

Management of Paediatric Sports Medicine Injuries

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BORN LOOSE



JOINT HYPERMOBILITY

“Double Jointed” - “Loose Jointed”

- 10% of general population have a degree of hypermobility
- Women: Men ration is 3: 1
- Hypermobility is a common condition in children since their connective tissues are not completely developed. Some children may “outgrow” their hypermobility.
- Hypermobile joints occur when the ligaments holding the joints are loose and is often associated with muscle weakness around the joints.
- Most people with hypermobility do not develop any problems from their “loose jointedness”

Joints most commonly affected by hypermobility include:



**Shoulders
Elbows
Wrists
Fingers
Knees**



BEIGHTON SCORE:

- Is a screening technique for hypermobility
- There are a total of 9 maneuvers.
- A point is gained for each movement that the person can positively perform
- A score of 3/9 is mildly hypermobile.
- A score of 9/9 would indicate extreme hypermobility

Dislocation VS Subluxation

DISLOCATION

Also known as luxation, occurs when the ends of your bones are forced out of position.

SUBLUXATION

Occurs when the joint comes out of place partially and then goes back into position (reduces)

Beighton Score



Shoulder Dislocation

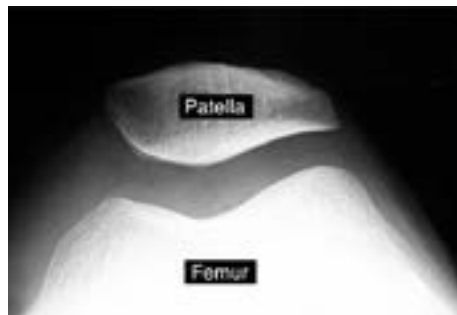


Joint Dislocations

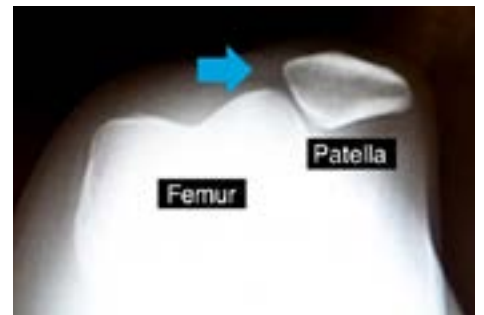
Any joint in the body has the potential to dislocate. However, there are some that are more susceptible than others such as the shoulder joint. Other common joints for dislocation are patellofemoral, elbow, wrist, finger, hip and the foot.



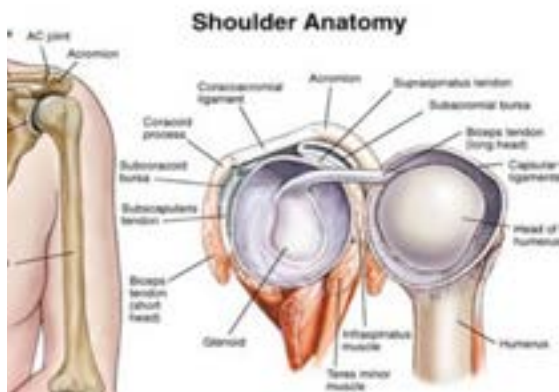
Joint dislocations are caused by trauma to the joint. Typically there is a significant and sudden force applied by either a blow or a fall that causes the bones in the joint to dislocate from their normal position. With each dislocation, the ligaments that help to stabilize the joint can be damaged or loosened making it easier for the joint to dislocate in the future.



Normal X-ray of kneecap (patella)



X-ray of dislocated kneecap (patella)



Bankart Tear

In individuals who have traumatic joint dislocations, there is further trauma to the joint stabilizing structures such as the ligaments, the surrounding soft tissues and muscles, as well as the bone. In the shoulder joint, there can be damage to the labrum, the ligaments, the rotator cuff muscles, the humeral head (Hills Sachs lesion) and the glenoid (socket of the shoulder joint).

ACL INJURIES

Adolescent females have 3 - 7 times the risk of tearing their ACL's



INCREASED INCIDENCE:

- Young athletes participating in more competitive, high impact and cutting sports
- Heightened awareness
- Improved methods of diagnosing ACL injuries in young athletes.

MECHANISM OF INJURY:

1. Deceleration, pivoting & twisting injury
2. Hyperextension injury
3. Contact vs Noncontact

HISTORY:

- Feel a pop
- Immediate Pain
- Swelling
- Feeling of Instability
- Difficulty weightbearing
- Knee Instability

ASSOCIATED INJURIES:

70% have meniscus pathology
46% have articular cartilage injury

FEMALES:

Females are at increased risk of ACL injury.

FACTORS:

- Hormonal
- Muscle imbalances
- Lower leg alignment
- Jump - Landing Mechanics

PHYSICAL EXAM:

Acute:

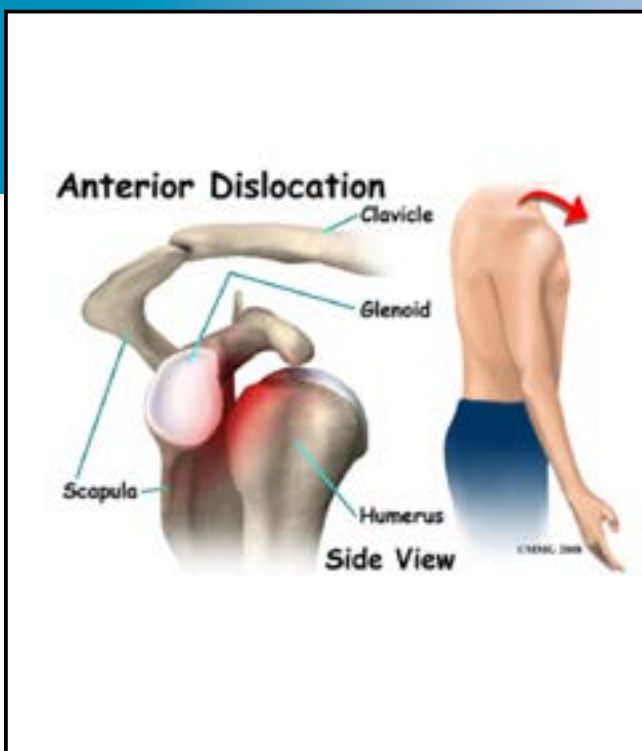
- Effusion
- Antalgic gait
- ACL laxity

Chronic:

- +/- Effusion
- Quadriceps wasting
- ACL laxity
- +/- Joint line tenderness

SHOULDER DISLOCATIONS

Shoulder joint is one of the most unstable and frequently dislocated joints in the body



DIRECTION OF DISLOCATION:

1. Anterior (>95%)
2. Posterior
3. Inferior

MECHANISM OF INJURY:

- Indirect force placed on the arm while in abduction and external rotation.
- Common in overhead sports

PHYSICAL EXAM:

- Deformity
- Decreased ROM
- Assess for neurological dysfunction (axillary nerve)

RECURRENT INSTABILITY:

1. AGE < 20 YEARS
2. MALES > FEMALES
3. RETURN TO CONTACT OR COLLISION SPORTS
4. BONE DEFECT
5. HYPERLAXITY

ATRAUMATIC INSTABILITY:

- Females
- Overhead sporting activities such as swimming
- Generalized ligamentous laxity
- Multidirectional instability
- Able to reduce spontaneously
- Treatment --> non-surgical, rotator cuff strengthening

PATELLAR DISLOCATIONS

Most patellar dislocations reduce spontaneously prior to seeking medical attention



The majority of patellar dislocations are lateral.

MECHANISM OF INJURY:

1. Sudden internal rotation of the femur of a fixed foot resulting in forced quadriceps contracting and pulling of the patella laterally
2. Direct blow to the medial side of the knee

HISTORY:

- Popping sensation
- Immediate Pain
- Swelling
- State that patella dislocated laterally
- Difficulty weightbearing

REDUCTION OF DISLOCATED PATELLA

Slowly extend the knee while applying a medially directed force along the lateral patella. Sedation is often necessary for successful reduction.

PHYSICAL EXAM:

Acute:

- Effusion
- Antalgic gait
- Medial retinacular tenderness

Chronic:

- +/- Effusion
- Quadriceps wasting
- Patellar apprehension
- Ligamentous laxity
- Patella alta
- Valgus alignment
- Hypermobile patella

ANKLE SPRAINS

Lateral ankle sprains are among the most common sports injuries



MECHANISM OF INJURY:

Inversion ankle The typical mechanism is inversion with the foot in the plantar flexed position resulting in injury to the lateral ankle stabilizers.

OPEN GROWTH PLATES:

Any swelling or tenderness of the lateral malleolus in a child with open growth plates indicates a Salter Harris type 1 fracture of the distal fibula.

LATERAL STABILIZING LIGAMENTS:

1. Anterior Talofibular Ligament (ATFL)
2. Calcaneofibular Ligament (CFL)
3. Posterior Talofibular Ligament (PTFL)

PHYSICAL EXAM:

- Focal tenderness
- Swelling
- +/- Ecchymosis
- Decreased range of motion
- Antalgic gait

Overuse INJURIES

01 APOPHYSITIS

Apophysitis refers to irritation and inflammation of the apophysis, a secondary ossification center which acts as an insertion site for a tendon. It is a common overuse injury in young athletes. In a growing athlete the apophysis is susceptible to injury because of repetitive stress or an acute avulsion injury.

OSGOOD SCHLATTERS:

- Traction apophysitis of ossification centre of the tibial tubercle
- Age: 11-15
- Boys > Girls
- Work with running, cutting and jumping activities

SINDING-LARSEN-JOHANSSON (JUMPER'S KNEE):

- Apophysitis of lower pole of the patella due to chronic repetitive traction of the patellar tendon
- Pre-pubescent athlete (10-13)
- Repetitive eccentric and deceleration loads of the extensor mechanism.
- running and jumping sports such as basketball.
- Focal tenderness lower pole of patella
- Quadriceps weakness
- Difficulty with squatting

SEVER'S:

- Apophysitis of the secondary ossification center of the calcaneus due to traction from the gastrocnemius-soleus complex.
- Age 9 to 12 years
- More common in boys
- Bilateral in 60% of cases
- Treat with relative rest, NSAIDS, heel cups, stretching.

LITTLE LEAGUER'S ELBOW:

- Seen in thrower's, pitchers
- Due to traction on the medial elbow
- Tender over medial epicondyle
- Treatment: cease throwing until symptoms resolve, NSAIDS, ice, physiotherapy
- Rule out OCD elbow

02 STRESS INJURIES

Overuse injuries in young athletes are often seen with rapid increases in training, such as during sports camps, and in athletes training at consistently high levels

Extrinsic Factors:

- hard training surfaces
- improper footwear
- inappropriate equipment
- poor coaching

Intrinsic Factors:

- extremity malalignment
 - excess femoral anteversion
 - valgus
 - foot pronation
- decreased flexibility
- muscle weakness or imbalance.

Manifestations of Overuse Injuries:

- Apophysitis
- Chronic anterior knee pain
- Stress fractures
- Tendonitis

“OVERUSE”

Repetitive stress on the musculo-skeletal system without sufficient recovery time which does not allow for the normal reparative processes.

03 CHRONIC ANTERIOR KNEE PAIN

History:

- Insidious onset
- Vague anterior knee pain / not associated with an acute knee injury

Exacerbated by:

- kneeling
- stairs
- squatting or kneeling
- sitting for prolonged periods of time

Physical Examination:

- Often normal
- Mild nonspecific peri-patellar tenderness
- Pain with patellar compression

Radiographs:

Plain Films: Normal

MRI: Often normal, may show chondromalacia patella.

Treatment:

Physiotherapy: Quad stretching and strengthening program

Brace: Patellofemoral knee brace / taping

Activity Modification: Remain active.

Avoid prolonged kneeling and squatting activities or aggravating activities.