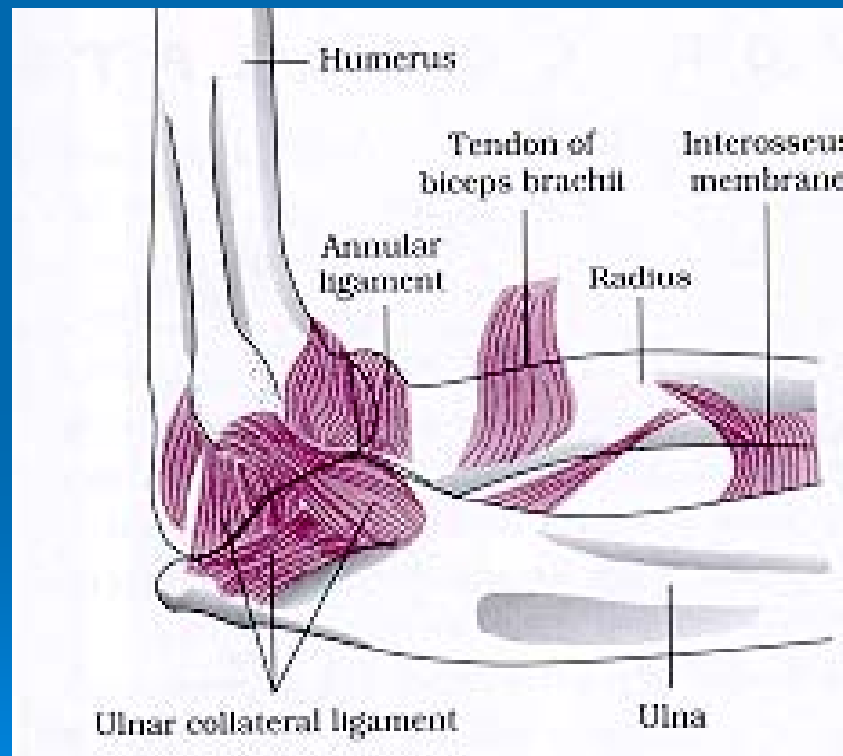


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## **Injuries to the Arm, Wrist, and Hand**

# Anatomy Review

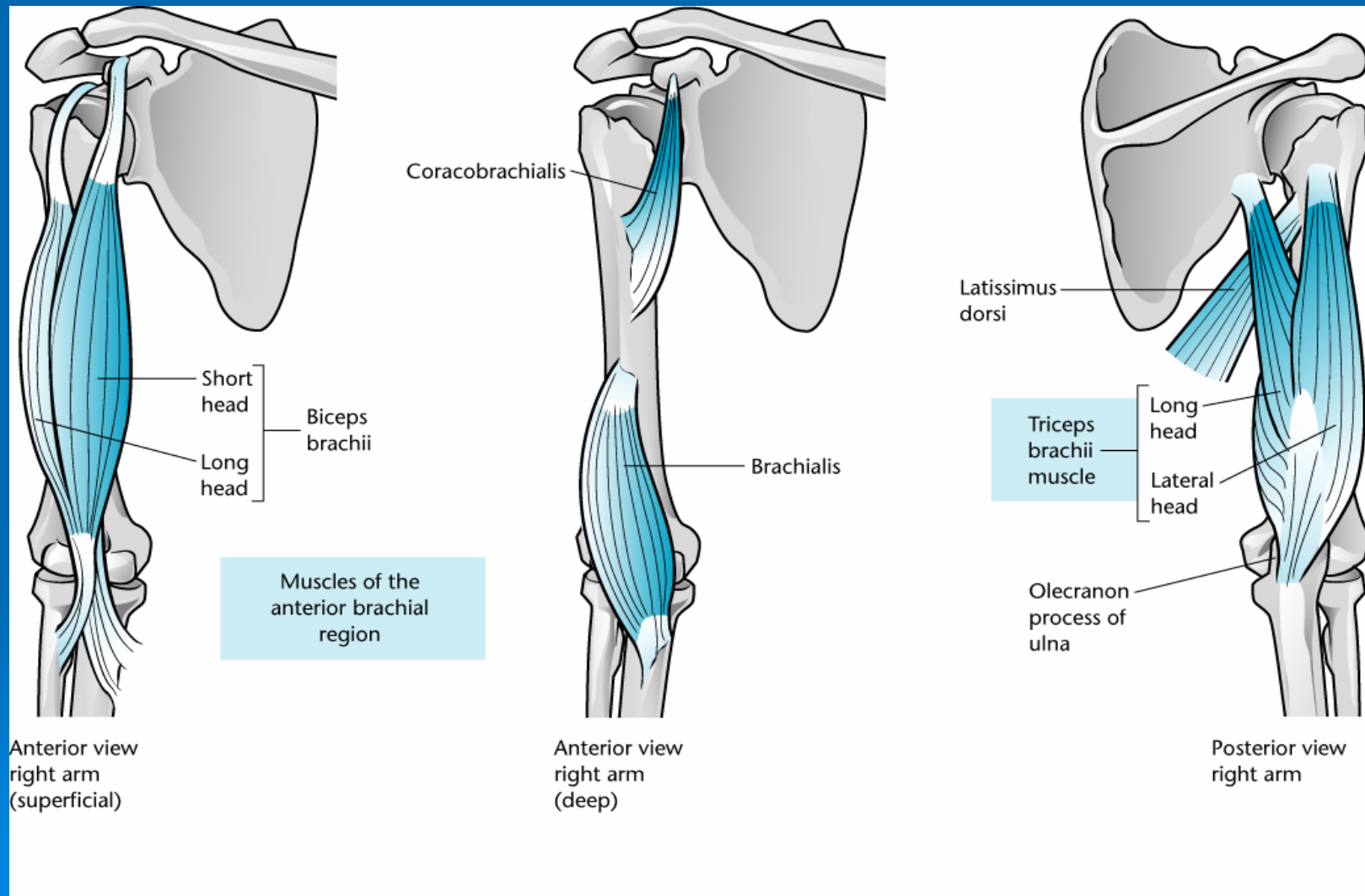


- The bones of the arm are the \_\_\_\_\_.
- The elbow is comprised of three articulations, the \_\_\_\_\_, humeroradial, and proximal radioulnar joints.
- Distal end of the forearm articulates with carpal bones to form the \_\_\_\_\_ and distal radioulnar joints.

# Anatomy Review (continued)

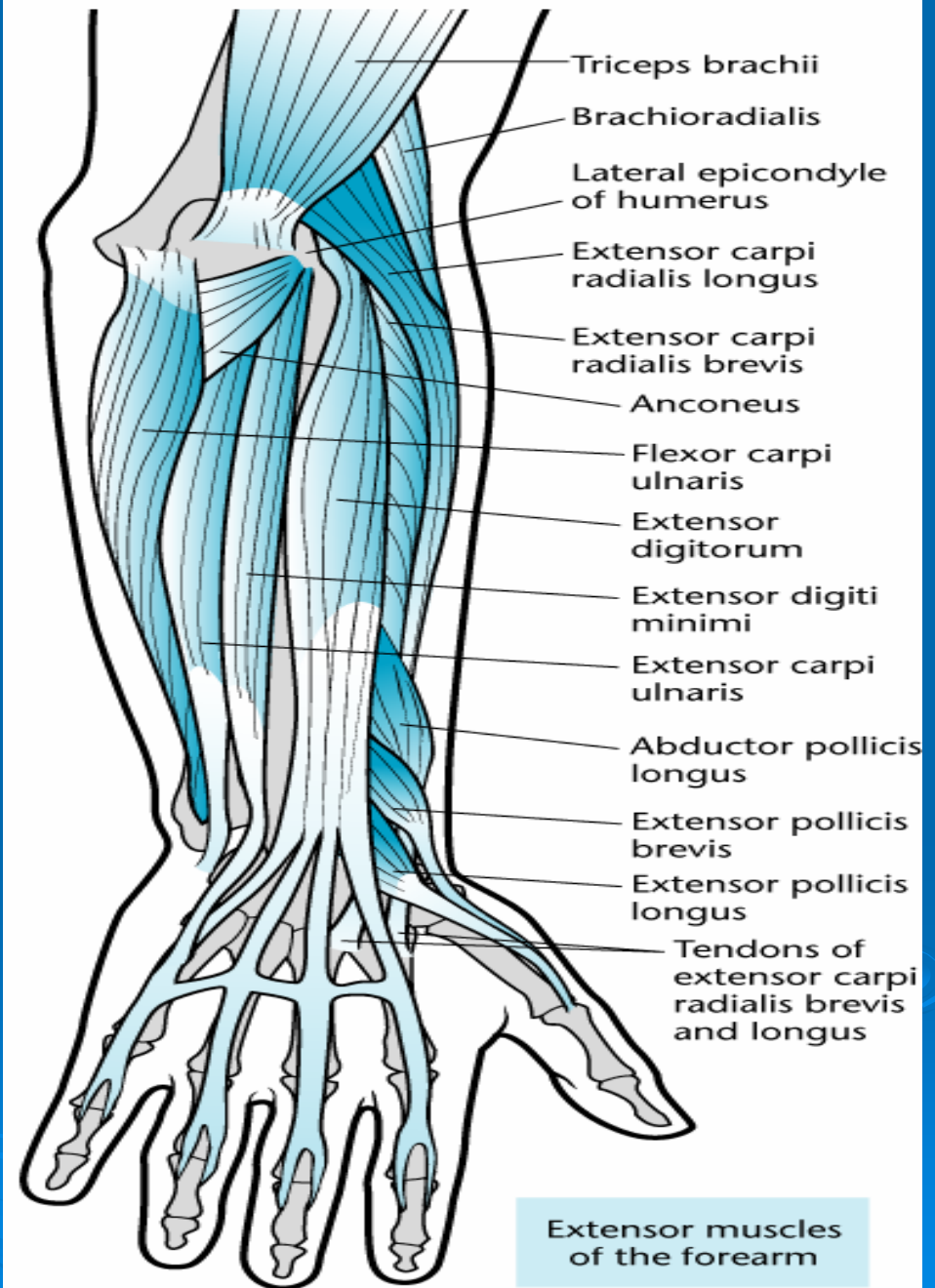
- Joints of the arm allow flexion/extension and \_\_\_\_\_ at the elbow.
- Joints of the wrist allow \_\_\_\_\_ and radial & ulnar deviation.

# Anatomy Review (continued)

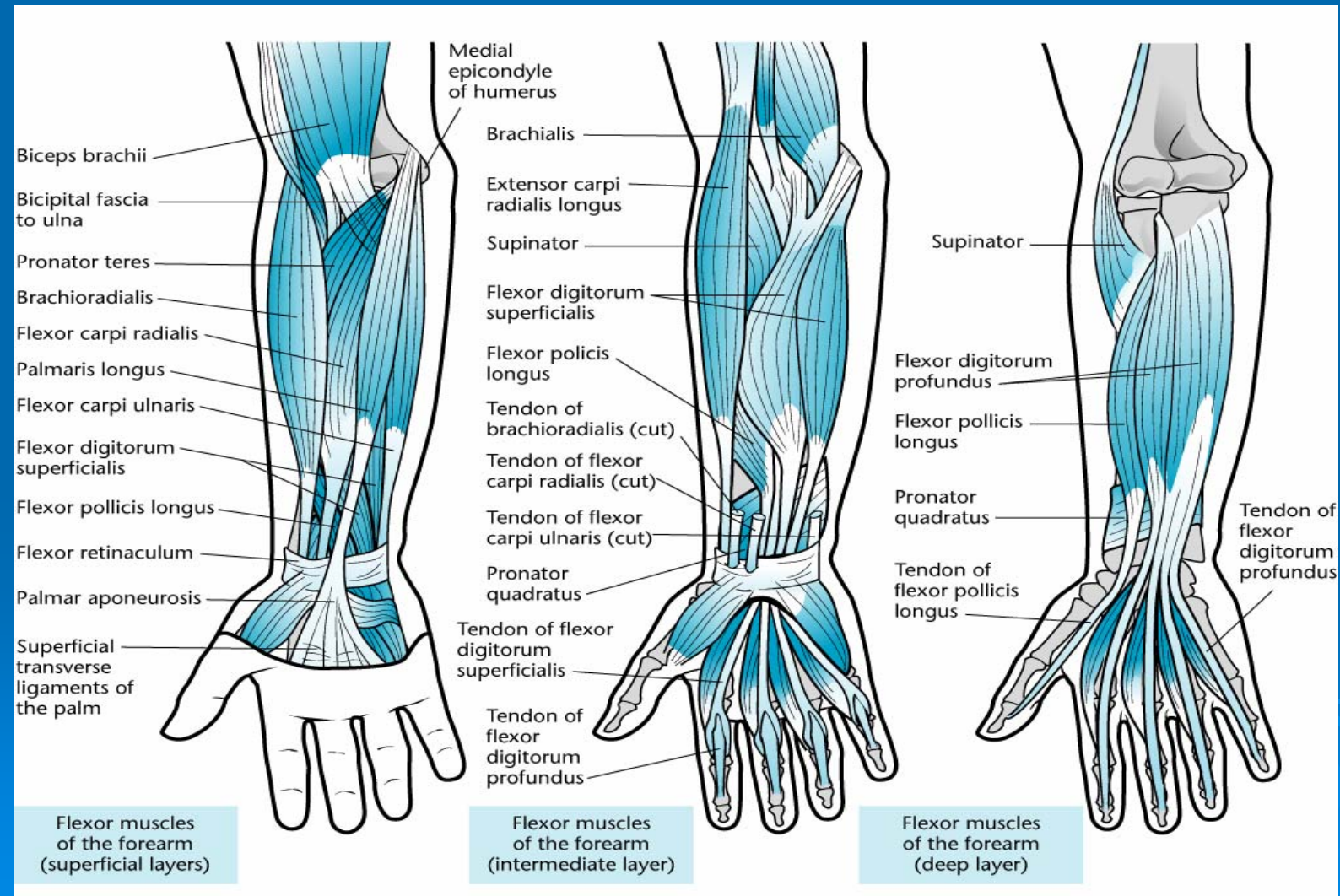


# Anatomy

(continued)



# Anatomy Review (continued)



# Soft Tissue Injuries to the Upper Arm

## Contusions and Fractures

- Such injuries are common in contact sports.
- \_\_\_\_\_  
\_\_\_\_\_.
- Significance of damage is  
\_\_\_\_\_  
\_\_\_\_\_.
- Repeated episodes can result in **traumatica.**



# Soft Injuries to the Upper Arm (continued)

## ➤ Myositis Ossificans Traumatica

- Chronic inflammation of the muscle that results in the development of bone-like tissue within the muscle.
- May cause \_\_\_\_\_, a “benign growth projecting from a bone surface capped by cartilage.”

## ➤ Myositis ossificans traumatica develops over weeks or months and is often ignored during the early stages.



# Myositis Ossificans Traumatica (continued)

Signs and symptoms include:

- \_\_\_\_\_.
- Pain, discoloration, and swelling.
- \_\_\_\_\_.
- Loss of sensation distally.

## First Aid

- Apply ice and compression.
- Place arm in a sling.
- If symptoms persist for 72 hours, refer to a physician.

# Fractures of the Upper Arm

Although rare, such fractures may be associated with activities that involve collisions between participants or high speed falls.

Signs and symptoms include:

- Severe pain in upper arm.
- Deformity & loss of function and unwillingness to use arm.
- Muscle spasm.
- Athlete reports an audible snap or pop at the time of injury.
- Sensory loss in forearm, if radial nerve is affected.

# Fractures of the Upper Arm (continued)

First aid includes:

- Immediate application of ice and compression.
- \_\_\_\_\_.
- \_\_\_\_\_.
- Sling-and-swathe bandage.
- Treatment for shock and transport immediately to medical facility.

# Elbow Injuries

## Sprains and Dislocations

- The three joints that comprise the elbow are bound together by several ligaments.
- \_\_\_\_\_ protect elbow from valgus and varus forces.
- Injury mechanism includes falling \_\_\_\_\_.
- Sprains also result from both valgus and varus forces that occur as \_\_\_\_\_.
- Elbow dislocations constitute extreme sprains.

# Elbow Dislocations (continued)

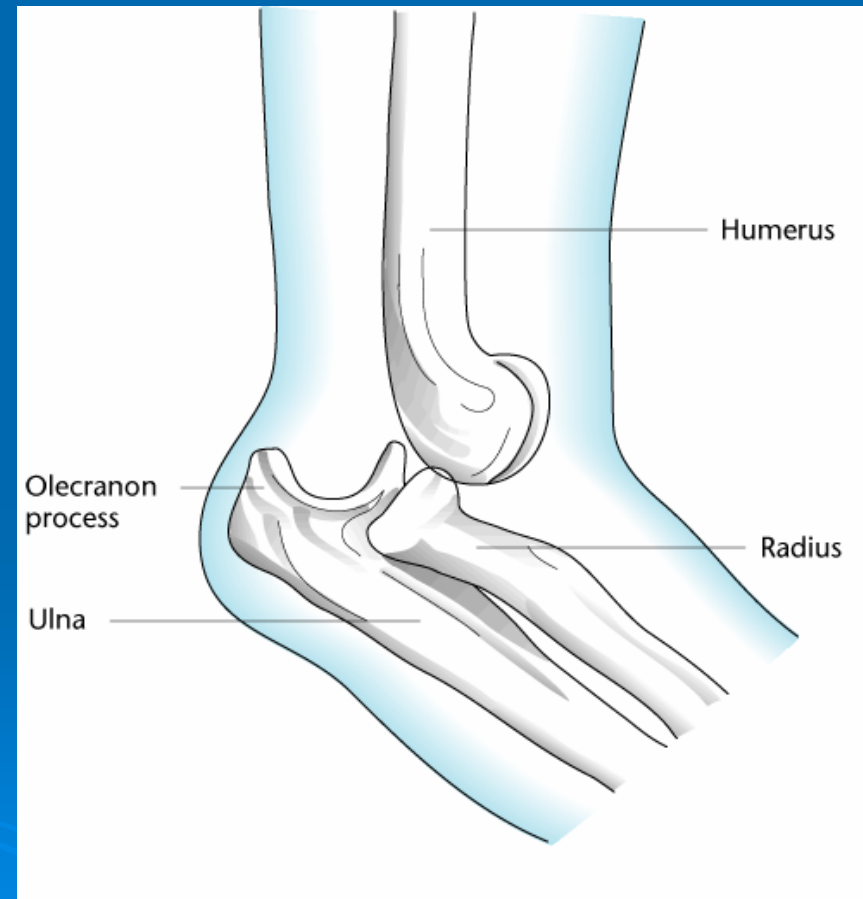
Mechanism for this injury includes falling either on

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_.

The deformity is usually obvious.





# Elbow Dislocation (continued)

Signs and symptoms include:

- Mild swelling & localized pain in minor sprains.
- Difficulty in gripping or making a fist.
- \_\_\_\_\_.
- Loss of function & severe pain.
- \_\_\_\_\_.



# Elbow Dislocation (continued)

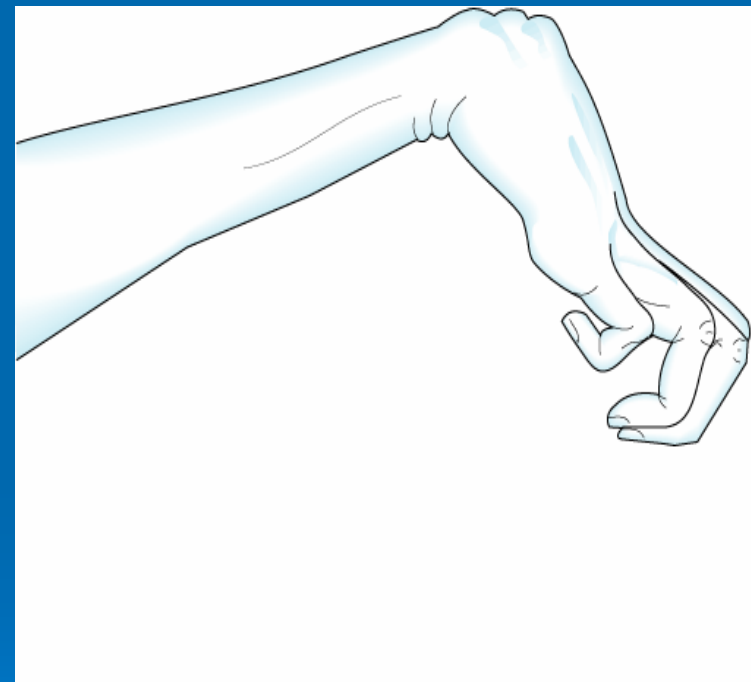
First aid includes:

- Application of ice & compression.
- Application of splint & sling-and-swathe bandage.
- \_\_\_\_\_.
- \_\_\_\_\_.
- Summon EMS.



# Elbow Fractures

- Elbow fractures generally involve the \_\_\_\_\_ or the proximal ulna or radius.
- If radial artery is compressed, there is risk of \_\_\_\_\_.
- Injury mechanism is similar to sprains and dislocations.





# Elbow Fractures (continued)

Signs and symptoms include:

- Recent history of elbow trauma.
- \_\_\_\_\_.
- Immediate swelling.
- \_\_\_\_\_.

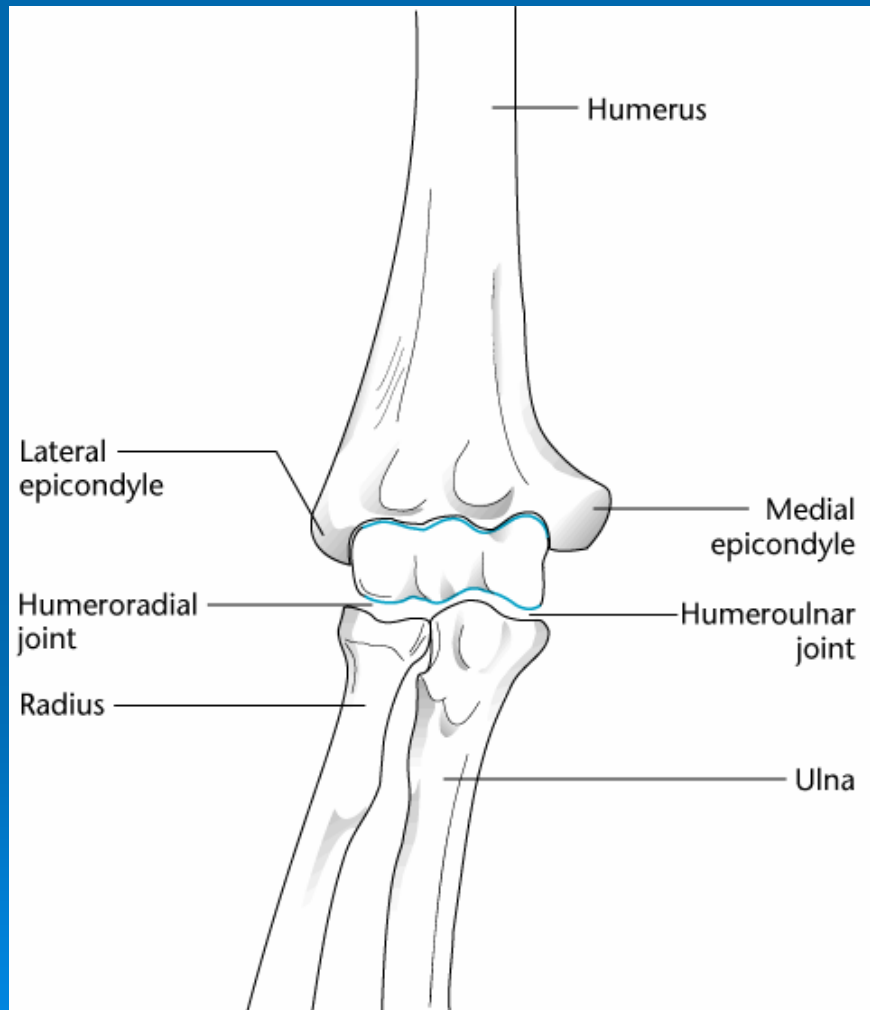
If forearm feels cold & clammy, and the athlete reports numbness in the hand, the forearm's blood supply is compromised.

# Elbow Fractures (continued)

## First Aid

- Immediate application of ice, but
- 
- Application of splint (avoid moving elbow bones) and support of the arm in a sling.
  - Treatment for shock.
  - Arrange for transport to medical facility.

# Epicondylitis of the Elbow



- \_\_\_\_\_ is the attachment site of the forearm flexors and ulnar collateral ligament.
- \_\_\_\_\_ is the attachment site of forearm extensors and radial collateral ligaments.
- Sports that require gripping combined with wrist movements place much stress on the epicondylar region.

# Epicondylitis of the Elbow (continued)

- Little League baseball pitching (“\_\_\_\_\_”) and golf (“golfer’s elbow”) associated with medial epicondyle injury.
- “\_\_\_\_\_” involves the lateral humeral epicondyle and the tendon of the extensor carpi radialis brevis muscle.
  - Factors include:
    - \_\_\_\_\_.
    - \_\_\_\_\_.
    - racket handle that’s too small.
    - change in racket materials.
    - grip that’s too tight.
    - \_\_\_\_\_.



# Epicondylitis of the Elbow (continued)

## Signs and symptoms include:

- Pain and swelling in the region of one or both epicondyles.
- \_\_\_\_\_.
- Radiating pain into forearm muscles.
- Epicondylar pain associated with

\_\_\_\_\_  
\_\_\_\_\_.

## First aid is not practical, but if symptoms worsen:

- Apply ice and compression.
- Refer to physician if pain persists.

# Elbow Injuries (continued)

## ➤ Contusions of the Elbow

Blows to the elbow are common; the majority result in temporary symptoms.

- Exception involves the \_\_\_\_\_.
- Repeated irritation of the bursa can result in inflammation (\_\_\_\_\_).

# Contusions of the Elbow (continued)

Signs and symptoms include:

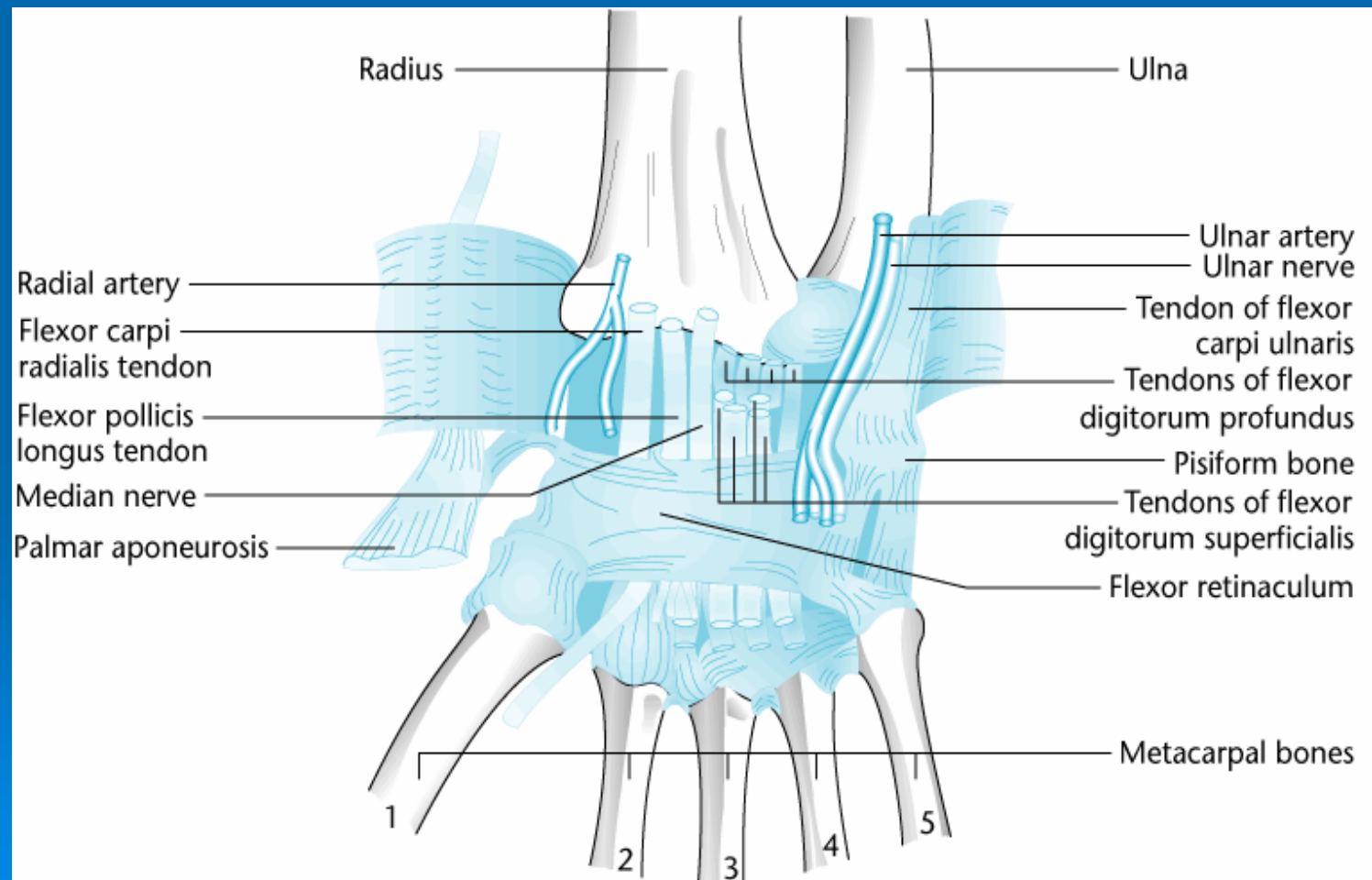
- Swelling around the \_\_\_\_\_.
- Pain and stiffness, especially when elbow is flexed.
- Elevated skin temperature over olecranon process, skin may be taut, and joint may show signs of internal hemorrhage.

## First Aid

- Apply ice and compression.
- In cases of bursitis, refer to a physician.

# Wrist and Forearm Injuries

## Anatomy of the Wrist



# Wrist and Forearm Injuries (continued)

## Anatomy of the wrist

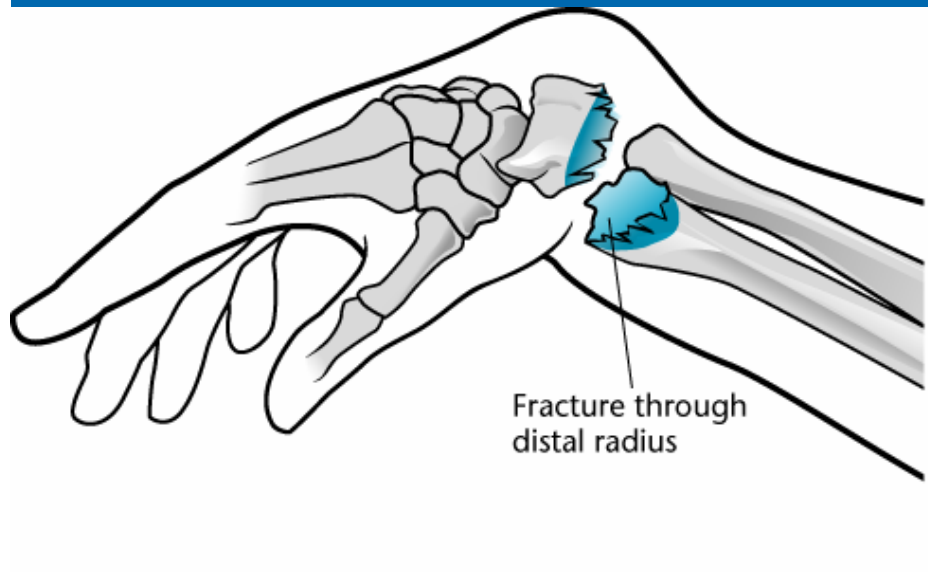
- Complex structure due to

\_\_\_\_\_

\_\_\_\_\_

- Tendons are held in place by the \_\_\_\_\_.
- Major vessels and nerves pass through this region. They are:
  - \_\_\_\_\_ and veins.
  - \_\_\_\_\_ nerves.

# Wrist and Forearm Injuries (continued)



Distal forearm fractures are rare in sports.

- \_\_\_\_\_, a transverse fracture of the distal radius, is the most serious.

# Colles' Fracture

## Signs and symptoms include:

- History of significant trauma.
- Feeling the bone snap or hearing a popping sound.
- \_\_\_\_\_; severe pain; and significant loss of wrist, hand, or finger motion.

Loss of sensation in either hand or fingers may occur.



# Colles' Fracture (continued)

## First Aid

- Immediately apply ice, compression, and elevation.
- **Do not use ice** if you suspect the vascular or nerve supply is affected.
- Treat for shock and transport to medical facility.

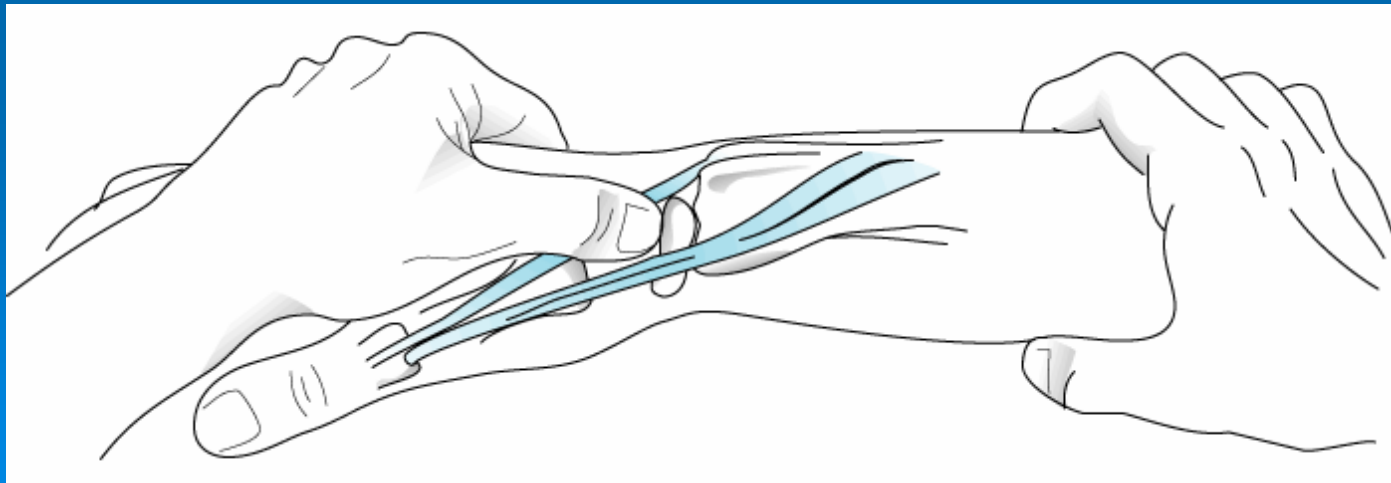
# Wrist Fractures

- Fractures of \_\_\_\_\_ common in sports.
- Most common wrist fractures involve \_\_\_\_\_ or \_\_\_\_\_ bone and tend to occur at the “waist,” the narrowest portion of the bone.
- Deformity is typically not present.
- When in doubt, refer to physician.

# Wrist Fractures (continued)

## Signs and symptoms include:

- History of wrist trauma with popping or snapping sensation.
- Pain with movement, wrist feels locked, and a positive “\_\_\_\_\_” test.

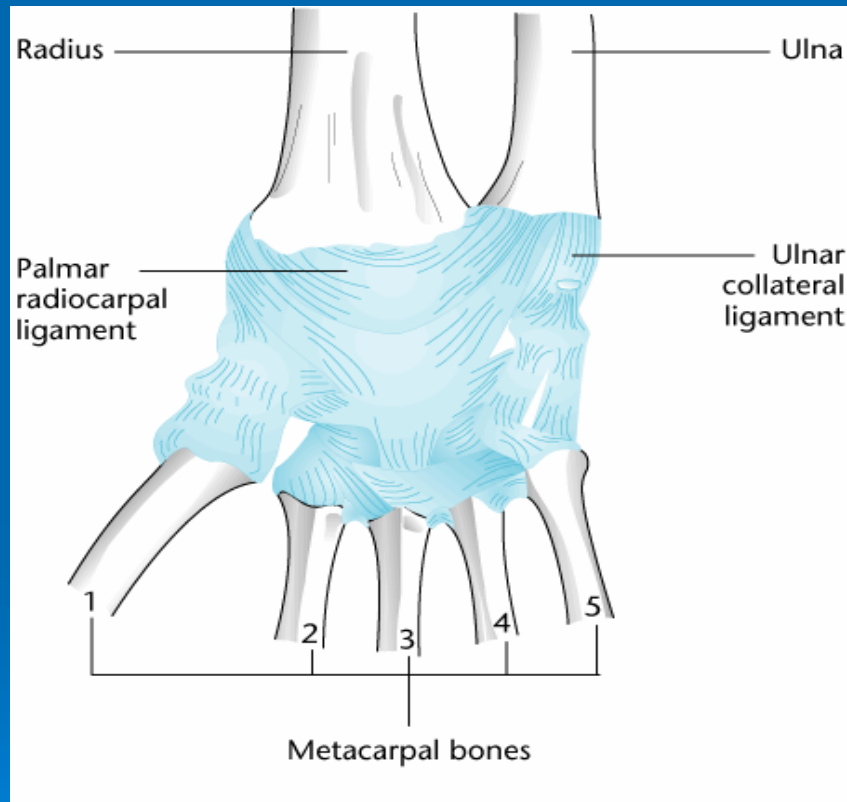


# Wrist Fractures (continued)

## First Aid

- Apply I.C.E.
- Apply a splint that immobilizes wrist.
- Support with sling-and-swathe bandage, leaving fingertips exposed to monitor blood flow beyond the splint.

# Wrist Sprains & Dislocations



**Ligamentous Anatomy -- Palmar**

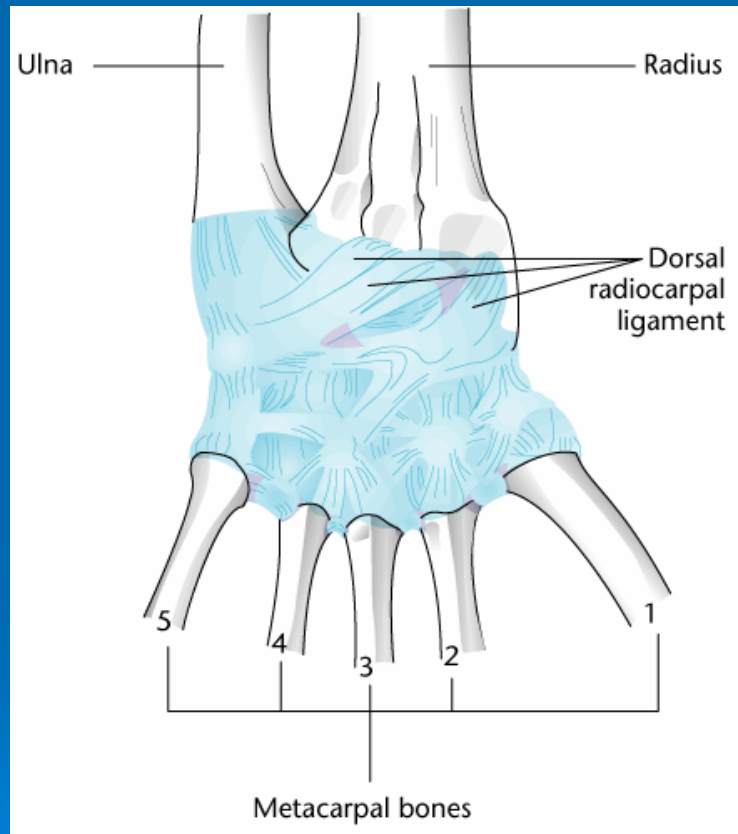
The same mechanisms that cause fractures can also cause sprains or dislocations in the region.

- Injury affects

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(wrist) joint and ligaments.

# Wrist Sprains & Dislocations (continued)



➤ \_\_\_\_\_ is the most commonly dislocated bone of wrist.

➤ Mechanism of this injury is

\_\_\_\_\_  
\_\_\_\_\_.

**Ligamentous Anatomy -- Dorsal**

# Wrist Sprains & Dislocations (continued)

## Signs and symptoms include:

- History of injury combined with snapping/popping sensation.
- Painful movement; movement may be impossible.
- Numbness and/or pain radiating into hands or fingers.

## First Aid

- Apply I.C.E.
- Splint with sling & swathe bandage.
  - **Expose fingertips.**
- Refer athlete to a physician.



# Nerve Injuries to the Wrist

- \_\_\_\_\_, which passes through carpal tunnel, is most commonly injured nerve in the region.
- \_\_\_\_\_  
\_\_\_\_\_ may be related to tendonitis or sprains in the region.
- Majority of carpal tunnel syndrome cases involve \_\_\_\_\_.
- Sports requiring gripping for extended periods have high incidence.

# Nerve Injuries to the Wrist (continued)

Signs and symptoms include:

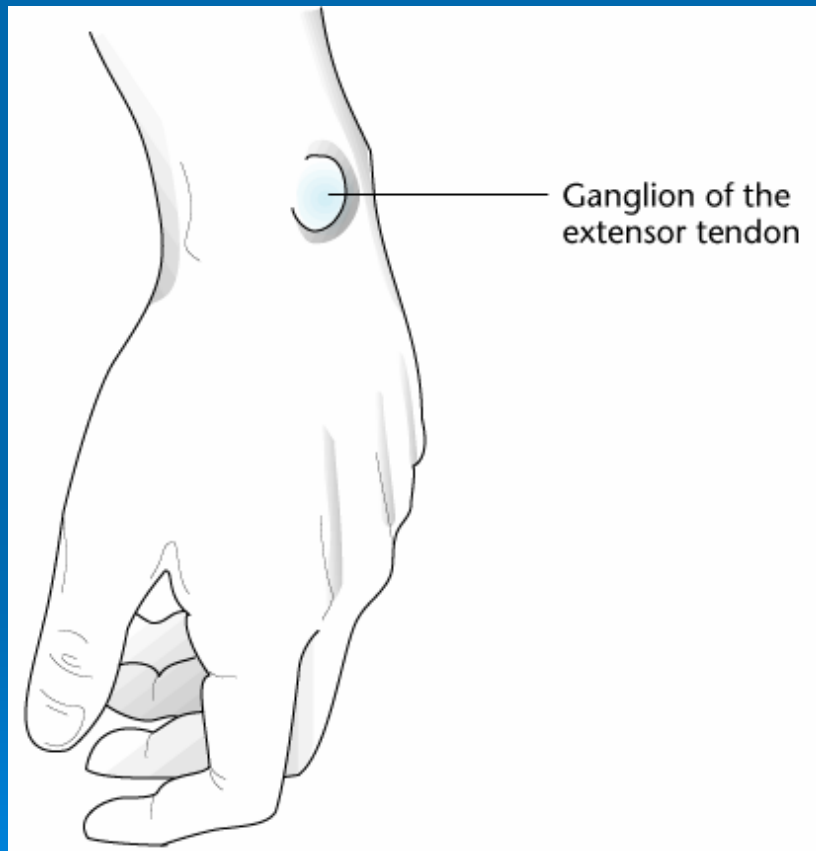
- \_\_\_\_\_ to a portion of hand and fingers and \_\_\_\_\_ in fingers affected by the nerve.
- Pain and tenderness on \_\_\_\_\_ of the wrist.
- Associated tendonitis.
- Symptoms may worsen when the wrist is fully flexed or extended or an object is gripped.

# Nerve Injuries to the Wrist (continued)

## First Aid

- Since this injury tends to develop over time, first aid is not a concern.
- If the injury is associated with acute trauma, treat with I.C.E.
  - **Do not** apply ice if vascular or nerve supply is compromised
- Any athlete complaining of such symptoms should be referred to a physician.

# Ganglions



Ganglion results from a

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surrounding a tendon.

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- Herniated area becomes filled with fluid.
- Some ganglions are soft; others are hard and painful.

# Ganglions (continued)

Signs and symptoms include:

- Visible swelling.
- Painful, hardened nodule, in advanced cases.

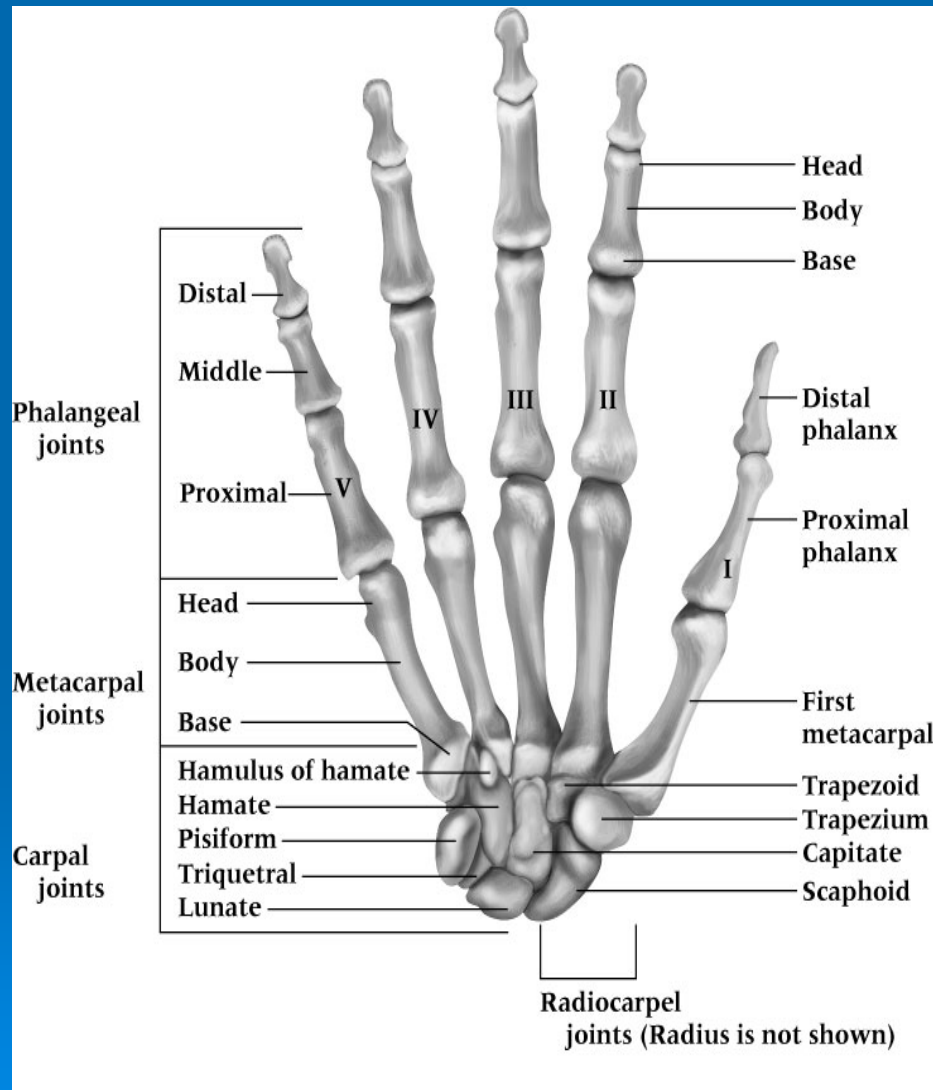
## First Aid

- Some ganglions spontaneously regress.
- Leave alone, if possible.
- They can be surgically removed.

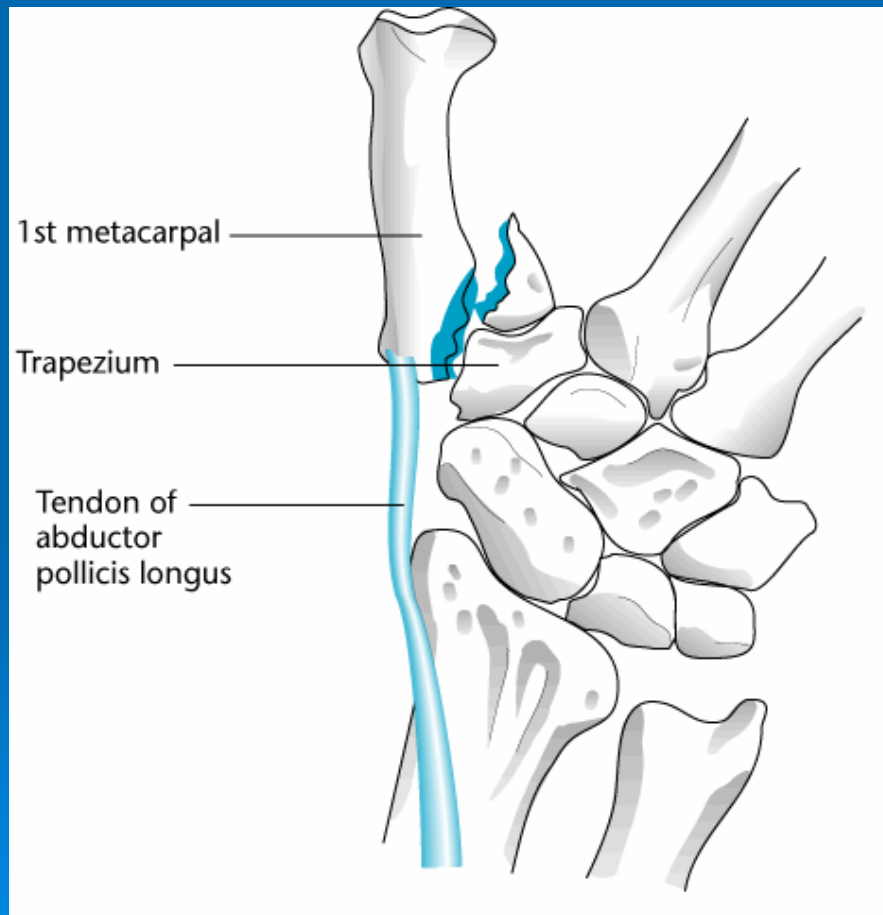
# Hand Injuries

## Hand Fractures

Fractures can occur to any of the 19 bones in the hand.



# Hand Fractures (continued)



- \_\_\_\_\_ is unique thumb injury.
- \_\_\_\_\_
  - Mechanism includes blows with a clenched fist.
  - Fracture involves 4<sup>th</sup> and/or \_\_\_\_\_ bone(s) near the proximal end(s).
  - Metacarpals can be fractured by a crushing mechanism.
  - Phalangeal fractures are common in sports.

# Hand Fractures (continued)

## Signs and symptoms include:

- History of trauma.
- Associated pain and dysfunction of hand.
- Deformity may be present.
- \_\_\_\_\_
- Significant inflammation.



# Hand Fractures (continued)

## First Aid

- Apply I.C.E.
- Apply splint and sling & swathe bandage.
  - Leave fingernails exposed.
  - An isolated phalangeal fracture can be

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- Refer athlete to a physician.

# Sprains and Dislocations of the Hand

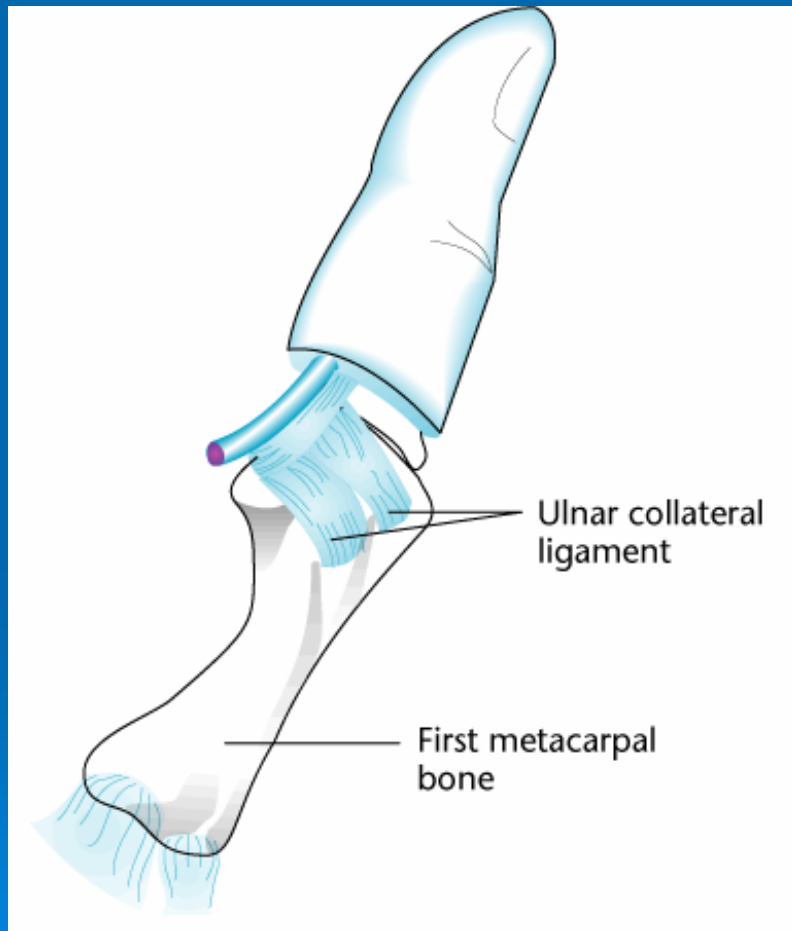
Any joint in the hand can be involved. Most common forms are:

- \_\_\_\_\_.
- \_\_\_\_\_.
- \_\_\_\_\_.

**Gamekeeper's thumb** involves sprain of the ulnar collateral ligament of the thumb.

- Mechanism of injury is a valgus force to the MP joint of the thumb.
- Thumb will be unstable.

# GameKeeper's Thumb



Signs and symptoms include:

- History of an appropriate injury mechanism.
- Pain over the area of the ulnar collateral ligament (MP joint).

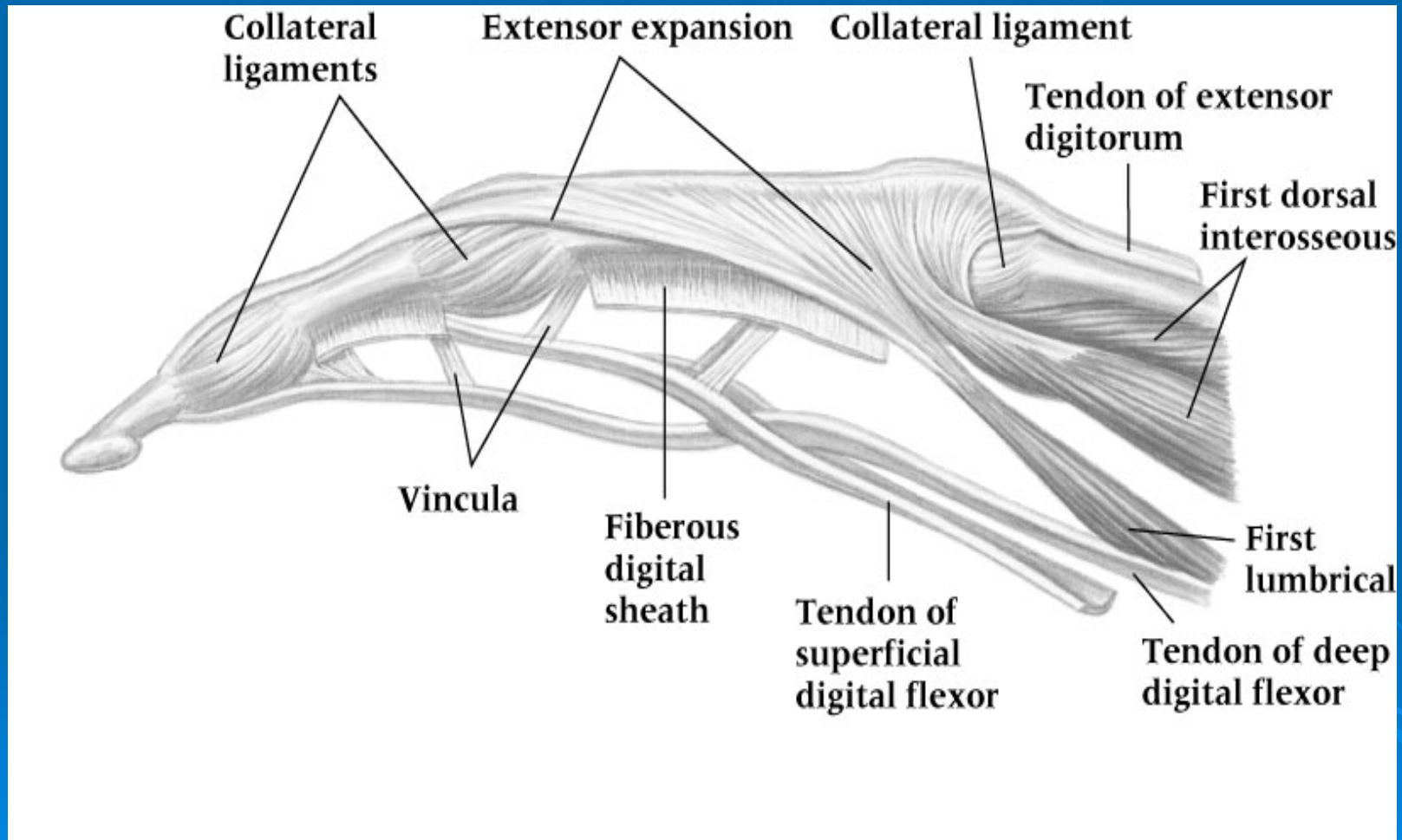
# GameKeeper's Thumb

## (continued)

Signs and symptoms include:

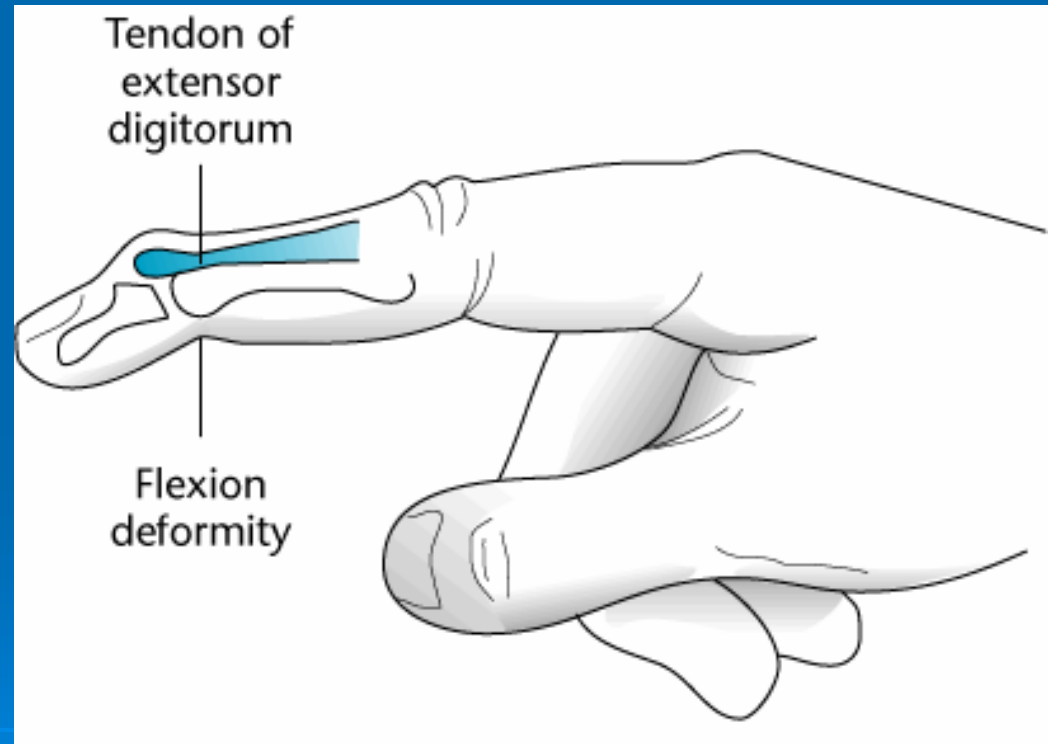
- Snapping or popping at the time of injury.
- Swelling of the MP joint.
- Inability to move the thumb.
- Inability to grip tightly using the thumb.

# Anatomy of the Finger Tendons



# Mallet (Baseball) Finger

- \_\_\_\_\_  
\_\_\_\_\_.
- Mechanism is a blow to the fingertip while extending it from a flexed position.
- \_\_\_\_\_  
\_\_\_\_\_.



# Mallet (Baseball) Finger (continued)

Signs and symptoms include:

- \_\_\_\_\_ is the MOST important sign.
- Recent trauma to fingertip.
- \_\_\_\_\_ of the base of distal phalanx.
- Inability to \_\_\_\_\_.

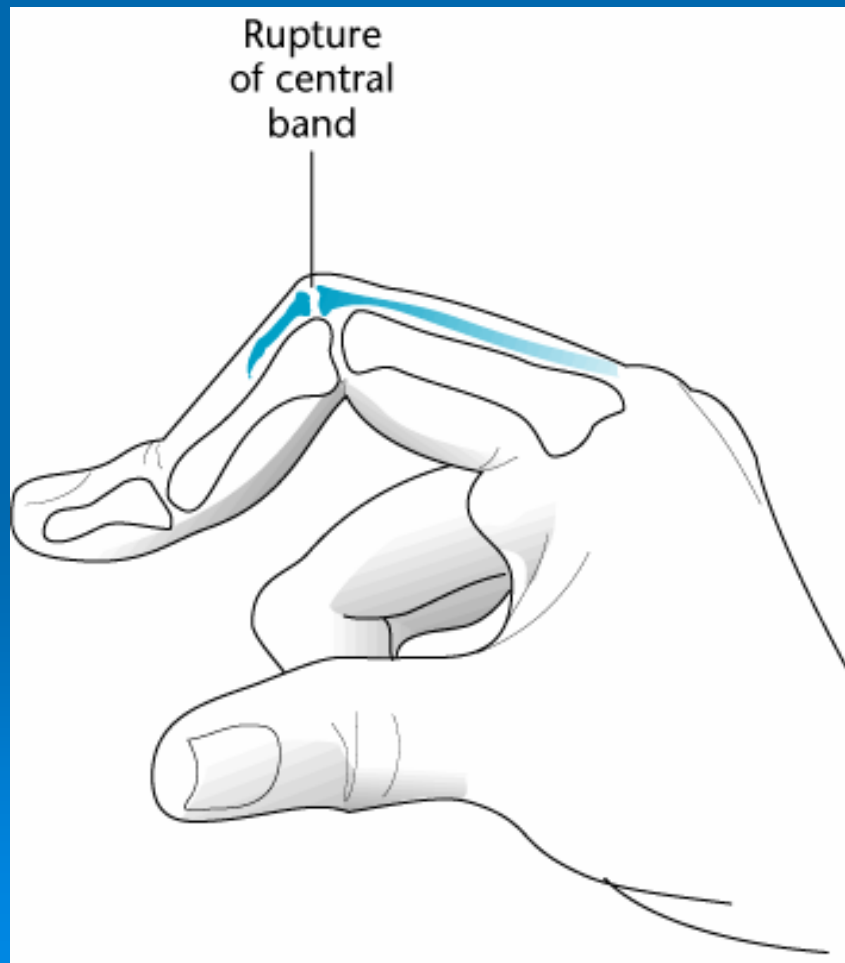
# Mallet (Baseball) Finger (continued)

First aid care involves:

- Immediate application of I.C.E.
- Immediate application of splint with the DIP joint extended.
  - **Do not let** the distal phalanx fall back into flexed position.
- Elevate arm in simple sling.
- Refer to medical care facility.



# Boutonnière Deformity



- Injury involves proximal-interphalangeal (PIP) joint. Extensor tendon is involved as it crosses the dorsal surface of the PIP.
- Mechanism of injury is a blow while the finger is flexed during active extension.

# Boutonnière Deformity (continued)

Signs and symptoms (continued):

- Joint becomes painful, swollen, then stiff.
- If uncorrected, deformity will develop.
- Deformity is characterized by

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# Boutonnière Deformity (continued)

## First Aid

- Apply I.C.E.
- Elevate in simple sling.
- Refer athlete to a physician.

# Wrist and Thumb Taping



# Wrist and Thumb Taping (continued)



# Wrist and Thumb Taping (continued)



# Wrist and Thumb Taping (continued)



# Wrist and Thumb Taping (concluded)

