

Injuries to Upper Limb

The following is a list of common sporting conditions and injuries. The severity of each condition may lead to different treatment protocols and certainly varying levels of intervention. As treatment therefore is quite subjective we have merely provided a list of commonly used modalities. Further tips may appear under *Treatment goals, advice and aftercare* for each injury.

Conservative treatment of sports injuries often includes:

- Rest.
- Ice.
- Anti-inflammatory medications.
- Stretching.
- Sports massage.
- Ultrasound.
- Strengthening exercises, especially eccentric.

Shoulder

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Acromio-Clavicular Joint Sprain

Structures affected

The acromio-clavicular (AC) joint

This joint is formed by the acromion and the distal end of the clavicle, the acromio-clavicular ligament joins the two bones together to form the joint

Graded as 1st, 2nd and 3rd class, as with all sprains

Signs and Symptoms

Localised pain on palpation

A palpable and/or visible separation between the two bones

Swelling

Pain when abducting the arm, and placing the hand on opposite shoulder

Biomechanics of injury

Falling on an outstretched arm

Direct impact to the clavicle (tackle)

Direct impact to the lateral aspect of the arm, compressing the clavicle

Assessments

Scarf test – asking the client to take the hand of the injured limb and wrap it around the opposite shoulder (like a scarf). A positive test would show inability to complete the movement and/or pain

X-ray to determine severity of sprain

Treatment Goals, Advice and Aftercare

- Ice the site of injury to reduce pain and inflammation
- Immobilise the arm, can be done using a sling
- Once pain subsides, begin to restore ROM
- Restore strength
- Grade 3 tears/disruptions will often require surgery

Rotator Cuff Strain

Structures affected

- Supraspinatus (supraspinatus fossa)
- Infraspinatus (posterior surface of the scapula)
- Teres minor (posterior surface of the scapula)
- Subscapularis (anterior surface of the scapula)
- Muscle strains normally occur at the MTJ but can also occur in the muscle belly
- Graded 1st, 2nd and 3rd degree according to severity and the number of fibres left in tact

Signs and Symptoms

- Sudden pain felt around the shoulder during activity
- Localised pain on palpation
- Possible discolouration
- A palpable dip may be felt in the muscle if there is a complete rupture
- Pain at end ROM

Biomechanics of injury

- Most likely to occur during eccentric muscle action
- High impact or unexpected force is usually associated with muscle strains
- Muscle imbalance between agonist and antagonist pairs will make the athlete more susceptible to muscle tears

Assessments

- Supraspinatus – pain/weakness when resisting abduction
- Infraspinatus and Teres Minor – pain/weakness when resisting external rotation
- Subscapularis – pain/weakness when resisting internal rotation

Treatment Goals, Advice and Aftercare

- P.R.I.C.E. during the acute phase
- Tensile loading is important after the acute phase of injury
- Isometric followed by dynamic and the resisted contractions
- Restoring length
- Restoring strength
- Insuring that proprioception has also been restored
- If 3rd degree sometimes surgery is necessary

Subacromial Bursitis

Structures affected

- The bursa which sits under the supraspinatus tendon
- This is located on the superior aspect of the greater tubercle of the humerus

Signs and Symptoms

- This will produce similar symptoms to supraspinatus tendonitis
- Pain will be less on resisted abduction than with tendonitis
- Pain will be similar to tendonitis with palpation
- Tightness in the supraspinatus muscle
- Pain felt in the shoulder during throwing on release of the ball
- Inflammation in the area
- Pain on the superior aspect of the shoulder

Biomechanics of injury

- Overuse injury
- The bursa becomes inflamed, often along with the tendon
- Sometimes related to change in technique or weight of object being lifted/thrown

Assessments

- Assess ROM of the shoulder, particularly abduction
- Pain on palpation
- Tightness of the supraspinatus
- Resisted arm abduction

Treatment Goals, Advice and Aftercare

- Apply ice to the area to reduce inflammation and pain
- Rest until pain and inflammation subside
- Begin to restore ROM of the shoulder, particularly abduction past 60°
- Restore strength in the rotator cuff muscles
- Assess technique
- Reduce weight being lifted/thrown if this was suspected to be a cause of the problem

Brachial Plexus Compression

Structures affected



Signs and Symptoms



Biomechanics of injury



Assessments



Treatment Goals, Advice and Aftercare



Frozen Shoulder

Structures affected

- Also known as adhesive capsulitis
- Affects the whole shoulder capsule
- Often only effects one side
- Condition is unique to the shoulder
- The fluid within the joint capsule become 'sticky' making the joint hard to move

Signs and Symptoms

- Recent surgery or immobilisation
- Slow onset of shoulder pain and stiffness
- Pain worsening at night
- Pain worsening when pressure is placed upon the effected side
- Decreased ROM
- Not being able to complete everyday tasks such as putting a coat on
- Muscle atrophy from lack of movement

Biomechanics of injury

- Often occurs in the older population, more commonly in women
- Can be as a result of trauma or surgery to the joint
- Immobility after an injury can lead to the onset of this condition
- Can also spontaneously happen, with no known cause
- The fluid in the capsule becomes inflamed leading to scar tissue formation within the capsule, allowing less free movement within the joint

Assessments

- Assess ROM in all movements
- Gain a full history to include any past injury to that shoulder or arm

Treatment Goals, Advice and Aftercare

- Be aware that this condition will take it's time to disappear!
- Starting with gentle continuous passive movements of the shoulder
- Massage to the area, where pain permits
- Passively take the joint to each end ROM (all 14 movements), the restore some mobility
- Get the client to actively take the joint to end ROM
- Begin stretching to restore ROM
- Restore strength to atrophied muscles
- Not all clients will react to above treatment and may require surgery, however this is a last resort

GH Instability

Structures affected

The gleno humeral joint (head of the humerus and glenoid fossa)
Muscles surrounding the shoulder joint, particularly the rotator cuff muscles (supraspinatus, infraspinatus, teres minor and subscapularis)

Signs and Symptoms

Complaint of discomfort around the joint
Laxity in the joint during sport and everyday tasks (i.e. throwing a ball or just carrying shopping bags)
History of dislocation

Biomechanics of injury

Trauma driving the humerus away from the fossa (either dislocation or subluxation)
Ligament laxity within the joint
Muscle weakness, particularly the rotator cuff muscles
Hypermobility, meaning the athlete has laxity in all joints

Assessments

Draw tests
Test for muscle weakness using resisted/strength tests

Treatment Goals, Advice and Aftercare

Exploratory arthroscopy may be used to determine cause of laxity if not already known
Some may require surgery to tighten ligaments
For muscle weakness, strength train the weak muscles using timing, reps and sets appropriate to train hypertrophy

The Elbow

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Golfers Elbow

Structures affected

The medial epicondyle, origin for the flexor and pronator muscles of the wrist

Signs and Symptoms

Gradual onset of pain on the lateral side of the elbow

Pain when flexing or pronating the wrist actively or against resistance

Biomechanics of injury

Repetitive strain placed upon the flexor and pronator muscles

Activities such as golf, forehand tennis and baseball players all commonly suffer this injury

Not as common as lateral epicondylitis

Assessments

Palpation of the medial epicondyle will cause pain

Resisted flexion and pronation may be weak and will cause pain

Passive extension and supination will be painful at end ROM

Treatment Goals, Advice and Aftercare

Ice the area to reduce inflammation

Rest until pain subsides

Restore ROM

Restore strength

Introduce throwing activities and any equipment

Assess technique and use of equipment

Tennis Elbow

Structures affected

The lateral epicondyle, common origin for the extensor and supinator muscles

Signs and Symptoms

Gradual onset of pain on the lateral side of the elbow

Pain when extending or supinating the wrist actively or against resistance

Biomechanics of injury

Most common in tennis (also known as Tennis elbow)

Common causes in tennis include excessive use of backhand, change in or poor grip size and string tension, technique and overuse

Stresses places upon the supinators and flexors of the wrist

Poor strength

Assessments

Palpation of the lateral epicondyle will cause pain

Resisted extension and supination may be weak and will cause pain

Passive flexion and pronation will be painful at end ROM

Treatment Goals, Advice and Aftercare

Ice the area to reduce inflammation

Rest until pain subsides

Restore ROM

Restore strength

Introduce throwing activities/racket

Assess technique and use of equipment/equipment changes

Bursitis

Structures affected

Inflammation of the bursa which lays over the olecranon process

Signs and Symptoms

Often painless in the early stages

Warm to touch and appear as a large lump on the posterior side of the elbow

The bursa becomes very painful as the injury worsens (described as a 'burning' pain)

Limited flexion of the elbow

Biomechanics of injury

Direct impact to the olecranon process and the bursa causing the bursa to bleed and become inflamed

Constantly leaning on the elbow (also known as students elbow!)

Assessments

Palpation of the bursa over the elbow will cause pain

Redness may appear on the skin and will feel warm to touch

Assess ROM of the elbow, flexion may be limited

Treatment Goals, Advice and Aftercare

Apply ice to the area to reduce inflammation and pain

Rest until pain and inflammation subside

Begin to restore ROM of the elbow, focussing on flexion in particular

Restore strength of all muscles affected due to rest (check in comparison to unaffected arm)

Dislocation

Structures affected

- Humeral-ulna dislocation
- Radioulna dislocation

Signs and Symptoms

- Sudden pain felt on impact
- Inflammation
- Discolouration
- Pain with pronation and supination
- Localised tenderness on palpation
- Obvious deformity
- Unable/unwilling to move the arm

Biomechanics of injury

- Humeral-ulna dislocation occurs when the radius and ulna displace posteriorly to the humerus often occurring from hyperextension
- Radioulna dislocation is the tearing of the annular ligament and interosseus membrane, can occur from direct impact to the lateral elbow

Assessments

- If signs and symptoms are present send for x-ray to confirm

Treatment Goals, Advice and Aftercare

- The limb will be relocated if necessary with or without surgery
- Limb will be immobilised
- Following immobilisation begin continuous passive movements
- Restore ROM
- Restore strength

The Forearm and Wrist

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Tenosynovitis

Structures affected

- Tenosynovitis of the abductor pollicis longus and extensor pollicis brevis tendons
- Lateral side of the thumb
- Tendon and the synovial sheath become inflamed

Signs and Symptoms

- Localised tenderness on palpation
- Pain worsened by ulna deviation
- Inflammation
- Poor ROM with ulna deviation

Biomechanics of Injury

- Overuse injury (now often known as texters thumb)
- Repetitive gripping combined with ulna deviation
- Inflammation of the tendons

Assessments

- Pain when closing the fist and deviating the hand towards the ulna (Finkelstein Test)
- Pain with resisted abduction and extension

Treatment Goals, Advice and Aftercare

- Ice the area to reduce inflammation
- Reduce action which caused problem in the first instance
- Passively begin to reintroduce motion
- Restore ROM
- Restore strength

Carpal Tunnel Syndrome

Structures affected

- Compression of the median nerve in the carpal tunnel
- Most commonly affects older adults

Signs and Symptoms for all ligaments

- Change in sensation in the hand a fingers
- Localised pain with palpation over the anterior aspect of the wrist
- Flexion of the fingers may become weak
- Adduction and abduction of the thumb may become weak and painful
- Holding the wrist in a flexed position will increase the pain

Biomechanics of Injury

- Overuse in sport and with action such as typing on a computer
- Bony abnormality
- Excess fluid retention
- Can be associated with fractures and dislocations where fragments of bone are displaced

Assessments

- Fully flex the wrists and place the posterior surface of the hands together with the fingers pointing to the floor
- Numbness or tingling in the digits is a positive sign
- Wrist pain in this position is normal

Treatment Goals, Advice and Aftercare

- Apply ice to the area to reduce inflammation
- Rest (often with immobilisation)
- Continuous passive motion to reintroduce movement
- Restore ROM
- Restore strength
- Reduce activity which caused injury in the first instance

The Forearm and Wrist

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Ruptured Ligaments

Structures affected

Ligaments supporting the proximal and distal inter phalangeal joints
 Sprains are categorised into 1st, 2nd and 3rd degree dependent upon the severity of the tear and the percentage of fibres that have torn

Signs and Symptoms

- Localised pain on palpation
- Pain when trying to grip anything
- Inflammation and discolouration
- Feeling very weak and poor stability

Biomechanics of Injury

Poor catching technique
 Impact
 Finger getting caught and excess valgus/varus strain placed upon the joint

Assessments

All symptoms above present
 Pain increases with valgus or varus strain

Treatment Goals, Advice and Aftercare

- If not treated chronic swelling may restrict ROM
- Ice application to reduce pain and inflammation
- Fluid drainage may be needed to reduce oedema
- Mobilisation following any adaptive shortening
- Restore ROM and strength
- Tensile loading
- Strapping and taping if necessary (in a 'cross' fashion)

Fractures

Structures affected

- Fracture of the distal radius and ulna, displacing the distal ends of the bone
- Metacarpal fractures
- Carpal bone fractures
- Fracture of the phalanges
- Beware of fractured scaphoid (seek medical care immediately)

Signs and Symptoms

- Sudden pain felt on impact
- Inflammation
- Discolouration
- Pain with movement
- Localised tenderness on palpation
- Obvious deformity
- Unable/unwilling to move the fingers or hand

Biomechanics of injury

- Fractures of the wrist often are consistent with falling with an open palm
- Scaphoid fracture due to impact of the against the radius from direct impact, often a fall or punch (common in boxers)

Assessments

- If symptoms are present send for x-ray to confirm
- For metacarpal and phalangeal fracture, apply a percussion test to end of the finger in line with the metacarpal. This is applied by flicking the end of the finger, with force towards the clients hand, positive test will cause pain

Treatment Goals, Advice and Aftercare

- Scaphoid fractures should be treated as soon as possible, due to the vascular supply, ensuring the bone has not completely broken can be crucial to healing
- Limb will be immobilised
- Following immobilisation begin continuous passive movements
- Restore ROM
- Restore strength
- Gradual return to sport/weight

You may pay particular attention to a full understanding of the relationship between damage, mechanics and which tests cause discomfort or pain – and in which range.