Chapter 9 – Elbow Pain
Elbow pain, as a soft tissue injury, is common and frequently disabling.

Because of the complexity of the joint, it is a potentially severe disability that is often refractory to what seems appropriate care.

The elbow joint consists of three articulations: the humeroulnar, the capitular radial (radiohumeral), and the radioulnar (fig. 9-1).

The humeroulnar joint permits flexion extension; the other two allow pronation and supination.

Two major collateral ligaments stabilize the elbow—an anterior band and a posterior band.

The brachialis, the long and short heads of the biceps, and the triceps muscles act on the elbow.

Many forearm muscles originate at the elbow—the flexor group from the medial epicondyle and the extensor group from the lateral epicondyle (fig. 9-2).

TRAUMA
Trauma to the elbow may result in major impairment and disability, because it hinders functional use of the hand and fingers and causes pain as well.

Sprains, which are examples of dislocation (subluxation), injure the ligaments and the joint capsules.

They become clinically evident from a meaningful history and physical examination.

Results of radiologic examination can eliminate the possibility of bony injury.

The sequela of untreated or improperly treated elbow fractures are ominous.

NERVE DAMAGE
Ulnar Nerve
The ulnar nerve’s being superficial in the olecranon fossa makes it subject to direct trauma.

The groove is behind the medial condyle.

The enclosed nerve is covered by a fibrous sheath termed the arcuate ligament, which forms the cubital tunnel (fig. 9-3).

Because the sensory fibers of ulnar nerves are more superficial than those of the motor fibers, sensory symptoms are more prevalent!

Initial symptoms of ulnar nerve pressure or trauma include paresthesia (numbness and tingling) of the ulnar nerve dermatomes of the hand, specifically the ulnar half of the fourth finger and the entire fifth finger (fig. 9-4).
The differential diagnosis with findings of paresthesia and paresis of the ring finger and little finger includes the possibility of cervical discogenic disease, thoracic outlet compression, or pressure of the ulnar nerve at the wrist.

Treatment is conservatively managed by avoiding direct pressure to the cubital canal by wearing a sponge pad over the elbow and also by avoiding excessive elbow flexion.

Surgical transplantation is usually avoided because it has been determined that conservative management is just as effective.

**Radial Nerve**

The radial nerve is subject to entrapment within its passage at the elbow (fig. 9-5).

As it passes the lateral condyle of the humerus, it travels below the origin of the short radial extensor muscle by means of a fibrous band that stretches from the epicondyle to the deep fascia of the volar surface of the forearm.

The radial nerve divides at this point into a deep branch and a superficial branch.

The superficial branch allows sensation to be perceived at the lateral aspect of the forearm.

The deep branch ultimately becomes the posterior interosseous nerve that supplies the motor functions of wrist (fig. 9-6) and finger dorsiflexion (fig. 9-7).

Forceful repeated contraction of these muscles tightens the fibrous band and compresses the nerve.

Pain is perceived over the lateral epicondyle, and so the syndrome somewhat resembles tennis elbow!

Treatment begins with avoidance of muscular activities that aggravate the symptoms.

This includes action involving forceful repeated wrist and finger extension with wrist supination.

Wearing a splint to restrain the wrist in neutral position is valuable.

Local injection of an analgesic agent and soluble steroid can also be useful.

Persistent symptoms may require surgical intervention to release the fibrous band.

**Baseball Elbow**

As can be seen in conditions involving pitching trauma (figs. 8-15 and 8-16), tennis trauma (fig. 8-17), and bowling trauma (fig. 8-18), the elbow undergoes repeated and excessive extension-flexion with simultaneous rapid pronation-supination.

The end point of these athletic activity motions usually causes collateral ligamentous and capsular stress as well as repeated forceful contraction of the biceps, triceps, and brachialis along with forceful contraction of the forearm muscles that attach to the condyles.
Treatment is initial rest and local analgesic applications of ice followed by heat.

Review of the patient’s athletic activities may reveal faulty neuromusculoskeletal activity patterns that can be corrected or modified.

**Epicondylalgia**
The condition more commonly termed tennis elbow is a frequent sports-related activity, but currently it is also seen in workplace-related pain and disability. Regardless of the actual pathology, numerous mechanisms cause the syndrome.

Repetitive trauma or acute trauma, either occupational or professional, are frequent causes of this syndrome.

An epicondylalgia of cervical origin has also been postulated, although this is contrary to local traumatic mechanisms.

This concept alleges that a lesion of C5-C6 with irritation of the C6 nerve root involves the anterior face of the epicondyle.

**Diagnosis**
The condition rarely appears before age 20 or after age 60, and is most common in patients between 35 and 50 years old.

It occurs equally in men and women but is more prevalent in the dominant arm.

Local tenderness is present at the anterolateral face of the epicondyle.

This is also the site of the radial head, the orbicular ligament, and the radial nerve or its branches.

Aggravation, if not initiation, of pain on wrist and finger extension and forearm supination.

Weakness of prehension resulting from pain may be present.

The test for radial nerve function measures the strength of the wrist extensors (fig. 9-6), supinator (fig. 9-11), the abductor pollicis longus, and the extensor pollicis longus (fig. 9-12).

The procedure rarely wakes the patient, which is not the case with rotator cuff injuries.

If the causative factor is cervical radiculitis, neck position during the night may aggravate the condition.

In the presence of cervical radiculitis, neck positions may initiate pain and local tenderness over the cervical foramen of C5-C6 may be palpated.

Treatment involving complete local rest of the elbow is effective during the immediate acute phase, but not when the pain persists or becomes chronic.

Local ice is initially effective, as are oral nonsteroidal anti-inflammatory medications.

A splint to limit wrist motions is also partially effective.
Local injection into the lateral epicondylar region of maximum tenderness suggests local pathology, although referred cervical pain may also be ameliorated by a local injection into the referred site.

Manipulation to complete the tear of the extensor musculature from its attachment site has been proposed (fig. 9-13).

A recent neuromusculoskeletal theory has posited that the mechanism of carpal tunnel syndrome" is similar to that seen with tennis elbow. The musculoskeletal function of the elbow that involves central coordination (agonist-antagonists) of the wrist flexors and extensors originating at the elbow are the result of breakdown within the peripheral inhibitory mechanism.

Instead of relaxation of the antagonists during contraction of the agonists, there is also cocontraction with both agonist-antagonist contracting simultaneously, thus causing a breakdown at the musculoskeletal attachments. The resultant pathology, such as tearing at the muscle tendon periosteum site or increased tautness of the fibrous band entrapping the radial nerve, is the result of this cocontraction.

The cause of central breakdown may be assumed to be fatigue as well as faulty neuromuscular activity. The cervical radicular component also implies that the postures and tensions of many activities leading to epicondylitis play a role in this situation.