



Al-Mustaqbal University
Collage of Engineering
Prosthetics and Orthotics Engineering
Third Stage

ORTHOTICS II

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Upper limb disorders

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Introduction

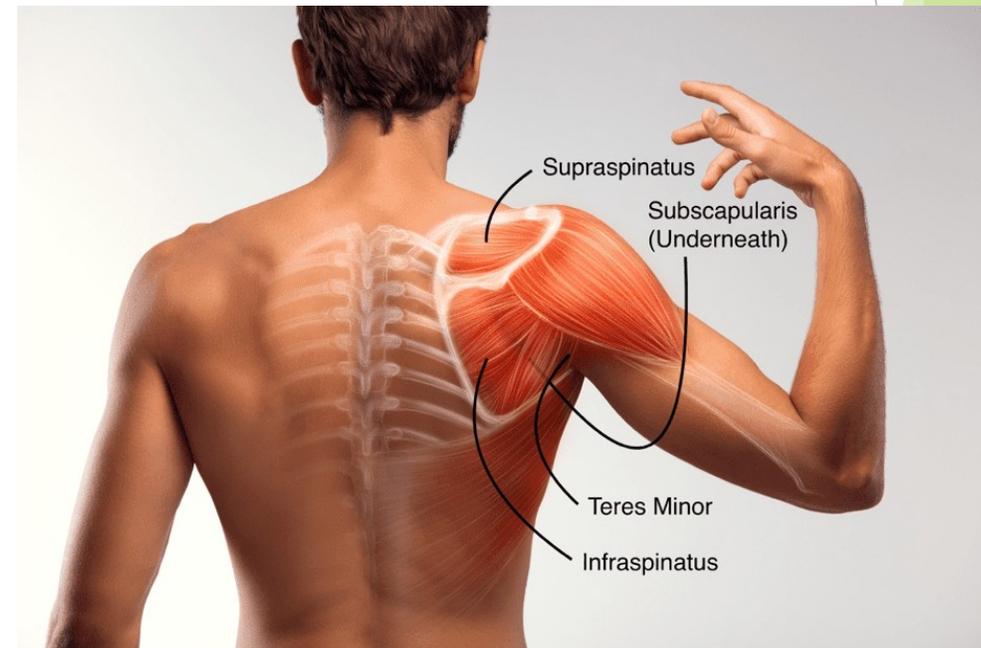
- Upper limb disorders (ULDs) are aches, pains, tension and disorders involving any part of the arm from fingers to shoulder, or the neck.
- Disorders of the upper limb include problems with the soft tissues, muscles, tendons and ligaments, along with the circulatory and nerve supply to the limb may cause significant morbidity and incur substantial costs. These conditions.
- Stiffness or pain from joints and inability to straighten or bend those joints. Aches and pains, tenderness, stiffness, weakness, tingling, numbness, cramp and swelling to muscles of the arms or the neck.

Classification

- ▶ The classification of ULDs is depend on the region, it can be in:
 1. Shoulder
 2. Elbow
 3. Wrist and hand

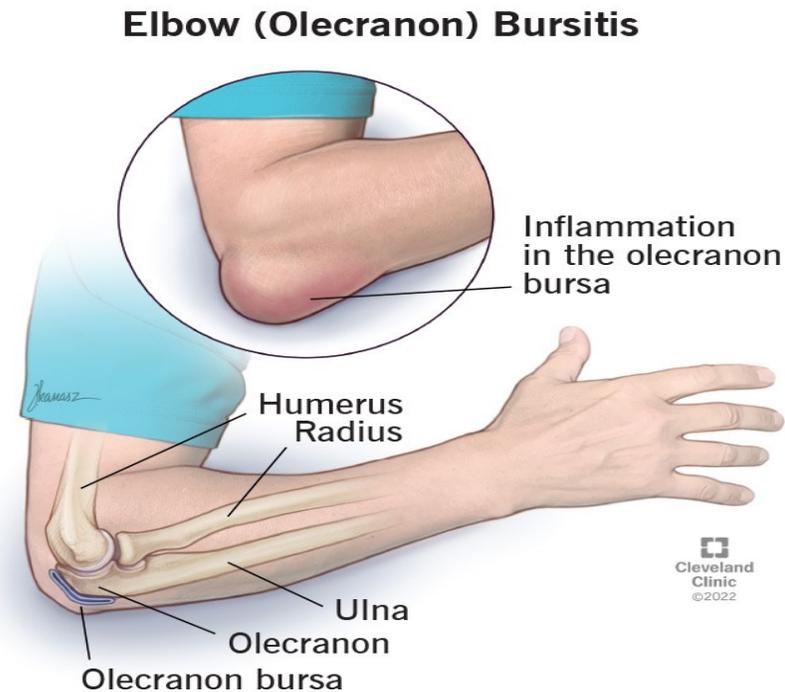
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- ▶ Shoulder disorders include rotator cuff, capsulitis (frozen shoulder), bicipital tendinitis and acromioclavicular joint dysfunction.
- ▶ The rotator cuff consists of a series of muscles which hold the humeral head in its articulation with the glenoid fossa of the scapula. Rotator cuff tendinitis typically results from eccentric overload of the shoulder while tears of the rotator cuff usually follow trauma.



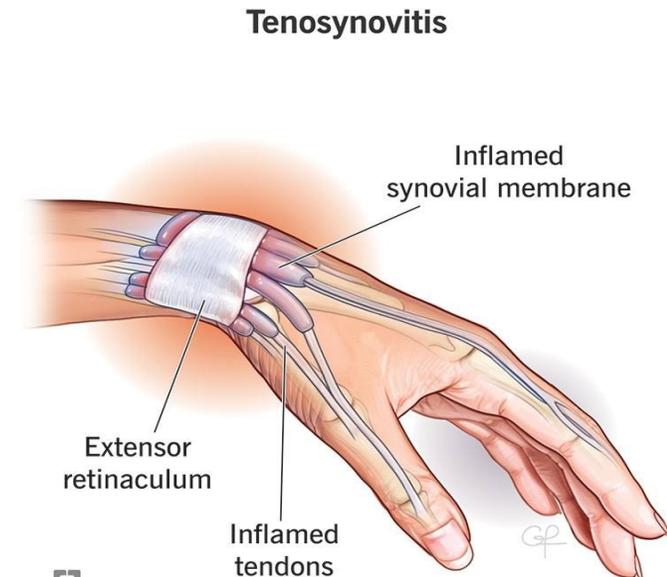
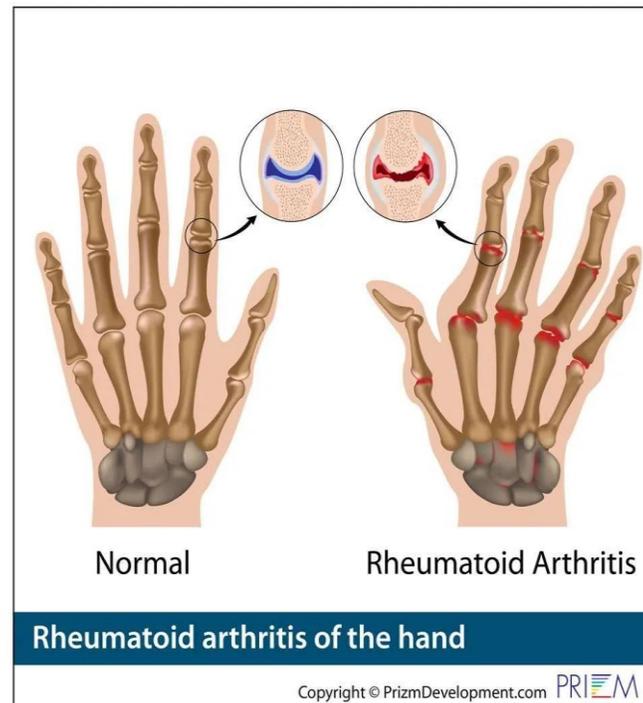
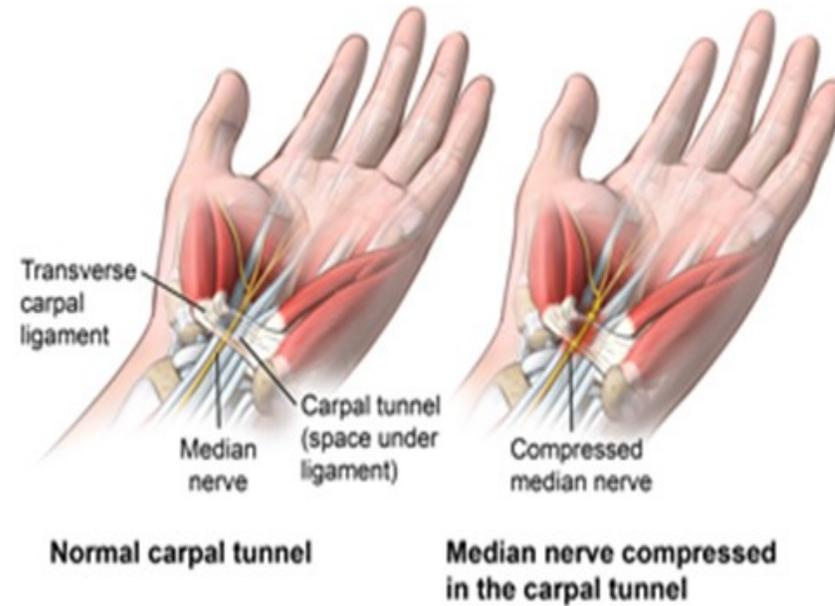
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- ▶ Elbow disorders include epicondylitis and olecranon bursitis.
- ▶ The most frequent disorders of the elbow to occur in relation to occupational activities. These insertional sites may become inflamed by trauma or repetitive use.



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- ▶ The major disorders affecting the wrist and hand are carpal tunnel syndrome, tenosynovitis, and arthritis of the hand joints.
- ▶ Carpal tunnel syndrome is by far the most commonly studied work-related upper limb disorder. An increased risk of carpal tunnel syndrome has been observed among workers who are exposed to vibration from tools, and in jobs in which repetitive and requires the use of high forces and flexion and extension of the wrist is essential.



Clinical Evaluation

- ▶ The most important symptom of musculoskeletal disease is pain. In eliciting a history of pain, particular attention must be given to the localization of the pain and whether its distribution is suggestive of an articular or peri-articular disorder.
- ▶ Other symptoms are:
 1. Swelling
 2. Stiffness
 3. Loss of function
 4. Relationship to trauma

Physical Examination

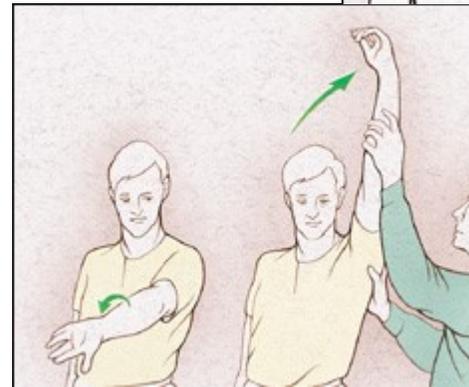
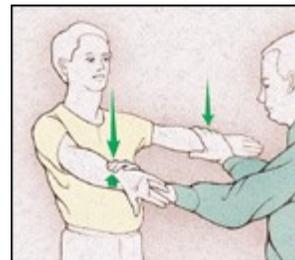
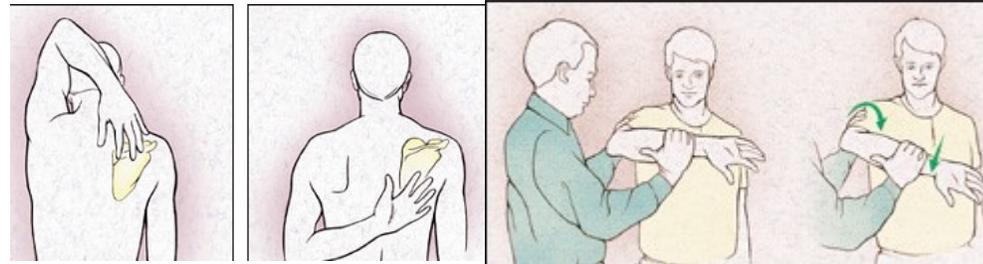
- ▶ The clinical examinations of the ULDs must follow the sequence of inspection, palpation, movements and stress test.
- ▶ When inspecting the upper extremities, it is essential to compare the affected extremity with the contralateral extremity because the latter can be used as a normal reference if the injury is unilateral
- ▶ Palpation is a powerful maneuver for identifying masses, abnormal skin temperature, areas of tenderness. When performing palpation, special attention should be paid to differences in hardness or mobility relative to that of the surrounding tissue.

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- ▶ at the shoulder, the region should be inspected for erythema, bruising and swelling. Comparison with the contralateral side should reveal any apparent asymmetry.
- ▶ Palpation is principally aimed at assessing tenderness in the region of the shoulder, the glenohumeral joint margin and the acromio-clavicular joint.
- ▶ The full range of active and passive movements should be assessed. Difference in the pattern of movement restriction provides the major clinical distinction between rotator cuff disease and capsulitis or glenohumeral arthritis.
- ▶ In rotator cuff disease, there is typically inability to maintain abduction through a painful arc between 30° and 120° . Resisted abduction, and external rotation, are also painful and restricted.
- ▶ Adhesive capsulitis, in contrast, is associated with painful restriction of both active and passive movements in all directions.

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- ▶ Finally, the examination of the shoulder should be completed with stress tests for the acromioclavicular joint (passive movement of the hand on the affected side towards the contralateral shoulder) and of the bicep's tendon (resisted flexion and supination).



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- ▶ At the elbow, inspection is primarily aimed at distinguishing swelling arising from olecranon bursitis.
- ▶ Palpation should be directed towards localized tenderness in the region of the epicondyles.
- ▶ Although the range of movement should include assessment of flexion and extension, the most helpful manor to distinguish medial and lateral epicondylitis are resisted flexion and extension of the wrist respectively, with the elbow held at right angles.

Cont.

- ▶ In evaluation of the wrist and hand, the thenar eminence should be inspected and any swelling over the tendon sheaths should be noted.
- ▶ The tendons should be palpated for localized superficial tenderness. The major functional movements of the hand to be assessed include pinch, grip and position,
- ▶ while wrist flexion and extension may be muted by tenosynovitis. Specific tests which might be helpful in delineating the most frequent hand and wrist disorders include full sensory and motor neurological examination of the hand for deficit in a median nerve distribution, resisted flexion and extension of the fingers (for tenosynovitis) and Finkelstein's maneuver (pain on flexion and ulnar deviation of the wrist in the region of the extensor pollicis longus tendon sheath).