, knee extended, leg resting on the examination table, foot dorsiflexed	Longitudinal – over the medial tubercle of the calcaneus	Longitudinal and transverse Sweeping from medial to lateral Sweeping from distal to proximal For longitudinal scanning put slight more pressure on the distal edge of the probe Dynamic: flexion-extension of the toes	Calcaneus
		Flexor digitorum longus tendon	Patient prone, knee extended, leg resting on the examination table, foot dorsiflexed	Longitudinal – plantar aspect of the foot, parallel to the MT bones	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	MT head Phalanges

	Others	Sesamoid bones	Patient prone, knee extended, leg resting on the examination table, foot dorsiflexed	Transverse– plantar aspect of the foot, over the first metatarsal head	Longitudinal and transverse Sweeping from medial to lateral Sweeping from proximal to distal	First MT head
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MT, metatarsal; MTP, metatarsophalangeal, IP, interphalangeal

### Online Supplementary Table 9. Peripheral nerves. US scanning procedures

Location	Structure	Patient (area) position	Probe placement-starting point	Scanning	Bony/other landmarks
Arm	Musculo-cutaneous nerve	Patient supine, shoulder externally rotated, elbow 90° flexed	Transverse - at the proximal mid portion of the upper anterior third of the humeral shaft	Transverse and longitudinal Sweeping from proximal to distal	Coracobrachialis muscle Biceps brachii muscle
Elbow	Ulnar nerve	Patient supine, shoulder externally rotated, elbow 90° flexed	Transverse – between the olecranon and the medial epicondyle	Transverse and longitudinal Sweeping from proximal to distal For longitudinal view, elbow extended Dynamic: flexion-extension of the elbow	Medial epicondyle
Forearm	Median, ulnar and sensory branch of the radial nerve.	Patient seated facing examiner. Elbow extended lying on the examination table, forearm supinated	Transverse –in the middle third of the forearm	Transverse and longitudinal Sweeping from proximal to distal	Ulnar artery Radial artery
	Posterior interosseous branch of the radial nerve	Patient seated facing examiner. Elbow extended lying on the examination table, forearm pronated	Transverse –proximal to elbow joint between brachialis and brachioradialis muscles	Transverse and longitudinal Sweeping from proximal to distal	Radial head and neck
Wrist & Hand	Median nerve	See Hand/wrist section			
	Ulnar nerve	Patient seated facing examiner. Forearm supinated, wrist supinated and in neutral position	Transverse – over the carpal bones, between the pisiform and the ulnar artery	Transverse and longitudinal Sweeping from proximal to distal	Guyon´s canal Pisiform bone Ulnar artery
	Radial nerve- sensory branch.	Hand resting on the ulnar side and first finger up	Transverse – over the distal radius	Transverse and longitudinal Sweeping from proximal to distal	Anatomic snuff-box
Hip/posterior thigh	Sciatic nerve	Patient prone, hip and knee extended, feet hanging over the edge of the examination table	Transverse – distal to the gluteal fold	Transverse and longitudinal Sweeping from proximal to distal	Common tendon of biceps femoris and semitendinosus
Knee and ankle	Tibial nerve	Patient prone, hip and knee extended, feet hanging over the edge of the examination table	Transverse – over the upper popliteal fossa	Transverse and longitudinal Sweeping from proximal to distal	Popliteal artery/Tibialis posterior artery
	Common peroneal nerve	Patient in lateral decubitus position, the examined knee slightly flexed <u>Alternative position:</u>	Transverse –medial to the distal biceps femoris tendon, at the level of the femoral condyle	Transverse and longitudinal Sweeping from proximal to distal	Biceps femoris tendon and lateral



		Patient prone, the examined knee slightly flexed			femoral condyle/Fibular head
	Sural nerve (ankle)	Patient prone, hip in internal rotation	Transverse – over the distal fibula, between the lateral malleolus and the Achilles tendon	Transverse and longitudinal Sweeping from proximal to distal	Small (short) saphenous vein Lateral malleolus
	Tibial nerve (ankle)	See ankle/foot section			

### Online Supplementary Table 10. Salivary glands. US scanning procedures

Location	Structure	Patient (area) position	Probe placement-starting point	Scanning	Bony/other landmarks
	Parotid	Patient supine, head turned to the opposite side, neck hyperextended	Transverse – from the tragus to the mandibular angle Longitudinal- from mandibular ramus to the mastoid process	Transverse and longitudinal Sweeping from medial to lateral Sweeping from proximal to distal	Tragus and mandibular angle (proximal and distal landmarks) Mandibular ramus and mastoid process (anterior and posterior landmarks)
	Submandibular	Patient supine, head turned to the opposite side, neck hyperextended	Longitudinal – parallel to the inferior aspect of the midpoint of the mandibular body	Longitudinal and transverse. Longitudinal – sweeping distally and medially from the inferior aspect of the mandibular body Transverse – sweeping from the anterior-medial to the posterior-lateral border of the gland	Midpoint of mandibular body

### Online Supplementary Table 11 Vessels. US scanning procedures

Location	Structure	Patient (area) position	Probe placement-starting point	Scanning	Bony/other landmarks
Head & neck	Temporal artery /Superficial temporal artery: frontal, parietal branches	Patient supine, head rotated away from the side being examined	Transverse in front of the left ear	Longitudinal and transverse Sweeping from proximal to distal	Tragus of the ear
	Facial artery				Thyroid gland Mandible body
	Carotid artery (Common, internal and external)	Patient supine with the head slightly extended and rotated away from the side being examined	Transverse at the neck, lateral to the thyroid gland	Transverse and longitudinal Sweeping from proximal to distal Examination of carotid arteries starts by imaging the common carotid artery and the carotid bifurcation in transverse	Thyroid gland

				section, then identifying the arteries in longitudinal section	
Shoulder	Axillary artery	Arm 90° abduction and externally rotated.	Longitudinally in the axilla along the humeral head and neck, proximal to the anterior circumflex artery bifurcation	Longitudinal and transverse Sweeping from proximal to distal, extending the scan to the first 5 cm of the proximal brachial artery	Humeral neck
	Subclavian (distal and proximal subclavian artery)	Patient supine, head rotated away from the side being examined.	Transverse above the clavicle Right artery- tilting the probe to be almost posterior to the sternoclavicular joint Left artery-upper half of manubrium sterni	The artery is then followed by tilting the probe and shifting it from medial to lateral or vice versa. The distal part of the subclavian artery which then continues as the axillary artery is seen in longitudinal and transverse scans below (distal to) the lateral part of the clavicle	Clavicle
	Brachial artery (distal)	Elbow extended lying on the examination table, forearm supinated.	Transverse to the humeral shaft	Transverse and longitudinal Sweeping from proximal to distal	Anterior elbow
Hip	Femoral artery	Patient supine, hip and knee in neutral position.	Longitudinal over the inguinal ligament and iliopectineal ligament	Longitudinal and transverse Sweeping from proximal to distal	Inguinal ligament

### Online Supplementary Table 12. Shoulder abnormalities

Structure	Abnormality
Acromioclavicular joint	Synovitis/effusion Degeneration/osteophytes Ganglion/cyst
Glenohumeral joint, posterior recess	Synovitis/effusion Cortical bone abnormalities
Glenohumeral joint, axillary recess	Synovitis/effusion Cortical abnormalities
Biceps tendon (long head)	Tenosynovitis/effusion Tendinopathy/tendinosis Dislocation/subluxation/instability Tear Calcification
Subscapularis tendon	Tendinopathy/tendinosis Tear Calcification Enthesophytes

Supraspinatus tendon	Cortical bone abnormalities (eg, erosions, osteophytes) Tendinopathy/tendinosis Tear Calcification Enthesophytes Cortical bone abnormalities (eg, erosions, osteophytes) Impingement
Infraspinatus tendon	Tendinopathy/tendinosis Tear Calcification Enthesophytes Cortical abnormalities (eg, erosions, osteophytes)
Deltoid muscle and tendon	Haematoma Rupture
Subacromial-subdeltoid bursa	Bursitis Intrabursal abnormalities
Subcoracoid bursa	Bursitis

**Online Supplementary Table 13. Elbow abnormalities**

Structure	Abnormality
Anterior humeroradial and humeroulnar joints, coronoid and radial fossae, annular recess	Synovitis/effusion Hyaline cartilage abnormalities Bone erosions Osteophytes
Posterior joint recess	Synovitis/effusion Crystal deposition
Distal biceps tendon	Bicipito-radial (cubital) bursitis
Common extensor tendons of the forearm	Tendinopathy/tendinosis/tear Enthesopathy Calcification Enthesophytes
Common flexor tendons of the forearm	Tendinopathy/tendinosis/tear Enthesopathy Calcification Enthesophytes

Triceps tendon and muscle	Enthesopathy Tendinopathy/tendinosis Calcification Crystal deposition Enthesophytes
Ulnar nerve	Instability, compression

**Online Supplementary Table 14. Wrist abnormalities**

Structure	Abnormality
Radiocarpal, midcarpal, distal radio-ulnar, carpometacarpal joints	Synovitis/effusion Ganglia/cysts Bone erosions Osteophytes Crystal deposition
Triangular fibrocartilage complex	Crystal deposition (CPPD disease)
Extensor tendons of the wrist and hand	Tenosynovitis Tendinopathy/tendinosis Tear Ganglion/cyst Rheumatoid nodules
Flexor tendons of the wrist and hand	Tenosynovitis Tendinopathy/tendinosis Tear Ganglion/cyst
Median nerve	Carpal tunnel syndrome

CPPD, calcium pyrophosphate deposition

**Online Supplementary Table 15. Hand abnormalities**

Structure	Abnormality
MCP, PIP, DIP joints	Synovitis/effusion Synovial cyst Luxation/subluxation Bone erosions Osteophytes

MCP cartilage	Foreign bodies Crystal deposition Damage Crystal deposition
Annular pulleys	Trigger finger (thickening, cyst)
Finger extensor tendons	Paratenonitis Tear Enthesopathy
Finger flexor tendons	Tenosynovitis Tear Enthesopathy Tendinopathy/tendinosis Ganglion/cyst

MCP, metacarpophalangeal; PIP, proximal interphalangeal; DIP, distal interphalangeal

#### Online Supplementary Table 16. Hip abnormalities

Structure	Abnormality
Femoral head	Cortical bone abnormalities (eg, osteophytes, erosions)
Anterior recess	Synovitis/effusion Bone erosions Osteophytes Crystal deposition
Gluteus minimus and medius tendons	Enthesopathy, calcification, tear
Iliopsoas bursa	Bursitis
Trochanteric bursa	Bursitis

#### Online Supplementary Table 17. Knee abnormalities

Structure	Abnormality
Suprapatellar recess	Synovitis/effusion Crystal deposition
Medial and lateral (parapatellar) joint recesses	Synovitis/effusion Crystal deposition

Femoral cartilage	Degenerative changes
	Crystal deposition
Tibiofemoral lateral joint space	Osteophytes
	Bone erosions
	Peripheral meniscal abnormalities (cysts), crystal deposition
Tibiofemoral medial joint space	Osteophytes
	Bone erosions
	Peripheral meniscal abnormalities (cysts), crystal deposition
Quadriceps tendon and muscle	Tendinopathy/tendinosis
	Enthesopathy
	Calcification
	Tear
	Enthesophytes
	Myositis ossificans
Patellar tendon	Tendinopathy/tendinosis
	Enthesopathy
	Tear
	Crystal deposition
	Calcification
	Osgood-Schlatter/Sinding-Larsen-Johansson disease
Pes anserinus	Bursitis
Iliotibial band	Enthesopathy
Prepatellar bursa	Bursitis
Superficial infrapatellar bursa	Bursitis
Deep infrapatellar bursa	Bursitis
Semimembranosus-gastrocnemius bursa	Baker's cyst

#### Online Supplementary Table 18. Ankle abnormalities

Structure	Abnormality
Tibiotalar joint, anterior and lateral recesses	Synovitis/effusion
	Bone erosions
	Osteophytes
	Crystal deposition
	Crystal deposition

Tibiotalar joint, posterior recess	Synovitis/effusion
Tibiotalar joint cartilage	Crystal deposition
Subtalar joint	Synovitis/effusion
Tibialis anterior tendon	Tenosynovitis
	Tendinopathy/tendinosis
	Tear
Extensor hallucis longus tendon	Tenosynovitis
	Tendinopathy/tendinosis
Extensor digitorum longus tendon	Tenosynovitis
	Tendinopathy/tendinosis
Peroneal tendons (peroneus brevis, peroneus longus)	Tenosynovitis
	Tendinopathy/tendinosis
	Tear
Medial (flexor) tendons (tibialis posterior, flexor digitorum longus, flexor hallucis longus)	Tenosynovitis
	Tendinopathy/tendinosis
	Tear
Achilles tendon	Tendinopathy/tendinosis
	Enthesopathy
	Paratenonitis
	Tear
	Spurs/enthesophytes
	Calcification
	Nodules (tophi, rheumatoid nodules, xanthomas)
Plantar fascia	Plantar fasciitis (i.e. enthesopathy)
	Calcification
	Tear
	Spurs/enthesophytes
Retrocalcaneal bursa	Bursitis
Retroachillean bursa	Bursitis

#### Online Supplementary Table 19. Foot abnormalities

Structure	Abnormality
Midtalar joints	Synovitis/effusion
	Osteophytes
MTP joint cartilage	Crystal deposition

MTP joints	Synovitis/effusion
	Bone erosions
	Osteophytes
	Gout tophi
IP joints	Synovitis/effusion
Flexor tendons	Tenosynovitis
Intermetatarsal spaces	Bursitis
	Neuroma
MTP, metatarsophalangeal	

**Online Supplementary Table 20. Peripheral nerve abnormalities**

Structure	Abnormality
Median nerve (wrist)	Carpal tunnel syndrome, compression
Ulnar nerve (elbow)	Instability, compression

**Online Supplementary Table 21. Vessel abnormalities**

Structure	Abnormality
Temporal, facial, axillary, carotid, subclavian arteries	Giant cell arteritis/vasculitis
Carotid, femoral arteries	Atherosclerosis



**Online Supplementary Figure 1. Study flow-chart for the article selection**

