

Injuries of the Forearm, Wrist, Hand and Finger

Assessment of the Forearm

- History
 - What was the cause?
 - What were the symptoms at the time of injury, did they occur later, were they localized or diffuse?
 - Was there swelling and discoloration?
 - What treatment was given and how does it feel now?

- Observation

- Visually inspect for deformities, swelling and skin defects
- Range of motion
- Pain w/ motion

- Palpation

- Palpated at distant sites and at point of injury
- Can reveal tenderness, edema, fracture, deformity, changes in skin temperature, a false joint, bone fragments or lack of bone continuity

Assessment of the Wrist, Hand and Fingers

- History
 - Past history
 - Mechanism of injury
 - When does it hurt?
 - Type of, quality of, duration of, pain?
 - Sounds or feelings?
 - How long were you disabled?
 - Swelling?
 - Previous treatments?

- Observation

- Postural deviations

- Is the part held still, stiff or protected?

- Wrist or hand swollen or discolored?

- General attitude

- What movements can be performed fully and rhythmically?

- Thumb to finger touching

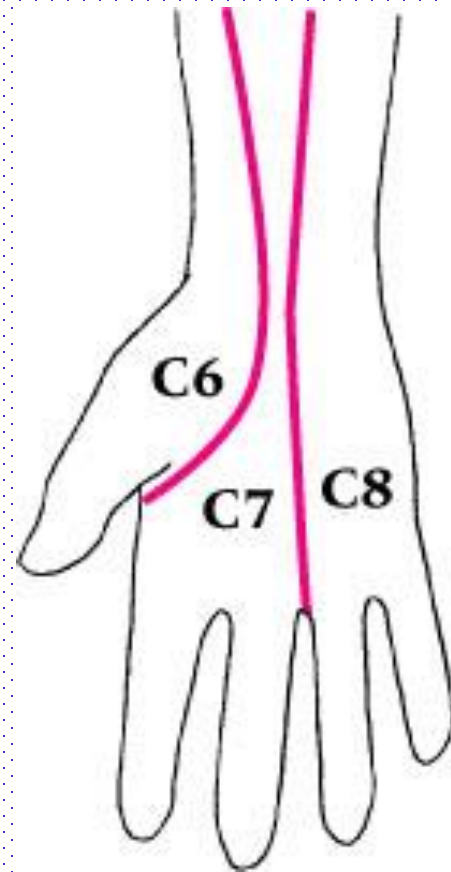
- Color of nailbeds

Blood and Nerve Supply

- Most of the flexors are supplied by the median nerve
- Most of the extensor are controlled by the radial nerve
- Blood is supplied by the radial and ulnar arteries

•Blood and Nerve Supply

- Three major nerves
 - Ulnar, median and radial
- Ulnar and radial arteries supply the hand
 - Two arterial arches (superficial and deep palmar arches)



– Circulatory and Neurological Evaluation

- Hands should be felt for temperature
 - Cold hands indicate decreased circulation
- Pinching fingernails can also help detect circulatory problems (capillary refill)
- Allen's test can also be used
 - Athlete instructed to clench fist 3-4 times, holding it on the final time
 - Pressure applied to ulnar and radial arteries
 - Athlete then opens hand (palm should be blanched)
 - One artery is released and should fill immediately (both should be checked)
- Hand's neurological functioning should also be tested (sensation and motor functioning)

- Functional Evaluation
 - Range of motion in all movements of wrist and fingers should be assessed
 - Active, resistive and passive motions should be assessed and compared bilaterally
 - Wrist - flexion, extension, radial and ulnar deviation
 - MCP joint - flexion and extension
 - PIP and DIP joints - flexion and extension
 - Fingers - abduction and adduction
 - MCP, PIP and DIP of thumb - flexion and extension
 - Thumb - abduction, adduction and opposition
 - 5th finger - opposition

Recognition and Management of Injuries to the Forearm

- Contusion

- Etiology

- Ulnar side receives majority of blows due to arm blocks
 - Can be acute or chronic
 - Result of direct contact or blow

- Signs and Symptoms

- Pain, swelling and hematoma
 - If repeated blows occur, heavy fibrosis and possibly bony callus could form w/in hematoma

- Contusion (continued)
 - Management
 - Proper care in acute stage involves RICE for at least one hour and followed up w/ additional cryotherapy
 - Protection is critical - full-length sponge rubber pad can be used to provide protective covering

- Forearm Fractures

- Etiology

- Common in youth due to falls and direct blows
 - Ulna and radius generally fracture individually
 - Fracture in upper third may result in abduction deformity due pull of pronator teres
 - Fracture in lower portion will remain relatively neutral
 - Older athlete may experience greater soft tissue damage and greater chance of paralysis due to Volkman's contracture

- Signs and Symptoms

- Audible pop or crack followed by moderate to severe pain, swelling, and disability
 - Edema, ecchymosis w/ possible crepitus

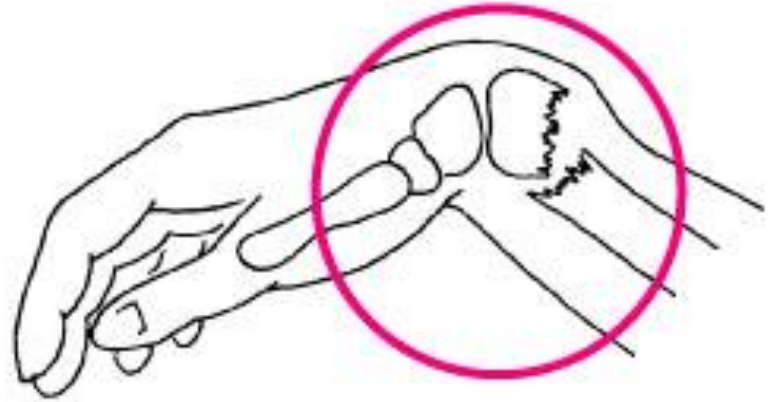
- Management
 - Initially RICE followed by splinting until definitive care is available
 - Long term casting followed by rehab plan



- Colles' Fracture

- Etiology

- Occurs in lower end of radius or ulna
 - MOI is fall on outstretched hand, forcing radius and ulna into hyperextension
 - Less common is the reverse Colles' fracture



– Signs and Symptoms

- Forward displacement of radius causing visible deformity (silver fork deformity)
- When no deformity is present, injury can be passed off as bad sprain
- Extensive bleeding and swelling
- Tendons may be torn/avulsed and there may be median nerve damage

– Management

- Cold compress, splint wrist and refer to physician
- X-ray and immobilization
- Severe sprains should be treated as fractures
- Without complications a Colles' fracture will keep an athlete out for 1-2 months
- In children, injury may cause lower epiphyseal separation

COLLES' FRACTURE

DISTAL RADIUS FRACTURE
WITH DORSAL ANGLE
AND IMPACTION

MAY BE SEEN
IN YOUNG ATHLETES
THAT SUSTAIN A HIGH
ENERGY FALL

MOST COMMONLY SEEN IN ELDERLY
WOMEN WITH OSTEOPOROTIC BONE
THAT SUSTAIN A LOW ENERGY FALL

DANCE FOLK
DROG MITT

FOOSH!

CRACK!

CRUSHED BY A FALL ONTO A HYPEREXTENDED, BIFIDLY
DEViated WRIST WITH THE FOREARM IN PRONATION



Recognition and Management of Injuries to the Wrist, Hand and Fingers

- Wrist Sprains

- Etiology

- Most common wrist injury
 - Arises from any abnormal, forced movement
 - Falling on hyperextended wrist, violent flexion or torsion
 - Multiple incidents may disrupt blood supply

- Signs and Symptoms

- Pain, swelling and difficulty w/ movement

– Management

- Refer to physician for X-ray if severe
- RICE, splint and analgesics
- Have athlete begin strengthening soon after injury
- Tape for support can benefit healing and prevent further injury

- Carpal Tunnel Syndrome

- Etiology

- Compression of median nerve due to inflammation of tendons and sheaths of carpal tunnel
 - Result of repeated wrist flexion or direct trauma to anterior aspect of wrist

- Signs and Symptoms

- Sensory and motor deficits (tingling, numbness and paresthesia); weakness in thumb

- Management

- Conservative treatment - rest, immobilization, NSAID's
 - If symptoms persist, corticosteroid injection may be necessary or surgical decompression of transverse carpal ligament

- Scaphoid Fracture

- Etiology

- Caused by force on outstretched hand, compressing scaphoid between radius and second row of carpal bones
 - Often fails to heal due to poor blood supply

- Signs and Symptoms

- Swelling, severe pain in anatomical snuff box
 - Presents like wrist sprain
 - Pain w/ radial flexion

- Management

- Must be splinted and referred for X-ray prior to casting
 - Immobilization lasts 6 weeks and is followed by strengthening and protective tape
 - Wrist requires protection against impact loading for 3 additional months

- Hamate Fracture

- Etiology

- Occurs as a result of a fall or more commonly from contact while athlete is holding an implement

- Signs and Symptoms

- Wrist pain and weakness, along w/ point tenderness
 - Pull of muscular attachment can cause non-union

- Management

- Casting wrist and thumb is treatment of choice
 - Hook of hamate can be protected w/ doughnut pad to take pressure off area

- **Wrist Ganglion**

- Etiology

- Synovial cyst (herniation of joint capsule or synovial sheath of tendon)
 - Generally appears following wrist strain

- Signs and Symptoms

- Appear on back of wrist generally
 - Occasional pain w/ lump at site
 - Pain increases w/ use
 - May feel soft, rubbery or very hard

- Management

- Old method was to first break down the swelling through distal pressure and then apply pressure pad to encourage healing
 - New approach includes aspiration, chemical cauterization w/ subsequent pressure from pad
 - Ultrasound can be used to reduce size
 - Surgical removal is most effective way

Location of a Ganglion Cyst



PART 1

• THE END !!!