UPPER LIMB

COURSE CONTENT

COMPETENCIES

The first year medical student should be able to understand and describe the gross anatomy of the various regions, bones, joints, muscles, vessels and nerves of upper limb, demonstrate the actions of the muscle groups at various joints, correlate the anatomical basis of clinical manifestations of nerve injuries and fractures of upper limb and demonstrate the radiological anatomy of upper limb.

REGIONS

Mammary gland; Axilla; Cubital fossa; Fascial spaces of the hand

Definition, location, boundaries, contents (major), venepuncture

Level 2: Details with relations and functional importance of individual structures
Fascial spaces – forearm space, radial bursa, ulnar bursa, palmar spaces
Dupuytren's contracture
Hand as a functional unit - grips
Nerve injury, carpal tunnel syndrome
Level 3: Applied aspects:
Axilla – Collaterals, lymph nodes (breast), axillary sheath (cervico-axillary canal), abscess drainage
Palm – Comparative anatomy (thumb, palmaris brevis), position of rest and of function, collaterals
Fascial spaces – Surgical significance

OSTEOLOGY

Identification, region, anatomical position, parts, joints formed, development; (For carpals, identification of individual carpals in an articulated hand)

Level 2: Description, attachments, relations; clavipectoral fascia; boundaries of anatomical snuff-box; salient features about carpals
Level 3: Applied aspects:
Clavicle – Line of force transmission, commonest site of fracture
Scapula – Fracture scapula
Humerus – Supracondylar spur, angle of humeral torsion, morphological neck, fractures - proximal end (neck), shaft, distal end (supracondylar)
Radius – Colles' fracture, Smith's fracture
Carpals, Metacarpals, Phalanges – Carpal tunnel syndrome, fracture scaphoid, Bennett's fracture, mallet finger, trigger finger

ARTHROLOGY

Shoulder girdle; Shoulder joint; Elbow; Radioulnar joints; Wrist; First carpometacarpal joint
Bones taking part, classification of joints, movement with muscles causing movements

Level 2: Midcarpal joint, metacarpophalangeal,interphalangeal joints;
Details of structure with functional correlation e.g. axis of movements; Retinacula; Bursae – subacromial bursitis; Dislocation (anterior, posterior, inferior); Fall on the outstretched hand
Level 3: Applied aspects:
Surgical approaches – shoulder joint; Elbow joint – subluxation of head of radius, tennis elbow, cubitus valgus, pulled elbow, carrying angle; Wrist joint; Radioulnar joints – changing axis during rotation

MYOLOGY

Attachments, nerve supply, actions of:

Pectoralis major, serratus anterior, trapezius, latissimus dorsi, deltoid, subscapularis, biceps brachii, brachialis, triceps brachii, pronator teres, pronator quadratus, flexor pollicis longus, flexor carpi radialis, flexor carpi ulnaris, flexor digitorum superficialis, flexor digitorum profundus, brachioradialis, extensor carpi radialis longus, extensor carpi radialis brevis, extensor carpi ulnaris, extensor digitorum, flexor pollicis longus, flexor pollicis brevis, abductor pollicis brevis, opponens pollicis, adductor pollicis

Level 2: Other muscles; Relations and functional correlation; Quadrangular and triangular spaces; Bicipital aponeurosis; Triangle of auscultation; Intramuscular injections

Level 3: Applied aspects – Volkmann's ischaemic contracture

ANGIOLOGY

Axillary, brachial, radial, ulnar arteries; Veins; Lymphatics

Commencement, course, branches, termination, main area of distribution and drainage; Anastomosis - scapula, elbow, palmar arterial arch

Level 2: Relations and functional correlation, presence and absence of collaterals in certain areas, venous drainage and lymphatics of upper limb

Level 3: Applied aspects:
Artery – Damage to vessels, Allen's test (to determine, patency of radial and ulnar artery), Raynaud's disease; Veins – Thrombosis; Lymphatics – Lymphangitis (red streaks), lymphadenitis; Development of arterial system, veins and lymphatics

NEUROLOGY

Nerves – Root value, origin, course, distribution of important nerves e.g. axillary, median, ulnar, musculocutaneous, radial

Brachial Plexus – Location, formation, distribution

Level 2: Root value of other nerves; Details of other nerves; Dermatomes; Ape hand, claw hand, wrist drop; Details of individual deformities

Level 3: Applied aspects:
Nerve injury at various sites - radial, median, ulnar, axillary with motor and sensory loss; Winging of scapula, Erb's palsy, Klumpke's palsy, Crutch palsy, ulnar paradox; Tendon reflex - biceps, triceps, brachioradialis; Limb bud, pre- and post-axial borders

ANATOMY PRACTICALS

SURFACE LIVING ANATOMY

BONY LANDMARKS (PALPATION OF):

Clavicle, spine of scapula, inferior angle, coracoid process, epicondyles of humerus, olecranon process of ulna, head and styloid processes of radius and ulna, heads of metacarpals (knuckles), pisiform, hook of hamate

JOINTS (DEMONSTRATION OF MOVEMENTS):

Shoulder girdle, shoulder joint, elbow joint, radio-ulnar joints, wrist joint, 1st carpo-metacarpal joint, MP and IP joints

MUSCLES (DEMONSTRATION OF ACTION)

Principle of testing — Trapezius, serratus anterior, latissimus dorsi, pectoralis major, deltoid, biceps brachii, brachioradialis, brachialis, extensors at the elbow, supinators, wrist extensors, wrist flexors, small muscles of the hand

NERVES: Superficial location of median nerve at the wrist, ulnar nerve behind medial epicondyle of humerus and radial nerve over anatomical snuff box; Dermatomes

Level 2: Ulnar nerve thickening in Leprosy

VESSELS (PALPATION OF): Axillary artery, brachial artery, radial artery

OTHERS: Axillary groups of lymph nodes; Anatomical snuff-box (boundaries), flexor retinaculum

RADIOLOGICAL ANATOMY: LIST OF SKIAGRAMS

Region	View	Identify
Shoulder region	AP	Clavicle, scapula, coracoid process, humerus — greater, lesser tuberosities
Arm Elbow region	AP/Lateral AP/Lateral	Trochlea, capitulum, head of radius, olecranon
Forearm Wrist and hand	AP/Lateral AP/Oblique	Styloid processes of radius, ulna, head of ulna, carpal bones

SECTIONAL ANATOMY

Cross-section at mid-arm level, mid-forearm level, through carpal tunnel

CLINICAL, SURGICAL AND FUNCTIONAL ANATOMY
(Anatomical basis only)

NERVES

Brachial plexus – Formation; Injury to upper trunk - Erb's paralysis; Axillary nerve damage - IM injection in deltoid; Radial nerve – Wrist drop, IM injection in triceps, anatomical explanation of deformity; Median nerve – Carpal tunnel syndrome, ape hand, motor, sensory loss; Ulnar nerve – Claw hand, motor, sensory loss
Level 2: Klumpke's paralysis; Other causes of axillary nerve damage; Fracture surgical neck humerus; Sites of damage to the radial nerve; Anatomical explanation of the deformites referred to above
Level 3: Brachial plexus block; Difference in the high / low injury – ulnar paradox

VESSELS

Artery - Axillary, brachial, radial; Palpable artery - radial pulse
Veins – Cephalic, median cubital, basilic vein; Lymphatics
Level 2: Anastomosis between axillary and subclavian arteries; Injury during IV injection into median cubital vein; Common sites of vene puncture; Lymphatics in relation to cancer of the breast
Level 3: Involvement in supracondylar fracture of humerus; Venesection

BONES

Common sites of fractures of upper limb bones
Level 2: Colles' fracture, clavicle fracture
Level 3: Surgical neck and supracondylar fracture of humerus

JOINTS

Shoulder – Anterior dislocation
Level 2: Frozen shoulder
Elbow – Posterior dislocation
Superior radioulnar joint
Level 2: Subluxation
Wrist – Involvement following Colles' fracture

MUSCLES

Trapezius – XI nerve injury, deformity; Rotator cuff muscles; Serratus anterior - Winging of scapula; Latissimus dorsi – Climbing; Abductors of the shoulder – Muscles in different ranges of abduction; Pronators / Supinators
Level 2: Frozen shoulder, Trapezitis

FASCIA

Dupuytren's contracture

HAND

Palmar spaces; Hand grips