

PATIENT INFORMATION SHEETS

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12. Kienböck's disease
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14. Dislocation of a MCP knuckle joint
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2. Costovertebral joint disorders
3. Scheuermann's disease
4. Thoracic intervertebral disc prolapse
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7. Stress fracture of the ribs

Low back pain

1. Low back pain
2. Acute nerve root compression
3. Stress fracture of the pars interarticularis (pars defect)
4. Spondylolisthesis

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1. Sacroiliac joint disorders
2. Iliolumbar ligament sprain
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4. Ischiogluteal bursitis
5. Piriformis conditions
6. Avulsion fracture of the ischial tuberosity

Hip and groin pain

1. Adductor muscle strain
2. Adductor tendinopathy
3. Osteitis pubis
4. Trochanteric bursitis
5. Stress fracture of the pubic ramus
6. Hip joint injury
7. Stress fracture of the neck of the femur
8. Snapping hip
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10. Iliopsoas bursitis
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14. Obturator nerve entrapment

Thigh pain

1. Quadriceps contusion (cork thigh)
2. Myositis ossificans
3. Quadriceps muscle strain (muscle tear)
4. Stress fracture of the shaft of the femur
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Knee injuries

1. Meniscal injury
2. Medial collateral ligament (MCL) injury
3. Anterior cruciate ligament (ACL) injury
4. Posterior cruciate ligament (PCL) injury
5. Lateral collateral ligament (LCL) injury
6. Articular cartilage damage
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10. Fat pad impingement
11. Fracture of the tibial plateau
12. Superior tibiofibular joint injury

13. Ruptured hamstring tendon
14. Patellofemoral syndrome (anterior knee pain, runner's knee)
15. Patellar tendinopathy (jumper's knee)
16. Synovial plica
17. Osgood-Schlatter's disease
18. Sinding-Larsen–Johansson syndrome
19. Quadriceps tendinopathy
20. Pre-patellar bursitis (housemaid's knee)
21. Iliotibial band friction syndrome (ITBFS)
22. Biceps femoris tendinopathy
23. Pes anserinus tendinopathy
24. Pellegrini-Stieda syndrome
25. Popliteus tendinopathy
26. Gastrocnemius tendinopathy
27. Baker's cyst

Lower leg pain

1. Gastrocnemius (calf) strain
2. Soleus (deep calf muscle) strain
3. Stress fracture of the tibia
4. Tenoperiostitis of the shin
5. Deep posterior compartment syndrome
6. Anterior compartment syndrome
7. Stress fracture of the fibula
8. Periosteal contusion—bone bruising
9. Achilles tendinopathy
10. Paratendinopathy of the Achilles
11. Partial tear of the Achilles tendon
12. Complete tear of the Achilles tendon
13. Retrocalcaneal bursitis
14. Sever's lesion

Ankle injuries

1. Lateral ligament injury (rolled ankle)
2. Medial ligament injury (ligament tear to the inside of your ankle)
3. Pott's fracture (ankle joint fracture)
4. Osteochondral fracture of the talar dome (bone-cartilage fracture within the ankle joint)
5. Dislocation of the peroneal tendons
6. Post-traumatic synovitis
7. Avulsion fracture of the base of the fifth metatarsal
8. Tibialis posterior tendinopathy
9. Flexor hallucis longus tendinopathy
10. Tarsal tunnel syndrome
11. Stress fracture of the medial malleolus
12. Peroneal tendinopathy
13. Sinus tarsi syndrome
14. Posterior impingement syndrome
15. Stress fracture of the talus
16. Anterior impingement syndrome
17. Tibialis anterior tendinopathy
18. Inferior tibiofibular joint injury

Foot pain

1. Plantar fasciitis
2. Fat pad contusion
3. Stress fracture of the calcaneus
4. Stress fracture of the navicular
5. Lisfranc's joint injury
6. Extensor tendinopathy
7. Midtarsal joint sprain
8. Stress fracture of the metatarsal

9. Fractures of the fifth metatarsal
10. First MTP joint sprain
11. Hallux rigidus/Hallux limitus
12. Hallus valgus (bunions)
13. Sesamoid injuries
14. Freiberg's osteochondritis
15. Morton's interdigital neuroma
16. Corns and calluses
17. Plantar warts

Medical conditions

Cardiovascular

1. Hypertrophic cardiomyopathy
2. Marfan's Syndrome
3. Arrhythmias and conduction abnormalities
4. 26th Bethesda Conference Guidelines for athletic participation for selected cardiovascular abnormalities

Respiratory

1. Shortness of breath
2. Cough
3. Asthma
4. Exercise-induced asthma (bronchoconstriction)
5. Sinusitis
6. Exercise-induced anaphylaxis
7. Exercise-induced angioedema

Gastrointestinal

1. Gastroesophageal reflux
2. Gastrointestinal bleeding
3. Abdominal pain (stitch)
4. Runner's diarrhea

The tired athlete

1. Overtraining syndrome
2. Depletion of iron stores
3. Chronic fatigue syndrome

Headache

1. Headache
2. Exercise-related headache
3. Vascular headache
4. Cervical headache

Environment illness

1. Hyperthermia (heat illness)
2. Hypothermia (cold illness)
3. Frostbite

Neck pain

What is it?

Neck pain refers to pain arising from structures in the neck.

How does it happen?

Neck pain results from damage to structures in the neck. This commonly occurs following a relatively simple movement such as bending forward or twisting your neck.

How does it feel?

Neck pain is experienced as pain felt in the neck, and occasionally in the head and shoulders. This may either be a dull ache or a sharp pain which is made worse by movement. In some situations it may prevent full motion of your neck. The pain may be in the middle of the neck, or to one or both sides of the neck. It may also radiate into the head, shoulders or arms.

What should you do?

If you have neck pain you should consult your nearest sports medicine professional for treatment.

What shouldn't you do?

If you have neck pain you shouldn't ignore the problem and continue to participate. This may lead to your problem getting worse resulting in a prolonged recovery. In addition, you should avoid activities which aggravate your pain.

Could there be any long-term effects?

Neck pain usually does not produce any long-term effects, as long it is properly diagnosed and appropriately treated. Recovery usually takes place in a matter of days to weeks. The main ongoing problem associated with neck pain is its tendency to re-occur or come back.

Management

The assistance of a sports medicine professional is important in the treatment of neck pain. Initially, they can assist in diagnosing the problem and determining its severity. This may require the use of imaging techniques such as X-ray, CT scanning or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may initially involve techniques to reduce your pain. These may include activity modification, the taking of anti-inflammatory medications, and physiotherapy treatment. When your pain has settled sufficiently, the sports medicine professional will be able to provide you with a series of stretching and strengthening exercises designed to return you back to participation and to reduce the chances of your neck pain re-occurring.

Acute nerve root pain

What is it?

Acute nerve root pain refers to when a nerve coming from the spinal cord gets compressed by a structure in the neck.

How does it happen?

Acute nerve root compression results usually from either irritation of a cervical disc (vertebral discs are located between each vertebral segment), or compromise of the intervertebral foramen (a small hole between every vertebral level where nerves exit the spinal canal) due to the presence of osteophytes (bony outgrowths) or inflammation of nearby structures.

How does it feel?

Acute nerve root compression produces a sudden onset of pain usually in the arm. Neck pain may or may not be present. Pain may be associated with pins and needles, numbness or loss of strength/movement in the arm.

What should you do?

If you have or suspect you have an acute nerve root pain, you should consult your nearest sports medicine professional.

What shouldn't you do?

If you have or suspect you have acute nerve root pain, you shouldn't ignore the problem and continue to participate. This may lead to your injury getting worse which may prolong your recovery. In addition, you shouldn't perform any activities which aggravate your pain.

Could there be any long-term effects?

Acute nerve root pain does not usually produce any long-term effects, as long as it is properly diagnosed and appropriately treated. Recovery usually takes place in a matter of weeks. However, in some cases this may be prolonged.

Management

The assistance of a sports medicine professional is important in the treatment of acute nerve root pain. Initially, they can assist in diagnosing the problem and determining its severity. This may require the use of imaging techniques such as an X-ray, CT scan or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may initially involve techniques to reduce your pain. These may include activity modification, the taking of anti-inflammatory medications, and physiotherapy. When your pain has settled sufficiently, the sports medicine professional will be able to provide you with a series of stretching and strengthening exercises designed to return you back to participation and to reduce the chances of the injury re-occurring.

Apophyseal wry neck

What is it?

Apophyseal wry neck refers to pain and tightness arising from one or more of the apophyseal joints (joints between each vertebral level) in the neck.

How does it happen?

Apophyseal wry neck usually occurs following a sudden movement resulting in sharp pain in the neck.

How does it feel?

Apophyseal wry neck is experienced as pain felt in the neck, and occasionally in the head and shoulders. This is usually a sharp pain which is made worse by movement. In most situations it will prevent full neck rotation to one side. The pain is usually to one side of the neck. It may also radiate into the head, shoulder or arm.

What should you do?

If you believe you have apophyseal wry neck you should consult your nearest sports medicine professional for treatment.

What shouldn't you do?

If you have apophyseal wry neck you shouldn't ignore the problem and continue to participate. This may lead to your problem getting worse resulting in a prolonged recovery. In addition, you should avoid activities which aggravate your pain.

Could there be any long-term effects?

Apophyseal wry neck usually does not produce any long-term effects, as long it is properly diagnosed and appropriately treated. Recovery usually takes place in a matter of days. The main ongoing problem associated with neck pain is its tendency to re-occur or come back.

Management

The assistance of a sports medicine professional is important in the treatment of apophyseal wry neck. Initially they can assist in diagnosing the problem and determining its severity. The sports medicine professional will be able to determine an appropriate treatment plan. This may initially involve techniques to reduce your pain. These may include activity modification, the taking of anti-inflammatory medications, and physiotherapy treatment. When your pain has settled sufficiently, the sports medicine professional will be able to provide you with a series of stretching and strengthening exercises designed to return you back to participation and to reduce the chances of your neck pain re-occurring.

Discogenic wry neck

What is it?

Discogenic wry neck refers to pain and tightness arising from one or more of the intervertebral discs (vertebral discs are located between each vertebral segment) in the neck or upper back.

How does it happen?

Discogenic wry neck usually has a gradual onset and classically occurs when waking after a long sleep in an awkward posture.

How does it feel?

Discogenic wry neck is experienced as pain felt in the neck, and occasionally in the head and shoulders. This is usually a constant pain which is made worse by movement. In most situations it will prevent full neck movement. The pain is usually to one side of the neck. It may also radiate into the head, shoulder or arm.

What should you do?

If you believe you have discogenic wry neck, you should consult your nearest sports medicine professional for treatment.

What shouldn't you do?

If you have discogenic wry neck, you shouldn't ignore the problem and continue to participate. This may lead to your problem getting worse resulting in a prolonged recovery. In addition, you should avoid activities which aggravate your pain.

Could there be any long-term effects?

Discogenic wry neck usually does not produce any long-term effects, as long it is properly diagnosed and appropriately treated. Recovery usually takes place in a matter of days. The main ongoing problem associated with neck pain is its tendency to re-occur or come back.

Management

The assistance of a sports medicine professional is important in the treatment of discogenic wry neck. Initially, they can assist in diagnosing the problem and determining its severity. The sports medicine professional will be able to determine an appropriate treatment plan. This may initially involve techniques to reduce your pain. These may include activity modification, the taking of anti-inflammatory medications, and physiotherapy treatment. When your pain has settled sufficiently, the sports medicine professional will be able to provide you with a series of stretching and strengthening exercises designed to return you back to participation and to reduce the chances of your neck pain re-occurring.

Acceleration/deceleration injury (whiplash)

What is it?

Acceleration/deceleration injury to the neck (whiplash) refers to the injury to any of a number of structures in the neck as a result of whiplash.

How does it happen?

Acceleration/deceleration injury to the neck is a common injury in motor vehicle accidents and contact sports. In most instances the head is either violently thrust forward or backward on impact, and injury to the structures in the neck results.

How does it feel?

Typically there is little or no pain at the time of injury. Depending on the severity of the injury, there will be a gradual increase in the intensity of the pain over the following 2–3 days. Pain is usually felt in the neck, and occasionally in the head and shoulders. This may either be a dull ache or a sharp pain which is made worse by movement. In some situations it may prevent full motion of your neck. The pain may be in the middle of the neck, or to one or both sides of the neck. It may also radiate into the head, shoulders or arms.

What should you do?

If you have had a whiplash episode you should consult your nearest sports medicine professional for treatment.

What shouldn't you do?

If you have had an acceleration/deceleration injury, you shouldn't ignore the problem and continue to exercise. This may lead to your problem getting worse, resulting in a prolonged recovery. In addition, you should avoid activities which aggravate your pain.

Could there be any long-term effects?

Mild–moderate acceleration/deceleration injury usually does not produce any long-term effects, as long it is properly diagnosed and appropriately treated. Recovery in a mild–moderate case usually takes place in matter of weeks to months. A severe case, however, can occasionally lead to degeneration of the discs in the neck and joint damage, resulting in long-term mobility and pain problems.

Management

The assistance of a sports medicine professional is important in the treatment of an acceleration/deceleration injury. Initially, they can assist in diagnosing the problem and in determining its severity. This may require the use of imaging techniques such as X-ray, CT scanning or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may initially involve techniques to reduce your pain. These may include activity modification, wearing of a soft collar, the taking of anti-inflammatory medications, and physiotherapy treatment. When your pain has settled sufficiently, the sports medicine professional will be able to provide you with a series of stretching and strengthening exercises designed to return you back to work and exercise, and to reduce the chances of your neck pain re-occurring.

Rotator cuff tendinopathy

What is it?

The rotator cuff refers to a group of four small muscles which run from the shoulder blade to the top of the arm bone. They support and move the shoulder joint. The rotator cuff muscles attach to the arm bone by tendons. Rotator cuff tendinopathy refers to inflammation and swelling within one or more of these tendons.

How does it happen?

Rotator cuff tendinopathy results from overuse or injury to a rotator cuff tendon. The most commonly involved tendon is that of the supraspinatus muscle. This muscle helps to raise the arm into the air. Its tendon passes through a small space between the top of the arm bone and the point of the shoulder. In this space the tendon is susceptible to 'wear and tear'. Repetitive use of the supraspinatus muscle and, therefore, the supraspinatus tendon can rub the tendon against the edges of the bony space resulting in microscopic tears within the substance of the tendon.

How does it feel?

Rotator cuff tendinopathy results in pain felt in the top of the upper arm. This is usually felt when you try to lift your arm into the air and typically develops gradually. Initially, the tendon may only be painful following exercise. For example, it may be first felt on rising the day following participation. Associated with the pain may be stiffness or tightness in the shoulder. Typically, these initial signs of rotator cuff tendinopathy are ignored, as they disappear quickly with use of the arm or applying heat (i.e. a hot shower) over the shoulder. However, as you continue to participate, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. For example, it may begin to be present during participation. In the earlier stages, this pain during participation may initially disappear as you warm up, only to return when you cool-down. However, as you continue to participate, the tendinopathy worsens and your pain may begin to be present for longer periods during participation until it is present each you lift your arm. This may interfere with your performance.

What should you do?

Rotator cuff tendinopathy generally does not get better on its own if the cause is not addressed and you continue to participate. If you have or suspect you have rotator cuff tendinopathy, you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of icing following participation. Icing may consist of crushed ice wrapped in a moist towel applied to the sore area for 15–20 minutes.

What shouldn't you do?

If you have or suspect you have rotator cuff tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout participation. If this occurs, your recovery may be prolonged and it may take a number of weeks or months for you to return to full participation.

Could there be any long-term effects?

Rotator cuff tendinopathy does not produce any long-term effects as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the upper arm and a prolonged lay-off from participation.

Management

The assistance of a sports medicine professional is important in the treatment of rotator cuff tendinopathy. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed rotator cuff tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Calcific tendinopathy of the rotator cuff

What is it?

The rotator cuff refers to a group of four small muscles which run from the shoulder blade to the top of the arm bone. They support and move the shoulder joint. The rotator cuff muscles attach to the arm bone by tendons. Calcific tendinopathy refers to the laying down of calcium deposits within one or more of these tendons.

How does it happen?

The cause of calcific tendinopathy is not clear. However, it may result from overuse or injury to a rotator cuff tendon. The most commonly involved tendon is that of the supraspinatus muscle. This muscle helps to raise the arm into the air. Its tendon passes through a small space between the top of the arm bone and the point of the shoulder. In this space the tendon is susceptible to 'wear and tear'. Repetitive use of the supraspinatus muscle and, therefore, the supraspinatus tendon can rub the tendon against the edges of the bony space. This can stimulate the laying down of calcium deposits within the tendon and also cause inflammation or swelling of the tendon.

How does it feel?

Calcific tendinopathy results in pain felt in the upper arm and over the shoulder. This pain is often intense such that it feels like a toothache-like pain in the shoulder. It is often present when the arm is at rest and made worse by movement of the arm.

What should you do?

Calcific tendinopathy often does not get better if it is not treated. Therefore, if you have or suspect you have calcific tendinopathy you should consult your nearest sports medicine professional.

What shouldn't you do?

If you have or suspect you have calcific tendinopathy, you shouldn't ignore the problem. This may lead to your injury getting worse. If this occurs your recovery may be prolonged.

Could there be any long-term effects?

Calcific tendinopathy does not usually produce any long-term effects as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the upper arm and a prolonged lay-off from participation. In some situations, this may occur despite appropriate treatment. In these cases, surgery may be required to remove the calcium deposits and to alleviate your pain.

Management

The assistance of a sports medicine professional is important in the treatment of calcific tendinopathy. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as an X-ray or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the taking of anti-inflammatory medications and, in some cases, the injection of a small amount of anti-inflammatory directly into the affected tendon.

Rotator cuff strain

What is it?

The rotator cuff refers to a group of four small muscles which run from the shoulder blade to the top of the arm bone. They act to both support and move the shoulder joint. A rotator cuff strain refers to a tear in one or more of these muscles.

How does it happen?

A rotator cuff muscle may be strained when it is forcibly contracted or overstretched. This can occur in any activity which requires movement of the shoulder.

How does it feel?

A tear of a rotator cuff muscle is usually felt as sudden pain or a 'twinge' felt in the shoulder area. In minor tears you may be able to continue participating with minimal hindrance. However, as the muscle cools down following participation the pain may gradually worsen as bleeding and swelling around the injured muscle takes place. In more severe tears, pain may be exaggerated such that you are unable to continue participating immediately following injury. In these cases the shoulder may also feel weak.

What should you do?

If you have or suspect you have a rotator cuff strain, it is advised you cease participating and begin initial treatment. The most important time in the treatment of a rotator cuff strain is the first 24–48 hours. This is when bleeding and swelling around the injured muscle is most active. Although swelling is a necessary step in the healing process, too much can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage, the injured rotator cuff muscle should be rested and iced. Rest involves ceasing to participate and limiting the use of the injured arm. Icing involves applying ice to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel. You should continue this until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury (within the first couple of days).

What shouldn't you do?

In the first few days following rotator cuff strain you shouldn't undertake activities which increase blood flow to the injured muscle. These include hot showers, shoulder stretching, heat rubs, massage, the consumption of alcohol and excessive use of the arm. These can prolong muscle bleeding and exaggerate swelling resulting in further pain and an extended recovery.

Could there be any long-term effects?

Most rotator cuff strains heal without complication within a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and the extent of damage. For example, when a rotator cuff muscle is completely torn surgery may be required to repair the muscle. To recover from surgery and enable the muscle to fully heal, a prolonged recovery may be required. Similarly, in minor tears recovery may be prolonged if the tear is not appropriately managed. This may result in a tight, weak rotator cuff muscle which is prone to reinjury with return to participation. This weakened muscle may also predispose you to other shoulder injuries such as rotator cuff tendinopathy.

Management

The assistance of a sports medicine professional is important in the treatment of a rotator cuff strain. Initially, they can assist in determining the exact tissue/s damaged and the extent of this damage. This may require the use of imaging techniques such as ultrasound to aid in the diagnosis. From this, a determination of how long the injury is expected to take to heal can be provided and an appropriate management plan developed. The latter may involve activity modification, the use of soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. These exercises will facilitate your return to participation, help prevent reinjury and reduce the likelihood of developing longer-term effects.

Dislocation of the shoulder joint (glenohumeral joint)

What is it?

A dislocation of the shoulder joint refers to when the top of the arm bone comes out of and stays out of its socket.

How does it happen?

When forces acting on the shoulder joint are too great for the supporting muscles and ligaments to resist, the top of the arm bone may be caused to 'pop out' or dislocate. This can occur with a direct blow to the shoulder joint which pushes the ball-shaped top of the arm bone out of its socket. Alternatively, it may result from the transmission of forces up the arm to the shoulder joint. For example, when you land on an outstretched hand, forces can be transmitted up the arm to the shoulder joint causing it to dislocate.

How does it feel?

The first sensation felt when the shoulder is dislocated is immediate and intense pain. This is often felt all over the shoulder and may also radiate down the arm. It is usually so intense that you cradle your arm against your body with your other arm. At the time of injury you may have also sensed the shoulder 'popping out'. This 'popping-out' or dislocation of the joint is often visible when you compare the appearance of the injured shoulder to the opposite side.

What should you do?

A shoulder dislocation is a serious injury which requires immediate medical attention. If you have or suspect you have dislocated your shoulder you should cease participating and go directly to your nearest sports medicine professional or doctor. To support your arm whilst travelling you should wear an arm sling or, if one is not available, fold up the bottom half of your jumper or shirt to support and cradle your arm. To help with your pain and reduce and control any swelling you should also apply ice to the shoulder. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth applied for up to 20 minutes.

What shouldn't you do?

If you have or suspect you have dislocated your shoulder, the main thing you shouldn't do is try to 'reduce' or relocate the top of the arm bone back into its socket by yourself. This requires the assistance of a sports medicine professional or a doctor. If not done properly serious damage may be done to other structures (nerves, bones, ligaments, cartilage) resulting in irreparable damage and/or a longer recovery time. In addition, you shouldn't undertake any activities which increase blood flow to the injured site. These include hot showers, heat rubs, the consumption of alcohol and massage. These will cause further swelling in the damaged tissues resulting in a prolonged recovery.

Could there be any long-term effects?

Due to the seriousness of a shoulder dislocation, there are unfortunately potential long-term effects. The most common of these is recurrent or ongoing shoulder dislocations. When the shoulder joint is dislocated, the tissues which support it are overstretched and in some cases torn. This makes the joint less stable and decreases its ability to resist or withstand external forces. As a consequence, it dislocates much more easily. Other long-term effects result from damage to surrounding structures when the shoulder joint is dislocated. Occasionally, when the shoulder joint is dislocated, nearby nerves may be damaged. This can result in numbness or altered sensation over the outside of the shoulder and occasionally weakness in the shoulder muscles. This can prolong your recovery. Similarly, recovery may be prolonged if a bone is fractured or broken when the shoulder is 'popped out'.

Management

The assistance of a sports medicine professional is important in the treatment of a dislocated shoulder. Initially, they can confirm that the shoulder is actually dislocated. If it is, they can assist in relocating or 'reducing' the bones back into their normal position. Following this, they can assess which tissues have been damaged and the extent of this damage. This may require the use of an X-ray to determine whether any of the bones are damaged. From this, the sports medicine professional will be able to provide you with a determination of how long the injury is expected to take to heal. During your recovery, they will be able to assist in reducing your pain and promoting your recovery. This will usually involve wearing a sling for the first few weeks followed by progressing you through a series of exercises designed to return you back to participation and reduce the risk of ongoing shoulder dislocations.

Shoulder instability

What is it?

Shoulder instability refers to when the capsule and ligaments supporting the shoulder joint become loose, enabling the bones forming the joint to move excessively on one another.

How does it happen?

Shoulder instability occurs when the capsule and ligaments supporting the shoulder joint become loose and allow excessive movement of the bones that make-up the joint. This most commonly occurs following a shoulder dislocation where the top of the arm bone is 'popped out' of its socket. This overstretches and injures the capsule and ligaments surrounding the shoulder joint, reducing their ability to support the joint and making the joint 'unstable'. Similarly, the capsule and ligaments supporting the shoulder joint may be overstretching and damaged if they are repetitively stressed. This can occur, for example, during throwing which stretches out these structures. If performed repetitively, this can make the capsule and ligaments loose and the shoulder joint 'unstable'. Shoulder instability may also result from ligament laxity you were born with. People with this type of laxity are often referred to as 'double jointed' and have loose ligaments and instability at most joints in the body.

How does it feel?

Shoulder instability may cause a number of sensations. In certain positions of the arm, the bones within the shoulder joint may slip or 'sublux'. This is often felt as a clunking sensation as the bones within the shoulder joint move excessively on one another. This clunking may be associated with pain which is felt deep within the shoulder. This may create a situation where you don't like moving the arm into the position where it clunks. In some situations you may also experience a 'dead arm' where the arm feels momentarily numb and weak after the bones slip or 'sublux'. When the capsule and ligaments supporting the shoulder joint are extremely loose, the shoulder joint may continually dislocate.

What should you do?

If you have or suspect you have shoulder instability, it is advised you seek the assistance of a sports medicine professional. Shoulder instability does not get better on its own.

What shouldn't you do?

If you have or suspect you have shoulder instability, you should avoid those positions or activities that are likely to cause a further episode. This may cause further damage and prolong your recovery.

Could there be any long-term effects?

Shoulder instability generally does not produce any long-term effects as long as it is accurately diagnosed and appropriately treated. Treatment often involves several months of intense shoulder rehabilitation. This is often successful; however, in some situations your instability may continue to be a problem. This may result in dislocation/s of the shoulder joint and subsequent damage to surrounding structures, including nerves, bone, and the cartilage lining the joint surfaces. Damage to the cartilage may result in shoulder arthritis later in life. To treat the ongoing laxity in the capsule and ligaments supporting the shoulder joint, surgery may be required to tighten these structures and increase the 'stability' of the joint.

Management

The assistance of a sports medicine professional is important in the treatment of shoulder instability. Initially, they can confirm your diagnosis and the extent of the damage. This may require the use of imaging techniques such as X-ray, CT scans or MRI. Following this, they can provide you with a determination of how long your rehabilitation is expected to take and determine an appropriate treatment program. This may involve the use of massage, stretches and a series of specific exercises designed to strengthen the muscles that stabilise and support the shoulder joint. Surgery to reconstruct the damaged joint lining ('labral tear') and tighten the loose ligaments is sometimes necessary. The sports medicine professional is able to determine whether and when this may be appropriate in your overall circumstances.

Fracture of the clavicle

What is it?

A fracture of the clavicle refers to a break in the collarbone.

How does it happen?

The clavicle is usually fractured following an impact to the point of the shoulder. The impact may be with a stationary object, such as the ground or wall, or with a moving object, such as an opponent. Similarly, the clavicle may be fractured when you fall on either your elbow or an outstretched hand. When this occurs, the force of the impact is transmitted along the bones in the arm to the clavicle. If the force is sufficient the clavicle may break.

How does it feel?

The first sensation felt when the clavicle is fractured is extreme pain experienced somewhere between the bottom of the neck and point of shoulder. There may also be an audible snap or crack as the bone breaks. When you look at your collarbone, there may be an obvious deformity or bump. This is due to either displacement of the broken ends of the bone or early bleeding and swelling around the site of the fracture.

What should you do?

A fracture of the clavicle is a serious injury. If you have or suspect you have a fracture of the clavicle, you should stop participating and seek the assistance of a sports medicine professional. To support your arm whilst travelling you should wear an arm sling or, if one is not available, fold up the bottom half of your jumper or shirt to support and cradle your arm. To help with your pain and reduce and control any swelling you should apply ice to the shoulder. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth applied for up to 20 minutes.

What shouldn't you do?

If you have or suspect that you have fractured your clavicle, you shouldn't perform any activities which may cause the broken ends of the bone to move on one another. To do achieve this you shouldn't use the injured arm until it has been assessed by a sports medicine professional. In addition, you should avoid any activities which may increase the blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase the bleeding around the fractured ends of bone and potentially prolong your recovery.

Could there be any long-term effects?

Most fractures of the clavicle heal without complication in a matter of weeks. This may leave a visible bump in the bone. However, this is a cosmetic problem in that it is a deformity which is pain free and doesn't interfere with the use of your arm. In a small number of cases the broken ends of the bone fail to heal or 'unite'. When this occurs you may need latter surgery or alternative treatments to stimulate healing.

Management

The assistance of a sports medicine professional is important in the treatment of a fractured clavicle. Initially, they can assist in diagnosing the injury and the extent of the damage. This may require the use of an X-ray to view the bone. From this, the sports medicine professional will be able to provide you with a determination of how long the injury is expected to take to heal and determine an appropriate treatment program. If your clavicle is fractured, the latter will usually involve wearing a sling for the first few weeks followed by a series of exercises designed to return you back to participation and reduce the risk of ongoing problems.

Acromioclavicular (AC) joint injury

What is it?

An acromioclavicular or AC joint injury refers to an injury to the joint between the end of your collarbone (clavicle) and the upper part of your shoulder blade (acromion).

How does it happen?

The AC joint is usually injured following an impact to the point of the shoulder. The impact may be with a stationary object, such as the ground or wall, or with a moving object, such as an opponent. This impact can push the upper part of the shoulder blade beneath the end of the collarbone. This can injure the capsule surrounding the AC joint and the ligaments which support the joint.

How does it feel?

The first sensation felt when the AC joint is injured is pain experienced on the top of the shoulder. This pain may be strong enough to stop you from using the injured arm and may cause you to cradle the arm close to your body. Depending on the severity of the injury, when you look at the site where the pain is coming from there may be an obvious deformity or bump. This is due to either displacement of the bones forming the joint or early bleeding and swelling around the injured structures.

What should you do?

If you have or suspect you have injured your AC joint, it is advised you cease participating and begin initial treatment. The most important time in the treatment of a AC joint injury is the first 24–48 hours. This is when bleeding and swelling around the injured tissues is most active. Although swelling is a necessary step in the healing process, too much can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the injured tissues, the shoulder should be rested and iced. Rest involves ceasing to participate and limiting the use of the injured arm. If the pain is strong you may use a sling to support the arm and reduce the tension on the injured structures. Icing involves applying ice to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel. You should continue this until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury (within the first couple of days).

What shouldn't you do?

In the first few days following AC joint injury, you shouldn't undertake activities which increase blood flow to the injured tissues. These include hot showers, heat rubs, massage, the consumption of alcohol and excessive use of the arm. These can prolong bleeding and exaggerate swelling resulting in further pain and an extended recovery.

Could there be any long-term effects?

Most AC joint injuries heal without complication, within a matter of weeks. However, a proportion of injuries can result in longer-term effects. In more serious injuries, recovery may be prolonged due to the extent and severity of damage to the injured tissues. Similarly, in more minor tears, recovery may be prolonged if the tear is not appropriately managed. This may result in ongoing shoulder pain and an increased risk of reinjury when you return to participation.

Management

The assistance of a sports medicine professional is important in the treatment of an AC joint injury. Initially, they can assist in diagnosing the injury and the extent of the damage. This may require the use of an X-ray to exclude damage to the bones. From this, the sports medicine professional will be able to provide you with a determination of how long the injury is expected to take to heal and determine an appropriate treatment program. The latter may involve the use of a sling to help with your pain, the use of ultrasound therapy to assist with the healing of the injured tissues and a series of exercises designed to return you back to participation and reduce the risk of reinjury. In terms of the latter, a sports medicine professional will also be able to advise you on other preventive measures, such as the use of strapping tape.

Adhesive capsulitis (frozen shoulder)

What is it?

Often referred to as 'frozen shoulder', adhesive capsulitis refers to inflammation and scarring of the capsule which surrounds the shoulder joint.

How does it happen?

The exact reason why adhesive capsulitis develops is not known. However, it tends to occur in the middle-aged or older athletes and is believed to result from some form of irritation to the shoulder joint and its surrounding capsule. Irritation to the shoulder joint capsule results in an inflammatory response. This inflammation of the shoulder joint capsule is referred to as 'capsulitis'. Associated with the capsulitis is the formation of adhesions or small scars between folds within the capsule. Consequently, the condition is referred to as adhesive capsulitis.

How does it feel?

The two main sensations felt with adhesive capsulitis are pain and a loss of movement in the shoulder. The pain may be aching, dull or stabbing, and is most frequently felt deep in the shoulder and over the outside of the upper arm. It is generally aggravated by almost all movements of the shoulder and arm, and its intensity or strength may vary from day-to-day depending on how much you use the arm. The pain is often strong enough to interfere with your normal activities and you may feel it at night when sleeping. The loss of movement in the shoulder results from the adhesions or scars forming within the joint capsule. These generally develop gradually resulting in a progressive rather than sudden loss in the range of motion in the shoulder. Stretching of these adhesions may aggravate your pain.

What should you do?

If you have or suspect you have adhesive capsulitis you should seek the assistance of a sports medicine professional or doctor as soon as possible.

What shouldn't you do?

If you have or suspect you have adhesive capsulitis you shouldn't ignore the problem. The longer you leave the condition without treatment, the worse it may become. This may make your pain and restriction in movement worse and prolong your recovery.

Could there be any long-term effects?

Adhesive capsulitis usually gets better on its own. However, this normally takes a number of months and there is little that can be done to accelerate this time frame. Treatment markedly reduces this recovery time. Fortunately, once recovery does occur the long-term outlook is good, unless there is some other underlying condition affecting the shoulder, such as a tear of the rotator cuff.

Management

If the diagnosis of adhesive capsulitis is made, the sports medicine professional will be to provide you with an appropriate treatment program. This will most commonly be aimed at reducing your pain and improving your shoulder range of motion. It may involve the use of anti-inflammatory medications, electrotherapy treatment, and stretching, strengthening and range of motion exercises. Occasionally, if these measures do not provide relief, referral from the sports physician for an injection into the shoulder may be appropriate. This is performed by a radiologist. It involves injecting fluid into the shoulder to stretch up the lining of the joint (hydrodilatation) and stretches up the restricted lining of the joint. It is followed up by physiotherapy to ensure that the extra range of motion gained by the procedure is maintained. The procedure also provides significant pain relief.

Biceps tendinopathy

What is it?

Biceps tendinopathy refers to inflammation within the tendon which connects the biceps muscle on the front of the upper arm with the shoulder blade.

How does it happen?

Biceps tendinopathy results from overuse of the biceps tendon. The function of the biceps tendon is to transmit forces produced by the biceps muscle to the shoulder blade so as to produce or control movement at the shoulder joint. To reach its insertion onto the shoulder blade, the biceps tendon passes through a narrow groove in the arm bone. In this groove the tendon is susceptible to 'wear and tear'. Repetitive use of the biceps muscle and, therefore, the biceps tendon can rub the tendon against the edges of the bony groove resulting in microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy.

How does it feel?

Biceps tendinopathy results in pain felt in the top of the upper arm. This pain typically develops gradually. Initially, the tendon may only be painful following exercise. For example, it may be first felt on rising the day following participation. Associated with the pain may be stiffness or tightness in the shoulder. Typically, these initial signs of biceps tendinopathy are ignored as they disappear quickly with use of the arm or applying heat (i.e. a hot shower) over the shoulder and upper arm. However, as you continue to participate, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. For example, it may begin to be present during participation. In the earlier stages, this pain during participation may initially disappear as you warm-up, only to return when you cool down. However, as you continue to participate, the tendinopathy worsens and your pain may begin to be present for longer periods during participation until it is present all of the time. This may interfere with your performance.

What should you do?

Biceps tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have biceps tendinopathy, you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. This should consist of icing following participation. Icing may consist of crushed ice wrapped in a moist towel applied over the sore site for 15-20 minutes or ice in a paper cup massaged over the sore region until the skin is numb.

What shouldn't you do?

If you have or suspect you have biceps tendinopathy you shouldn't ignore the problem. Your pain may get better as you exercise, however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout participation. If this occurs, your recovery may be prolonged and it may take a number of weeks or months for you to return to full participation.

Could there be any long-term effects?

Biceps tendinopathy does not produce any long-term effects as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the upper arm and a prolonged lay-off from participation.

Management

The assistance of a sports medicine professional is important in the treatment of biceps tendinopathy. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed biceps tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Rupture of the long head of biceps

What is it?

Rupture of the long head of biceps refers to a complete break within the tendon which connects the biceps muscle on the front of the upper arm with the shoulder blade.

How does it happen?

A rupture of the long head of biceps can occur when the biceps muscle is forcibly contracted. The function of the biceps tendon is to transmit forces produced by the biceps muscle to the shoulder blade so as to produce or control movement at the shoulder joint. Forcible contraction of the muscle can overstress the biceps tendon resulting in it breaking or rupturing. This most commonly occurs in the middle-aged or older athlete who has a history of biceps tendinopathy. To reach its insertion onto the shoulder blade, the biceps tendon passes through a narrow groove in the arm bone. In this groove the tendon is susceptible to 'wear and tear'. Repetitive use of the biceps muscle and, therefore, the biceps tendon can rub the tendon against the edges of the bony groove resulting in microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy. Where this occurs, it results in an area of weakness within the biceps tendon which can rupture if forces are great enough.

How does it feel?

A complete rupture of the long head of biceps results in instant pain felt in the top of the upper arm. This is often associated with a sensation of something suddenly snapping or tearing. The pain may settle quickly, however, when you look at the front of the upper arm and biceps muscle it appears different than normal. There may be bunching up of the muscle in the lower part of the upper arm resulting in a prominent lump. This lump may become more apparent if you contract or tighten your biceps muscle.

What should you do?

A rupture of the long head of biceps does not get better on its own. Therefore, if you have or suspect this injury, it is advised you seek the assistance of a sports medicine professional as soon as possible (i.e. on the same day as the injury). In the meantime you can begin initial treatment to limit the amount of bleeding and swelling within and around the torn ends of the tendon. This should consist of rest and the application of ice to the shoulder. Rest involves ceasing to participate and limiting the amount you use the injured arm. Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, this should be applied using crushed ice wrapped in a moist cloth or towel.

What shouldn't you do?

Following a rupture of the long head of biceps you shouldn't undertake activities which increase blood flow to the injured site and, therefore, bleeding and swelling to the area. These include hot showers, heat rubs, massage, the consumption of alcohol and excessive activity.

Could there be any long-term effects?

A rupture of the long head of biceps does not heal by itself. As a result it may be repaired surgically. The decision to perform surgery will depend on how much the injury is interfering with the functioning of your arm, and your individual sport and situation. If your arm functioning is not impaired, the tendon may not be repaired. In these cases you should be able to return to participation following a short period of rehabilitation.

Management

The assistance of a sports medicine professional is important in the treatment of a rupture of the long head of biceps. Initially, they can assist in diagnosing the problem and establishing its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may require surgery, the use of soft tissue treatment such as massage and stretching, and the progression through a series of strengthening exercises.

Pectoralis major strain

What is it?

A pectoralis major strain refers to a tear in the large muscle which covers the chest.

How does it happen?

A pectoralis major strain typically occurs when the muscle is forcibly contracted whilst in a stretched position. This can occur during weight training when performing bench press exercises. When the bar is lowered, the pectoralis major muscle is stretched across the chest. In this position, overstretching of the muscle combined with the need to generate high muscle forces to lift and lower the bar may place too much stress on the muscle. The muscle subsequently tears.

How does it feel?

The first sensation you feel when the pectoralis major muscle is torn is sudden pain felt in the chest or, more commonly, at the front of the armpit. At the same time you may have a sensation of something tearing. In minor tears you may be able to continue participating with minimal hindrance. However, as the muscle cools down following participation, pain may gradually worsen as bleeding and swelling around the injured muscle takes place. This may be associated with progressive tightening and stiffening of the pectoralis muscle. In more severe tears these sensations may be exaggerated such that you are unable to continue participating immediately following injury due to excessive pain, and muscle tightness, weakness and spasm. In complete tears of the pectoralis major muscle, you may have instant pain which quickly subsides. However, as the muscle is completely torn, you are unable to produce force and the arm is substantially weakened.

What should you do?

To limit the severity of the injury, it is advised you cease participating and begin initial treatment. The most important time in the treatment of a pectoralis major strain is the first 24–48 hours. This is when bleeding and swelling around the injured muscle is most active. Although swelling is a necessary step in the healing process, too much can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the pectoralis muscle, the muscle should be rested and iced. Rest involves ceasing to participate and limiting the use of the injured arm. Icing involves applying ice to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel. You should continue this until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury (within the first couple of days).

What shouldn't you do?

In the first few days following a pectoralis major strain you shouldn't undertake activities which increase blood flow to the injured muscle. These include hot showers, pectoralis stretching, heat rubs, massage, the consumption of alcohol and excessive use of the arm. These can prolong muscle bleeding and exaggerate swelling resulting in further pain and an extended recovery.

Could there be any long-term effects?

Most pectoralis major strains heal without complication, within a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and the extent of damage. Complete tears of the muscle rarely heal by themselves and may require surgery to reunite the torn ends of the muscle. If a complete tear is not diagnosed and addressed early, it may prolong your recovery. Similarly, in more minor tears, recovery may be prolonged if the tear is not appropriately managed. This may result in a tight, weak pectoralis major muscle which is prone to reinjury when you return to participation.

Management

The assistance of a sports medicine professional is important in the treatment of a pectoralis major strain. Initially, they can assist in determining the exact tissue/s damaged and the extent of this damage. This is particularly important in complete tears of the pectoralis major muscle and may require the use of imaging techniques such as ultrasound. From this, a determination of how long the injury is expected to take to heal can be provided and an appropriate management plan developed. The latter may mean the use of a number of treatment techniques to assist in reducing pain and swelling and to enhance the healing of the injured structures. This can be facilitated by providing you with an appropriate progression of exercises aimed at increasing your muscle length, strength and function. These exercises will facilitate your return to participation and help prevent reinjury.

Levator scapulae syndrome

What is it?

Levator scapulae syndrome refers to pain arising from the levator scapulae muscle where it attaches to the top of the shoulder blade in the upper back.

How does it happen?

Levator scapulae syndrome results from prolonged overstretching of the levator scapulae muscle. This can occur if you have poor posture of your shoulders. For example, when sitting hunched over with your shoulders rounded. This stretches the levator scapulae muscle and, when performed over a long-period of time, can result in inflammation and pain within the muscle.

How does it feel?

Levator scapulae syndrome produces pain which is felt in the upper back. This is most often felt where the muscle attaches to the top of the shoulder blade. However, it may also be felt in the neck, over the top of the shoulder or between the shoulder blades. This pain may disappear quickly when heat (i.e. a hot shower) is applied over the shoulder blade.

What should you do?

If you have or suspect you have levator scapulae syndrome, you should seek the assistance of a sports medicine professional.

What shouldn't you do?

If you have or suspect you have levator scapulae syndrome, you shouldn't ignore the problem. Your pain may improve if you apply heat over the shoulder or massage the sore area; however, unless the cause of the problem is identified and addressed the pain will continue to return and may get progressively worse.

Could there be any long-term effects?

Levator scapulae syndrome does not produce any long-term effects, as long as it accurately diagnosed and appropriately treated.

Management

The assistance of a sports medicine professional is important in the treatment of levator scapulae syndrome. Initially, they can assist in confirming your diagnosis and the reason why you developed it. Following this, the sports medicine professional will be able to design an appropriate treatment plan to reduce your pain and reduce the chance of it returning. This may involve massage, stretching and strengthening exercises, and exercises designed to improve your posture.

Nerve entrapments around the shoulder

What is it?

A nerve entrapment around the shoulder refers to when a nerve within the shoulder becomes stuck to or compressed by tissues surrounding it.

How does it happen?

Nerves in the shoulder may become entrapped when adhesions develop between the nerve and the surrounding tissues. These adhesions may restrict how much the nerve can slide forwards and backwards as the arm is moved. This may cause overstretching of the nerve at the site of the adhesions resulting in the interference of signals being transmitted by the nerve. Alternatively, the nerves in the shoulder may become entrapped by excessively tight surrounding tissues. These may compress the nerve and interfere with the transmission of its signals. In the shoulder the most commonly entrapped nerve is the suprascapular nerve. This may be entrapped as it passes around the bony edges of the shoulder blade.

How does it feel?

When a nerve in the shoulder is entrapped the most common sensation felt is pain. For the suprascapular nerve this is usually felt over the shoulder blade. However, it may also be felt in the arm, neck or even the chest. Often associated with this is a feeling of weakness in the shoulder.

What should you do?

Nerve entrapments in the shoulder generally do not get better on their own if the cause of the entrapment is not treated. If you have or suspect you have a nerve entrapment, you should consult your nearest sports medicine professional. In the meantime, you should avoid activities which aggravate or provoke your pain. This may lead to the further entrapment and worsening of your pain.

What shouldn't you do?

If you have or suspect you have an entrapped nerve in your shoulder, you shouldn't ignore the problem. This can lead to your injury getting worse which may prolong your recovery.

Could there be any long-term effects?

Nerve entrapments in the shoulder do not usually produce any long-term effects as long as they are properly diagnosed and appropriately treated. If not, they can lead to ongoing pain in the shoulder, wasting of the muscles the entrapped nerve supplies and a prolonged lay-off from participation. Appropriate treatment often involves surgery to remove the structures that have entrapped the nerve.

Management

The assistance of a sports medicine professional is important in the treatment of an entrapped nerve in the shoulder. Initially, they can assist in diagnosing the cause of the problem and establishing its severity. This may require the use of electromyography tests which assess whether the muscles supplied by the nerve are functioning normally. From their assessment, the sports medicine professional will be able to determine an appropriate treatment plan. In the shoulder, this often requires surgery to remove the structures that have entrapped the nerve. Following surgery the sports medicine professional will also be able to assist in returning you to participation. This may involve soft tissue treatment such as massage and stretching, and specific exercises to strengthen your shoulder.

Extensor tendinopathy ('tennis elbow')

What is it?

Commonly referred to as 'tennis elbow', extensor tendinopathy refers to degeneration and inflammation within the tendons on the outside of the elbow. These tendons connect the forearm muscles to the arm bone. These muscles function to move the wrist, hand and fingers.

How does it happen?

Extensor tendinopathy is a common injury associated with activities requiring repetitive use of the wrist and hand, and results from overuse of the tendons on the outside of the forearm. The function of these tendons is to transmit forces produced by the forearm muscles to their origin from the arm bone. Repetitive use of the forearm muscles and, therefore, the forearm tendons can lead to microscopic tears within the tendons and degeneration or breakdown of the tendons. To repair this degeneration the body commences an inflammatory response.

How does it feel?

The primary sensation with extensor tendinopathy is pain felt on the outside of the elbow and forearm. This pain typically develops gradually. Initially, it may only be painful following exercise. Associated with the pain may be stiffness or tightness in the elbow and forearm region. Typically, these initial signs of extensor tendinopathy are ignored, as they disappear quickly with use of the arm or applying heat (i.e. a hot shower) over the elbow and forearm region. However, as you continue to exercise, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. In the earlier stages, this pain during exercise may initially disappear as you warm up, only to return when you cool down. However, as you continue to exercise, the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Extensor tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have extensor tendinopathy, you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of icing following exercise and regular gentle stretching of the forearm muscles. Icing should consist of crushed ice wrapped in a moist towel applied for 15–20 minutes or ice in a paper cup massaged over the outside of the elbow until the skin is numb.

What shouldn't you do?

If you have or suspect you have extensor tendinopathy you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout exercise. If this occurs, your recovery may be prolonged and it may take a number of weeks or months for you to return to exercise and sport.

Could there be any long-term effects?

Extensor tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain on the outside of the elbow and a prolonged lay-off from exercise and sport.

Management

The assistance of a sports medicine professional is important in the treatment of extensor tendinopathy. Initially, they can assist in diagnosing the problem and establishing its severity. An ultrasound examination may be required to confirm the diagnosis. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed extensor tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Entrapment of the posterior interosseous nerve

What is it?

Entrapment of the posterior interosseous nerve refers to when the posterior interosseous nerve becomes caught as it travels through the supinator muscle on the outside of the elbow and forearm.

How does it happen?

Entrapment of the posterior interosseous nerve may result from adhesions developing between the nerve and the supinator muscle through which it passes to gain entry to the forearm. These adhesions may restrict how much the nerve can slide forwards and backwards as the arm is moved. This may cause overstretching of the nerve at the site of the adhesions resulting in the interference of signals being transmitted by the nerve. Alternatively, the posterior interosseous nerve may be entrapped if the supinator muscle through which it passes is excessively large or tight. This may compress the nerve and interfere with the transmission of its signals.

How does it feel?

When the posterior interosseous nerve is entrapped, the most common sensation felt is pain. This is usually experienced on the outside of the forearm about four finger breadths down from the elbow joint. It is often made worse by turning the forearm so that the palm of the hand faces upwards.

What should you do?

Entrapment of the posterior interosseous nerve generally does not get better on its own if the cause of the entrapment is not treated. If you have or suspect that you have posterior interosseous nerve entrapment, you should consult your nearest sports medicine professional. In the meantime, you should avoid activities which aggravate or provoke your pain. These may lead to the further entrapment and worsening of your pain.

What shouldn't you do?

If you have or suspect you have entrapment of the posterior interosseous nerve, you shouldn't ignore the problem. This can lead to your injury getting worse which may prolong your recovery.

Could there be any long-term effects?

Entrapment of the posterior interosseous nerve does not usually produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to ongoing pain in the elbow and a prolonged lay-off from exercise and sport. In some situations, this may occur despite appropriate treatment. In these cases surgery may be required to remove the structures which have entrapped the nerve, so as to alleviate your pain.

Management

The assistance of a sports medicine professional is important in the treatment of an entrapped posterior interosseous nerve. Initially, they can assist in diagnosing the cause of the problem and establishing its severity. This may require the use of special nerve conduction tests which assess the transmission of signals along the nerve. From their assessment, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification and soft tissue treatment such as massage and stretching. The sports medicine professional will also be able to assess and determine why you developed entrapment of the posterior interosseous nerve and address this during your recovery to prevent a re-occurrence when you return to exercise and sport.

Flexor tendinopathy ('golfer's elbow')

What is it?

Commonly referred to as 'golfer's elbow', flexor tendinopathy refers to degeneration and inflammation within the tendons on the inside of the elbow. These tendons connect the forearm muscles to their origin from the arm bone. These muscles function to move the wrist, hand and fingers.

How does it happen?

Flexor tendinopathy is a common injury in activities requiring a lot of use of the wrist and hand, and results from overuse of the tendons on the inside of the forearm. The function of these tendons are to transmit forces produced by the forearm muscles to their origin from the arm bone. Repetitive use of the forearm muscles and, therefore, the forearm tendons can lead to microscopic tears within the tendons and degeneration or breakdown of the tendons. To repair this damage the body commences an inflammatory response.

How does it feel?

The primary sensation with flexor tendinopathy is pain felt along the inside of the elbow and forearm. This pain typically develops gradually. Initially it may only be painful following exercise. Associated with the pain may be stiffness or tightness in the elbow and forearm region. Typically, these initial signs of flexor tendinopathy are ignored as they disappear quickly with use of the arm or applying heat (i.e. a hot shower) over the elbow and forearm region. However, as you continue to exercise, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. In the earlier stages, this pain during exercise may initially disappear as you warm up only to return when you cool down. However, as you continue to exercise, the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Flexor tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have flexor tendinopathy, you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. This should consist of icing following exercise and regular gentle stretching of the forearm muscles. Icing should consist of crushed ice wrapped in a moist towel applied for 15–20 minutes or ice in a paper cup massaged over the inside of the elbow until the skin is numb.

What shouldn't you do?

If you have or suspect that you have flexor tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout exercise. If this occurs, your recovery may be prolonged and it may take a number of weeks or months for you to return to exercise and sport.

Could there be any long-term effects?

Flexor tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain along the inside of the elbow and a prolonged lay-off from exercise and sport.

Management

The assistance of a sports medicine professional is important in the treatment of flexor tendinopathy. Initially, they can assist in diagnosing the problem and establishing its severity. This may require the use of imaging techniques such as ultrasound. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed flexor tendinopathy and address this during your recovery to prevent a re-occurrence when you return to exercise and sport.

Medial collateral ligament sprain

What is it?

A medial collateral ligament sprain refers to when the ligament which runs down and supports the inner aspect of the elbow joint is overstretched and injured.

How does it happen?

The medial collateral ligament may be overstretched following a single incident such as when your elbow is bent the wrong way or, more commonly, as a result of continuous stretching of the ligament over a period of time. The latter frequently occurs in sports involving throwing. When the arm is 'wound up' or 'cocked' prior to throwing, a lot of stress is placed on the medial collateral ligament of the elbow. When performed repeatedly over a period of time, this may cause overstretching of the ligament and subsequent inflammation and scarring within the ligament.

How does it feel?

When the medial collateral ligament is overstretched, the most common sensation felt is pain. This is usually felt along the inside surface of the elbow. If the medial collateral ligament is injured following a single incident, this pain will be felt at the time of the injury. However, if the collateral ligament is injured due to repeated stretching of the ligament, it may develop more gradually. Initially, the pain may only be present following a session of hard throwing. However, as you throw more, the pain may progress to become present during throwing. In the earlier stages, this pain during exercise may initially disappear as you warm up, only to return when you cool down. As it progresses further, the pain may begin to be present for longer periods during exercise until it is present all the time.

What should you do?

To limit the severity of a medial collateral ligament injury it is advised that you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the elbow, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby, reducing the extent of swelling and tissue damage.

If your medial collateral ligament has developed due to repeated minor trauma to the ligament, the inflammatory process taking place may have become chronic. Therefore, it may not respond as well to the RICE regime. However, it is still advised you follow this regime. This will help control the inflammation and swelling, and help reduce your pain. In addition, it is advised you avoid the activities you think may have caused your injury, such as throwing. Following this, you should consult your nearest sports medicine professional for specific treatment.

What shouldn't you do?

If you have or suspect you have injured your medial collateral ligament, you shouldn't undertake activities which increase blood flow to the injured area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity. These may increase the bleeding and swelling around the injured ligament and potentially prolong your recovery. In addition, you shouldn't continue to exercise until you have seen a sports medicine professional. This may lead to further stretching and injury to the ligament.

Could there be any long-term effects?

Medial collateral ligament injuries generally heal without complication or long-term effects within a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. When the medial collateral ligament is injured, it is not uncommon to also injure surrounding structures. Injury to these structures may prolong your recovery. Similarly, recovery may be delayed if the injury is not appropriately diagnosed and managed. This may result in a poorly healed ligament which is susceptible to reinjury when you return to exercise and sport.

Management

The assistance of a sports medicine professional is important in the treatment of a medial collateral ligament injury. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as ultrasound, X-ray or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess why you developed a medial collateral ligament injury and address this during your recovery to prevent a re-occurrence when you return to full activity.

Ulnar nerve compression at the elbow

What is it?

Ulnar nerve compression refers to when the ulnar nerve is compressed as it passes behind the bony bump on the inside of the elbow. This bony bump is often referred to as the 'funny bone'.

How does it happen?

Ulnar nerve compression typically occurs following a direct blow to the nerve as it passes behind the inside of the elbow. This can occur when you use your elbow to break your fall and when you bang your elbow on a hard surface such as a table. This may injure the nerve directly and interfere with the transmission of signals along it. Alternatively, it may injure structures surrounding the nerve. To repair damage to these structures, the body commences an inflammatory response. This inflammation around the nerve may compress it and interfere with the transmission of signals.

How does it feel?

When the ulnar nerve is compressed, you may experience changes in sensation in the area of skin the nerve supplies. This area includes the inside of the forearm, the palm of the hand on the little finger side, the little finger and half of the ring finger. In these areas, sensory changes may include a feeling of pins and needles or numbness. In addition to sensory changes, you may also experience some tenderness if you touch the nerve where it is compressed or inflamed. This is usually behind the inside of the elbow.

What should you do?

Ulnar nerve compression generally does not get better on its own if the cause of the compression is not treated. If you have or suspect you have compression of the ulnar nerve, you should consult your nearest sports medicine professional. If you have numbness in your forearm or hand, you should be careful near hot objects. Contact of these with the numb area of skin may result in a burn.

What shouldn't you do?

If you have or suspect that you have ulnar nerve compression, you shouldn't ignore the problem. This can lead to your injury getting worse which may prolong your recovery.

Could there be any long-term effects?

Ulnar nerve compression does not usually produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to ongoing altered sensation in the forearm and hand, and a prolonged lay-off from exercise and sport. In some situations, this may occur despite appropriate treatment. In these cases, surgery may be required to remove the structures which are compressing the nerve, so as to alleviate your symptoms.

Management

The assistance of a sports medicine professional is important in the treatment of ulnar nerve compression. Initially, they can assist in diagnosing the cause of the problem and establishing its severity. This may require the use of special nerve conduction tests which assess the transmission of signals along the nerve. From their assessment, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification and soft tissue treatment such as massage and stretching. The sports medicine professional will also be able to assess and determine why you developed ulnar nerve compression and address this during your recovery to prevent a re-occurrence when you return to full activity. This may require the wearing of elbow pads to prevent reinjury to the nerve.

Olecranon bursitis

What is it?

Also known as 'student's elbow', olecranon bursitis refers to inflammation and swelling of the bursa located between the point of the elbow (olecranon) and overlying skin. A bursa is a fluid-filled sac which allows adjacent tissues to slide over one another without friction.

How does it happen?

Olecranon bursitis occurs when the olecranon bursa is damaged or irritated. This can occur following either a single injury or a series of injuries to the bursa. Injury may result from a direct blow to the point of the elbow such as falling on a hard surface with your elbow being used to stop the fall. This can damage blood vessels within the olecranon bursa, causing bleeding. The blood in the bursa causes an inflammatory response resulting in swelling of the bursa and subsequent bursitis. Another cause of olecranon bursitis is repeated minor trauma. This can occur when you repeatedly rest on your elbows on a hard surface for long periods of time such as when working or studying. Thus, the term 'student's elbow'. This increases wear and tear on the bursa causing microtrauma which, over time, can result in bursal thickening, inflammation and bursitis.

How does it feel?

Olecranon bursitis causes pain and swelling over the point of the elbow. You may feel the pain most when you lean on your elbows or when you bend and straighten your arm. The swelling may be substantial, resulting in distension of the bursa and a large bulge over the point of the elbow. There may also be small lumps that can be felt underneath the skin over the point of the elbow. These lumps result from the thickening of the bursal sac and may give you pain and the feeling that something is floating around under the skin.

What should you do?

To limit the severity of olecranon bursitis, it is advised that you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process, however too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the elbow, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

If your bursitis develops from repeated minor trauma to the olecranon bursa, the inflammatory process taking place may have become chronic. Therefore, it may not respond as well to the RICE regime. However, it is still advised you follow this regime. This will help control the inflammation and swelling, and help reduce your pain. In addition, it is advised you avoid the activities you think may have caused your bursitis, such as leaning on your elbows on a hard surface. If this is not possible, you should take regular breaks and cushion the point of your elbow to reduce pressure and friction on the olecranon bursa. Following this, you should consult your nearest sports medicine professional, as bursitis of this type often requires active treatment in the form of anti-inflammatory drugs or an injection to resolve it.

What shouldn't you do?

In the first few days following an injury to the olecranon bursa, you shouldn't undertake activities which increase blood flow to the elbow. These include hot showers, heat rubs, massage, the consumption of alcohol and excessive activity. These can prolong bleeding in the bursa resulting in further swelling and an extended recovery. In olecranon bursitis caused by repeated minor trauma you should also avoid these activities until you consult your nearest sports medicine professional, as they can make your swelling worse. In addition, you shouldn't undertake any activity which involves resting on your elbows. This could further irritate the olecranon bursa, making the pain and swelling worse.

Management

The assistance of a sports medicine professional is important in the treatment of olecranon bursitis. In bursitis caused by an injury, they will be able to assist in determining the extent of damage to the bursa and whether any surrounding tissues have been injured. From this, an estimation of how long your injury is expected to take to heal can be provided. The sports medicine professional can also use a number of treatment techniques to assist in reducing the pain and swelling, and enhance the healing of the injured structures. This will facilitate your return to activity.

In olecranon bursitis caused by repeated minor trauma, the sports medicine professional will be able to assist in identifying the cause and how best to stimulate healing, thereby reducing your pain and swelling. In some situations, this may involve draining the swelling in the bursa, taking anti-inflammatory medications or injecting a small quantity of anti-inflammatory directly into the bursa to stimulate healing. Following healing, the sports medicine professional will be able to advise on how to prevent this injury from re-occurring.

Posterior dislocation of the elbow joint

What is it?

A posterior dislocation of the elbow joint refers to when the bones that join to make the elbow joint shift on one another such that the joint surfaces are no longer in contact.

How does it happen?

When forces acting on the elbow joint are too great for the supporting muscles and ligaments to resist, the elbow joint may be caused to dislocate. This usually requires considerable force and can occur following a direct impact to the arm such as occurs in contact sports or following a fall from a height.

How does it feel?

The first sensation felt when the elbow is dislocated is immediate and intense pain felt in and around the elbow. It is usually so intense that you cradle your arm against your body with your other arm. At the time of injury, you may have also sensed something 'popping out'. This 'popping out' or dislocation of the joint is often visible when you compare the appearance and contours of the injured elbow to the opposite side.

What should you do?

A posterior dislocation of the elbow is a serious injury which requires immediate medical attention. When you dislocate your elbow, occasionally the artery which supplies blood to the forearm, wrist and hand may be injured. Damage to this blood vessel can have dire consequences if it is not treated immediately. If you have or suspect you have dislocated your elbow you should go directly to your nearest emergency department. To support your arm whilst travelling, you should wear an arm sling or, if one is not available, fold up the bottom half of your jumper or shirt to support and cradle your arm. To help with your pain, you can apply ice to the elbow. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth applied for up to 20 minutes.

What shouldn't you do?

If you have or suspect that you have dislocated your elbow, the main thing you shouldn't do is try to 'reduce' or relocate the bones back into their normal position. This requires the assistance of a doctor. If not done properly, serious damage may be done to other structures (arteries, nerves, bones, ligaments, cartilage), resulting in irreparable damage and/or a longer recovery time. In addition, you shouldn't undertake any activities which increase blood flow to the injured site. These include hot showers, heat rubs, the consumption of alcohol and massage. These will cause further swelling in the damaged tissues, resulting in a prolonged recovery.

Could there be any long-term effects?

Due to the seriousness of an elbow dislocation there are potential long-term effects. When the elbow joint is dislocated it is not uncommon to injure surrounding structures. The most significant of these is the artery supplying blood to the forearm, wrist and hand. Injury to this artery may lead to damage to tissues in these regions reducing the function of your arm. In addition to damage to blood vessels, when the elbow is dislocated, it is not uncommon to overstretch ligaments, compress nerves, break bones and damage the cartilage lining the joint surfaces of the elbow joint. Injury to these structures may prolong your recovery and result in ongoing elbow problems.

Management

The assistance of a sports medicine professional is important in the treatment of a dislocated elbow. Initially, they can confirm that the elbow is actually dislocated. If it is, they can assist in relocating or 'reducing' the bones back into their normal position and assess whether the artery to forearm, wrist and hand has been damaged. Following this, they can assess whether any other tissues have been damaged and the extent of this damage. An X-ray may be ordered to determine whether any of the bones are damaged. From this, they can provide you with an estimation of how long the injury is expected to take to heal. During your recovery, the sport medicine professional will be able to assist in reducing your pain and promoting your recovery. This may involve wearing a sling for the first few weeks, followed by a progression of exercises designed to return you back to full function and reduce the risk of ongoing elbow problems.

Fracture of the radius and ulna

What is it?

A fracture of the radius and ulna refers to a break in the two bones within the forearm.

How does it happen?

A fracture of the radius and ulna are typically caused by a fall where you land on an outstretched hand or forearm. These bones may also be broken by hitting your forearm on a stationary object or being struck by an object travelling at high speed.

How does it feel?

The first sensation felt when the radius and ulna are broken is immediate and intense pain felt in the forearm. This pain is often so intense that you cradle your injured arm against your body with your other arm. When you look at the forearm there may be an obvious deformity. This results from movement or displacement of the bone pieces when the bones are broken.

What should you do?

A fracture of the distal radius and ulna is a serious injury which requires immediate medical attention. If you suspect a fracture, it is advised you cease your activity or sport, begin initial treatment and seek immediate medical attention. Initial treatment involves immobilising the arm as soon as possible using splints and bandages. You may alternatively place the arm in a sling if a splint is not available.

What shouldn't you do?

If you have or suspect that you have fractured your radius and ulna, you shouldn't perform any activities which may cause the broken ends of the bone to move on one another. To achieve this, you shouldn't use or bend the injured arm until it has been assessed by a sports medicine professional. In addition, you should avoid any activities which may increase the blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase bleeding and swelling around the broken ends of bone and potentially prolong your recovery.

Could there be any long-term effects?

Most fractures of the radius and ulna heal without complication, in a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. When the radius and ulna are broken a number of nearby structures may also be injured. These include nerves, blood vessels, ligaments, muscles and tendons. Injury to these structures may delay your recovery.

Management

The assistance of a sports medicine professional is important in the treatment of a fractured radius and ulna. Initially, they can assist in diagnosing the injury and the extent of the damage. An X-ray may be used to confirm the diagnosis. From this, they can provide you with an estimation of how long the injury is expected to take to heal and determine the appropriate treatment. Treatment may involve applying an arm cast and wearing a sling or, in some cases, surgery to put the bones back in their original position and to hold them there. If a cast is required, a sports medicine professional will be able to assist you when the bones have healed and the cast is removed. When a cast is applied, the joints within the cast become stiff and the muscles lose strength. Although range of movement and strength will gradually return as you use your forearm, the return is slow and often not complete, predisposing you to other injuries. A sports medicine professional can facilitate the return of your joint range of movement and muscle strength, and ensure that upon return to activity and sport you are at minimal risk of further injury.

Fracture of the distal radius and ulna

What is it?

Often referred to a 'Colles' fracture', a fracture of the distal radius and ulna refers to a break in the forearm bones just above the wrist joint.

How does it happen?

A fracture of the distal radius and ulna are most frequently caused by a fall where you land on an outstretched hand.

How does it feel?

The first sensation felt when the distal radius and ulna are fractured is immediate and intense pain felt just above the wrist joint. This pain is often so intense that you cradle your injured arm against your body with your other arm. When you look at the back of the wrist there may be an obvious bump or deformity. This results from displacement of the bone pieces when the bones are broken.

What should you do?

A fracture of the distal radius and ulna is a serious injury which requires immediate medical attention. If you have or suspect you have this injury, you should cease participating and go directly to your nearest sports medicine professional. To support your arm whilst travelling you should wear an arm sling or, if one is not available, fold up the bottom half of your jumper or shirt to support and cradle your arm. To help with your pain and reduce and control any swelling, you should apply ice to the wrist. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth applied for up to 20 minutes. You should also apply compression. Compression involves the application of a firm elastic bandage around the injured site. It should be firm but not tight enough to cause you increased pain.

What shouldn't you do?

If you have or suspect you have fractured your distal radius and ulna, you shouldn't perform any activities which may cause the broken ends of the bone to move on one another. To do achieve this, you shouldn't use the injured arm until it has been assessed by a sports medicine professional. In addition, you should avoid any activities which may increase the blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase bleeding and swelling around the broken ends of bone and potentially prolong your recovery.

Could there be any long-term effects?

Most fractures of the distal radius and ulna heal without complication in a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. When the distal radius and ulna are broken, a number of nearby structures may also be injured. These include the cartilage lining the surfaces of the wrist joint, nerves, blood vessels, ligaments and tendons. Injury to these structures may delay your recovery. In addition, injury to the cartilage can increase your chance of developing arthritis within the wrist later in life.

Management

The assistance of a sports medicine professional is important in the treatment of a fractured distal radius and ulna. Initially, they can assist in diagnosing the injury and the extent of the damage. This may require the use of an X-ray to view the bones. From this, they can provide you with a determination of how long the injury is expected to take to heal and determine the appropriate treatment. This may involve applying an arm cast and wearing a sling or, in some cases, surgery to put the bones back in their original position and hold them there. If a cast is required, a sports medicine professional will be able to assist you when the bones have healed and the cast is removed. When a cast is applied, the joints within the cast become stiff and the muscles lose strength. Although range of movement and strength will gradually return as you use your wrist, the return is slow and often not complete, predisposing you to other injuries. A sports medicine professional can facilitate the return of your joint range of movement and muscle strength, and ensure that upon return to participation you are at minimal risk of further injury.

Fracture of the scaphoid

What is it?

A fracture of the scaphoid refers to a break in one of the wrist bones.

How does it happen?

The scaphoid bone is typically fractured following a fall on the outstretched hand.

How does it feel?

A fracture of the scaphoid normally produces pain on the thumb side of the wrist joint. Typically, when a bone is broken intense pain is felt. However, in the case of a fractured scaphoid this pain may not be very strong and the injury may feel more like a wrist sprain. Similarly, in comparison to fractures of other bones, a fracture of a scaphoid frequently doesn't result in any obvious deformity at the wrist and doesn't cause much swelling. As a result, many people don't actually realise that they have broken their scaphoid.

What should you do?

A fracture of the scaphoid is a serious injury which requires immediate medical attention. If you have or suspect you have this injury, you should cease participating and go directly to your nearest sports medicine professional or doctor. To support your arm and hand whilst travelling you should wear an arm sling or, if one is not available, fold up the bottom half of your jumper or shirt to support and cradle your arm. To help with your pain and reduce and control any swelling, you should apply ice to the wrist. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth applied for up to 20 minutes. You should also apply compression. Compression involves the application of a firm elastic bandage around the injured site. It should be firm but not tight enough to cause you increased pain.

What shouldn't you do?

If you have or suspect you have fractured your scaphoid, you shouldn't perform any activities which may cause the broken ends of the bone to move on one another. To do achieve this, you shouldn't use the injured hand until it has been assessed by a sports medicine professional. In addition, you should avoid any activities which may increase the blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase the bleeding around the fractured ends of bone and potentially prolong your recovery.

Could there be any long-term effects?

Most fractures of the scaphoid heal without complication in a matter of weeks. However, a proportion of injuries can result in longer-term effects. This most commonly occurs when the broken pieces of the scaphoid bone fail to join or 'unite' back together. This is a serious consequence which will prolong your recovery and may require surgery or alternative treatments to stimulate healing.

Management

The assistance of a sports medicine professional is important in the treatment of a fractured scaphoid. Initially, they can assist in diagnosing the injury and the extent of the damage. This may require the use of an X-ray or CT scan to view the bones. From this, they can provide you with a determination of how long the injury is expected to take to heal and determine the appropriate treatment. This may involve applying an arm cast and wearing a sling. If a cast is required, a sports medicine professional will be able to assist you when the bone has healed and the cast is removed. When a cast is applied, the joints within the cast become stiff and the muscles lose strength. Although range of movement and strength will gradually return as you use your wrist, the return is slow and often not complete, predisposing you to other injuries. A sports medicine professional can facilitate the return of your joint range of movement and muscle strength, and ensure that upon return to participation you are at minimal risk of further injury.

Fracture of the hook of hamate

What is it?

A fracture of the hook of hamate refers to a break of the hook of bone on the hamate, one of the wrist bones.

How does it happen?

The hook of hamate is typically fractured following a direct impact to the bone in the palm of the hand. This can happen, for example, whilst playing golf when your club hits the ground instead of the ball. This can drive the club handle into the palm breaking the hook of hamate.

How does it feel?

A fracture of the hook of hamate produces pain on the little finger side of the palm and weakness of grip.

What should you do?

A fracture of the hook of hamate is a serious injury which requires immediate medical attention. If you have or suspect you have this injury you should cease participating and go directly to your nearest sports medicine professional or doctor. To help with your pain and control any swelling, you should apply ice to the palm. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth applied for up to 20 minutes.

What shouldn't you do?

If you have or suspect you have fractured your scaphoid, you shouldn't perform any activities which may cause the broken bone to move. To achieve this, you shouldn't use the injured hand until it has been assessed by a sports medicine professional. In addition, you should avoid any activities which may increase the blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase the bleeding around the fractured ends of bone and potentially prolong your recovery.

Could there be any long-term effects?

Hook of hamate fractures often do not heal by themselves. This results from difficulty in achieving good immobilisation of the fracture site. This is required to enable the hook of hamate to reattach with the rest of the hamate bone. As a result, surgical removal of the hook of hamate is frequently performed when it is fractured. Following surgical removal, there are no long-term effects and you often can resume participation within a couple of months. However, if during the fracture of the hook of hamate you injured neighbouring structures (i.e. nerves), this return may be prolonged.

Management

The assistance of a sports medicine professional is important in the treatment of a fractured hook of hamate. Initially, they can assist in diagnosing the injury and the extent of the damage. This may require the use of an X-ray or CT scan to view the bones. From this, they can provide you with a determination of how long the injury is expected to take to heal and determine the appropriate treatment. This may involve surgery to remove the broken piece of the hook of hamate, followed by a short period of immobilisation in a cast or splint. Following removal of the cast or splint, a sports medicine professional will be able to facilitate your return to participation by encouraging the return of flexibility in your joints and the return of strength in your muscles.

Scaphiolunate dissociation

What is it?

Scaphiolunate dissociation refers to when the two wrist bones, scaphoid and lunate, move excessively on one another.

How does it happen?

Scaphiolunate dissociation results from an injury to the ligament which joins the scaphoid and lunate wrist bones together. This ligament is typically injured following a fall on the outstretched hand. This can tear the ligament, enabling the two wrist bones to move excessively on each other. Injury to this ligament also allows the wrist bones to separate or 'dissociate' from one another when the wrist is used.

How does it feel?

Scaphiolunate dissociation normally produces pain in the wrist joint. This is typically felt in the back of the wrist and when the wrist is moved or used. Associated with this pain may be a feeling of the bones in the wrist moving excessively on one another. You may also have some swelling on the back of the wrist.

What should you do?

Scaphiolunate dissociation does not get better on its own. If you have or suspect that you have this injury you should consult your nearest sports medicine professional.

What shouldn't you do?

If you have or suspect you have scaphiolunate dissociation, you shouldn't ignore the problem. Also, you shouldn't perform any activities which cause the wrist bones to move excessively on one another. These may lead to your injury getting worse, resulting in a prolonged recovery.

Could there be any long-term effects?

Scaphiolunate dissociation is an injury which does not heal by itself. In the majority of cases, surgery is required to repair the ligament which holds to the two wrist bones together. This is necessary to stop the bones from moving excessively on one another. Following surgery, a cast is normally worn for a number of weeks to allow the repaired tissues to heal.

Management

The assistance of a sports medicine professional is important in the treatment of scaphiolunate dissociation. Initially, they can assist in diagnosing the injury and the extent of the damage. This may require the use of an X-ray or CT scan to view the tissues in the wrist joint. From their assessment, the sports medicine professional will be able to determine an appropriate treatment plan. In scaphiolunate dissociation this often requires surgery. Following surgery you may be required to wear a cast. If so, the sports medicine professional will be able to assist you when your wrist has healed and the cast is removed. When a cast is applied, the joints within the cast become stiff and the muscles lose strength. Although range of movement and strength will gradually return as you use your wrist, the return is slow and often not complete, predisposing you to other injuries. A sports medicine professional can facilitate the return of your joint range of movement and muscle strength, and ensure that upon return to participation you are at minimal risk of further injury.

De Quervain's tenosynovitis

What is it?

De Quervain's tenosynovitis refers to inflammation of the soft tissues surrounding the tendons that move the thumb.

How does it happen?

De Quervain's tenosynovitis is an overuse injury. The tendons of the thumb originate from above the wrist joint. They reach the thumb by going around a bony bump or prominence on the outside of the wrist and by crossing the wrist joint. Where they pass around the bony bump at the wrist, the tendons and tissues surrounding the tendons can be rubbed against the bone. Repeated rubbing can result in microtrauma. To repair this microtrauma the body commences an inflammatory response in the injured tissues.

How does it feel?

De Quervain's tenosynovitis results in pain and tenderness over the thumb tendons as they cross the top of the wrist joint. Here the tendons may also be swollen. When the thumb and wrist are moved, crepitus or creaking of the tendons may be felt or heard.

What should you do?

De Quervain's tenosynovitis generally does not get better on its own if it is left untreated and you continue to use your thumb and wrist. If you have or suspect you have De Quervain's tenosynovitis, you should consult your nearest sports medicine professional for treatment. In the meantime, you should avoid activities which aggravate or provoke your pain. These may lead to the further rubbing of the tendons and their surrounding tissues against the bone, worsening of your pain and a prolonged recovery.

What shouldn't you do?

If you have or suspect that you have De Quervain's tenosynovitis, you shouldn't ignore the problem. This can lead to your injury getting worse which may prolong your recovery.

Could there be any long-term effects?

De Quervain's tenosynovitis does not usually produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to ongoing pain at the wrist and a prolonged lay-off from participation.

Management

The assistance of a sports medicine professional is important in the treatment of De Quervain's tenosynovitis. Initially, they can assess your problem and establish its severity. From their assessment, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the taking of anti-inflammatory medications, and soft tissue treatment such as massage and stretching.

Ganglion formation

What is it?

A ganglion is a bag of fluid that creates a pea-sized bump or mass under the skin.

How does it happen?

The cause of a ganglion is not completely known. However, the most likely reason for their formation is a weakness in the lining of a joint or tendon. This weakness balloons outward as it fills with fluid from within the joint or from around the tendon. This creates a bag or balloon of fluid under the skin.

How does it feel?

A ganglion may be painless and have no effect on the use of your wrist, hand and fingers. Alternatively, it may be tender when touched or painful when the nearby joints are moved. This may restrict how far you can move these joints. The ganglion may change in size from day to day as it fills and empties with fluid.

What should you do?

A ganglion is not a serious problem. If your ganglion does not cause you any pain or problems with the use of your wrist, hand or fingers it does not require any treatment. However, if your ganglion is painful you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have a ganglion you shouldn't 'play' with it or continually touch it. This may irritate it making it painful.

Could there be any long-term effects?

Ganglions do not produce any long-term effects.

Management

If your ganglion is symptomatic and producing pain, a sports medicine professional will be able to assist you. This may involve draining the ganglion with a needle and injecting a small quantity of anti-inflammatory into the ganglion to alleviate your pain. If this fails to settle your pain the sports medicine professional will be able to organise surgery to remove the ganglion.

Triangular fibrocartilage complex tear

What is it?

The triangular fibrocartilage complex is found at the end of the forearm bones within the wrist joint. As its name suggests, it consists of a triangular-shaped piece of cartilage. This is attached to the end of both of the forearm bones. A triangular fibrocartilage complex tear refers to an injury to this cartilage.

How does it happen?

A tear of the triangular fibrocartilage complex most commonly occurs when a compressive force is placed through the wrist joint. This can occur when using the hand to break a fall or when using the hand to support body weight, such as in gymnastics.

How does it feel?

A triangular fibrocartilage complex tear causes pain felt in the wrist joint. This is usually made worse by putting weight through the joint, such as when leaning on your hands or by moving the joint. Movement may also produce a clicking sensation within the wrist. The wrist may also swell. This may occur quickly or over a number of hours, and is usually seen over the back of the wrist.

What should you do?

If you have or suspect you have a triangular fibrocartilage complex tear, you should cease participating and begin initial treatment. This should consist of the **RICE** regime (Rest, Ice, Compression, Elevation). Rest involves ceasing to participate. Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally it should be applied using crushed ice wrapped in a moist cloth or towel. Compression involves the application of a firm elastic bandage around the wrist. Elevation involves lying or sitting with the injured site resting comfortably on a chair or pillows so that it is above the level of the heart. You should continue the RICE regime until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury (within the first couple of days).

What shouldn't you do?

If you have or suspect you have a triangular fibrocartilage complex tear, you shouldn't perform any activities which increase blood flow to the injured area. These activities include hot showers, heat rubs, massage and the consumption of alcohol. These may increase swelling around the injury site and potentially prolong your recovery.

Could there be any long-term effects?

Most triangular fibrocartilage complex tears get better within a number of weeks, enabling a return to participation. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and the extent of the damage to the cartilage. For example, in more severe tears, surgery may be required to remove the torn cartilage so as to provide relief from symptoms. In these cases, recovery may be prolonged. Recovery may also be prolonged if structures other than the triangular fibrocartilage complex are injured. These include the wrist or forearm bones and surrounding ligaments.

Management

The assistance of a sports medicine professional is important in the treatment of triangular fibrocartilage complex tear. Initially, they can assist in assessing your wrist and the extent of the damage. This may require the use of imaging techniques such as an X-ray or CT arthrogram. From this, they can provide you with a determination of how long the injury is expected to take to heal and determine an appropriate treatment plan. The latter may involve wearing a splint, undergoing treatments to decrease pain and swelling and improve joint movement, and performing stretching and strengthening exercises. When you do return to participation, the sports medicine professional will be able to advise you on and provide you with protective equipment such as a wrist brace or strapping to prevent further injury.

Wrist tendinopathy

What is it?

Wrist tendinopathy refers to inflammation and swelling within one or more of the tendons which cross the wrist joint.

How does it happen?

The function of the tendons which cross the wrist joint is to transmit forces produced by the forearm muscles to the hand and fingers. Repetitive use of these muscles and, therefore, their tendons can lead to microscopic tears within the substance of the tendons. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy.

How does it feel?

Wrist tendinopathy results in pain within the affected tendon as it crosses the wrist joint. This pain typically develops gradually. Initially, the tendon may only be painful following use. For example, it may be first felt on rising the day following participation. Associated with the pain may be swelling, crepitus or creaking and wrist stiffness. Typically, these initial signs of wrist tendinopathy are ignored, as they disappear quickly with use of the wrist and hand or with the application of heat (i.e. a hot shower) over the wrist. However, as you continue to participate, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. For example, it may begin to be present during participation. In the earlier stages this pain during participation may initially disappear as you warm up, only to return when you cool down. However, as you continue to participate, the tendinopathy worsens and your pain may begin to be present for longer periods during participation until it is present all of the time. This may interfere with your performance.

What should you do?

Wrist tendinopathy generally does not get better on its own if the cause is not addressed and you continue to participate. If you have or suspect you have wrist tendinopathy, you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of regular forearm muscle stretching and icing following participation. Icing may consist of crushed ice wrapped in a moist towel applied for 15–20 minutes or ice in a paper cup massaged up and down over the sore area until the skin is numb.

What shouldn't you do?

If you have or suspect that you have wrist tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout participation. If this occurs, your recovery may be prolonged and it may take a number of weeks or months for you to return to full participation.

Could there be any long-term effects?

Wrist tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the wrist and a prolonged lay-off from participation.

Management

The assistance of a sports medicine professional is important in the treatment of wrist tendinopathy. Initially, they can assist in diagnosing the problem and establishing its severity. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed wrist tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full participation.

Carpal tunnel syndrome

What is it?

Carpal tunnel syndrome refers to a nerve disorder occurring at the wrist which causes pain, sensory changes and a loss of function within the hand.

How does it happen?

Carpal tunnel syndrome results from compression of the median nerve as it passes through the carpal tunnel. The carpal tunnel is made up on three sides by the wrist bones, with the roof of the tunnel consisting of a strong, broad ligament. Passing through this tunnel is the median nerve which sends signals from the brain to the hand, and a number of tendons which move the fingers. As the walls of the tunnel are inflexible, if any of the contained tendons become inflamed or swell, the median nerve can become compressed. This can interfere with the messages or signals transmitted by the nerve.

How does it feel?

Carpal tunnel syndrome can produce a number of sensations, all resulting from the compression of the median nerve. The most common include pain in the wrist and hand, and numbness and tingling in the fingers (not including the little finger). These may be present when the wrist is moved. However, they may also be present when the hand is resting or even at night-time. Carpal tunnel syndrome may also cause a sensation of weakness within the hand. This may result in a clumsy hand, the frequent dropping of objects and the poor performance in any sport which requires a strong grip.

What should you do?

If you have or suspect you have carpal tunnel syndrome, you should consult your nearest sports medicine professional. In the meantime you should avoid any activities which cause your pain, or numbness and tingling to worsen.

What shouldn't you do?

If you have or suspect you have carpal tunnel syndrome, you shouldn't ignore the problem. This can lead to your problem getting worse. If this occurs, your recovery may be prolonged.

Could there be any long-term effects?

In many cases of carpal tunnel syndrome there are no long-term effects, as long as it is properly diagnosed and appropriately treated. However, in serious cases and in cases that are left untreated recovery may be prolonged. In these cases, the muscles in the hand may weaken and the hand may feel numb most of the time. To remove the compression on the nerve and enable recovery in these cases, surgery may be required.

Management

The assistance of a sports medicine professional is important in the treatment of carpal tunnel syndrome. Initially, they can assist in confirming your diagnosis and establishing its severity. This may require the use of special nerve conduction tests which assess the transmission of signals along the median nerve. From their assessment, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the taking of anti-inflammatory medications and splinting of the wrist and hand. In severe or long-standing cases, surgery may be required.

Ulnar nerve compression at the wrist

What is it?

Ulnar nerve compression refers to compression of the ulnar nerve as it passes over the front of the wrist joint and into the palm of the hand.

How does it happen?

Ulnar nerve compression at the wrist occurs when the nerve is sandwiched between a hard object outside the body and the bones adjacent to the nerve in the wrist and palm of the hand. This is often seen in cyclists who compress the nerve on the handle bars, and participants in the martial arts who compress the nerve when defending or attacking using the wrist and palm of the hand. The nerve may also become compressed when the tissues surrounding the nerve become inflamed or swollen. When the nerve is compressed, the messages or signals transmitted by the nerve can be interfered with.

How does it feel?

When the ulnar nerve is compressed at the wrist, you may experience pain, numbness or pins and needles in the area of skin supplied by the nerve. This area includes the little finger and half of the ring finger. In addition, you may also have some tenderness if you touch the nerve where it is compressed on the front of the wrist and palm of the hand.

What should you do?

If you have or suspect that you have compression of the ulnar nerve, you should consult your nearest sports medicine professional. In the meantime, you should avoid any activities which cause your pain, numbness or pins and needles to worsen.

What shouldn't you do?

If you have or suspect you have compression of the ulnar nerve, you shouldn't ignore the problem. This can lead to your problem getting worse. If this occurs, your recovery may be prolonged.

Could there be any long-term effects?

Ulnar nerve compression does not usually produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to ongoing altered sensation in the hand and a prolonged lay-off from participation. In some situations this may occur despite appropriate treatment. In these cases, surgery may be required to remove the structures which are compressing the nerve so as to alleviate your symptoms.

Management

The assistance of a sports medicine professional is important in the treatment of ulnar nerve compression. Initially, they can assist in diagnosing the cause of the problem and establishing its severity. This may require the use of special nerve conduction tests which assess the transmission of signals along the nerve. From their assessment, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the taking of anti-inflammatory medications and splinting of the wrist and hand. The sports medicine professional will also be able to assess and determine why you developed ulnar nerve compression and address this during your recovery to prevent a re-occurrence when you return to full participation.

Injury to the distal radial epiphysis

What is it?

An injury to the distal radial epiphysis is an injury to the region of bone growth at the end of the forearm bone in younger athletes.

How does it happen?

During growth the end of the forearm bone is separated by the bulk of the forearm bone by a growth plate. This growth plate enables bone growth to occur. However, it also represents a site of weakness in the bone. When forces are repetitively put through the forearm bone and, therefore, through the growth plate, the growth plate may be injured. This most commonly occurs in gymnasts who repetitively put compressive forces through the growth plate when supporting their weight with their arms.

How does it feel?

An injury to the distal radial epiphysis generally causes pain within and just above the wrist joint. This is usually felt on the back side of the wrist and is made worse by bending the wrist backwards, such as when your child leans on their hands. In addition, the amount of movement in the wrist may be reduced.

What should you do?

If your child has or you suspect your child has an injury to their distal radial epiphysis, you should consult your nearest sports medicine professional for assistance. In the meantime, you should advise your child to avoid activities which aggravate or make their wrist pain worse.

What shouldn't you do?

If your child has or you suspect your child has an injury to their distal radial epiphysis you shouldn't ignore the problem. This may lead to their injury getting worse which may prolong their recovery. In addition, you shouldn't encourage them to exercise through the pain.

Could there be any long-term effects?

An injury to the distal radial epiphysis does not produce any long-term effects, as long as it is appropriately managed. Recovery usually takes place within a matter of weeks.

Management

The assistance of a sports medicine professional is important in the treatment of an injury to the distal radial epiphysis. Initially, they can assist in diagnosing the injury and the extent of the damage. This may require the use of imaging techniques such as an X-ray. From this, the sports medicine professional will be able to determine an appropriate management plan. This may involve a period of rest and modification of your child's activities. Following this, the sports medicine professional will be able to advise you and your child on the appropriate time for return to full participation.

Kienböck's disease

What is it?

Kienböck's disease refers to a condition which affects one of the bones in the wrist – the lunate.

How does it happen?

Kienböck's disease results from poor circulation or blood flow to the lunate bone in the wrist. This may occur following repeated injury or trauma to the wrist which damages the blood vessels that supply the lunate bone with its nutrients. The end result is avascular necrosis of the lunate or, in other words, death (necrosis) of the lunate bone due to interference of its blood supply (avascular).

How does it feel?

Kienböck's disease causes pain felt in the middle of the wrist joint. The wrist may also be weak such that your ability to grip things is reduced.

What should you do?

If you have or suspect you have Kienböck's disease, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect that you have Kienböck's disease, you shouldn't perform any activities which cause your wrist pain. These may further interfere with the blood flow to the lunate bone, leading to your injury getting worse.

Could there be any long-term effects?

Kienböck's disease does not usually produce any long-term effects as long as it is accurately diagnosed and appropriately treated. Recovery usually takes place in matter of weeks to months. In some situations this may be prolonged if the blood flow to the lunate bone does not improve. In these cases surgery may be required to facilitate healing.

Management

The assistance of a sports medicine professional is important in the treatment of Kienböck's disease. Initially they can assist in diagnosing the injury and the extent of the damage. This may require the use of imaging techniques such as an X-ray or bone scan. From this, the sports medicine professional will be able to provide you with a determination of how long the injury is expected to take to heal and determine the appropriate treatment. The latter may involve applying a splint or cast to the wrist to immobilise it. It may also involve surgery.

Fracture of a metacarpal

What is it?

A fracture of a metacarpal refers to a break in one of the knuckle bones.

How does it happen?

A fracture of a metacarpal is most frequently caused by punching something hard or by being hit on the hand by an object travelling at high speed.

How does it feel?

The first sensation felt when a metacarpal bone is broken is immediate and intense pain at the site of the fracture. This will be somewhere between the knuckle and the wrist joint. When you look at the hand there may be an obvious bump or deformity. This results from movement or displacement of the bone pieces when the metacarpal is broken.

What should you do?

A fracture of a metacarpal is a serious injury which requires immediate medical attention. If you have or suspect that you have this injury, you should cease participating and go directly to your nearest sports medicine professional or doctor. To help with your pain and reduce and control any swelling, you should apply ice to the hand. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth applied for up to 20 minutes. You should also apply compression. Compression involves the application of a firm elastic bandage around the injured site. It should be firm but not tight enough to cause you increased pain.

What shouldn't you do?

If you have or suspect that you have fractured a metacarpal bone, you shouldn't perform any activities which may cause the broken ends of the bone to move on one another. To do achieve this, you shouldn't use the injured hand until it has been assessed by a sports medicine professional. In addition, you should avoid any activities which may increase the blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase bleeding and swelling around the broken ends of the bone and potentially prolong your recovery.

Could there be any long-term effects?

Most metacarpal fractures heal without complication in a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. When a metacarpal bone is broken, a number of nearby structures may also be injured. These include the surrounding joints and the cartilage lining the surfaces of these joints, nerves, blood vessels, ligaments and tendons. Injury to these structures may delay recovery. In addition, injury to the surrounding joints and the cartilage lining the surfaces of these joints can increase your chance of developing arthritis within the joint in later life.

Management

The assistance of a sports medicine professional is important in the treatment of a fractured metacarpal. Initially, they can assist in diagnosing the injury and the extent of the damage. This may require the use of an X-ray to view the bones. From this, they can provide you with a determination of how long the injury is expected to take to heal and determine the appropriate treatment. This may involve wearing a splint or, in some cases, performing surgery to put the bones back in their original position and to hold them there. When the bone has healed sufficiently, the sports medicine professional will be able to assist in returning you to participation. This may involve undergoing treatments to decrease any pain and swelling and improve joint movement, and performing stretching and strengthening exercises. When you do return to participation, the sports medicine professional will be able to advise you on and provide you with protective equipment such as splints and supports to protect the hand.

Dislocation of a metacarpophalangeal (knuckle) joint

What is it?

A dislocation of a metacarpophalangeal joint refers to when the bones which make a knuckle joint displace or 'pop out' of their normal position.

How does it happen?

A knuckle joint is caused to dislocate when it is forcibly bent in the wrong direction. This can occur when a ball hits the finger or when the finger gets caught on an object such as a fellow competitor's jumper, a net or the ground.

How does it feel?

The first sensation felt when a knuckle joint is dislocated is immediate and intense pain in the knuckle. Associated with this is an obvious bump or deformity at the knuckle when you look at it. This results from the displacement of the bones which join to make the joint. The knuckle may also swell. This may occur quickly or over a number of hours.

What should you do?

If you have or suspect you have dislocated a knuckle joint, you should cease participating and go directly to your nearest sports medicine professional or doctor to have the joint examined. To help with your pain and control any swelling, you should apply ice to the finger. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth applied around the injured joint for up to 20 minutes.

What shouldn't you do?

If you have or suspect you have dislocated a knuckle joint, you shouldn't try to relocate the bones or 'reduce' the dislocation. This can lead to further damage and a prolonged recovery. In addition, you should avoid any activities which may increase the blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase bleeding and swelling around the dislocated joint, potentially prolonging your recovery.

Could there be any long-term effects?

Dislocation of a knuckle joint generally heals without complication in a matter of months. However, to enable this to occur, surgery is frequently required to relocate or reduce the bones back to their normal position. Following surgery, recovery may be prolonged if, at the time of your injury, you damaged structures surrounding the joint. These include the ligaments supporting the knuckle joint, the bones making up the joint and the cartilage lining the surfaces of the joint. Similarly, recovery may be prolonged if the dislocated knuckle is not appropriately treated. This may result in a stiff, swollen and painful finger.

Management

The assistance of a sports medicine professional is important in the treatment of a dislocated knuckle joint. Initially, they can assist in relocating or 'reducing' the bones back into their normal position. This may require surgery. Following this, the sports medicine professional can assess which tissues have been damaged and the extent of this damage. This may require the use of an X-ray to determine whether any of the bones are damaged. From this, they can provide you with a determination of how long the injury is expected to take to heal and determine an appropriate treatment plan. This may involve wearing a splint, undergoing treatments to decrease pain and swelling and improve joint movement, and performing stretching and strengthening exercises. When you do return to participation, the sports medicine professional will be able to advise you on and provide you with protective equipment such as splints and supports to protect the knuckle joint.

Fracture of a phalanx (finger)

What is it?

A fracture of a phalanx refers to a break in one of the finger bones.

How does it happen?

A fracture of a finger bone is often caused by crushing the finger between two objects. This can occur, for example, when a finger is jammed between a fast moving ball and a stick or bat.

How does it feel?

The first sensation felt when a finger bone is broken is immediate and intense pain at the site of the fracture. This will be somewhere within the finger. When you look at the finger there may be an obvious bump or deformity. This results from movement or displacement of the bone pieces when the finger bone is broken. The finger may also swell. This may occur quickly or over a number of hours.

What should you do?

A fracture of a finger bone is a serious injury which requires immediate medical attention. If you have or suspect that you have this injury, you should cease participating and go directly to your nearest sports medicine professional or doctor. To help with your pain and control any swelling, you should apply ice to the finger. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth applied for up to 20 minutes. Adequate icing may also be achieved by submerging the finger in a cup of ice with a little bit of water.

What shouldn't you do?

If you have or suspect you have fractured a finger bone, you shouldn't perform any activities which may cause the broken ends of the bone to move on one another. To achieve this, you shouldn't use the hand with the injured finger until it has been assessed by a sports medicine professional. In addition, you should avoid any activities which may increase the blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase bleeding and swelling around the broken ends of bone potentially, prolonging your recovery.

Could there be any long-term effects?

Most fractures of a finger heal without complication, in a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. When a finger bone is broken, a number of nearby structures may also be injured. These include surrounding joints and the cartilage lining the surfaces of these joints, nerves, blood vessels, ligaments and tendons. Injury to these structures may delay recovery.

Management

The assistance of a sports medicine professional is important in the treatment of a fractured finger bone. Initially, they can assist in diagnosing the injury and the extent of the damage. This may require the use of an X-ray to view the bones. From this, they can provide you with a determination of how long the injury is expected to take to heal and determine the appropriate treatment. This may involve applying a splint or, in some cases, performing surgery to put the bones back in their original position and to hold them there. When the bone has healed sufficiently, the sports medicine professional will be able to assist in returning you to participation. This may involve undergoing treatments to decrease any pain and swelling and improve joint movement, and performing stretching and strengthening exercises. When you do return to participation, the sports medicine professional will be able to advise you on and provide you with protective equipment such as splints and supports to protect the finger.

Dislocation of a finger joint

What is it?

A dislocation of a finger joint refers to when a bone within the finger displaces or 'pops out' of its normal position.

How does it happen?

A finger joint is caused to dislocate when it is forcibly bent in the wrong direction. This can occur when a ball hits the finger or when the finger gets caught on an object such as a fellow competitor's jumper, a net or the ground.

How does it feel?

The first sensation felt when a finger joint is dislocated is immediate and intense pain in the finger. Associated with this is an obvious bump or deformity in the finger when you look at it. This results from the displacement of the finger bones. The finger may also swell. This may occur quickly or over a number of hours.

What should you do?

If you have or suspect you have dislocated a finger joint, you should cease participating and go directly to your nearest sports medicine professional or doctor to have the bones relocated or 'reduced'. To help with your pain and control any swelling, you should apply ice to the finger. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth applied for up to 20 minutes. Adequate icing may also be achieved by submerging the finger in a cup of ice with a little bit of water.

What shouldn't you do?

If you have or suspect you have dislocated your finger, you shouldn't try to relocate the bones or 'reduce' the dislocation unless you have experience in doing so. In some instances, this can lead to further damage and a prolonged recovery. In addition, you should avoid any activities which may increase the blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase bleeding and swelling around the dislocated joint potentially prolonging your recovery.

Could there be any long-term effects?

Most dislocations of a finger joint heal without complication in a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. When a finger joint is dislocated, the ligaments supporting the joint are often injured and pieces of bone may be chipped off. Injury to these structures may delay recovery. Similarly, recovery may be prolonged if the dislocated finger is not appropriately treated. This may result in a stiff, swollen and painful finger.

Management

The assistance of a sports medicine professional is important in the treatment of a dislocated finger joint. Initially, they can assist in relocating or 'reducing' the bones back into their normal position. Following this, they can assess which tissues have been damaged and the extent of this damage. This may require the use of an X-ray to determine whether any of the bones are damaged. From this, the sports medicine professional will be able to provide you with a determination of how long the injury is expected to take to heal and determine an appropriate treatment plan. This may involve wearing a splint, undergoing treatments to decrease pain and swelling and improve joint movement, and performing stretching and strengthening exercises. When you do return to participation, the sports medicine professional will be able to advise you on and provide you with protective equipment such as splints and supports to protect the finger.

Ligament injuries in the fingers

What is it?

Ligament injuries in the fingers refer to when one or more of the ligaments supporting a finger joint is overstretched and damaged.

How does it happen?

A ligament supporting a finger joint is injured when it is overstretched. This can occur when the finger is forcibly bent in the wrong direction. This is common in the sporting arena and may occur when a ball hits the finger or when the finger gets caught on an object such as a fellow competitor's jumper, a net or the ground.

How does it feel?

The first sensation felt when a ligament supporting a finger joint is injured is pain in the finger. This is often made worse by movement of the finger or touching the finger where the ligament is injured. Associated with the pain may be swelling of the finger. This may occur quickly or over a number of hours.

What should you do?

If you have or suspect you have a ligament injury in your finger, you should cease participating and begin initial treatment. This should consist of the **RICE** regime (Rest, Ice, Compression, Elevation). Rest involves ceasing to participate. Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally it should be applied using crushed ice wrapped in a moist cloth or towel. Adequate icing may also be achieved by submerging the finger in a cup of ice with a little bit of water. Compression involves the application of a firm elastic bandage around the finger. This can be difficult to achieve if the injured ligament is at the base of the finger. Elevation involves lying or sitting with the injured site resting comfortably on a chair or pillows so that it is above the level of the heart. You should continue the RICE regime until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury (within the first couple of days).

What shouldn't you do?

If you have or suspect you have a ligament injury in your finger, you shouldn't perform any activities which increase blood flow to the injured area. These activities include hot showers, heat rubs, massage and the consumption of alcohol. These may increase swelling around the injured ligament and potentially prolong your recovery.

Could there be any long-term effects?

Most ligament injuries within a finger heal without complication in a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. When a ligament supporting a finger joint is injured, occasionally a piece of the bone it attaches to may be chipped-off. This may prolong your recovery. Recovery may also be prolonged if the ligament is completely torn. This may require surgery to repair the ligament.

Management

The assistance of a sports medicine professional is important in the treatment of an injured ligament within a finger. Initially, they can assist in assessing which tissues have been damaged and the extent of this damage. This may require the use of an X-ray to determine whether any of the bones are damaged. From this, they can provide you with a determination of how long the injury is expected to take to heal and determine an appropriate treatment plan. The latter may involve wearing a splint, undergoing treatments to decrease pain and swelling and improve joint movement, and performing stretching and strengthening exercises. When you do return to participation the sports medicine professional will be able to advise you on and provide you with protective equipment such as splints and supports to protect the injured ligament/s.

Thoracic intervertebral joint disorders

What is it?

Thoracic intervertebral joints are the joints between two vertebrae in the upper back region. Each vertebra within the upper back is joined to the vertebra below and the vertebra above by three separate joints. A thoracic intervertebral joint disorder refers to an injury affecting one of these three joints.

How does it happen?

Thoracic intervertebral joint disorders most commonly result from an overstretching injury. This can occur very simply such as when the upper back is rotated or bent too far. These excessive movements can overstretch structures supporting the joint, resulting in a thoracic intervertebral joint sprain. Similarly, structures supporting the thoracic intervertebral joints may be overstretched due to poor posture. Slumped sitting can overstretch the structures supporting the joints, resulting in a thoracic intervertebral joint disorder.

How does it feel?

A thoracic intervertebral joint disorder results in pain felt within the upper back. Pain is often a dull ache that will be made worse by movements of the trunk. Stiffness in the upper region of the back may also be experienced.

What should you do?

If you have or suspect you have a thoracic intervertebral joint disorder, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect you have a thoracic intervertebral joint disorder, you shouldn't ignore the problem. This may lead to your injury deteriorating which may prolong your recovery. In addition, you shouldn't perform activities that aggravate your pain.

Could there be any long-term effects?

Thoracic intervertebral joint disorders do not produce any long-term effects. Recovery usually takes place in a number of days to weeks.

Management

The assistance of a sports medicine professional is important in the treatment of thoracic intervertebral joint disorders. Initially, they can assist in diagnosing the problem and its severity. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, using anti-inflammatory medications, electrotherapy treatment, thoracic intervertebral joint mobilisation or stretches.

Costovertebral joint disorders

What is it?

A costovertebral joint is the joint between a vertebra in the upper back and a rib bone. A joint disorder refers to an injury affecting this joint.

How does it happen?

Costovertebral joint disorders most commonly result from an overstretching injury to the joint. This can occur very simply such as when the trunk and rib cage is rotated. This can overstretch the structures supporting the costovertebral joint resulting in a costovertebral joint sprain.

How does it feel?

A costovertebral joint disorder will result in upper back pain. This pain is often a dull ache that is made worse by deep breathing, coughing or rotation movements the trunk and rib cage. It is usually felt just to the side of the spine and most commonly between the shoulder blades.

What should you do?

If you have or suspect you have a costovertebral joint disorder, you should consult your nearest sports medicine professional for advice and treatment.

What shouldn't you do?

If you have or suspect you have a costovertebral joint disorder, you shouldn't ignore the problem. This may lead to your injury deteriorating which may prolong your recovery. In addition, you shouldn't perform activities that aggravate your pain.

Could there be any long-term effects?

Costovertebral joint disorders do not produce any long-term effects. Recovery usually takes place in a number of days. However, this may be prolonged if your costovertebral pain is due to conditions other than a typical costovertebral joint sprain. These include degenerative changes within the costovertebral joint, such as osteoarthritis, or an inflammatory condition affecting the costovertebral joint (such as ankylosing spondylitis). Your sports medicine professional will be able to assess whether your pain is caused by these conditions.

Management

The assistance of a sports medicine professional is important in the treatment of a costovertebral joint disorder. Initially, they can assist in diagnosing the problem and its severity. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, using anti-inflammatory medications, electrotherapy treatment, costovertebral joint mobilisation or stretches.

Scheuermann's disease

What is it?

Scheuermann's disease refers to a postural deformity affecting the spine. It is more a condition rather than a disease and is one which is seen in younger athletes.

How does it happen?

The cause of Scheuermann's disease is not known.

How does it feel?

Scheuermann's disease produces mild to moderate pain felt in the upper back. This is usually made worse by physical activity. In addition, the back may appear to be rounded and they may report feeling stiff when trying to 'straighten up'. Occasionally, Scheuermann's disease does not produce any of these sensations. In these cases, it may be diagnosed by accident when a child has a chest or spine X-ray.

What should you?

If your child has or you suspect they have Scheuermann's disease, you should consult your nearest sports medicine professional for advice. In the meantime, they should avoid activities that aggravate or make this back pain worse.

What shouldn't you do?

If your child has or you suspect they have Scheuermann's disease, you shouldn't ignore the problem. This may lead to their injury deteriorating which may prolong their recovery or increase the risk of spinal deformity once this disorder has resolved itself.

Could there be any long-term effects?

Scheuermann's disease does not produce any long-term effects if it is appropriately managed. It is a self-limiting condition, which means it will settle with time. This may take six to twelve months; however, it can take up to two years. During this time, it is important that they perform regular stretching and strengthening exercises to maintain or improve their posture. These will help reduce postural deformities when the condition resolves.

Management

The assistance of a sports medicine professional is important in the management of Scheuermann's disease. Initially they can assist in diagnosing the problem and determining its severity. This may require the use of imaging techniques such as an X-ray. From this information, the sports medicine professional will be able to determine an appropriate management plan. This may involve activity modification, treatments to assist to reduce back pain, and stretching or strengthening exercises designed to assist with their posture.

Thoracic intervertebral disc prolapse

What is it?

A thoracic intervertebral disc refers to the disc between two vertebrae in the upper back. A thoracic intervertebral disc prolapse refers to an injury that causes this disc to bulge outward.

How does it happen?

Thoracic intervertebral disc prolapses occur when the disc between two vertebrae in the upper back is injured. This may occur when the disc is compressed or when the trunk is rotated too far. When the disc is injured, it may bulge outward. This bulge can compress nearby structures such as nerves.

How does it feel?

A thoracic intervertebral disc prolapse results in pain most frequently felt in the middle of the back. This pain is often very strong and made worse by movement of the trunk. Frequently, the pain will radiate or 'shoot' around the chest wall and abdomen.

What should you do?

If you have or suspect you have a thoracic intervertebral disc prolapse, you should consult your nearest sports medicine professional for advice and treatment.

What shouldn't you do?

If you have or suspect you have a thoracic intervertebral disc prolapse, you shouldn't ignore the problem. This may lead to your injury deteriorating which may prolong your recovery. In addition, you shouldn't perform any activities that aggravate your pain.

Could there be any long-term effects?

With treatment, thoracic intervertebral disc prolapses get better within a number of weeks to months. However, this may be prolonged depending on the size of the bulge in the disc.

Management

The assistance of a sports medicine professional is important in the treatment of a thoracic intervertebral disc prolapse. Initially, they can assist in diagnosing the problem and determine its severity. This may require the use of imaging techniques such as X-rays or MRI. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the use of anti-inflammatory medications, electrotherapy treatment, thoracic intervertebral joint mobilisation or stretches.

Rib trauma and rib fractures

What is it?

Rib trauma and rib fractures refer to damage to the rib bones that form the chest.

How does it happen?

Rib trauma results from a direct blow to the chest. This most commonly occurs in contact sports such as football and Rugby; however, it may also occur in ball sports such as hockey and cricket. The trauma may range anywhere from rib bruising to a single or multiple rib fractures.

How does it feel?

Rib trauma results in chest pain at the site of the injury. This pain is often sharp and intense, and is made worse by deep breathing or coughing.

What should you do?

If you have or suspect you have rib trauma, you should cease activity and begin initial treatment. This should consist of icing. Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, this should be applied using crushed ice wrapped in a moist cloth or towel. You should continue icing until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury. If you are having trouble breathing you should go to the nearest emergency department.

What shouldn't you do?

If you have or suspect you have rib trauma, you shouldn't undertake activities that increase blood flow to the injured area. These include hot showers, heat rubs, consumption of alcohol and excessive activity. These may increase bleeding and swelling around the injured structures and potentially prolong your recovery.

Could there be any long-term effects?

Rib trauma usually heals within a number of weeks and does not produce any long-term effects. However, a small proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. Occasionally, when the ribs are damaged, underlying structures may also be involved; these include the lungs, liver, spleen and kidneys. Injuries to these structures can prolong your recovery.

Management

The assistance of a sports medicine professional is important in the treatment of rib trauma. Initially, they can assist in determining which tissues have been damaged and the extent of their damage. This may require the use of an X-ray to image the rib cage. From this, a determination of how long the injury is expected to take to heal can be provided and an appropriate treatment plan developed. This may involve an initial period of rest and analgesic medications to help with your pain. When you do return to sport participation, you may be advised on protective devices and padding to reduce the risk of a further rib injury.

Costochondritis

What is it?

Sometimes referred to as Tietze's syndrome, costochondritis refers to inflammation of the joint between one of the ribs and the breastbone (sternum).

How does it happen?

Costochondritis may result from a single injury such as direct trauma to the joint between the rib and breastbone. This may occur during tackling in contact sports or if hit in the chest in ball sports. Similarly, costochondritis may result from excessive 'wear-and-tear' of the joint. This may occur in activities that require a lot of trunk and rib cage rotation.

How does it feel?

Costochondritis is experienced as central chest pain, which is aggravated or made worse by activity. The area around the joint may also be tender to touch.

What should you do?

If you have or suspect you have costochondritis, you should consult your nearest sports medicine professional for advice.

What shouldn't you do?

If you have or suspect you have costochondritis, you shouldn't ignore the problem and continue with activity. This may lead to your injury deteriorating which may prolong your recovery. In addition, you shouldn't perform any activities that aggravate your pain.

Could there be any long-term effects?

Costochondritis does not produce any long-term effects. However, recovery is often prolonged and it may be a number of weeks before you can return to participation.

Management

The assistance of a sports medicine professional is important in the treatment of costochondritis. Initially, they can assist in diagnosing the problem and its severity. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the use of anti-inflammatory medications and electrotherapy treatment. When recovery is prolonged, an anti-inflammatory can be injected directly into the sore region to stimulate healing.

Stress fracture of the ribs

What is it?

A stress fracture of a rib is an incomplete fracture or crack within one of the rib bones.

How does it happen?

A stress fracture of a rib results from an imbalance between bone formation and bone resorption within the rib. When a rib is stressed, the rib responds by increasing its bone turnover, this is a normal action of bone. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone at the same location. To do this, old bone is resorbed (removed) before it is replaced with new bone. If bone formation cannot keep up with bone resorption, areas of weakness can develop within the rib. These can develop into a stress fracture if the rib is continually stressed. This commonly occurs in rowers where the muscles required to move the oar originate from the ribs. The pulling of the muscles on the ribs can overstress the bone, leading to a stress fracture.

How does it feel?

A stress fracture of a rib is characterised by increasing chest pain developing over a period of weeks. The pain is generally localised over the site of the stress fracture and made worse by exercise. Initially, it may have only been present following activity. However, with participation, the pain may have progressed to be present during exercise. It may also have reached such a level that activity is too painful to perform and the rib is sore during breathing and coughing. When you touch the site where you feel the pain it may also be tender, red and warm.

What should you do?

If you have or suspect you have a stress fracture of a rib, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect you have a stress fracture of a rib, you shouldn't continue to exercise or compete in sports. A stress fracture represents an area of breakdown and weakness within the bone. If you continue to exercise or compete, the area of breakdown has the potential to increase, weakening the bone further. This can lead to a larger crack in the bone and potentially a complete bone fracture.

Could there be any long-term effects?

A stress fracture of a rib does not produce any long-term effects, as long as it is properly treated. Recovery usually occurs in a number of weeks.

Management

The assistance of a sports medicine professional is important in the treatment of a stress fracture of a rib. Initially, they can assist in diagnosing the injury. This may require the use of a number of imaging techniques such as a bone scan, CT scan or MRI. From this, the sports medicine professional will be able to provide you with an estimation of how long the injury is expected to take to heal and determine an appropriate treatment plan. This may involve a period of rest or activity modification, the use of anti-inflammatory medications and electrotherapy treatment. The sports medicine professional will also be able to assess why you developed a stress fracture of a rib and address this during your recovery to prevent its re-occurrence when you return to full activity.

Low back pain

What is it?

Low back pain refers to pain arising from any number of structures in the lower back.

How does it happen?

Low back pain results from damage to structures in the back (i.e. muscle, ligament, disc, nerve and bone). It commonly occurs following a relatively simple movement such as bending forward or twisting through the spine. However, lower back pain can also occur through more complex and forceful movements of the lower spine.

How does it feel?

Low back pain is experienced as pain from the lower back. This is often a dull or strong ache, which is made worse by movement. In some situations, it may prevent you from 'straightening up' to a normal standing posture. The pain may be central in the back, to one side or on both sides of the spine. It may also radiate down into the buttocks, back of the thigh or lower leg.

What should you do?

If you have low back pain, you should consult your nearest sports medicine professional for an appropriate assessment, diagnosis and treatment.

What shouldn't you do?

If you have low back pain, you shouldn't ignore the problem and continue to participate in sport. This may lead to the problem increasing and result in a prolonged recovery. In addition, you should avoid other activities which aggravate your pain.

Could there be any long-term effects?

Low back pain usually does not produce any long-term effects, as long it is properly diagnosed and appropriately treated. Recovery usually takes place in a number of days to weeks. The main ongoing problem associated with low back pain is its tendency to re-occur if poorly managed.

Management

The assistance of a sports medicine professional is important in the treatment of low back pain. Initially, they can assist in diagnosing the problem and determining its severity. This may require the use of imaging techniques such as an X-ray, CT scan or MRI. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may initially involve techniques to reduce your pain. These may include activity modification, anti-inflammatory medications, spinal traction, electrotherapy treatment, or taping of the lower back. When your pain has settled sufficiently, the sports medicine professional will be able to provide you with a series of stretching and strengthening exercises designed to return you to your sport, while reducing the chances of your back pain re-occurring.

Acute nerve root compression

What is it?

Acute nerve root compression refers to when a nerve leaving from the spinal cord is compressed by a structure within the back.

How does it happen?

Acute nerve root compression most commonly occurs when an intervertebral disc prolapses. An intervertebral disc refers to the disc between two vertebrae in the lower back. When this disc is injured, its contents may prolapse or bulge outwards into the spinal canal that contains the spinal cord and the nerves that lead on towards the legs. This bulge, therefore, can compress these structures. The mechanism of injury can occur following a relatively simple movement such as bending forward or twisting the spine, as well as through a more complex and forceful movement of the spine.

How does it feel?

Acute nerve root compression produces a sudden onset of pain felt in the lower back. This may be associated with the inability to stand up straight and made worse by sitting, bending, lifting, coughing or sneezing. In addition, this nerve compression may produce pain within the legs. This results from compression of the nerves to the legs. This source of leg pain may be sharp, shooting, and accompanied with pins and needles, numbness or weakness in the legs.

What should you do?

If you have or suspect you have an acute nerve root compression, you should consult your nearest sports medicine professional. If, in addition to back and leg pain, you have numbness in the saddle region and are having difficulty passing water (urination) you should go to your nearest emergency department.

What shouldn't you do?

If you have or suspect you have an acute nerve root compression, you shouldn't ignore the problem and continue to participate in sport. This may lead to your problem increasing which may prolong your recovery. In addition, you should not perform any activities that aggravate your pain.

Could there be any long-term effects?

Acute nerve root compression does not usually produce any long-term effects, as long as it is appropriately diagnosed and treated. Recovery usually takes place in a number of weeks. However, in some cases, this period may be prolonged. This will largely depend on the size of the disc bulge and the extent of nerve compression. If the disc bulge is extremely large and causing severe nerve compression, it may be necessary to undergo surgical procedure to release the pressure on the nerve. This will prolong your recovery time.

Management

The assistance of a sports medicine professional is important in the treatment of acute nerve root compression. Initially, they can assist in diagnosing the problem and determining its severity. This may require the use of imaging techniques such as an X-ray, CT scan or MRI. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may initially involve techniques to reduce your pain. These may include activity modification, anti-inflammatory medications, spinal traction, electrotherapy treatment, or taping of the back. When your pain has settled sufficiently, the sports medicine professional will be able to provide you with a series of stretching and strengthening exercises. These will be designed to return you back into sports participation, while reducing the chances of the injury re-occurring.

Stress fracture of the pars interarticularis (pars defect)

What is it?

Often referred to as a 'pars defect', a stress fracture of the pars interarticularis refers to an incomplete fracture or crack within the rear portion of a vertebra.

How does it happen?

A stress fracture of the pars interarticularis is usually a result from an overuse injury. In activities that require excessive arching or rotation of the lower back, the rear portion of the vertebral bones are overstressed. In response to this increased stress, the bone increases its bone turnover. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone at the same location. To do this, old bone is resorbed (removed) before it is replaced with new bone. If bone formation cannot keep up with bone resorption, areas of weakness can develop within the bone. These can develop into a stress fracture if the bone is continually loaded. This is commonly seen in activities such as gymnastics, fast bowling in cricket, tennis, rowing, dance, weightlifting, pole vaulting and any throwing activities such as baseball pitching, javelin, discus and hammer throw.

How does it feel?

A stress fracture of the pars interarticularis results in pain that is felt in the lower back. This pain is usually on one side of the spine and is made worse through activity, particularly those involving arching of the back. Occasionally the pain may extend into the buttocks. In some situations, the stress fracture of the pars interarticularis may be asymptomatic and it may have been discovered incidentally following an X-ray of the lower back.

What should you do?

If you have or suspect you have a stress fracture of the pars interarticularis, it is advised you avoid activities which aggravate your pain and seek the assistance of a sports medicine professional.

What shouldn't you do?

If you have or suspect you have a stress fracture of the pars interarticularis, you shouldn't continue with activities which aggravate your pain by making it worse. These will lead to further pain and deterioration of your condition.

Could there be any long-term effects?

A stress fracture of the pars interarticularis is a serious structural problem within the back. Despite this, appropriate management can usually return you to your desired activities without ongoing problems.

Management

The assistance of a sports medicine professional is important in the treatment of a stress fracture of the pars interarticularis. Initially, they can assist in diagnosing the problem and determining its severity. This may require the use of imaging techniques such as an X-ray, CT scan or MRI. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may include activity modification, electrotherapy treatment, taping of the back, and the progression through a series of stretching and strengthening exercises relevant for injury recovery.

Spondylolisthesis

What is it?

A spondylolisthesis refers to the slipping of one vertebra (spinal bone) forward on another. The term is derived from the Greek language *spondylos*, meaning vertebra, and *olisthanein*, meaning to slip or slide.

How does it happen?

A spondylolisthesis results from damage to the rear portion of a vertebra. This portion of the vertebral bone acts as an anchor to stop the main body of the vertebra from slipping forwards. When the back portion of the vertebra is damaged, it enables the main portion of the vertebra to slip forwards resulting in a spondylolisthesis.

How does it feel?

A spondylolisthesis results in pain felt in the lower back. This pain is usually aggravated by activity, particularly activities that involve extension or arching of the back. Occasionally the pain may extend into the buttocks, back of the thighs and the lower legs. In some situations, the spondylolisthesis may be asymptomatic and it may have been discovered incidentally following an X-ray of the lower back.

What should you do?

If you have or suspect you have a spondylolisthesis, it is advised you avoid activities that aggravate your pain and seek the assistance of a sports medicine professional.

What shouldn't you do?

If you have or suspect you have a spondylolisthesis, you shouldn't continue with activities that aggravate your back or make the pain worse. These may lead to further vertebral slipping and deterioration of your condition.

Could there be any long-term effects?

A spondylolisthesis is a serious structural problem. It is a condition that does not repair itself and a condition with which people have to live with for the rest of their lives. Despite this, appropriate management can usually help you continue with your desired activities, without ongoing problems.

Management

The assistance of a sports medicine professional is important in the treatment of a spondylolisthesis. Initially, they can assist in diagnosing the problem and determining its severity. This may require the use of imaging techniques such as an X-ray, CT scan or MRI. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may include activity modification, anti-inflammatory medications, electrotherapy treatment, taping of the back, and progression through a series of stretching and strengthening exercises to assist in stabilisation of the lower back.

Sacroiliac joint disorders

What is it?

The sacroiliac joint is the joint that is found between the two pelvic bones (sacrum and ilium) at the back of the pelvis. The sacrum is a continuation of the vertebral column. Disorders of this joint refer to any condition affecting the function of the joint.

How does it happen?

The exact cause of a sacroiliac joint disorder is not clear. However, it may result from excessive movement in the joint. This excessive movement stresses the ligaments and soft tissue structures that support the joint. If the ligaments and supporting structures are continually stressed and overstretched, pain and inflammation of the sacroiliac joint can result.

How does it feel?

Sacroiliac joint disorders generally cause pain. This is frequently experienced very low in the back, around the top of the buttocks. It is often only felt in one buttock; however, in some instances it may be felt in both. The pain may also be referred to the groin or the front and outside of the thigh.

What should you do?

If you have or suspect you may have a sacroiliac joint disorder, you should consult your nearest sports medicine professional.

What shouldn't you do?

If you have or suspect you have a sacroiliac joint disorder, you shouldn't ignore the problem and continue to participate in sport. This may lead to your problem deteriorating, resulting in a prolonged recovery. In addition, you should avoid activities that aggravate your pain.

Could there be any long-term effects?

Sacroiliac joint disorders usually do not produce any long-term effects, as long as they are properly diagnosed and appropriately treated. Recovery usually takes place in a number of weeks. Occasionally this recovery may be prolonged if the injury is severe.

Management

The assistance of a sports medicine professional is important in the treatment of a sacroiliac joint disorder. Initially, they can assist in diagnosing the problem and determining its severity. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the use of anti-inflammatory medications, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. Occasionally an injection of an anti-inflammatory may be injected into the sacroiliac joint to stimulate healing.

Iliolumbar ligament sprain

What is it?

The iliolumbar ligament is a ligament that runs from the pelvis bone (ilium) to the lowest lumbar vertebra in the back. A ligament sprain refers to a ligament that is overstretched and injured.

How does it happen?

An iliolumbar ligament sprain occurs when the ligament is overstretched. This usually occurs when the lower back is forcefully bent, arched or twisted.

How does it feel?

An iliolumbar ligament sprain results in lower back and upper buttock pain. This is usually felt deep in the back and to one side of the spine. It may be made worse through activities such as bending, arching or twisting the back.

What should you do?

If you have or suspect you have sprained your iliolumbar ligament, you should consult your nearest sports medicine professional.

What shouldn't you do?

If you have or suspect you have sprained your iliolumbar ligament, you shouldn't ignore the problem and continue to participate in sport. This may lead to your injury deteriorating which may prolong your recovery. In addition, you should not perform any activities that aggravate your pain.

Could there be any long-term effects?

An iliolumbar ligament sprain does not produce any long-term effects, as long as it properly diagnosed and appropriately treated. Recovery usually takes place in a number of days to weeks.

Management

The assistance of a sports medicine professional is important in the treatment of an iliolumbar ligament sprain. Initially, they can assist in diagnosing the problem and determining its severity. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the use of anti-inflammatory medications, and soft tissue treatment such as massage and joint mobilisation. If recovery is prolonged, an injection of an anti-inflammatory directly into the iliolumbar ligament may be used to stimulate healing.

Hamstring origin tendinopathy

What is it?

Hamstring origin tendinopathy refers to inflammation within the tendon of the hamstring muscle group at the region where they originate from (in the buttocks).

How does it happen?

Hamstring origin tendinopathy results from overuse of the hamstring tendon, at its origin in the buttock. The function of the hamstring tendon is to transmit forces produced by the large muscle group on the back of the thigh (hamstrings) to the pelvic bone complex. Repetitive use of the hamstring muscle group and, therefore, the hamstring tendon can lead to microscopic tears within the tendon. To repair these tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy.

How does it feel?

Hamstring origin tendinopathy results in pain felt deep into the lower part of the buttock. This pain typically develops gradually; initially the pain may only be present following exercise. This may be that it is first felt on rising the day following sport participation. Associated with this pain may be stiffness or tightness in the hamstring muscles. Typically, these initial signs of hamstring origin tendinopathy are ignored, as they disappear quickly with walking or movement. However, as you continue to participate in sport, the tendinopathy progresses and the pain becomes more intense and more frequent. In the earlier stages, this pain during participation may initially disappear as you warm up, only to return when you cool down. However, as you continue to participate, the tendinopathy worsens and your pain may begin to be present for longer periods during participation until it is present all of the time and may interfere with your performance.

What should you do?

Hamstring origin tendinopathy generally does not improve on its own, especially if the cause is not addressed and you continue to exercise. If you have or suspect you have hamstring origin tendinopathy, you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of icing following participation and regular gentle hamstring stretching. Icing may consist of crushed ice wrapped in a moist towel applied to the region of pain for 15–20 minutes.

What shouldn't you do?

If you have or suspect you have hamstring origin tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury deteriorating. This may then reach the stage where your pain does not 'warm up' and you feel it throughout sport participation. If this occurs, your recovery may be prolonged and it may take a number of weeks for you to return to full participation.

Could there be any long-term effects?

Hamstring origin tendinopathy does not produce any long-term effects if it is properly diagnosed and appropriately treated. If this is not achieved, it can lead to prolonged pain and time out from activity.

Management

The assistance of a sports medicine professional is important in the treatment of hamstring origin tendinopathy. Initially, they can assist in diagnosing the problem and establishing its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this information, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed this injury and address prevention of re-occurrence when you return to full activity.

Ischiogluteal bursitis

What is it?

Ischiogluteal bursitis refers to inflammation of the bursa located between the origin of the hamstring muscles and the ischial tuberosity (the bone from which these muscles originate). A bursa is a fluid-filled sac, which allows adjacent tissues to slide over one another without producing friction and therefore irritation.

How does it happen?

Ischiogluteal bursitis occurs when the ischiogluteal bursa is damaged or irritated. This can occur following either a single 'traumatic' injury or a series of injuries to the bursa. Injury may result from a direct blow to the bursa such as falling on a hard surface. This can damage blood vessels within the ischiogluteal bursa causing bleeding. The blood in the bursa causes an inflammatory response, resulting in swelling of the bursa and subsequent bursitis. Alternatively, ischiogluteal bursitis may be caused by repeated minor trauma. This can occur with sitting for a prolonged period on a hard surface. This type of ischiogluteal bursitis is commonly referred to as 'weaver's bottom'. Sitting for a prolonged period can increase wear and tear on the bursa causing microtrauma. Over time, this can result in bursal thickening, inflammation and bursitis. This can also occur with tight muscles around the bursa. The ischiogluteal bursa works to allow the gluteal and hamstring muscles to slide smoothly and without friction over the nearby bone (ischial tuberosity). When these muscles are excessively tight, they place increased pressure and friction on the bursa, resulting in bursitis.

How does it feel?

Ischiogluteal bursitis generally causes a dull ache in the buttock that may become sharp with movements of the hip joint. The pain may radiate down the outside of the thigh and is often aggravated by activities such as walking, running, or stair climbing. Similarly, it is also often aggravated by sitting, which compresses the bursa against the adjacent bone.

What should you do?

If you have ischiogluteal bursitis, it is advised you avoid activities that aggravate your pain and seek the assistance of a sports medicine professional to establish its cause. If the cause of the bursitis is not addressed, the pain may dissipate when you rest, only to return as soon as you recommence activity.

What shouldn't you do?

If you have ischiogluteal bursitis, you should not continue with activities which aggravate your pain or make it worse. These will increase friction on the bursa, further irritating it, and possibly delay your recovery.

Could there be any long-term effects?

Unless the cause of irritation on the ischiogluteal bursa is accurately identified and addressed, ischiogluteal bursitis will not get better on its own. Your pain may disappear with a period of lay-off or treatment; however, with recommencement of activity, excessive friction on the bursa continues resulting in inflammation and the re-occurrence of your pain.

Management

The assistance of a sports medicine professional is important in the treatment of ischiogluteal bursitis. They will be able to confirm your diagnosis and use a number of treatment techniques to reduce your pain. In some situations, this may involve draining the bursa, using anti-inflammatory medications or injecting a small quantity of an anti-inflammatory directly into the bursa to stimulate healing. More importantly, the sports medicine professional will be able to determine the cause of irritation on the bursa. Addressing this primary problem as your pain settles will help prevent a re-occurrence when you return to activity.

Piriformis conditions

What is it?

The piriformis is a short muscle deep in the buttock region, which arises from the sacral bone of the pelvis and attaches to the top of the femur at the hip. Piriformis conditions refer to buttock pain that is caused by this muscle.

How does it happen?

Piriformis conditions usually result from tightening of the piriformis muscle. This may occur as a result of a previous strain in the muscle or because of repeated microtrauma to the muscle. Microtrauma refers to microscopic damage to the muscle, which does not produce any symptoms such as pain. If the body is not given enough time to heal this microtrauma, further damage to the muscle may occur. This can lead to progressive tightening and thickening of the muscle. Stretching of this tight muscle when the hip and leg are moved in activities may then cause pain.

How does it feel?

Piriformis conditions produce pain felt deep into the buttock. This is especially felt when the hip is moved to its extremes of movement and particularly when the hip is rotated. For example, whilst changing direction during running.

What should you do?

If you have or suspect you have a piriformis condition, you should consult your nearest sports medicine professional.

What shouldn't you do?

If you have or suspect you have a piriformis condition, you shouldn't ignore the problem and continue to participate in sport. This may lead to your problem deteriorating, resulting in a prolonged recovery. In addition, you should avoid activities that aggravate your pain.

Could there be any long-term effects?

A piriformis condition does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. Recovery usually takes place within a number of days to weeks.

Management

The assistance of a sports medicine professional is important in the treatment of a piriformis condition. Initially, they can assist in diagnosing the problem and establishing its severity. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft-tissue treatment such as massage and stretching, and electrotherapy treatment. Following on from this, a series of progressive strengthening exercises will enable you to return to sport participation.

Avulsion fracture of the ischial tuberosity

What is it?

The ischial tuberosity is the bone in the buttock from which the hamstring muscle group (back of the thigh) originates. It is also the point of bone in the pelvis we sit on. An avulsion fracture of the ischial tuberosity refers to a fracture of this bone, where a piece of the tuberosity is pulled away from the rest of the pelvis bone. This is an injury most commonly seen in adolescent athletes.

How does it happen?

The large muscle group on the back of the thigh (hamstrings) attaches to the pelvis bone at the ischial tuberosity. With a strong contraction of the hamstring muscle group the piece of the ischial tuberosity to which the hamstrings attach may be pulled away or avulsed from the rest of the ischial bone.

How does it feel?

An avulsion fracture of the ischial tuberosity results in pain felt deep in the lower part of the buttock. This pain is often sudden in onset and is usually strong enough to interfere with your performance and stop you from participating in sport.

What should you do?

If you have or suspect you have an avulsion fracture of the ischial tuberosity, you should cease activity and begin initial treatment. This should consist of rest and ice. Rest involves ceasing to participate and limiting the amount of weight you put through the injured site. This may require using crutches if you are having difficulty walking. Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, this should be applied using crushed ice wrapped in a moist cloth or towel. You should continue resting and icing until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

If you have or suspect you have an avulsion fracture of the ischial tuberosity, you should not undertake activities that increase blood flow to the injured area. These include hot showers, heat rubs, consumption of alcohol and excessive activity. These may increase the bleeding and swelling around the injured structures and potentially prolong your recovery.

Could there be any long-term effects?

Avulsion fractures of the ischial tuberosity usually heal within a number of weeks and do not produce long-term effects if they are appropriately treated. However, a small proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage.

Management

The assistance of a sports medicine professional is important in the treatment of an avulsion fracture of the ischial tuberosity. Initially, they can assist in determining the tissues that have been damaged and the extent of this damage. This may require the use of an X-ray to image the bone. From this, a determination of how long the injury is expected to take to heal can be provided and an appropriate treatment plan developed. The latter may involve an initial period of rest or activity modification, soft tissue treatment such as massage and stretching, treatments to assist in pain reduction, and the progression through a series of specific strengthening exercises. In addition, the sports medicine professional will be able to advise you on the appropriate time and plan for returning to full sport participation.

Adductor muscle strain

What is it?

An adductor muscle strain refers to a tear in one of the muscles which run down the inside of the thigh.

How does it happen?

An adductor muscle strain typically occurs when the muscle is overstretched or forcibly contracted, or a combination of both. This commonly occurs during rapid changes in direction when running.

How does it feel?

The first sensation you feel when an adductor muscle is torn is sudden pain felt either along the inside of the thigh or in the groin region. At the same time you may have a sensation of something tearing. In minor tears you may be able to continue participating with minimal hindrance. However, as the muscle cools down following participation, pain may gradually worsen as bleeding and swelling around the injured muscle takes place. This may be associated with progressive tightening and stiffening of the pectoralis muscle. In more severe tears, these sensations may be exaggerated such that you are unable to continue participating immediately following injury due to excessive pain, and muscle tightness, weakness and spasm. In these cases, the pain may be so intense that you may be unable to walk without a limp.

What should you do?

To limit the severity of the injury it is advised you cease participating and begin initial treatment. The most important time in the treatment of an adductor muscle strain is the first 24–48 hours. This is when bleeding and swelling in and around the injured muscle is most active. To control the amount of bleeding and swelling, and limit the amount of damage to the injured adductor muscle, the RICE regime should be commenced (Rest, Ice, Compression, Elevation). Rest involves ceasing to participate and limiting the amount of weight you put through the injured site. This may require using crutches if you are having difficulty walking. Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel. Compression involves the application of a firm elastic bandage around the injured site. It should be firm but not tight enough to cause pain. Elevation involves lying with the injured site resting comfortably on a chair or pillows so that it is above the level of the heart. You should continue the RICE regime until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury (within the first couple of days).

What shouldn't you do?

In the first few days following an adductor muscle strain, you shouldn't undertake activities which increase blood flow to the adductor muscles. These include hot showers, groin stretching, heat rubs, massage, the consumption of alcohol and excessive activity. These can prolong muscle bleeding, resulting in further pain and an extended recovery.

Could there be any long-term effects?

Most adductor muscle strains heal without complication within a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. When an adductor muscle is strained, a number of structures contained within and around the muscle may also be injured. Injury to these structures may delay return to participation. Similarly, return can be delayed if the strain is not appropriately managed. This may result in a tight, weak adductor muscle which is prone to reinjury with return to participation.

Management

The assistance of a sports medicine professional is important in the treatment of an adductor muscle strain. Initially, they can assist in determining the exact tissue/s damaged and the extent of this damage. From this, a determination of how long the injury is expected to take to heal can be provided. Sports medicine professionals can also use a number of treatment techniques to assist in reducing the pain and swelling, and enhance the healing of the injured structures. This may involve progressing you through a series of exercises designed to increase your muscle range of motion and strength. These will facilitate your return to participation and help prevent reinjury.

Adductor tendinopathy

What is it?

Adductor tendinopathy refers to damage to the tendons of the adductor muscles where they originate from the pelvis bone high up in the groin.

How does it happen?

Adductor tendinopathies commonly result from overuse of the adductor tendons. The function of the adductor tendons is to transmit forces produced by the adductor muscles on the inside of the thigh to the pelvis bone to produce movement of the leg. Repetitive use of the adductor muscles and, therefore, the adductor tendons can lead to microscopic tears within the tendons or pulling of the tendon away from the pelvis bone. This is common in sports that involve a lot of side-to-side movement and cutting manoeuvres, such as football and soccer.

How does it feel?

Adductor tendinopathies result in pain felt high up on the inside of the thigh close to the groin. Initially it may only be felt following exercise. For example, it may be first felt on rising the day following participation. Associated with the pain may be stiffness or tightness in the groin region. Typically, these initial signs of adductor tendinopathy are ignored, as they disappear quickly with walking about or applying heat (i.e. a hot shower) over the groin region. However, as you continue to participate, the tendinopathy progresses and the pain in the groin becomes more intense and more frequent. For example, it may begin to be present during participation. In the earlier stages this pain during participation may initially disappear as you warm-up, only to return when you cool down. However, as you continue to participate, the tendinopathy worsens and your pain may begin to be present for longer periods during participation until it is present all of the time. This may interfere with your performance.

What should you do?

Adductor tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have an adductor tendinopathy you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of icing following participation and regular gentle groin stretching. Icing should consist of crushed ice wrapped in a moist towel applied to the sore area for 15–20 minutes.

What shouldn't you do?

If you have or suspect you have an adductor tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout participation. If this occurs, your recovery may be prolonged and it may take a number of months for you to return to full participation.

Could there be any long-term effects?

Adductor tendinopathy usually does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. Recovery usually takes place in a matter of weeks.

Management

The assistance of a sports medicine professional is important in the treatment of adductor tendinopathy. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed adductor tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Osteitis pubis

What is it?

Osteitis pubis refers to inflammation of the pubic symphysis joint. This is the joint at the front of the pelvis between the two pubic bones.

How does it happen?

The exact cause of osteitis pubis is not clear. However, it appears to be an overuse injury associated with excessive kicking or abdominal muscle contraction, for example, repeated sit-ups. During these activities, the muscles that produce the movement attach close to the pubic symphysis joint. Their pull on the joint may cause excessive movement of the joint, resulting in an inflammatory response and subsequent osteitis pubis.

How does it feel?

Osteitis pubis results in a dull aching pain in the groin region which is aggravated by activity.

What should you do?

If you have or suspect you have osteitis pubis, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect you have osteitis pubis, you shouldn't ignore the problem and continue to participate. This may lead to your injury getting worse which may prolong your recovery. In addition, you shouldn't perform any activities which aggravate your pain.

Could there be any long-term effects?

Unfortunately, the recovery time associated with osteitis pubis can be prolonged and it may be a number of months before you can return to participation.

Management

The assistance of a sports medicine professional is important in the treatment of osteitis pubis. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as X-ray, ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the taking of anti-inflammatory medications, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises.

Trochanteric bursitis

What is it?

Trochanteric bursitis refers to inflammation and swelling of the bursa located between the point of the hip (trochanter) and the overlying gluteal muscles. A bursa is a fluid-filled sac which allows adjacent tissues to slide over one another without friction.

How does it happen?

Trochanteric bursitis occurs when the trochanteric bursa is irritated. This commonly results from excessive friction on the bursa. This can occur when you have tight gluteal muscles or poor biomechanics around the pelvis. The trochanteric bursa works to allow the gluteal muscles to slide smoothly and without friction over the point of the hip. When these muscles are excessively tight, they place increased pressure and friction on the bursa. This increases wear and tear on the bursa, causing microtrauma which, over time, can result in bursal thickening, inflammation and bursitis.

How does it feel?

Trochanteric bursitis causes pain over the outside of the hip. In some instances, this pain may radiate down the outside of the thigh as far down as the knee. This pain may be aggravated by activities involving movement of the hip such as walking, running, stair climbing, crossing your legs and getting in and out of the car. The area may be tender to touch and warm.

What should you do?

If you have trochanteric bursitis, it is advised you avoid activities which aggravate your pain and seek the assistance of a sports medicine professional to establish the cause. If the cause isn't addressed, the pain may go away if you rest, only to return as soon as you recommence activity.

What shouldn't you do?

If you have trochanteric bursitis, you shouldn't continue with activities which aggravate your hip and make your pain worse. These will increase friction on the bursa, further irritating it, and possibly delay recovery.

Could there be any long-term effects?

Trochanteric bursitis does not produce any long-term effects and usually gets better within a matter of weeks.

Management

The assistance of a sports medicine professional is important in the treatment of trochanteric bursitis. They will be able to confirm your diagnosis and use a number of treatment techniques to reduce your pain. In some situations, this may involve draining the bursa, taking anti-inflammatory medications or injecting a small quantity of anti-inflammatory directly into the bursa to stimulate healing. However, more importantly, the sports medicine professional will be able to determine the cause of the irritation on your bursa. Addressing this as your pain settles will help prevent the re-occurrence of trochanteric bursitis when you return to activity.

Stress fracture of the pubic ramus

What is it?

A stress fracture of the pubic ramus is an incomplete fracture or crack within a portion of one of the bones that form the pelvis.

How does it happen?

Stress fractures of the pubic ramus result from an imbalance between bone formation and bone resorption. When the pubic ramus is loaded or stressed, such as during weight-bearing exercise, the pubic ramus responds by increasing its bone turnover. This is necessary for it to live-up to your demands on it. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone at the same location. To do this, old bone is resorbed (removed) before it is replaced with new bone. If bone formation cannot keep up with bone resorption, areas of weakness can develop within the pubic ramus. These can develop into a stress fracture if the bone is continually loaded.

How does it feel?

A stress fracture of the pubic ramus is characterised by increasing groin pain developing over a period of weeks. The pain is generally very localised over the site of the stress fracture and made worse by exercise. It may also be felt in the buttocks. Initially the pain may have only been present following activity. However, with continued loading and stress, it may have progressed to be present during exercise. It may also have reached a level such that activity is too painful to perform and the pubic bone is sore during walking, rest and even at night. When you touch the site where you feel the pain it may be tender and warm.

What should you do?

If you have or suspect a stress fracture of the pubic ramus, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect a stress fracture of the pubic ramus, you shouldn't continue to exercise or compete. A stress fracture represents an area of breakdown and weakness within the bone. If you continue to exercise or compete, the area of breakdown has the potential to increase weakening the bone further. This can lead to a larger crack in the bone and potentially a complete bone fracture.

Could there be any long-term effects?

A stress fracture of the pubic ramus does not produce any long-term effects, as long as it is properly treated and the cause identified and addressed. If this does not happen, you may be at risk of a larger crack, a complete bone fracture or further stress fractures when you recommence participation.

Management

The assistance of a sports medicine professional is important in the treatment of a stress fracture of the pubic ramus. Initially, they can assist in diagnosing the injury and the extent of the damage to the bone. This may require the use of a number of imaging techniques such as a bone scan, CT scan or MRI. From this, the sports medicine professional will be able to provide you with an estimation of how long the injury is expected to take to heal and determine an appropriate treatment plan. The latter may initially involve a period of rest and the use of crutches and anti-inflammatory medications to help with your pain. This may be followed by a stretching and gradual exercise program to facilitate your return to activity. The sports medicine professional will also be able to assess and determine why you developed a stress fracture of the pubic ramus and address this during your recovery to prevent the re-occurrence of the stress fracture when you return to full activity.

Hip joint injury

What is it?

A hip joint injury refers to an overstretching injury to the hip joint and its supporting structures.

How does it happen?

Hip joint injuries result from moving the hip joint too far. This can overstretch the structures supporting the joint. These structures include the surrounding joint capsule which holds the fluid within the joint and the ligaments which support this capsule. These structures may be overstretched following a single incident, such as rotating the hip too far, or overstretched following repeated movement of the hip joint.

How does it feel?

A hip joint injury results in hip pain. This is usually felt deep within the hip joint. However, it may also radiate to be felt down the front of the thigh. The pain is usually made worse by moving the hip, such as twisting it in or out.

What should you do?

If you have or suspect you have injured your hip joint, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect you have injured your hip joint, you shouldn't ignore the problem and continue to participate. This may lead to your injury getting worse which may prolong your recovery. In addition, you shouldn't perform any activities which aggravate your pain.

Could there be any long-term effects?

An injury to the hip joint usually does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. Recovery usually takes place in a matter of weeks. Occasionally this recovery may be prolonged if the injury is severe.

Management

The assistance of a sports medicine professional is important in the treatment of a hip joint injury. Initially, they can assist in diagnosing the problem and determining its severity. This may require the use of imaging techniques such as X-ray, ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the taking of anti-inflammatory medications, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. Occasionally an injection of anti-inflammatory may be injected into the hip joint to stimulate healing.

Stress fracture of the neck of the femur

What is it?

A stress fracture of the neck of the femur is an incomplete fracture or crack within the top of the thigh close to where it attaches to the pelvis.

How does it happen?

Stress fractures of the neck of the femur result from an imbalance between bone formation and bone resorption. When the neck of the femur is loaded or stressed, such as during weight-bearing exercise, it responds by increasing its bone turnover. This is necessary for it to live up to your demands on it. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone at the same location. To do this, old bone is resorbed (removed) before it is replaced with new bone. If bone formation cannot keep up with bone resorption, areas of weakness can develop within the neck of the femur. These can develop into a stress fracture if the bone is continually loaded.

How does it feel?

A stress fracture of the shaft of the femur is characterised by a dull ache felt in the groin. The pain generally develops over a period of weeks and is difficult to localise. It is frequently made worse by exercise; however, it may also be felt during walking, rest and even at night.

What should you do?

If you have or suspect a stress fracture of the neck of the femur, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect you have a stress fracture of the neck of the femur, you shouldn't continue to exercise or compete. A stress fracture represents an area of breakdown and weakness within the bone. If you continue to exercise or compete, the area of breakdown has the potential to increase, weakening the bone further. This can lead to a larger crack in the bone and potentially a complete bone fracture.

Could there be any long-term effects?

A stress fracture of the neck of the femur does not produce any long-term effects, as long as it is properly treated and the cause identified and addressed. If this does not happen, you may be at risk of a larger crack, a complete bone fracture or further stress fractures when you recommence participation.

Management

The assistance of a sports medicine professional is important in the treatment of a stress fracture of the neck of the femur. Initially, they can assist in diagnosing the injury and the extent of the damage to the bone. This may require the use of a number of imaging techniques such as a bone scan, CT scan or MRI. From this, the sports medicine professional will be able to provide you with an estimation of how long the injury is expected to take to heal and determine an appropriate treatment plan. The latter may initially involve a period of rest and the use of crutches and anti-inflammatory medications to help with your pain. This may be followed by a stretching and gradual exercise program to facilitate your return to activity. The sports medicine professional will also be able to assess and determine why you developed a stress fracture of the neck of the femur and address this during your recovery to prevent the re-occurrence of the stress fracture when you return to full activity.

Snapping hip

What is it?

As the name suggests, snapping hip refers to a condition which produces a snapping noise in the hip. It is a condition commonly seen in ballet dancers.

How does it happen?

Snapping hip is caused by a tight muscle in the hip snapping over a bone. When the hip is moved, the muscles around the hip glide over the bones and any bumps on the bones. If a muscle is tight it can momentarily get caught or snagged. With continued movement this snagged muscle can snap over the bone.

How does it feel?

Snapping hip produces a snapping noise within the hip when the joint is moved. This may be associated with a sensation of something getting snagged and then releasing when it snaps over the bone. Often this snapping is painless.

What should you do?

If you have or suspect you have a snapping hip, you should consult your nearest sports medicine professional for assistance. In the meantime, you should avoid any activities which cause your hip to snap.

What shouldn't you do?

If you have or suspect you have a snapping hip, you shouldn't ignore the problem. This may lead to your condition getting worse such that it begins producing pain and begins interfering with your performance.

Could there be any long-term effects?

Snapping hip is not a serious condition. With appropriate treatment it does not produce any long-term effects.

Management

The assistance of a sports medicine professional is important in the treatment of snapping hip. Initially, they can assist in determining the cause of the snapping. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage, and the progression through a series of specific stretching exercises.

Iliopsoas (hip flexor) strain

What is it?

An iliopsoas muscle strain refers to a tear within the iliopsoas muscle, the main muscle which bends (flexes) the hip.

How does it happen?

An iliopsoas muscle strain typically occurs when the muscle is explosively and forcibly contracted. This can occur in activities such as sprinting or kicking. In these activities, the iliopsoas is particularly vulnerable to tearing when it is working in a stretched position or when required to contract against a load (i.e. kicking a ball).

How does it feel?

The first sensation you feel when the iliopsoas muscle is torn is sudden pain in the front of the hip and groin due to damage to muscle fibers. At the same time you may have a sensation of something tearing. In minor tears you may be able to continue participating with minimal hindrance. However, as the muscle cools down following participation, pain may gradually worsen as bleeding and swelling around the injured muscle takes place. This may be associated with progressive tightening and stiffening of the iliopsoas muscle. In more severe tears these sensations may be exaggerated such that you are unable to continue participating immediately following injury due to excessive pain in the groin and muscle tightness, weakness and spasm. In these cases, the pain may be so intense that you may be unable to walk without a limp.

What should you do?

To limit the severity of the injury it is advised you cease participating and begin initial treatment. The most important time in the treatment of an iliopsoas muscle strain is the first 24–48 hours. This is when bleeding and swelling around the injured muscle is most active. Although swelling is a necessary step in the healing process, too much can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the iliopsoas muscle, rest and ice should be undertaken. Rest involves ceasing to participate and limiting the amount of weight you put through the injured site. This may require using crutches if you are having difficulty walking. Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel. You should continue this until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury (within the first couple of days).

What shouldn't you do?

In the first few days following iliopsoas muscle strain you shouldn't undertake activities which increase blood flow to the injured muscle. These include hot showers, hip flexor and groin stretching, heat rubs, massage, the consumption of alcohol and excessive activity. These can prolong muscle bleeding and exaggerate swelling, resulting in further pain and an extended recovery.

Could there be any long-term effects?

Most iliopsoas muscle strains heal without complication within a matter of weeks. However, a proportion of injuries can result in longer-term effects depending on the severity of the injury and extent of damage. When the iliopsoas is torn, a number of structures contained within and around the muscle may be injured. Injury to these structures may delay return to participation. Similarly, return can be delayed if the tear is not appropriately managed. This may result in a tight, weak iliopsoas which is prone to reinjury with return to participation.

Management

The assistance of a sports medicine professional is important in the treatment of an iliopsoas muscle strain. Initially, they can assist in determining the exact tissue/s damaged and the extent of this damage. From this, a determination of how long the injury is expected to take to heal can be provided. A sports medicine professional can also use a number of treatment techniques to assist in reducing pain and swelling and enhance the healing of the injured structures. This can be facilitated by providing you with an appropriate progression of exercises aimed at increasing your range of motion, strength and function. These exercises will facilitate your return to participation and help prevent reinjury.

Iliopsoas bursitis

What is it?

Iliopsoas bursitis refers to inflammation of the bursa located between the powerful muscle (iliopsoas) which bends your hip and the underlying bone. A bursa is a fluid-filled sac which allows adjacent tissues to slide over one another without friction.

How does it happen?

Iliopsoas bursitis occurs when the iliopsoas bursa is irritated. This commonly results from excessive friction of the bursa on the underlying bone. This can occur when you have a tight iliopsoas muscle. The iliopsoas bursa works to allow the iliopsoas muscle to slide smoothly and without friction over the underlying bone. When this muscle is excessively tight, it is placing increased pressure and friction on the bursa. This increases wear and tear on the bursa causing microtrauma which, over time, can result in bursal thickening, inflammation and bursitis.

How does it feel?

Iliopsoas bursitis causes pain over the front of the hip. In some instances, this pain may also be felt in the groin region. This pain is often aggravated by activities involving movement of the hip such as walking, running, stair climbing, crossing your legs and getting in and out of the car.

What should you do?

If you have or suspect you have iliopsoas bursitis it is advised you avoid activities which aggravate your pain and seek the assistance of a sports medicine professional to establish the cause. If the cause isn't addressed, the pain may go away if you rest, only to return as soon as you recommence activity.

What shouldn't you do?

If you have or suspect you have iliopsoas bursitis you shouldn't continue with activities which aggravate your pain making it worse. These will increase friction on the bursa, further irritating it, and possibly delay recovery.

Could there be any long-term effects?

Iliopsoas bursitis does not produce any long-term effects and usually gets better within a matter of weeks.

Management

The assistance of a sports medicine professional is important in the treatment of iliopsoas bursitis. They will be able to confirm your diagnosis and use a number of treatment techniques to reduce your pain. In some situations, this may involve draining the bursa, taking anti-inflammatory medications or injecting a small quantity of anti-inflammatory directly into the bursa to stimulate healing. However, more importantly, the sports medicine professional will be able to determine the cause of the irritation on your bursa. Addressing this as your pain settles will help prevent the re-occurrence of iliopsoas bursitis when you return to activity.

Rectus abdominis tendinopathy

What is it?

Rectus abdominis tendinopathy refers to damage to the tendon of the rectus abdominis muscle where it attaches to the pelvis bone just above the genitals. The rectus abdominis muscle is the muscle down the middle of the abdomen which in lean people looks like a 'wash-board' or 'six-pack'.

How does it happen?

Rectus abdominis tendinopathies commonly result from overuse of the rectus abdominis tendon. The function of the rectus abdominis tendon is to transmit forces produced by the rectus abdominis muscle to the pelvis bone to produce movement of the trunk. Repetitive use of the rectus abdominis muscle and, therefore, the rectus abdominis tendon can lead to microscopic tears within the tendons or pulling of the tendon away from the pelvis bone.

How does it feel?

Rectus abdominis tendinopathy results in pain felt just above the genitals where the muscle attaches to the pelvis bone. This is usually felt when the rectus abdominis muscle is contracted such as during a sit-up.

What should you do?

Rectus abdominis tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have rectus abdominis tendinopathy, you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of icing following participation. Icing should consist of crushed ice wrapped in a moist towel applied to the sore area for 15–20 minutes.

What shouldn't you do?

If you have or suspect you have rectus abdominis tendinopathy, you shouldn't ignore the problem. This can lead to your injury getting worse prolonging your recovery.

Could there be any long-term effects?

Rectus abdominis tendinopathy usually does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. Recovery usually takes place in a matter of weeks.

Management

The assistance of a sports medicine professional is important in the treatment of rectus abdominis tendinopathy. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the taking of anti-inflammatory medications, soft tissue treatment such as massage, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed rectus abdominis tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Inguinal hernia

What is it?

An inguinal hernia refers to when part of the abdominal contents bulge through a defect in the wall of the abdomen.

How does it happen?

Inguinal hernias result from a weakness in the lower abdominal wall and lower abdominal muscles. When this is coupled with an increase in intra-abdominal pressure, such as during lifting, pushing, coughing, or straining during urination or defecation, a portion of the abdominal contents may be pushed through the area of weakness.

How does it feel?

Inguinal hernias produce a dragging sensation and pain on one side of the lower abdomen just above the genitals. This is usually aggravated by activities which increase intra-abdominal pressure (i.e. lifting, pushing and coughing). Depending on how much of the abdominal contents has pushed through the area of weakness in the abdominal wall, there may be a visible swelling at the site of the pain.

What should you do?

If you have or suspect you have an inguinal hernia, you should consult your nearest sports medicine professional as soon as possible.

What shouldn't you do?

If you have or suspect you have an inguinal hernia, you shouldn't ignore the problem and continue to participate. This may lead to your hernia getting worse and result in irreversible changes.

Could there be any long-term effects?

An inguinal hernia represents a condition which does not get better by itself. Surgery is required to repair to the defect in the abdominal wall and to return the abdominal contents back to their original position. Following surgery, recovery usually takes place in a matter of weeks and there are usually no long-term effects.

Management

The assistance of a sports medicine professional is important in the treatment of inguinal hernia. Initially, they can assist in diagnosing the problem and establishing its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This will most frequently involve surgery.

Posterior inguinal wall weakness ('sportsman's hernia')

What is it?

Posterior inguinal wall weakness refers to a weakness in the deeper layer of the abdominal muscles just above the genitals.

How does it happen?

Posterior inguinal wall weakness results from a weakness in the deeper layers of the lower abdominal wall and lower abdominal muscles. This enables the abdominal contents to push outwards, compressing structures in the groin. This is most commonly seen in sports that involve kicking.

How does it feel?

Posterior inguinal wall weakness is felt as gradually worsening groin pain which develops over a long period of time (i.e. months). This pain is often difficult to locate and made worse by activity, especially kicking. It is not painful when you are at rest; however, upon resumption of activity the pain returns almost immediately.

What should you do?

If you have or suspect you have a posterior inguinal wall weakness, you should consult your nearest sports medicine professional.

What shouldn't you do?

If you have or suspect you have an posterior inguinal wall weakness, you shouldn't ignore the problem and continue to participate. This may lead to your problem getting worse prolonging your recovery.

Could there be any long-term effects?

Posterior inguinal wall weakness represents a condition which does not get better by itself. Surgery is required to repair the defect in the abdominal wall. Following surgery, recovery usually takes place in a matter of months and there are usually no long-term effects.

Management

The assistance of a sports medicine professional is important in the treatment of posterior inguinal wall weakness. Initially, they can assist in diagnosing the problem and establishing its severity. This may require the use of imaging techniques such as a peritoneogram. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This will most frequently involve surgery. Following surgery, the sports medicine professional will be able to commence you on a rehabilitation program involving strengthening of the lower abdominal muscles to facilitate your return to participation and to prevent further problems.

Obturator nerve entrapment

What is it?

Entrapment of the obturator nerve refers to when the obturator nerve becomes caught as it travels through muscles and tissues in its course from the back to the inner thigh.

How does it happen?

Entrapment of the obturator nerve may result from adhesions developing between the nerve and the muscles and tissues through which it passes to gain entry to the inner thigh. These adhesions may restrict how much the nerve can slide forwards and backwards as the leg is moved. This may cause overstretching of the nerve at the site of the adhesions, resulting in the interference of signals being transmitted by the nerve. Alternatively, the obturator nerve may be entrapped if the muscles and tissues through which it passes are excessively tight. This may compress the nerve and interfere with the transmission of signals.

How does it feel?

When the obturator nerve is entrapped, the most common sensation felt is pain. This is usually an aching pain experienced on the inside of the thigh which is made worse by activity. Occasionally with exercise you may also experience some numbness on the inside of the thigh.

What should you do?

Entrapment of the obturator nerve generally does not get better on its own if the cause of the entrapment is not treated. If you have or suspect that you have obturator nerve entrapment, you should consult your nearest sports medicine professional. In the meantime, you should avoid activities which aggravate or provoke your pain. This may lead to the further entrapment and worsening of your condition.

What shouldn't you do?

If you have or suspect that you have entrapment of the obturator nerve, you shouldn't ignore the problem. This can lead to your injury getting worse which may prolong your recovery.

Could there be any long-term effects?

Entrapment of the obturator nerve does not usually produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to ongoing pain in the inner thigh and a prolonged lay-off from participation. In some situations, this may occur despite appropriate treatment. In these cases, surgery may be required to remove the structures which have entrapped the nerve so as to alleviate your pain.

Management

The assistance of a sports medicine professional is important in the treatment of an entrapped obturator nerve. Initially, they can assist in diagnosing the cause of the problem and establish its severity. From their assessment, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification and soft tissue treatment such as massage and stretching. The sports medicine professional will also be able to assess and determine why you developed entrapment of the obturator nerve and address this during your recovery to prevent a re-occurrence when you return to full participation.

Quadriceps contusion (cork thigh, corky, quadriceps hemorrhage)

What is it?

A quadriceps contusion refers to the damage to and resultant bleeding (hemorrhage) within and around the large muscle group on the front of the thigh.

How does it happen?

A quadriceps contusion is typically caused by impact from a direct blow to the thigh. This is usually a result of being struck by an object or colliding with another player. The result is a crush injury to the quadriceps muscle as it is compressed against the underlying bone. This damages the muscle fibres and blood vessels contained within the muscle, resulting in bleeding and swelling of the muscle.

How does it feel?

The first sensation felt following a quadriceps contusion is pain at the point of impact. In mild contusions this pain may initially settle, allowing you to continue participating. However, as the muscle cools down after activity, the pain may gradually increase as bleeding and swelling within and around the muscle continues. This may be associated with progressive tightening and stiffening of the quadriceps as the small compartments within the muscle become filled with blood. In more severe contusions, these sensations may be exaggerated such that you are unable to continue participating in activity immediately following the injury due to excessive pain, muscle tightening, weakness and spasm. In these cases, you may be unable to walk without a limp and there can be an obvious increase in size of the thigh due to the swelling and bleeding.

What should you do?

To limit the severity of this injury it is advised you stop your activity immediately and start an initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the quadriceps muscle, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your leg. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around the injury site. It should be firm but not tight enough to cause pain. Applying a compressive bandage while the quadriceps muscle is on a 'gentle' stretch will enhance the compressive forces within the muscle.

Elevation involves lying with your leg resting comfortably on a chair or pillows so that it is above the level of your heart.

You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

Following a contusion injury to the thigh, you shouldn't undertake activities which increase blood flow to the quadriceps muscle. These include hot showers, vigorous quadriceps stretching, heat rubs, massage, consumption of alcohol and excessive activity. These can increase muscle bleeding, resulting in further pain and an extended recovery period.

Management

The assistance of a sports medicine professional is important in the treatment of a quadriceps contusion. Initially, they can assist in determining the exact tissue/s damaged and the extent of this damage. From this information an indication of how long the injury is expected to take to heal can be determined. Sports medicine professionals can also use a number of treatment techniques to assist in reducing pain and swelling and enhance the healing of the injured structures. This can be performed whilst minimising the risk of a re-bleed and will accelerate your return to sports participation. In addition, they can progress you through a series of exercises designed to increase your muscle range of motion and maintain muscle strength. A sports medicine professional will also be able to advise you on other preventive measures such as the use of padding and thigh protectors for your return to sport.

Myositis ossificans

What is it?

Myositis ossificans refers to the formation of bone within a muscle. This can occur in the quadriceps muscle following a quadriceps contusion injury.

How does it happen?

A quadriceps contusion is caused by a direct blow or impact to the front of the thigh. The result is a crush injury to the quadriceps muscle as it is compressed against the underlying bone. Although the process of myositis ossificans is not completely understood, this initial injury can lead to the migration of bone cells into the muscle where they begin forming small quantities of bone. Myositis ossificans may also develop if a quadriceps contusion is caused to re-bleed during recovery. This may occur when someone returns to activity too early, or through over-vigorous massage or stretching of the quadriceps muscle.

How does it feel?

The development of myositis ossificans can be indicated by an unexpectedly slow recovery from a quadriceps contusion. You may have experienced initial improvements in pain and range of motion during the initial weeks of recovery, as the blood in the muscle was being resorbed. However, as bone gradually formed in the muscle, these initial improvements slowed or were lost, resulting in ongoing pain and muscle stiffness. You may have also begun experiencing pain during the night and increased pain in the morning.

What should you do?

The best approach to addressing the problem of myositis ossificans is to prevent its occurrence. This can be achieved by appropriately managing any quadriceps contusions (see quadriceps contusion). However, if you have suffered a recent quadriceps contusion and suspect you may have developed myositis ossificans, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect you have myositis ossificans, you shouldn't try to 'stretch out' the injury. Overstretching of the injured site will aggravate this injury, resulting in more pain, more bone formation and, subsequently, a further delay in recovery. Likewise, you should avoid deep massage over the injured site.

Could there be any long-term effects?

Myositis ossificans generally does not produce any long-term effects due to the bone formed in the muscle being resorbed over a period of weeks to months. Unfortunately, little can be done to accelerate this process of resorption.

Management

The assistance of a sports medicine professional is important in the treatment of myositis ossificans. Initially, they can assist in confirming the diagnosis and the extent of the bone ingrowth into the muscle. From this, an indication of how long the injury is expected to take to heal can be determined. During your recovery, the sports medicine professional can use a number of other treatment techniques to facilitate a reduction in your pain and the return of your muscle length and muscle strength. This will facilitate your return to participation in sport and help prevent reinjury. A sports medicine professional will also be able to advise you on other preventive measures such as the use of padding and thigh protectors for your return to sport.

Quadriceps muscle strain (muscle tear)

What is it?

A quadriceps muscle strain refers to a tear in the large muscle group, which covers the front of the thigh.

How does it happen?

A quadriceps muscle strain typically occurs when the muscle is contracted with excessive force. This can occur in activities such as sprinting, jumping or kicking. In these activities, the quadriceps muscle group is particularly vulnerable to tearing, especially when it is working in a stretched position or required to contract against a load (i.e. kicking a ball).

How does it feel?

When the quadriceps muscle is strained the first sensation you feel is sudden pain in the front of the thigh, due to damage to muscle fibres. At the same time you may have a 'tearing' sensation. With minor strains you may be able to continue participating with minimal restriction. However, as the muscle cools down following activity, pain may gradually increase as bleeding and swelling around the injured muscle continues. This may be associated with progressive tightening and stiffening of the quadriceps muscle. In more severe strains, these sensations may be exaggerated such that you are unable to continue participating due to excessive pain in the thigh, muscle tightness, weakness and spasm. In these cases, the pain may be so intense that you may be unable to walk without a limp. There may also be obvious swelling and a visible defect in the muscle.

What should you do?

To limit the severity of this injury it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the quadriceps muscle, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

You should continue the RICE regime until you consult a sports medicine professional, preferably within 2 days of the initial injury.

What shouldn't you do?

Following a quadriceps muscle strain, you shouldn't undertake activities which increase blood flow to the quadriceps muscle. These include hot showers, quadriceps stretching, heat rubs, massage, consumption of alcohol and excessive activity. These can increase muscle bleeding, resulting in further pain and an extended recovery period.

Could there be any long-term effects?

Although most quadriceps muscle strains heal without complication within a number of weeks, a proportion of injuries can result in longer-term effects, depending on the extent of damage and inappropriate early management. When the quadriceps is torn a number of structures contained within and around the muscle may be injured. Injury to these structures may delay return to sports participation. This may also result in a tight or weakened quadriceps muscle group that is prone to reinjury when returning to activity. Reinjury may also result if the cause of the initial quadriceps tear was not accurately diagnosed and addressed.

Management

The assistance of a sports medicine professional is important in the treatment of a quadriceps muscle strain. Initially, they can assist in determining the exact tissue/s damaged and the extent of this damage. From this information an indication of how long the injury is expected to take to heal can be determined. Sports medicine professionals can also use a number of other treatment techniques to assist in reducing pain and swelling and enhance the healing of the injured structures. This should also include an appropriate progression of exercises aimed at increasing your range of motion, strength and function. These exercises will facilitate your return to sport participation and, by identifying the reason why you tore your quadriceps, help prevent reinjury. This can be performed whilst minimising the risk of a re-bleed and will accelerate your return to sports participation.

Stress fracture of the shaft of the femur

What is it?

A stress fracture of the shaft of the femur is an incomplete fracture or crack within the length of the thighbone (femur).

How does it happen?

Stress fractures result from an imbalance between bone formation and bone resorption. When the femur is loaded or stressed, such as during weight-bearing exercise, the femur responds by increasing its bone turnover. This is a normal response to demands placed on bone. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone at the same location. To achieve this, old bone is resorbed (removed) before it is replaced with new bone. If new bone formation cannot keep up with bone resorption, areas of weakness can develop within the femur. These can develop into a stress fracture if the bone is continually loaded. This injury is commonly seen in distance runners.

How does it feel?

A stress fracture of the shaft of the femur is characterised by a dull ache felt in the front of the thigh that will develop over a period of weeks. The pain is often hard to localise and may even be felt in the knee. The pain is frequently made worse by exercise; however, it may also be felt during walking, rest and even at night.

What should you do?

If you have or suspect you have a stress fracture of the shaft of the femur, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect you have a stress fracture of the shaft of the femur, you shouldn't continue to exercise or participate in sport. A stress fracture represents an area of breakdown and weakness within the bone. If you continue to exercise or compete, the area of breakdown has the potential to increase, this will weaken the bone further. This can potentially lead to a complete bone fracture.

Could there be any long-term effects?

A stress fracture of the shaft of the femur does not produce any long-term effects, as long as it is appropriately treated and the cause of the injury identified and addressed. If this does not happen, you may be at risk of a larger crack, a complete bone fracture or further stress fractures when you recommence sport participation.

Management

The assistance of a sports medicine professional is important in the treatment of a stress fracture. Initially, they can assist in diagnosing the injury and the extent of the damage to the bone. This may require the use of a number of imaging techniques such as a bone scan, CT scan or MRI. From this information, they will be able to provide you with an estimation of how long the injury is expected to take to heal and determine an appropriate treatment plan. The treatment plan may initially involve a period of rest or the use of crutches and medications to help with your pain. A progressive exercise program to facilitate your return to activity may follow this. The sports medicine professional should also be able to assess and determine why you developed a stress fracture and address this during your recovery to prevent its re-occurrence when you return to full activity.

Hamstring muscle strain

What is it?

A hamstring muscle strain refers to a tear in the muscle group which covers the back of the thigh.

How does it happen?

A hamstring muscle strain typically occurs when the muscle is contracted with excessive force in a stretched position. This commonly occurs during running or sprinting just before or after the foot hits the ground. In this position, the hamstring muscle group is stretched over the back of the hip and knee joints whilst it is working hard to slow down the forward swinging leg and secondly propel your body forward.

How does it feel?

When the hamstring muscle is strained, the first sensation you feel is sudden pain in the back of the thigh, due to damage to muscle fibres. At the same time you may have a 'tearing' sensation. With a minor strain, you may be able to continue participation with minimal restriction. However, as the muscle cools down following activity, pain may gradually increase as bleeding and swelling around the injured muscle continues. This may be associated with progressive tightening and stiffening of the hamstring muscle group. In more severe strains, these sensations may be exaggerated such that you are unable to continue participation due to excessive pain in the thigh, muscle tightness, weakness and spasm. In these cases, the pain may be so intense that you may be unable to walk without a limp. There may also be obvious swelling and a visible defect in the muscle.

What should you do?

To limit the severity of this injury, it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the hamstring muscle, the **RICE** regime should be commenced (Rest, Ice, Compression, and Elevation). This will help to reduce blood flow to the injured area, thereby, reducing the extent of swelling and tissue damage.

You should continue the RICE regime until you consult a sports medicine professional, preferably within 2 days of the initial injury.

What shouldn't you do?

Following a hamstring muscle strain, you shouldn't undertake activities which increase blood flow to the hamstring muscle. These include hot showers, hamstring stretching, heat rubs, massage, consumption of alcohol and excessive activity. These can increase muscle bleeding, resulting in further pain and an extended recovery period.

Could there be any long-term effects?

Although most hamstring muscle strains heal without complication within a number of weeks, a proportion of injuries can result in longer-term effects, depending on the extent of damage and inappropriate early management. When the hamstring muscle is torn, a number of structures contained within and around the muscle may be injured. Injury to these structures may delay return to sports participation. This may also result in a tight or weakened hamstring muscle group that is prone to reinjury when returning to activity. Reinjury may also result if the cause of the initial hamstring tear was not accurately diagnosed and addressed.

Management

The assistance of a sports medicine professional is important in the treatment of a hamstring muscle strain. Initially, they can assist in determining the exact tissue/s damaged and the extent of this damage. From this information, an indication of how long the injury is expected to take to heal can be determined. Sports medicine professionals can also use a number of other treatment techniques to assist in reducing pain and swelling and enhance the healing of the injured structures. This should also include an appropriate progression of exercises aimed at increasing your range of motion, strength and function. These exercises will facilitate your return to sports participation and, by identifying the reason why you tore your hamstring, help prevent reinjury. This can be performed whilst minimising the risk of a re-bleed and will accelerate your return to sports participation.

Meniscal injury

What is it?

A meniscal injury refers to damage to one of the two C-shaped cartilages which separate the bones in the knee joint. These cartilages act as shock absorbers within the knee to assist in cushioning forces.

How does it happen?

The menisci in the knee are most commonly injured when the knee is twisted. This often occurs when changing directions quickly whilst the foot is fixed on the ground. It may also occur if a fellow competitor hits your knee causing it to twist or buckle.

How does it feel?

The first sensation felt when a meniscus is injured is pain within the knee joint. This may be associated with a sensation of something tearing. Depending on the severity of the injury, the knee may swell and you may have difficulty walking due to pain. Swelling may be immediate or occur over a period of hours. The knee may also feel weak and 'unstable', and may produce clicking noises, lock or give way.

What should you do?

To limit the severity of this injury it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the knee, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your leg. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your knee. It should be firm but not tight enough to cause pain.

Elevation involves lying with your knee resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

Following injury to a meniscus, you shouldn't undertake activities which increase blood flow to the injured area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity. These may increase the bleeding and swelling within the knee and potentially prolong your recovery.

Could there be any long-term effects?

Because the menisci in the knee have a poor blood supply, when they are injured they are unable to heal by themselves. As such, they can result in ongoing problems, depending on the severity of the injury. These problems include persistent knee swelling, clicking, locking and giving way. To limit these ongoing problems surgery is often performed to remove the damaged portion of the meniscus. Recovery from surgery normally takes a number of weeks. In some situations, this may be prolonged if, at the time of the injury, other structures within the knee were also injured.

Management

The assistance of a sports medicine professional is important in the treatment of a meniscal injury. Initially they can assist in determining which tissues have been damaged and the extent of this damage. From this, they will be able to determine the most appropriate treatment. This may involve surgery, activity modification, and strengthening and stretching exercises.

Medial collateral ligament (MCL) injury

What is it?

A medial collateral ligament injury refers to a sprain (tear) in the ligament which runs down and supports the inner aspect of the knee joint.

How does it happen?

The medial collateral ligament is injured when it is overstretched (sprained). This commonly occurs when an opponent or team-mate falls across the outside of your knee when your foot is fixed on the ground. This causes the knee to bend inwards, overstretching and injuring the medial collateral ligament.

How does it feel?

The first sensation felt when the medial collateral ligament is injured is pain along the inner aspect of the knee. There may also be an audible snap, crack or tear. Depending on the severity of the injury, the knee may swell and you may have difficulty walking due to pain. Swelling may be immediate or occur over a period of hours. The knee may also feel weak and 'unstable'.

What should you do?

To limit the severity of this injury it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the knee, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your leg. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your knee. It should be firm but not tight enough to cause pain.

Elevation involves lying with your knee resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

Following injury to the medial collateral ligament, you shouldn't undertake activities which increase blood flow to the injured area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity. These may increase the bleeding and swelling around the injured ligament and potentially prolong your recovery.

Could there be any long-term effects?

Most medial collateral ligament injuries heal without complication within a matter of weeks. However, a proportion of injuries can result in longer-term effects depending on the severity of the injury and extent of damage. When the medial collateral ligament is injured, it is not uncommon to also injure other ligaments which support the knee and surrounding structures. Injury to these structures may prolong your recovery. Similarly, recovery may be delayed if the injury is not appropriately diagnosed and managed. This may result in a poorly healed ligament which is susceptible to reinjury when you return to sport.

Management

The assistance of a sports medicine professional is important in the treatment of a medial collateral ligament injury. Initially, they can determine which tissues have been damaged and the extent of this damage. Imaging techniques such as an X-ray, ultrasound or CT scan may be used to confirm the diagnosis. Your sports medicine professional will then determine how long the injury should take to heal. In addition, sports medicine professionals can use a number of treatment techniques to assist in reducing the pain and swelling and enhance the healing of the injured structures. This will facilitate your return to activity and sport and limit possible long-term effects. You will be provided and supervised with a rehabilitation program, which will progress you through a series of exercises designed to limit both long-term effects and reduce your chance of reinjury. A sports medicine professional will also be able to advise you on other preventive measures such as the use of strapping tape or knee braces.

Anterior cruciate ligament (ACL) injury

What is it?

An anterior cruciate ligament or 'ACL' injury refers to a tear in one of the cruciate ligaments inside the knee joint.

How does it happen?

The ACL is most commonly injured when the knee is twisted. This can occur when landing from a jump, pivoting or decelerating suddenly. Often it is surprising how relatively simple the movement or activity is which injures the ACL. The ACL may also be torn when the knee is injured directly. This can occur, for example, when another player falls across your knee, bending it in the wrong direction.

How does it feel?

When the ACL is torn, there is often an audible 'pop', 'crack' or feeling of something going out and then going back in. When the ACL is completely torn, you may experience extreme pain for the first few minutes after the injury. Even though the pain may subside quickly, you will usually be unable to continue participating because the knee may feel 'unstable' or collapse when you try run and twist on the knee. Following an ACL injury the knee frequently swells. This may occur quickly (i.e. within the first couple hours) or overnight.

What should you do?

To limit the severity of the symptoms it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the knee, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your leg. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your knee. It should be firm but not tight enough to cause pain.

Elevation involves lying with your knee resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

If you have or suspect you have injured your ACL, you shouldn't continue to participate. This may cause your knee to give way or collapse, potentially injuring other structures. In addition, you shouldn't undertake activities which increase blood flow to the injured knee. These include hot showers, heat rubs, the consumption of alcohol and excessive activity. These may increase the bleeding and swelling around the injured ligament and potentially prolong your recovery.

Could there be any long-term effects?

Unfortunately, an injury to the ACL often results in a prolonged recovery, and is the most common cause of prolonged absence from sport. Two reasons for this are that the ACL does not heal by itself and that the knee cannot function very well without this ligament. Surgery is usually required to repair or 'reconstruct' the ACL. During surgery, tissue from another part of your body may be used to replace or reconstruct the ACL. Following surgery, it may be more than twelve months before you return to full contact sport. This may be prolonged if, at the time of your injury you also injured surrounding structures. Other structures that may be injured could include the menisci, the medial collateral ligament, or cartilage lining the joint surfaces. Injury to these structures may result in prolonged swelling and pain and a slow recovery following surgery.

Management

The assistance of a sports medicine professional is important in the treatment of an ACL injury. Initially, they can assist in confirming your diagnosis and determine whether you need surgery. Whether you undergo surgery or not, the sports medicine professional will also be able to assist in returning you to your job, activity or sport. This will involve a rehabilitation program designed to assist in reducing your swelling, improve your joint flexibility and strengthen the muscles supporting the knee joint.

Posterior cruciate ligament (PCL) injury

What is it?

A posterior cruciate ligament or 'PCL' injury refers to a tear in one of the cruciate ligaments inside the knee joint.

How does it happen?

The PCL is most commonly injured when the knee is hyperextended or, in other words, bent backwards. This can happen when you land from jumping with the knee straight or when a fellow participant hits the front of your knee joint.

How does it feel?

The first sensation felt when the posterior cruciate ligament is injured is a deep pain within the knee or at the back of the knee. There may also be an audible snap, crack or tear. Depending on the severity of the injury, the knee may swell and you may have difficulty walking due to pain. Swelling may be immediate or occur over a period of hours. The knee may also feel weak and 'unstable'.

What should you do?

To limit the severity of the symptoms it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the knee, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your leg. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your knee. It should be firm but not tight enough to cause pain.

Elevation involves lying with your knee resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

If you have or suspect you have injured your PCL, you shouldn't continue to participate. This may cause your knee to give way or collapse, potentially injuring other structures. In addition, you shouldn't undertake activities which increase blood flow to the injured knee. These include hot showers, heat rubs, the consumption of alcohol and excessive activity. These may increase the bleeding and swelling around the injured ligament and potentially prolong your recovery.

Could there be any long-term effects?

Although PCL injuries do not heal by themselves, with a comprehensive rehabilitation program you can usually return to sport within a matter of months. However, this may be prolonged if at the time of your injury, you also injured surrounding structures. These include the menisci inside the knee and the cartilage lining the joint surfaces. Injury to these structures may result in prolonged swelling and pain and a slow recovery. In some instances when the PCL is injured, surgery may be required to repair the ligament or to repair any damage to surrounding structures.

Management

The assistance of a sports medicine professional is important in the treatment of a PCL injury. Initially, they can assist in confirming your diagnosis and determine whether you have injured any surrounding structures. From this, they will be able to determine how long the injury is expected to take to heal and determine an appropriate treatment program. This may involve a series of exercises designed to assist in reducing your swelling, improve your joint flexibility and strengthen the muscles supporting the knee joint.

Lateral collateral ligament (LCL) injury

What is it?

A lateral collateral ligament injury refers to a tear in the ligament which runs down and supports the outer aspect of the knee joint.

How does it happen?

The lateral collateral ligament is injured when it is overstretched (sprained). This commonly occurs when an opponent or team-mate falls across the inside of your knee when your foot is fixed on the ground. This causes the knee to bend outwards, overstretching and injuring the lateral collateral ligament.

How does it feel?

The first sensation felt when the lateral collateral ligament is injured is pain along the outer aspect of the knee. There may also be an audible snap, crack or tear. Depending on the severity of the injury, the knee may swell and you may have difficulty walking due to pain. Swelling may be immediate or occur over a period of hours. The knee may also feel weak and 'unstable'.

What should you do?

To limit the severity of the symptoms it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the knee, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your leg. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your knee. It should be firm but not tight enough to cause pain.

Elevation involves lying with your knee resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

Following injury to the lateral collateral ligament, you shouldn't undertake activities which increase blood flow to the injured area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity. These may increase the bleeding and swelling around the injured ligament and potentially prolong your recovery.

Could there be any long-term effects?

Most lateral collateral ligament injuries heal without complication within a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. When the lateral collateral ligament is injured, it is not uncommon to also injure other ligaments which support the knee and surrounding structures. Injury to these structures may prolong your recovery. Similarly, recovery may be delayed if the injury is not appropriately diagnosed and managed. This may result in a poorly healed ligament which is susceptible to reinjury when you return to your activity or sport.

Management

The assistance of a sports medicine professional is important in the treatment of a lateral collateral ligament injury. Initially, they can diagnose which tissues have been damaged and the extent of this damage. From this, a determination of how long the injury is expected to take to heal can be provided. In addition, the sports medicine professional can use a number of treatment techniques to assist in reducing the pain and swelling and enhance the healing of the injured structures. This will facilitate your return to exercise and sport and limit possible long-term effects. This will be assisted by progressing you through a series of exercises designed to both limit long-term effects and reduce your chance of reinjury upon return to sport. In terms of the latter, a sports medicine professional will also be able to advise you on other preventive measures such as the use of strapping tape or knee braces.

Articular cartilage damage

What is it?

Articular cartilage damage refers to an injury to the cartilage lining the joint surfaces of the bones within the knee joint.

How does it happen?

The articular cartilage of the knee joint may be damaged in isolation following a direct injury to the knee. This may occur when you land on your knees, compressing the kneecap against the underlying bone and cartilage. Similarly, the articular cartilage within the knee may be damaged when any of the structures supporting the knee joint are injured (i.e. ligaments, menisci).

How does it feel?

Damage to the articular cartilage within the knee results in pain within the knee joint. Damage occurs frequently deep within the joint or behind the kneecap. The pain is often aggravated by activities which compress the damaged cartilage such as weight-bearing. Similarly, damage to the articular cartilage results in ongoing and persistent swelling within the knee.

What should you do?

If you have or suspect you have injured your articular cartilage, you should cease your activity or sport and begin initial treatment to control any swelling. To limit the severity of the symptoms it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the knee, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your leg. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your knee. It should be firm but not tight enough to cause pain.

Elevation involves lying with your knee resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

If you have or suspect you have damaged your articular cartilage, you shouldn't undertake activities which increase blood flow to the injured area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity. These may increase the swelling within the knee and potentially prolong your recovery.

Could there be any long-term effects?

Unfortunately, damage to the articular cartilage can result in long-term effects. Depending on the severity of the injury, damage to the articular cartilage within the knee can result in ongoing pain and swelling, resulting in a prolonged recovery. In addition, articular cartilage damage can result in the development of arthritis within the joint.

Management

The assistance of a sports medicine professional is important in the treatment of articular cartilage damage. Initially, they can assist in determining the extent of the damage. The use of imaging techniques such as X-ray or MRI may be of benefit. In addition, this injury may require arthroscopic surgery to directly visualise the cartilage. From this, they will be able to determine the most appropriate treatment. This may involve activity modification, treatments to decrease pain and swelling, and strengthening and stretching exercises.

Fracture of the patella (kneecap)

What is it?

A fracture of the patella refers to a break in the kneecap bone.

How does it happen?

The kneecap is typically fractured following a direct blow to the front of the knee. It may also be fractured with a strong contraction of the quadriceps muscle on the front of your thigh. Contraction of this muscle places increased force on your kneecap. If these forces are great enough, your kneecap can break.

How does it feel?

The first sensation felt when the kneecap is fractured is immediate and intense pain over the front of the knee. This pain may worsen with movement of the knee joint or tightening of the thigh muscle. The pain is frequently strong enough to cause you to limp and, in some instances, may be so intense that you are unable to put any weight through the injured leg at all. If the kneecap has a complete break in it, the broken pieces of bone may move on one another. This may give the front of the knee a different appearance to normal. An altered appearance may also result from swelling around the injury. Swelling may occur quickly (i.e. within the first 1–2 hours) or overnight.

What should you do?

A patella fracture represents a serious knee injury. If you suspect a patella fracture it is advised you cease your activity or sport, begin initial treatment and seek immediate medical attention. Initial treatment involves immobilising the knee as soon as possible using splints and bandages. You may raise the injured knee above the level of the heart once immobilised to help reduce pain and swelling.

What shouldn't you do?

If you have or suspect you have fractured your kneecap, you shouldn't perform any activities which may cause the broken ends of the bone to move on one another. To achieve this, you shouldn't use or bend the injured leg until it has been assessed by a sports medicine professional. In addition, you should avoid any activities which may increase blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase bleeding and swelling around the broken ends of bone and potentially prolong your recovery.

Could there be any long-term effects?

Most fractures of the kneecap heal without complication in a matter of weeks. However, a proportion of injuries can result in longer-term effects depending on the severity of the injury and extent of damage. Injury may also occur to the cartilage lining the undersurface of the kneecap and the tissues which support the kneecap. Injury to these structures may delay recovery. A delayed recovery may occur if the broken ends of bone fail to join back together. In addition to prolonging your recovery, injury to the underlying cartilage can also increase your chance of developing arthritis within the knee in later life.

Management

The assistance of a sports medicine professional is important in the treatment of a fractured kneecap. Initially, they can assist in diagnosing the injury and the extent of the damage. Imaging techniques such as an X-ray, CT scan or MRI may be of benefit. From this, they can estimate how long the injury is expected to take to heal and determine an appropriate treatment program. This may involve using crutches, wearing a splint or brace and, in some cases, surgery to hold the broken pieces of bones together. During your recovery, the sports medicine professional will also be able to give you a series of exercises designed to facilitate your recovery and reduce the risk of secondary injury when you return to your activity or sport.

Patella dislocation (kneecap)

What is it?

Dislocation of the patella refers to when the kneecap (patella) moves out, and stays out of its normal position.

How does it happen?

The patella is dislocated when forces acting on the kneecap are too great for the supporting muscles and ligaments to resist. This can occur with a direct blow to the kneecap which pushes it out to the side of the leg. For example, when landing on your knees. Alternatively, the patella may be dislocated when the knee is twisted such as during rapid changes in direction.

How does it feel?

The first sensation felt when the patella is dislocated is immediate and intense pain over the front of the knee. The pain may be associated with a feeling of the knee 'giving way' or something 'popping out'. This 'popping out' or dislocation of the patella is often visible when you compare the appearance and contours of the injured knee to the opposite side. The knee may also swell quickly (i.e. within the first 1–2 hours).

What should you do?

A patellar dislocation is a serious injury which requires immediate medical attention. If you have or suspect that you have dislocated your kneecap, you should cease your activity or sport and go directly to your nearest sports medicine professional or doctor. To help with your pain and reduce and control any swelling, you should surround the knee in ice. Ideally, this should be in the form of crushed ice wrapped in a moist towel or cloth and applied for up to 20 minutes.

What shouldn't you do?

If you have or suspect that you have dislocated your kneecap, the main thing you shouldn't do is try to 'reduce' or relocate the kneecap back into its socket by yourself. This requires the assistance of a sports medicine professional or a doctor. If done incorrectly, serious damage may be sustained to other structures (nerves, bones, ligaments, cartilage) resulting in irreparable damage and/or a longer recovery time. In addition, you shouldn't undertake any activities which increase blood flow to the injured site. These include hot showers, heat rubs, alcohol and massage. These will cause further swelling in the damaged tissues resulting in a prolonged recovery.

Could there be any long-term effects?

Due to the seriousness of a patellar dislocation, there are unfortunately potential long-term effects. The most common of these is recurrent or ongoing patellar dislocations. When the kneecap is dislocated the tissues which support it are overstretched and, in some cases, torn. This makes the joint less stable and decreases its ability to resist or withstand external forces. As a consequence, it dislocates much more easily. Other long-term effects result from damage to surrounding structures when the kneecap is dislocated. Occasionally, when the kneecap is dislocated the cartilage lining the undersurface of the patella may be damaged. Damage to this structure can prolong your recovery and increase your chance of developing knee arthritis.

Management

The assistance of a sports medicine professional is important in the treatment of a dislocated patella. Initially, they can confirm that the kneecap is actually dislocated. If it is, they can relocate or 'reduce' the kneecap back into its normal position. Following this, they can assess which tissues have been damaged and the extent of this damage. This may require the use of an X-ray, CT scan, MRI or arthroscope. From this, they can estimate how long the injury is expected to take to heal. During your recovery, the sports medicine professional will be able to assist in reducing your pain and promoting your recovery. This may involve wearing a brace and using crutches for the first few weeks, followed by progressing you through a series of exercises designed to return you back to your activity or sport and reduce the risk of ongoing dislocations. A sports medicine professional will also be able to advise you on other preventive measures such as the use of strapping tape or knee braces.

Patella tendon rupture

What is it?

Patella tendon rupture refers to a complete tear of the tendon which joins the kneecap (patella) to the shin bone (tibia).

How does it happen?

Complete tears of the patella tendon often occur when the thigh muscle (quadriceps) is forcibly contracted. The function of the patellar tendon is to transmit forces produced by the thigh muscle to the shin bone. Forcible contraction of this muscle can overstress the patella tendon, resulting in it breaking or completely tearing.

How does it feel?

A complete tear of the patella tendon results in instant pain felt in the front of the knee just below the kneecap. Associated with this may be a feeling of something tearing or snapping. Following a complete tear of the patella tendon, you will be unable to continue your activity or sport due to profound weakness in the thigh muscle. You may also be unable to stand on the injured leg without it collapsing or giving way.

What should you do?

A complete tear of the patellar tendon is a serious injury which requires surgical repair. Therefore, if you have or suspect you have a complete tear of the patellar tendon, it is advised you seek the assistance of a sports medicine professional as soon as possible (i.e. on the same day as the injury). In the meantime, you can commence early treatment to limit the amount of bleeding and swelling within and around the torn ends of the tendon. To control the amount of swelling the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting any weight you put through your leg. Crutches will be required.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your knee. It should be firm but not tight enough to cause pain.

Elevation involves lying with your knee resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably on the same day as the injury.

What shouldn't you do?

Following a complete tear of the patella tendon, you shouldn't undertake activities which increase blood flow to the injured site and, therefore, bleeding and swelling to the area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity.

Could there be any long-term effects?

A complete tear of the patella tendon is a serious injury which does not heal by itself without appropriate treatment. Appropriate treatment often involves surgical repair. Following surgery, the rehabilitation period is prolonged and it may be a number of months before you can walk on the injured leg. It may be a further number of months before your muscle flexibility and strength return to satisfactory levels to enable return to your activity or sport. Even then there is often some residual disability.

Management

The assistance of a sports medicine professional is important in the treatment of a complete tear of the patellar tendon. Initially, they will diagnose the problem and establish the severity of the tear. Imaging techniques such as ultrasound or MRI may be used. From this, the sports medicine professional will be able to determine an appropriate treatment plan. In the majority of cases this will involve surgical repair.

Following surgery, the sports medicine professional will be able to rehabilitate your tendon so that you can return to your activity or sport. This may involve the use of soft tissue treatments such as massage and stretching, and a progressive rehabilitation program.

Fat pad impingement

What is it?

Also known as Hoffa's syndrome, fat pad impingement refers to when the fat pad in the front of the knee joint gets pinched between the kneecap and the underlying leg bone.

How does it happen?

The fat pad on the front of the knee can get pinched two ways. Firstly, it can get pinched if the knee is forcibly extended or straightened. This can occur when kicking or landing from a jump, and causes the bottom of the kneecap to dig into the fat pad. Secondly, the fat pad may get pinched if it is enlarged or swollen. This can occur with repetitive minor pinching, or following damage to the fat pad such as occurs during arthroscopic surgery. This results in it bulging around the bottom of the kneecap making it more susceptible to being pinched. When the fat pad is pinched it can become inflamed and painful.

How does it feel?

Fat pad impingement results in pain felt just beneath the kneecap. This is most commonly felt when the knee is forcibly extended or straightened. When the impingement is due to an enlarged or swollen fat pad, the area below the kneecap may bulge and may be firmer than on the other knee, due to the formation of scar tissue.

What should you do?

If you have or suspect you have fat pad impingement, you should consult your nearest sports medicine professional. In the meantime, you should avoid any activities which cause pinching of your fat pad and make your pain worse. Icing the front of your knee will be of benefit. Ice should be applied to the injured area for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

What shouldn't you do?

If you have or suspect you have fat pad impingement, you shouldn't ignore the problem. This may result in ongoing pinching of the fat pad and ongoing pain.

Could there be any long-term effects?

Fat pad impingement does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the region just below the kneecap and a prolonged lay-off from your activity or sport.

Management

The assistance of a sports medicine professional is important in the treatment of fat pad impingement. Initially, they can assist in diagnosing the problem and its severity. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, regular icing, the taking of anti-inflammatory medications and taping of the knee.

Fracture of the tibial plateau

What is it?

A fracture of the tibial plateau refers to a break in the top of the shin bone (tibia) just below where it joins with the thigh bone to form the knee joint.

How does it happen?

The tibial plateau may be fractured following a direct blow to the knee joint or as a result of a compressive force going through the knee. The latter may occur when forces are transmitted up the leg following a fall from a height or when the knee is bent in the wrong direction.

How does it feel?

The first sensation experienced when the tibial plateau is fractured is immediate and intense pain within the knee joint. This pain is often made worse by movement of the knee and is frequently strong enough to prevent you from putting any weight through the injured leg. The knee may also swell quickly following injury (i.e. within the first 1–2 hours).

What should you do?

A fracture of the tibial plateau represents a serious knee injury. If you suspect a tibial plateau fracture it is advised you cease your activity or sport, begin initial treatment and seek immediate medical attention. Initial treatment involves immobilising the knee as soon as possible using splints and bandages. Once the knee is immobilised, you may raise it above the level of the heart to help reduce pain and swelling.

What shouldn't you do?

If you have or suspect you have fractured your tibial plateau, you shouldn't perform any activities which cause excessive movement of the injured leg until it has been assessed by a sports medicine professional. In addition, you should avoid any activities which may increase blood flow to the injured area. These include hot showers, heat rubs, massage and the consumption of alcohol. These may increase bleeding and swelling around the broken bone and potentially prolong your recovery.

Could there be any long-term effects?

Many tibial plateau fractures heal without complication within a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. When the tibial plateau is broken, a number of structures close to the bone may also be injured. These include the cartilage lining the knee joint and the ligaments which support the knee. Injury to these structures may delay your recovery. In addition to prolonging your recovery, injury to the underlying cartilage can also increase your chance of developing arthritis within the knee.

Management

The assistance of a sports medicine professional is important in the treatment of a tibial plateau fracture. Initially, they can assist in diagnosing the injury and the extent of the damage. This may require the use of an X-ray to visualise the bone. From this, they will be able to estimate how long the injury is expected to take to heal and determine an appropriate treatment program. This may involve using crutches, wearing a splint or brace and, in some cases, surgery to hold the broken pieces of bones together. When your bone has healed sufficiently, the sports medicine professional will be able to give you a series of exercises designed to facilitate your recovery and reduce the risk of other injuries when you return to activity or sport.

Superior tibiofibular joint injury

What is it?

The superior tibiofibular joint is the joint between the shin bone (tibia) and the smaller bone in the leg (fibula) where they meet just below the knee joint. A superior tibiofibular joint injury refers to when this joint and its supporting structures are damaged.

How does it happen?

An injury to the superior tibiofibular joint may result from direct trauma to the joint. This can occur when the outside of the leg is kicked just below the knee joint. Similarly, the joint may be injured when the leg is rotated or twisted. This can occur when pivoting or cutting from side-to-side and is often coupled with an injury to either the ankle or knee.

How does it feel?

A superior tibiofibular joint injury results in pain felt just below the outside of the knee. This is usually brought on by activities which require rotation of the leg. For example, pivoting or cutting from side-to-side.

What should you do?

If you have or suspect you have injured your superior tibiofibular joint, you should cease your activity or sport and begin initial treatment to control any swelling and to limit the severity of the symptoms. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the superior tibiofibular joint, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby, reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your leg. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your knee and leg. It should be firm but not tight enough to cause pain.

Elevation involves lying with your knee and leg resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

Following an injury to the superior tibiofibular joint, you shouldn't undertake activities which increase blood flow to the injured area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity. These may increase the bleeding and swelling within the injured structures and potentially prolong your recovery.

Could there be any long-term effects?

An injury to the superior tibiofibular joint usually gets better within a couple of weeks and does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the region just below the outside of the knee and a prolonged lay-off from your activity or sport.

Management

The assistance of a sports medicine professional is important in the treatment of a superior tibiofibular joint injury. Initially, they can assist in diagnosing the problem and its severity. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, regular icing, electrotherapy treatment, and stretching and strengthening exercises.

Ruptured hamstring tendon

What is it?

A rupture of a hamstring tendon refers to a complete tear within one of the hamstring tendons on the back of the thigh.

How does it happen?

A complete tear of a hamstring tendon often occurs when the hamstring muscle group on the back of the thigh is forcibly contracted. The function of the hamstring tendons is to transmit forces produced by the hamstring muscle group to the leg bone. Forcible contraction of this group of muscles can overstress a hamstring tendon, resulting in it completely tearing. This most frequently occurs during sprinting.

How does it feel?

A complete tear of a hamstring tendon results in instant pain felt behind the knee in the lower part of the back of the thigh. Associated with this may be a feeling of something tearing or snapping and a feeling of weakness in the hamstring muscle group.

What should you do?

A complete tear of a hamstring tendon is a serious injury which often requires surgical repair. Therefore, if you have or suspect a complete tear of a hamstring tendon it is advised you seek the assistance of a sports medicine professional as soon as possible (i.e. on the same day as the injury). In the meantime, you can commence early treatment to limit the amount of bleeding and swelling within and around the torn ends of the tendon. This should involve the **RICE** regime (Rest, Ice, Compression, Elevation).

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your leg. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your knee and thigh. It should be firm but not tight enough to cause pain.

Elevation involves lying with your knee and thigh resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably on the same day as the injury.

What shouldn't you do?

Following a complete tear of a hamstring tendon, you shouldn't undertake activities which increase blood flow to the injured site and, therefore, bleeding and swelling in the area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity.

Could there be any long-term effects?

A complete tear of a hamstring tendon is a serious injury which does not heal by itself without appropriate treatment. Appropriate treatment often involves surgical repair. Following surgery, the rehabilitation period is prolonged and it may be a number of weeks before you can walk on the injured leg. It may be a further number of weeks before your muscle flexibility and strength return to satisfactory levels to enable return to your activity or sport.

Management

The assistance of a sports medicine professional is important in the treatment of a complete tear of a hamstring tendon. Initially, they can assist in diagnosing the problem and establishing its severity. Imaging techniques such as ultrasound or MRI may be used. From this, the sports medicine professional will be able to determine an appropriate treatment plan. In the majority of cases this will involve surgical repair.

Following surgery, the sports medicine professional will be able to rehabilitate your tendon so that you can return to your activity or sport. This may involve the use of soft tissue treatment such as massage and stretching, and a progressive rehabilitation program.

Patellofemoral syndrome (anterior knee pain, runner's knee)

What is it?

Patellofemoral syndrome refers to pain arising from the joint between the kneecap and the underlying thigh bone. Other names for this condition include patellofemoral pain syndrome, chondromalacia and runner's knee.

How does it happen?

Patellofemoral syndrome most often results from overuse of the knee. When the knee is bent and straightened, the kneecap (patella) slides up and down within a groove on the end of the thigh bone (femur). With repeated bending and straightening, such as during activities involving walking, running, jumping and cycling, the underneath surface of the kneecap can become irritated. This can result in pain and occasionally swelling.

How does it feel?

The main sensation associated with patellofemoral syndrome is pain. This is felt behind and around the kneecap. Patellofemoral syndrome is commonly aggravated by walking, running, going downstairs or sitting for a prolonged period with a bent knee. Associated with this pain may be grinding noises heard when the knee is bent or straightened, a sensation of the knee giving way and weakness in the knee. The knee may also swell at times.

What should you do?

Patellofemoral syndrome frequently does not get better on its own if the cause is not addressed and you continue your activity or sport. If you have or suspect patellofemoral syndrome, you should consult your nearest sports medicine professional. In the meantime, you should avoid any activities which aggravate or cause your knee pain to occur. Icing the front of your knee will be of benefit. Ice should be applied to the injured area for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

What shouldn't you do?

If you have or suspect you have patellofemoral syndrome, you shouldn't ignore the problem. This may lead to your problem getting worse such that your pain becomes more severe and is felt more frequently.

Could there be any long-term effects?

Patellofemoral syndrome does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. Recovery usually takes a number of weeks. During this period you can often keep participating. In some situations recovery may be prolonged. In these cases, surgery may be required to assist in improving the biomechanics of the kneecap and to relieve pain. This is only performed after conservative or non-surgical treatment has failed to give relief.

Management

The assistance of a sports medicine professional is important in the treatment of patellofemoral syndrome. Initially they can assist in diagnosing the problem and establishing the severity of the condition. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve initial activity modification, the taking of anti-inflammatory medications, soft tissue treatment such as massage and stretching, taping or bracing of the kneecap and specific knee strengthening exercises to improve kneecap movement (tracking). The sports medicine professional will also be able to assess and determine why you developed patellofemoral syndrome and address this during your recovery to prevent a re-occurrence when you return to exercise and sport.

Patellar tendinopathy (jumper's knee)

What is it?

Often referred to as 'jumper's knee', patellar tendinopathy refers to inflammation within the tendon which lies just below the knee-cap (patella).

How does it happen?

Patellar tendinopathy is a common injury in sports predominantly involving jumping and landing, and results from overuse of the patellar tendon. The function of the patellar tendon is to transmit forces produced by the large thigh muscle (quadriceps) to the shin bone (tibia) to produce movement of the knee joint. Repetitive use of the quadriceps muscle and, therefore, the patellar tendon can lead to microscopic tears within the substance of the tendon. Gradual degeneration of the tendon may occur as a result. Factors which may contribute to patellar tendinopathy include a recent change in training (including frequency, duration, intensity, training surfaces), reduced rest times, biomechanical abnormalities, and decreased muscle flexibility. These factors can lead to increased stress on the patellar tendon, microtears and subsequent tendinopathy.

How does it feel?

Patellar tendinopathy results in pain felt just below the kneecap. This pain may be aggravated by activities such as jumping, hopping and bounding and typically develops gradually. Initially, the tendon may only be painful following exercise. Associated with the pain may be stiffness or tightness in region of the kneecap. Typically, these initial signs of patellar tendinopathy are ignored as they disappear quickly with walking about or applying heat (i.e. a hot shower) over the kneecap region. However, as you continue to exercise, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. In the earlier stages, this pain during exercise may initially disappear as you warm up, only to return when you cool down. However, as you continue to exercise the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Patellar tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have patellar tendinopathy, you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. This should consist of icing following exercise and regular thigh stretching. Icing should consist of crushed ice wrapped in a moist towel applied just below the kneecap for 15–20 minutes or ice in a paper cup massaged over the region just below the kneecap until the skin is numb.

What shouldn't you do?

If you have or suspect you have patellar tendinopathy you shouldn't ignore the problem. Your pain may get better as you exercise, however, the exercise you are doing may interfere with the healing process and be causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout exercise. If this occurs, your recovery may be prolonged and it may take a number of months for you to return to your activity or sport.

Could there be any long-term effects?

Patellar tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the region just below the kneecap and a prolonged lay-off from exercise and sport.

Management

The assistance of a sports medicine professional is important in the treatment of patellar tendinopathy. Initially, they can assist in diagnosing the problem and its severity. Imaging techniques such as ultrasound or MRI may be used. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed patellar tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Synovial plica

What is it?

The synovial membrane encloses the knee joint and acts to secrete fluid into the joint, which provides nutrition and frictionless movement. The synovial plica refers to a fold in the synovial membrane, which can produce knee pain when irritated.

How does it happen?

The synovial plica is found along the inside border of the kneecap. It can produce pain when it becomes inflamed. This may occur following a direct impact to the plica or when it is overstretched.

How does it feel?

An injury to the synovial plica can produce pain along the inside border of the kneecap. This may be a sharp pain which may be felt when you squat down. When the inside border of the kneecap is touched, a tender, thickened band of tissue may be felt.

What should you do?

If you have or suspect your knee pain is coming from the synovial plica, you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. Icing will be of benefit. Icing should consist of crushed ice wrapped in a moist towel applied to the inner aspect of the kneecap for 15–20 minutes or ice in a paper cup massaged over the region until the skin is numb every 1–2 hours.

What shouldn't you do?

If you have or suspect your knee pain is coming from the synovial plica, you shouldn't ignore the problem. This may lead to your injury getting worse, prolonging your recovery.

Could there be any long-term effects?

An injury to the synovial plica does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. In some cases treatment may involve arthroscopic surgery to remove the plica. This is a minor operation and has no long-term consequences.

Management

The assistance of a sports medicine professional is important in the treatment of pain arising from the synovial plica. Initially, they can assist in diagnosing the problem and its severity. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, the progression through a series of specific strengthening exercises and, in some cases, surgery.

Osgood-Schlatter's disease

What is it?

Osgood-Schlatter's disease refers to an injury to the bone growth plate in the shin bone (tibia) just below the kneecap, which occurs in younger athletes. It is more a condition than disease.

How does it happen?

The large muscle on the front of the thigh (quadriceps) attaches to the shin bone via the patellar tendon. The function of this tendon is to transmit forces produced by the thigh muscle to the shin to support and move the knee joint. In children, the portion of the shin bone into which the patellar tendon inserts is separated from the bulk of the shin bone by a growth plate. This growth plate enables bone growth to occur. However, it also represents a site of weakness in the bone. Forceful and repeated contraction of the thigh muscle can injure the growth plate. This commonly occurs in sports which involve running and jumping and occurs during a period of rapid growth. During rapid growth, the thigh muscle and patellar tendon become tighter as the bones grow. This leads to increased pulling of the thigh muscle and patellar tendon on the shin bone and growth plate.

How does it feel?

Pain felt where the patellar tendon attaches to the shin bone in people with Osgood-Schlatter's disease. The painful site is just below the kneecap in the bony bump on the front of the shin, called the tibial tuberosity. Pain is felt most commonly during activity or exercise. The tibial tuberosity may also be tender to touch and swollen.

What should you do?

If your child has pain below the kneecap and you think it may be Osgood-Schlatter's disease, you should consult a sports medicine professional for assistance. In the meantime, you should limit their participation in their chosen sport/s to restrict the amount of damage to the growth plate. To help with their pain and to control any swelling you can apply ice. Ideally, this should consist of crushed ice wrapped in a moist towel applied just below the kneecap for 15–20 minutes, every 1–2 hours.

What shouldn't you do?

If you think your child has Osgood-Schlatter's disease, you shouldn't encourage them to exercise or exercise through the pain. This may make their injury worse, prolonging their recovery.

Could there be any long-term effects?

Osgood-Schlatter's disease does not produce any long-term effects as long as it is appropriately managed. It is a self-limiting condition which settles when growth ceases and the tibial tuberosity fuses with the rest of the shin bone. This may take anywhere from six months to two years to resolve. Osgood-Schlatter's will not interfere with your child's growth and the only remnants may be an enlarged tibial tuberosity.

Management

The assistance of a sports medicine professional is important in the treatment of Osgood-Schlatter's disease. Initially, they can assist in diagnosing the injury and the extent of the damage. From this, they will be able to determine an appropriate management plan. This may involve an initial period of rest or activity modification, regular icing, soft tissue treatment such as massage and stretching, treatments to assist in relieving pain, and the progression through a series of specific strengthening exercises. In addition, the sports medicine professional will be able to advise you and your child on an appropriate time for return to exercise and sport.

Sinding-Larsen–Johansson syndrome

What is it?

Sinding-Larsen–Johansson disease refers to an injury to the bone growth plate at the bottom of the kneecap which occurs in younger athletes.

How does it happen?

The large muscle on the front of the thigh (quadriceps) attaches to the kneecap which, in turn, is attached to the shin bone (tibia) via the patellar tendon. The function of this tendon is to transmit forces produced by the thigh muscle from the kneecap to the shin to support and move the knee joint. In children, the portion of the kneecap from which the patellar tendon originates is separated from the bulk of the kneecap by a growth plate. This growth plate enables bone growth to occur. However, it also represents a site of weakness in the bone. Forceful and repeated contraction of the thigh muscle can injure the growth plate. This commonly occurs in sports which involve running and jumping and occurs during a period of rapid growth. During rapid growth, the thigh muscle and patellar tendon become tighter as the bones grow. This leads to increased pulling of the patellar tendon on the kneecap and growth plate.

How does it feel?

Pain is felt where the patellar tendon attaches to the kneecap in Sinding-Larsen–Johansson syndrome. This is in the lowest portion of the kneecap. This pain is felt most commonly during activity or exercise. The bottom of the kneecap may also be tender to touch and swollen.

What should you do?

If your child has pain at the bottom of the kneecap and you think it may be Sinding-Larsen–Johansson syndrome you should consult a sports medicine professional for assistance. In the meantime, you should limit their participation in their chosen sport/s to restrict the amount of damage to the growth plate. To help with their pain and to control any swelling you can apply ice. Ideally this should consist of crushed ice wrapped in a moist towel applied just the bottom of the kneecap for 15–20 minutes every 1–2 hours.

What shouldn't you do?

If you think your child has Sinding-Larsen–Johansson syndrome you shouldn't encourage them to exercise or play sport through the pain. This may make their injury worse prolonging their recovery.

Could there be any long-term effects?

Sinding-Larsen–Johansson syndrome does not produce any long-term effects, as long as it is appropriately managed. It is a self-limiting condition which settles when growth ceases. This may take anywhere from six months to two years to resolve. Sinding-Larsen–Johansson syndrome will not interfere with your child's growth.

Management

The assistance of a sports medicine professional is important in the treatment of Sinding-Larsen–Johansson syndrome. Initially, they can assist in diagnosing the injury and the extent of the damage. From this, they will be able to determine an appropriate management plan. This may involve an initial period of rest or activity modification, regular icing, soft tissue treatment such as massage and stretching, treatments to assist in relieving pain, and the progression through a series of specific strengthening exercises. In addition, the sports medicine professional will be able to advise you and your child on the appropriate time for return to exercise and sport.

Quadriceps tendinopathy

What is it?

Quadriceps tendinopathy refers to inflammation within the tendon of the large quadriceps muscle on the front of the thigh just before it attaches to the kneecap (patella).

How does it happen?

Quadriceps tendinopathy results from overuse of the quadriceps tendon. The function of the quadriceps tendon is to transmit forces produced by the large thigh muscle (quadriceps) to the kneecap to produce movement of the knee joint. Repetitive use of the quadriceps muscle and, therefore, the quadriceps tendon can lead to microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy.

How does it feel?

Quadriceps tendinopathy results in pain felt just above the kneecap. This pain typically develops gradually and may be aggravated by activities such as jumping, hopping and bounding. Initially, the tendon may only be painful following exercise. Associated with the pain may be stiffness or tightness in the quadriceps muscle and in the region of the kneecap. Typically, these initial signs of quadriceps tendinopathy are ignored as they disappear quickly with walking about or applying heat (i.e. a hot shower) over the kneecap region. However, as you continue to exercise, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. In the earlier stages, this pain during exercise may initially disappear as you warm up, only to return when you cool down. However, as you continue to exercise, the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Quadriceps tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have quadriceps tendinopathy, you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. This should consist of icing following participation and regular thigh stretching. Icing should consist of crushed ice wrapped in a moist towel applied just below the knee-cap for 15–20 minutes or ice in a paper cup massaged over the region just below the kneecap until the skin is numb every 1–2 hours.

What shouldn't you do?

If you have or suspect you have quadriceps tendinopathy you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout exercise or sport. If this occurs, your recovery may be prolonged and it may take a number of months for you to return to exercise and sport.

Could there be any long-term effects?

Quadriceps tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the region just above the kneecap and a prolonged lay-off from exercise and sport.

Management

The assistance of a sports medicine professional is important in the treatment of quadriceps tendinopathy. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as ultrasound and MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed quadriceps tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Pre-patellar bursitis (housemaid's knee)

What is it?

Also known as 'housemaid's knee', pre-patellar bursitis refers to inflammation and swelling of the bursa located between the kneecap (patella) and overlying skin. A bursa is a fluid-filled sac which allows adjacent tissues to slide over one another without friction.

How does it happen?

Pre-patellar bursitis occurs when the pre-patellar bursa is damaged or irritated. This can occur following either a single injury or a series of injuries to the bursa. A direct blow or fall onto the knee can damage blood vessels within the pre-patellar bursa causing bleeding. The blood in the bursa causes an inflammatory response, resulting in the swelling of the bursa and subsequent bursitis. Similarly, pre-patellar bursitis may result from repeated minor trauma to the bursa. This can occur with repeated kneeling. This increases wear and tear on the bursa causing microtrauma which, over time, can result in bursal thickening, inflammation and bursitis.

How does it feel?

Pre-patellar bursitis causes pain and swelling in the area in front of the kneecap. The pain is most often felt when you kneel. In terms of the swelling, it may always be present or may only occur following activity. If the condition has been present for some time, there may also be small lumps that can be felt underneath the skin over the kneecap. These lumps result from thickening of the bursal sac and may give you pain and the feeling that something is floating around in front of the kneecap.

What should you do?

If you have or suspect you have pre-patellar bursitis, you should cease your activity or sport and begin initial treatment to control any swelling. To limit the severity of the symptoms it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however, too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the knee, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your leg. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your knee. It should be firm but not tight enough to cause pain.

Elevation involves lying with your knee resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

In the first few days following an injury to the pre-patellar bursa, you shouldn't undertake activities which increase blood flow to the knee. These include hot showers, heat rubs, massage, the consumption of alcohol and excessive activity. These can prolong bleeding in the bursa, resulting in further swelling and an extended recovery. In pre-patellar bursitis caused by repeated minor trauma, you should also avoid these activities until you consult your nearest sports medicine professional as they can make your swelling worse. In addition, you shouldn't undertake any activity which involves kneeling. This will irritate the pre-patellar bursa further, making the pain and swelling worse.

Management

The assistance of a sports medicine professional is important in the treatment of pre-patellar bursitis. In bursitis caused by a single injury, they will be able to assist in determining the extent of damage to the bursa and whether any surrounding tissues have been injured. An estimation of how long your injury is expected to take to heal can be provided. Sports medicine professionals can also use a number of treatment techniques to assist in reducing the pain and swelling and enhance the healing of the injured structures. This will facilitate your return to activity. In pre-patellar bursitis caused by repeated minor trauma, sports medicine professionals will be able to assist in identifying the cause and how best to stimulate healing, thereby reducing your pain and swelling. In some situations, this may involve draining the swelling in the bursa, taking anti-inflammatory drugs or injecting a small quantity of drug directly into the bursa to stimulate healing. Following healing, the sports medicine professional will be able to advise on how to prevent this injury from re-occurring.

Iliotibial band friction syndrome (ITBFS)

What is it?

The iliotibial band is a band of strong connective tissue which runs from the pelvic bone (ilium) down the outside of the thigh to the top of the shin bone (tibia). Iliotibial band friction syndrome is a condition which describes the rubbing of this band of tissue as it passes over a bony bump on the outside of the knee joint.

How does it happen?

Iliotibial band friction syndrome is an overuse injury. When the knee is bent and straightened the iliotibial band slides over a bony bump on the outside of the knee. When this is performed repeatedly or when the band is excessively tight, wear and tear of the band can develop as it flicks over the bony bump. To heal this damage, the body commences an inflammatory response. This can cause pain at the site of the injury.

How does it feel?

Iliotibial band friction syndrome results in pain felt on the outside of the knee. This pain is often aggravated by activities which involve repeated bending and straightening of the knee, such as running. It typically develops gradually. Initially, the pain may begin as a dull ache down the side of the knee which appears near the end of a session and disappears when you stop. However, if you continue to exercise and cause further rubbing of the iliotibial band, the pain may progress to become more intense and appear earlier in a session. It may also take longer to disappear when you stop exercising.

What should you do?

Iliotibial band friction syndrome generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have iliotibial band friction syndrome you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. This should consist of icing following exercise. Icing should consist of crushed ice wrapped in a moist towel applied for 15–20 minutes over the outside of the knee or ice in a paper cup massaged up and down the outside of the knee until the skin is numb every 1–2 hours.

What shouldn't you do?

If you have or suspect you have iliotibial band friction syndrome, you shouldn't ignore the problem. This may lead to your problem getting worse such that your pain becomes more severe and is felt more frequently.

Could there be any long-term effects?

Iliotibial band friction syndrome generally does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. Recovery usually takes a number of weeks. During this period you can often keep exercising, depending upon the severity of your pain. In a small number of cases recovery may be prolonged. In these cases surgery may be required to stop the iliotibial band from rubbing and to relieve pain. This is only performed after conservative or non-surgical treatment has failed to give relief.

Management

The assistance of a sports medicine professional is important in the treatment of iliotibial band friction syndrome. Initially, they can assist in diagnosing the problem and establish its severity. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve initial activity modification, the taking of anti-inflammatory medications, soft tissue treatment such as massage and stretching, and specific strengthening exercises to stop, rubbing of the iliotibial band. The sports medicine professional will also be able to assess and determine why you developed iliotibial band friction syndrome and address this during your recovery to prevent a re-occurrence when you return to exercise and sport.

Biceps femoris tendinopathy

What is it?

Biceps femoris tendinopathy refers to inflammation within the biceps femoris tendon which lies to the outside of the back of the knee.

How does it happen?

Biceps femoris tendinopathy occurs predominantly in sports involving a lot of acceleration and deceleration. The function of the biceps femoris tendon is to transmit forces produced by the biceps femoris muscle, part of the hamstring muscle group, to the lower leg to control movement of the leg at the knee joint. Repetitive use of the biceps femoris muscle and, therefore, the biceps femoris tendon can lead to microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy.

How does it feel?

Biceps femoris tendinopathy results in pain felt to the outside of the back of the knee. This pain typically develops gradually. Initially, the tendon may only be painful following exercise. Typically, this initial sign of biceps femoris tendinopathy is ignored, as it disappears quickly with walking about or applying heat (i.e. a hot shower) over the back of the knee. However, as you continue to exercise, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. In the earlier stages, this pain during exercise may initially disappear as you warm up, only to return when you cool down. However, as you continue to exercise, the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Biceps femoris tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have biceps femoris tendinopathy, you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. This should consist of icing following exercise and regular hamstring stretching. Icing may consist of crushed ice wrapped in a moist towel applied to the back of the knee for 15–20 minutes or ice in a paper cup massaged over the painful area until the skin is numb every 1–2 hours.

What shouldn't you do?

If you have or suspect biceps femoris tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may interfere with the healing process and be causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout exercise. If this occurs, your recovery may be prolonged and it may take a number of weeks for you to return to exercise and sport.

Could there be any long-term effects?

Biceps femoris tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain behind the knee and a prolonged lay-off from exercise and sport.

Management

The assistance of a sports medicine professional is important in the treatment of biceps femoris tendinopathy. Initially, they can assist in diagnosing the problem and its severity. Imaging techniques such as ultrasound or MRI may be used to confirm the diagnosis. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed biceps femoris tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Pes anserinus tendinopathy

What is it?

Pes anserinus tendinopathy refers to inflammation within the tendons which attach to the inside of the lower leg just below the knee joint.

How does it happen?

Pes anserinus tendinopathy results from overuse of the tendons which attach just below the inner surface of the knee. The function of these tendons is to transmit forces produced by three inner thigh muscles to the shin bone to control movement of the knee joint. Repetitive use of these muscles and, therefore, their tendons can lead to microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendons is tendinopathy.

How does it feel?

Pes anserinus tendinopathy results in pain felt on the inner aspect of the leg just below the knee joint which typically develops gradually. Initially the tendons may only be painful following exercise. Typically, this initial sign of pes anserinus tendinopathy is ignored, as it disappears quickly with walking about or applying heat (i.e. a hot shower) over the inside of the knee. However, as you continue to exercise, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. In the earlier stages, this pain during exercise may initially disappear as you warm up, only to return when you cool down. However, as you continue to exercise, the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Pes anserinus tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have pes anserinus tendinopathy, you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. This should consist of icing following exercise. Icing should consist of crushed ice wrapped in a moist towel applied just below the inside of the knee for 15–20 minutes or ice in a paper cup massaged over the region just below the inside of the knee until the skin is numb every 1–2 hours.

What shouldn't you do?

If you have or suspect you have pes anserinus tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout exercise. If this occurs, your recovery may be prolonged and it may take a number of weeks for you to return to exercise and sport.

Could there be any long-term effects?

Pes anserinus tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the region just below the inside of the knee and a prolonged lay-off from exercise and sport.

Management

The assistance of a sports medicine professional is important in the treatment of pes anserinus tendinopathy. Initially they can assist in diagnosing the problem and its severity. Imaging techniques such as ultrasound or MRI may be used to confirm the diagnosis. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed pes anserinus tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Pellegrini-Stieda syndrome

What is it?

The medial collateral ligament runs down the inner aspect of the knee from the thigh bone (femur) to the shin bone (tibia). Pellegrini-Stieda syndrome refers to an injury to and calcification of the medial collateral ligament where it attaches to the thigh bone.

How does it happen?

Pellegrini-Stieda syndrome results from an injury to the attachment site of the medial collateral ligament to the thigh bone. This most commonly occurs following a direct injury to the site, such as being hit on the inside of the knee with a ball travelling at high speed. It may also occur following an overstretching injury to the medial collateral ligament. This can occur when an opponent or team-mate falls across the outside of the knee when the foot is fixed on the ground. This causes the knee to bend inwards, overstretching and injuring the medial collateral ligament.

How does it feel?

Pellegrini-Stieda syndrome results in a restriction in the amount of movement within the knee. The movement most commonly affected is straightening of the knee. Twisting of the knee may also be affected. In addition to a restricted range of motion, when the inside of the knee is touched there may be a tender lump.

What should you do?

If you have or suspect you have Pellegrini-Stieda syndrome, you should consult your nearest sports medicine professional for treatment. In the meantime you can begin initial treatment. This should consist of regular icing to control any swelling. Icing should consist of crushed ice wrapped in a moist towel applied to the inside of the knee for 15–20 minutes every 1–2 hours.

What shouldn't you do?

If you have or suspect you have Pellegrini-Stieda syndrome you shouldn't ignore the problem. This may lead to your injury getting worse prolonging your recovery.

Could there be any long-term effects?

With appropriate treatment Pellegrini-Stieda syndrome usually gets better in a matter of weeks with no long-term consequences.

Management

The assistance of a sports medicine professional is important in the treatment of Pellegrini-Stieda syndrome. Initially, they can assist in determining the extent of the injury. Imaging techniques such as X-ray or ultrasound may help confirm the diagnosis. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, joint range of motion exercises, soft tissue treatment such as massage and stretching, and in some cases the injection of anti-inflammatory medication into the injured site.

Popliteus tendinopathy

What is it?

Popliteus tendinopathy refers to inflammation within the popliteus tendon which lies to the outside of the back of the knee joint.

How does it happen?

Popliteus tendinopathy results from overuse of the popliteus tendon. The function of the popliteus tendon is to transmit forces produced by the popliteus muscle to the shin bone (tibia) to control movement of the knee joint. Repetitive use of the popliteus muscle and, therefore, the popliteus tendon can lead to microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy.

How does it feel?

Popliteus tendinopathy results in pain felt just to the outside of the back of the knee which typically develops gradually. Initially the tendon may only be painful following exercise. Associated with the pain may be stiffness or tightness behind the knee. Typically, these initial signs of popliteus tendinopathy are ignored as they disappear quickly with walking about or applying heat (i.e. a hot shower) over the back of the knee. However, as you continue to exercise, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. In the earlier stages, this pain during exercise may initially disappear as you warm up, only to return when you cool down. However, as you continue to exercise, the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Popliteus tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have popliteus tendinopathy, you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. This should consist of icing following participation. Icing should consist of crushed ice wrapped in a moist towel applied to the outside of the back of the knee for 15–20 minutes every 1–2 hours.

What shouldn't you do?

If you have or suspect you have popliteus tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout exercise. If this occurs, your recovery may be prolonged and it may take a number of weeks for you to return to exercise and sport.

Could there be any long-term effects?

Popliteus tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the region behind the knee and a prolonged lay-off from exercise and sport.

Management

The assistance of a sports medicine professional is important in the treatment of popliteus tendinopathy. Initially, they can assist in diagnosing the problem and its severity. Imaging techniques such as ultrasound or MRI may be used to confirm the diagnosis. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed popliteus tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Gastrocnemius tendinopathy

What is it?

Gastrocnemius tendinopathy refers to inflammation within the tendon of the large calf muscle where it originates from the back of the knee joint.

How does it happen?

Gastrocnemius tendinopathy results from overuse of the gastrocnemius tendon. The function of the gastrocnemius tendon is to transmit forces produced by the large calf muscle (gastrocnemius) to the thigh bone and ankle. Repetitive use of the quadriceps muscle and, therefore, the gastrocnemius tendon can lead to microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy.

How does it feel?

Gastrocnemius tendinopathy results in pain felt behind the knee joint which typically develops gradually. Initially the pain may only be present following exercise. Associated with the pain may be stiffness or tightness in the calf muscle and behind the knee joint. Typically, these initial signs of gastrocnemius tendinopathy are ignored, as they disappear quickly with walking about or applying heat (i.e. a hot shower) over the back of the knee. However, as you continue to exercise, the tendinopathy progresses and the pain becomes more intense and more frequent. For example, it may begin to be present during exercise. In the earlier stages, this pain during exercise may initially disappear as you warm up, only to return when you cool down. However, as you continue to exercise, the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Gastrocnemius tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have gastrocnemius tendinopathy, you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. This should consist of icing following exercise and regular calf stretching. Icing should consist of crushed ice wrapped in a moist towel applied to the back of the knee for 15-20 minutes every 1-2 hours.

What shouldn't you do?

If you have or suspect you have gastrocnemius tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout exercise. If this occurs, your recovery may be prolonged and it may take a number of weeks for you to return to exercise and sport.

Could there be any long-term effects?

Gastrocnemius tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the region behind the knee joint and a prolonged lay-off from exercise and sport.

Management

The assistance of a sports medicine professional is important in the treatment of gastrocnemius tendinopathy. Initially, they can assist in diagnosing the problem and establishing its severity. Imaging techniques such as ultrasound or MRI may be used to confirm the diagnosis. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed gastrocnemius tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Baker's cyst

What is it?

Baker's cyst refers to a persistent swelling which develops in the back of the knee.

How does it happen?

A Baker's cyst most commonly develops following an injury to a structure within the knee joint. When this injury is left untreated it can result in ongoing swelling. This swelling can develop into a Baker's cyst behind the knee.

How does it feel?

A Baker's cyst results in an obvious swelling on the back of the knee. This swelling may fluctuate from day-to-day depending on your activities. The swollen area may be tender when touched.

What should you do?

A Baker's cyst generally does not get better on its own if its cause is not addressed. If you have or suspect you have a Baker's cyst, you should consult your nearest sports medicine professional to determine its cause and to have it treated.

What shouldn't you do?

If you have or suspect you have a Baker's cyst you shouldn't ignore the problem. This may lead to your problem getting worse resulting in a prolonged recovery. In addition, you shouldn't participate in activities which cause the cyst to increase in size.

Could there be any long-term effects?

A Baker's cyst generally does not produce any long-term effects, as long as its cause is properly diagnosed and appropriately treated. If the cause is not treated, the Baker's cyst will persist.

Management

The assistance of a sports medicine professional is important in the treatment of a Baker's cyst. Primarily they will be able to determine why it has developed. This may require the use of imaging techniques such as X-ray, ultrasound or MRI. Treatment of the Baker's cyst involves treatment of the underlying injury. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises.

Gastrocnemius (calf) strain

What is it?

The calf refers to the two muscles at the back of the lower leg that together form the Achilles tendon. The more superficial of these, gastrocnemius, provides the sudden explosive drive for the initial 'take off' in running. It is the more commonly injured of the two muscles, especially in people in their forties. A gastrocnemius strain refers to a tear in this large powerful muscle forming the bulk of the calf.

How does it happen?

A gastrocnemius strain typically occurs when the muscle is forcibly contracted whilst in a stretched position. This can occur when accelerating from a stationary position or when lunging forward, such as in tennis or squash. A gastrocnemius strain may also occur following stepping in a pot-hole whilst running. This may cause the heel to drop suddenly, overstretching the gastrocnemius muscle. Factors which may contribute to a strain of the gastrocnemius muscle include an inadequate warm-up, muscle stiffness or tightness, fatigue or overuse, an inadequate recovery period between training sessions, reduced muscle strength, and faulty biomechanics.

How does it feel?

The first sensation you feel when the gastrocnemius muscle is torn is sudden pain in the calf. This may be associated with a stabbing or tearing sensation. In minor tears, you may be able to continue participating with minimal hindrance. However, as the muscle cools down following completion of participation, the pain may gradually worsen as bleeding and swelling around the injured muscle takes place. This may be associated with progressive tightening and stiffening of the gastrocnemius muscle. In more severe tears, you are unable to continue participating immediately following injury due to excessive pain, and muscle tightness, weakness and spasm. In these cases, the pain may be so intense that you may be unable to weight-bear.

What should you do?

To limit the severity of the injury it is advised you cease participating and begin initial treatment. The most important time in the treatment of a gastrocnemius strain is the first 24–48 hours. This is when bleeding and swelling in and around the injured muscle is most active. To control the amount of bleeding and swelling, and limit the amount of damage to the muscle, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). You should continue the RICE regime until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury (within the first couple of days).

What shouldn't you do?

In the first few days following a gastrocnemius strain, you shouldn't undertake activities which increase blood flow to the injured muscle. These include hot showers, calf-stretching, heat rubs, massage, consumption of alcohol and excessive weight-bearing activity. These can prolong muscle bleeding and exaggerate swelling, resulting in further pain and an extended recovery.

Management

The assistance of a sports medicine professional is important in the treatment of a gastrocnemius muscle strain. Initially, they can assist in determining the exact tissue/s damaged and the extent of this damage. From this, a determination of how long the injury is expected to heal can be provided. Sports medicine professionals can also use techniques to assist in reducing the pain and swelling and enhance the healing of the injured structures. In addition, they can progress you through a series of exercises designed to increase your muscle range of motion and strength. These will facilitate your return to participation and help prevent reinjury.

Soleus (deep calf muscle) strain

What is it?

A soleus strain refers to a tear in the muscle which forms the deeper of the two muscles of the calf which together form the Achilles tendon.

How does it happen?

A soleus strain may occur when the muscle is forcibly contracted whilst in a stretched position. This can occur when accelerating from a stationary position or when lunging forward, such as in tennis or squash. A soleus strain may also occur following stepping in a pothole whilst running. This may cause the heel to drop suddenly and unexpectedly, overstretching the soleus muscle. Factors which may contribute to a strain of the soleus muscle include an inadequate warm-up, muscle stiffness or tightness, fatigue or overuse, an inadequate recovery period between training sessions, reduced muscle strength, and faulty biomechanics.

How does it feel?

The first sensation you feel when the soleus muscle is torn is sudden pain felt deep in the calf. This may be associated with a stabbing or tearing sensation. In minor tears, you may be able to continue participating with some difficulty. However, as the muscle cools down following completion of participation, pain may gradually worsen as bleeding and swelling around the injured muscle takes place. This may be associated with progressive tightening and stiffening of the calf. Alternatively, in minor strains you may not have any pain and the injury may only present as increasing calf tightness experienced over a period of days or weeks. In more severe tears, pain and muscle tightness may be so intense such that you are unable to continue participating immediately following injury. In these cases, the pain may be so strong that you may be unable to walk without a limp or have difficulty with any weight-bearing.

What should you do?

To limit the severity of the injury it is advised you cease activity and begin initial treatment. The most important time in the treatment of a soleus strain is the first 24–48 hours. This is when bleeding and swelling in and around the injured muscle occurs predominantly. To control the amount of bleeding and swelling, and limit damage to the soleus muscle, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). You should continue the RICE regime until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury (within the first couple of days). It may be necessary to use crutches for a period to help getting about, partially weight-bearing as pain allows.

What shouldn't you do?

In the first few days following a soleus strain, you shouldn't undertake activities which increase blood flow to the injured muscle and so increase local bleeding within the muscle. These include hot showers, calf stretching, heat rubs, massage, the consumption of alcohol and excessive weight-bearing activity. .

Could there be any long-term effects?

Most soleus strains heal without complication within a matter of weeks. However, a proportion of injuries can result in longer-term effects, depending on the severity of the injury and extent of damage. Recovery can be delayed if the strain is not appropriately managed. This may result in a tight, weak soleus muscle that is prone to reinjury with delayed return to activity.

Management

The assistance of a sports medicine professional is important in the treatment of a soleus muscle strain. Initially, they can assist in determining the exact tissue/s damaged and the severity of the injury. From this, a determination of how long the injury is expected to heal can be provided. Sports medicine professionals can also use a number of treatment techniques to assist in reducing the pain and swelling and enhance the healing of the injured structures. In addition, they can progress you through a series of exercises designed to increase your muscle range of motion and strength. These will facilitate your return to participation and help prevent reinjury.

Stress fracture of the tibia

What is it?

A stress fracture of the tibia is an incomplete fracture or crack within the shin bone (tibia).

How does it happen?

When the tibia is loaded or stressed, such as during weight-bearing exercise, the tibia responds by increasing its bone production and turnover. This is necessary for it to live up to your demands on it. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone at the same location. To do this, old bone is resorbed (removed) before it is replaced with new bone. If bone formation cannot keep up with bone removal, areas of weakness can develop within the tibia. These can develop into a stress fracture if the bone is continually loaded and this process is continued for a period of time. Factors contributing to a stress fracture of the tibia include a recent change in training (including frequency, duration, intensity, training surfaces and footwear). Commencing a new activity, biomechanical abnormalities, muscle fatigue or menstrual disturbances can contribute.

How does it feel?

A stress fracture of the tibia is characterised by increasing shin pain developing over a period of weeks. The pain is generally very localised over the site of the stress fracture and made worse by exercise. Initially, it may have only been present following activity. However, with continued loading and stress, the pain may have progressed to be present during exercise. It may also have reached a level such that activity is too painful to perform and the tibia is sore during walking, rest and even at night. When you touch the site where you feel the pain it will be tender.

What should you do?

If you are concerned you have a stress fracture of the tibia, you should consult your nearest sports medicine professional for assistance. Activity load will need to be reduced.

What shouldn't you do?

If you have or suspect a stress fracture of the tibia, you will need to modify activity. A stress fracture represents an area of breakdown and weakness within the bone. If you continue to exercise or compete, this process increases, further weakening the bone. This can potentially lead to a complete bone fracture.

Could there be any long-term effects?

A stress fracture of the tibia does not produce any long-term effects, as long as it is properly treated, and the cause identified and addressed. Occasionally, tibial stress fractures, particularly in the front of the mid portion of the tibia, can be slow to heal, almost developing into a 'chronic stress fracture' situation.

Management

The assistance of a sports medicine professional is important in the treatment of a stress fracture of the tibia. Initially, they can assist in confirming the diagnosis and the extent of the damage to the bone. This may require the use of a number of imaging techniques because unless the stress fracture has been present for a prolonged time it may not be visible on a plain X-ray. A bone scan is almost always necessary to confirm the diagnosis and determine an appropriate treatment plan. The latter may initially involve a period of rest and the use of crutches, anti-inflammatory medications and icing to help with your pain. A program of modified activity is critical. Low impact 'cross training' swimming, deep water running and cycling will maintain an aerobic base without delaying healing.

The sports medicine professional will also be able to assess and determine why you developed a stress fracture of the tibia and address this during your recovery to prevent its recurrence when you return to full activity.

Tenoperiostitis of the shin

What is it?

Commonly referred to as 'shin splints', tenoperiostitis refers to inflammation occurring where a tendon or muscle attaches to a bone.

How does it happen?

Tenoperiostitis results from overuse. Tendons and muscles attach to bone via a layer of connecting tissue overlying the bone. This tissue is called the periosteum. When muscles contract, they pull on their tendons which, in turn, pull on the periosteum overlying the bone. With overuse, poor biomechanics or excessive muscle tightness, this pulling can damage the periosteum. This results in an inflammatory response as the body attempts to repair the damage. Consequently, tenoperiostitis is inflammation (-itis) where a tendon (teno-) attaches to the periosteum (-periosti-).

How does it feel?

Tenoperiostitis is typically felt as pain along the inside border of the shin bone (tibia). It is usually painful as you begin exercising, however, as the area begins to warm up the pain may subside. Following exercise, your pain may gradually return as inflammation takes place. The area of tenderness may be painful to touch and you may feel thickened areas or bands of tissue adjacent to the tibia.

What should you do?

Tenoperiostitis generally does not settle on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have tenoperiostitis, you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of icing following exercise and massage to the inside border of the shin bone followed by ice to reduce any post-massage soreness. Icing may consist of crushed ice wrapped in a moist towel applied for 15–20 minutes or ice in a paper cup massaged up and down the inside of the shin until the skin is numb.

What shouldn't you do?

If you have shin soreness, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout an entire exercise session.

Could there be any long-term effects?

Tenoperiostitis does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. However, the condition can recur unless causative factors are not addressed. Possibly it may lead to a compartment syndrome.

Management

The assistance of a sports medicine professional is important in the treatment of tenoperiostitis. Initially, they can assist in diagnosing the problem and establishing its severity. From this, an appropriate treatment plan will be developed. This may involve initial activity modification, soft tissue treatment such as massage and stretching, and the correction of biomechanic abnormalities using orthoses. The sports medicine professional will also be able to assess and determine why you developed tenoperiostitis and address this during your recovery to prevent a re-occurrence when you return to full participation.

Deep posterior compartment syndrome

What is it?

Deep posterior compartment syndrome refers to exercise-induced leg pain resulting from muscle 'swelling' and an increase in pressure in the deep posterior compartment of the lower leg.

How does it happen?

The muscles in the lower leg are divided into a number of separate compartments by 'sleeves' of thick, inelastic connective tissue. The deep posterior compartment is the one directly behind the shin bone (tibia) and deep into the large calf muscle. When you exercise, blood flow is increased to this compartment and the contained muscles increase in volume (swell). When there is not enough room within the compartment for this increased muscle volume, compartmental pressure rises. This can interfere with the blood flow to the muscles and nerves in the compartment, causing pain. Factors that may contribute to deep posterior compartment syndrome include an increase in the size and volume of the muscles within the compartment, unaccustomed strenuous exercise, or progressive tightening of the surrounding connective tissue 'sleeve'.

How does it feel?

The most common sensation when you have deep posterior compartment syndrome is a pain along the inside edge of the shin bone (tibia). It may be an ache, tightness, cramping or squeezing pain. It is generally worse during exercise and does not settle until you stop exercising. When you stop, the pain slowly disappears as muscle volume ('swelling') and pressure within the deep posterior compartment return to normal. In some instances, you may also experience weakness or pins and needles in the lower leg. Pins and needles results from compression of nerves within the compartment.

What should you do?

Deep posterior compartment syndrome generally persists, even despite a prolonged period of rest, without specific treatment. Therefore, if you experience symptoms described above, it is advised you seek the assistance of a sports medicine professional. In the meantime, you should avoid activities which bring on your pain. It may be necessary to exclude a stress fracture, and as such it is advisable to reduce your activity load, pending sports medicine review. You may begin initial treatment. This should consist of deep massage along the inside edge of the shin bone (tibia), followed by ice to reduce any post-massage soreness.

What shouldn't you do?

If you have or suspect you have deep posterior compartment syndrome, you shouldn't attempt to exercise through the pain. This can make your problem worse by causing further tightening of the connective tissue 'sleeve'.

Could there be any long-term effects?

Deep posterior compartment syndrome does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated.

Management

The assistance of a sports medicine professional is important in the treatment of deep posterior compartment syndrome. Initially, they can assist in diagnosing the problem and its severity. This may involve performing compartment pressure testing. This test measures the pressure within the muscle compartment before and after exercising. The test confirms the diagnosis if the pressure after exercise is abnormally high and takes an abnormally long time to settle after exercise. Using local anesthetic, a small tube is placed in your muscle before and after you exercise. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This initially may involve soft tissue treatment such as massage, correction of your biomechanics using orthoses. In some cases, surgery to cut the 'sleeve' of connective tissue surrounding the compartment is necessary, as this enables the muscle to expand during exercise without increasing pressure.

Anterior compartment syndrome

What is it?

Anterior compartment syndrome refers to exercise-induced leg pain resulting from muscle 'swelling' and an increase in pressure in the anterior compartment of the lower leg.

How does it happen?

The muscles in the lower leg are divided into a number of separate compartments by 'sleeves' of thick, inelastic connective tissue. The anterior compartment is the one on the front of the lower leg to the outside of the front edge of the shin bone (tibia). When you exercise, blood flow is increased to this compartment and the contained muscles increase in volume (swell). When there is not enough room within the compartment for this increased muscle volume, compartmental pressure rises. This can interfere with the blood flow to the muscles and nerves in the compartment, causing pain. Factors that may contribute to anterior compartment syndrome include an increase in the size and volume of the muscles within the compartment, unaccustomed strenuous exercise, or progressive tightening of the surrounding connective tissue 'sleeve'.

How does it feel?

The most common sensation when you have anterior compartment syndrome is pain along the front of the lower leg. This is commonly felt to the outside of the front edge of the shin (tibia). It may be an aching, tight, cramping or squeezing pain. It is generally only felt during exercise and does not go away until you lower your exercise intensity or stop exercising. When you stop, the pain slowly disappears as muscle volume (swelling) and pressure within the anterior compartment return to normal. In some instances, you may also experience lower leg weakness and numbness. Numbness results from compression of a nerve which passes through the anterior compartment and is felt between the big toe and second toe.

What should you do?

Anterior compartment syndrome generally does not get better on its own. Therefore, if you have or suspect you have anterior compartment syndrome, it is advised you seek the assistance of a sports medicine professional. In the meantime, you should avoid activities which bring on your pain and you may begin initial treatment. The latter should consist of deep massage of the anterior compartment followed by ice to reduce any post-massage soreness.

What shouldn't you do?

If you have or suspect you have anterior compartment syndrome, you shouldn't attempt to exercise through the pain. This can make your problem worse by causing further tightening of the connective tissue 'sleeve'.

Could there be any long-term effects?

Anterior compartment syndrome does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated.

Management

The assistance of a sports medicine professional is important in the treatment of deep posterior compartment syndrome. Initially, they can assist in diagnosing the problem and its severity. This may involve performing compartment pressure testing. This test measures the pressure within the muscle compartment before and after exercising. The test confirms the diagnosis if the pressure after exercise is abnormally high and takes an abnormally long time to settle after exercise. Using local anesthetic, a small tube is placed in your muscle before and after you exercise. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This initially may involve soft tissue treatment such as massage, correction of your biomechanics using orthoses. In some cases, surgery to cut the 'sleeve' of connective tissue surrounding the compartment is necessary, as this enables the muscle to expand during exercise without increasing pressure.

Stress fracture of the fibula

What is it?

A stress fracture of the fibula is a partial or incomplete fracture within the fibula bone (the smaller of the two lower leg bones).

How does it happen?

Stress fractures of the fibula result from an imbalance between bone formation and bone breakdown. When the fibula is loaded or stressed, such as during weight-bearing exercise, the fibula responds by increasing its bone turnover. This is necessary for it to live up to your demands on it. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone at the same location. To do this, old bone is resorbed (removed) before it is replaced with new bone. If bone formation cannot keep up with bone resorption, areas of weakness can develop within the fibula. These can develop into a stress fracture if the bone is continually loaded. Factors which may contribute to a stress fracture of the fibula include a recent change in training (including frequency, duration, intensity, training surfaces and footwear), the taking up of a new activity, biomechanical abnormalities, muscle fatigue—or menstrual disturbances in female athletes.

How does it feel?

A stress fracture of the fibula is characterised by increasing pain developing over a period of weeks. The pain is felt in the outside of the lower leg and is generally very localised over the site of the stress fracture. Initially, it may have only been present following activity. However, with continued loading and stress, the pain may have progressed to be present during exercise. It may also have reached a level such that activity is too painful to perform and the fibula is sore during walking, rest and even at night. When you touch the site where you feel the pain it may be tender and warm.

What should you do?

If you have symptoms as described and suspect a stress fracture of the fibula, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have a stress fracture of the fibula, you shouldn't continue to exercise or compete. A stress fracture represents an area of breakdown and weakness within the bone. If you continue to exercise or compete, the area of breakdown has the potential to increase weakening the bone further. This can delay healing.

Could there be any long-term effects?

A stress fracture of the fibula does not produce any long-term effects, as long as it is properly treated, and the cause identified and addressed. If this does not happen, you may be at risk of a complete bone fracture or further stress fractures when you recommence participation.

Management

The assistance of a sports medicine professional is important in the treatment of a stress fracture of the fibula. Initially, they can assist in diagnosing the injury and the extent of the damage to the bone. This may require the use of a number of imaging techniques, as the fracture is not easily diagnosed on a plain X-ray. A bone scan will confirm the presence of a stress fracture. From this, they will be able to provide you with an estimation of how long the injury is expected to take to heal and determine an appropriate treatment plan. The latter may initially involve a period of rest and the use of crutches, anti-inflammatory medications and icing to help with your pain. A program of modified activity is critical. Low impact 'cross training' activity such as swimming, deep-water running and cycling will maintain an aerobic base without delaying healing. This may be followed by a stretching and gradual exercise program to facilitate your return to activity. The sports medicine professional will also be able to assess and determine why you developed a stress fracture of the fibula and address this during your recovery to prevent its re-occurrence when you return to full activity.

Periosteal contusion—bone bruising

What is it?

Periosteal contusion refers to bleeding and hematoma (local collection of blood) underneath the periosteum overlying the shin bone (tibia).

How does it happen?

A periosteal contusion results from a direct blow with a hard object to the tibia. The object may be a boot, stick or ball. When these hit the shin, the layer of tissue overlying and attaching to the outer surface of the tibia may be damaged. This tissue is referred to as the periosteum. It contains nerve fibers and blood vessels. Damage to the blood vessels in the periosteum may result in bleeding underneath the periosteum. When this blood clots it forms a hematoma and an inflammatory response is commenced to remove it and heal the area.

How does it feel?

The two most common things associated with periosteal contusions are pain and swelling. At the time of injury, periosteal contusions are extremely painful. This results from the stimulation of nerve fibers within the periosteum, and usually settles relatively quickly within a matter of minutes. However, the pain may persist or return as bleeding occurs under the periosteum. This may result in a prominent bump forming on the front of the shin. This swelling is usually tender and may harden as the blood clots to form a hematoma.

What should you do?

To limit the severity of your injury it is advised, having ceased activity, to begin initial treatment. The critical time in the treatment of a periosteal contusion is the first 24–48 hours. This is when bleeding and swelling in and around the injured site is most active. To control the bleeding and swelling, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). Rest involves limiting the amount of weight you put through the injured site. This may require using crutches if you are having difficulty walking. Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel. Compression involves the application of a firm elastic bandage around the injured site. It should be firm but not tight enough to cause pain. Elevation involves lying with the injured site resting comfortably on a chair or pillows so that it is above the level of the heart. You should continue the RICE regime until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury (within the first couple of days).

What shouldn't you do?

In the first few days following a direct blow to your tibia, you shouldn't undertake activities which increase blood flow to the injured area. These include hot showers, heat rubs, massage, the consumption of alcohol and excessive activity. These can prolong bleeding underneath the periosteum, resulting in further pain and an extended recovery.

Could there be any long-term effects?

Most periosteal contusions heal without complication within a matter of days to weeks with rest and protection from reinjury. The pain usually settles first, leaving a prominent bump on the shin which slowly disappears.

Management

The assistance of a sports medicine professional is important in the treatment of a periosteal contusion. Initially, they can assist in determining the exact tissue/s damaged and the extent of the damage. From this, a determination of how long the injury is expected to take to heal can be provided. Sports medicine professionals can also use a number of treatment techniques to assist in reducing the pain and swelling and enhance the healing of the injured structures. This will facilitate your return to participation. Finally, a sports medicine professional will be able to advise you on other preventive measures such as the use of padding and shin protectors when you return to participation.

Achilles tendinopathy

What is it?

Achilles tendinopathy refers to degeneration within the large tendon which joins the calf muscles (gastrocnemius and soleus) to the heel bone (calcaneus).

How does it happen?

Achilles tendinopathy is a common injury in sports involving running and jumping, and results from overuse of the tendon. The function of the Achilles tendon is to transmit forces produced by the calf muscles to the heel bone. Repetitive use of the calf muscles and, therefore, the Achilles tendon can lead to microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. Although this response is initially part of the healing process, when the stresses are repeated, the inflammation is prolonged and so produces local tissue damage. Factors which may contribute to Achilles tendinopathy include a recent change in training (including frequency, duration, intensity, training surfaces), reduced rest times, biomechanical abnormalities, poor footwear, and decreased muscle flexibility and joint range of motion. These factors can lead to increased stress on the Achilles tendon, microtears and subsequent tendinopathy.

How does it feel?

Achilles tendinopathy results in pain within the tendon just above where it attaches to the heel bone. This pain typically develops gradually. Initially, the tendon may only be painful following exercise. For example, it may be first felt on rising the day following participation. Associated with the pain may be stiffness or tightness in the Achilles region. Typically, these initial signs of Achilles tendinopathy disappear quickly with walking about or applying heat (i.e. a hot shower) over the Achilles region. However, as you continue to participate, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. For example, it may begin to be present during participation. In the earlier stages, this pain during participation may initially disappear as you warm up, only to return when you cool-down. However, as you continue to participate, the tendinopathy worsens and your pain may begin to be present for longer periods during participation until it is present all of the time. This may interfere with your performance.

What should you do?

Achilles tendinopathy generally does not settle without assessment and medical care. If you have or suspect you have Achilles tendinopathy, you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of icing following participation and regular calf stretching. Icing may consist of crushed ice wrapped in a moist towel applied for 15–20 minutes or ice in a paper cup massaged up and down over the Achilles region until the skin is numb.

What shouldn't you do?

If you have or suspect you have Achilles tendon tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout participation. If this occurs, your recovery may be prolonged and it may take a number of months for you to return to full participation.

Management

The assistance of a sports medicine professional is important in the treatment of Achilles tendinopathy. Initially, they can assist in diagnosing the problem and establishing its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will determine an appropriate treatment plan. This involves activity modification, soft tissue treatment such as massage and stretching, correction of your biomechanics using orthoses, and the progression through a series of specific strengthening exercises. Anti-inflammatory medication is necessary. Local cortisone injection is generally not advised.

Paratendinopathy of the Achilles tendon

What is it?

The Achilles tendon is the large tendon connecting the calf muscles (gastrocnemius and soleus) to the heel bone (calcaneus). It is surrounded by a sleeve of connective tissue called the paratenon. Paratendinopathy refers to inflammation of this sleeve.

How does it happen?

Paratendinopathy may develop from irritation and repeated trauma to the paratenon. The paratenon functions to protect the Achilles tendon and enhance movement between the tendon and adjacent structures. It may be irritated when this movement is interfered with. For example, when wearing ill-fitting shoes which put excessive force and pressure on the back of the heel. Alternatively, paratendinopathy may develop following repeated trauma. Repetitive use of the calf muscles and, therefore, the Achilles tendon can lead to trauma to the paratenon as the tendon moves in this connective tissue sleeve. The end result is microtrauma of the paratenon. To repair this microtrauma, the body commences an inflammatory response. This inflammation, when persistent within the paratenon, produces a paratendinopathy.

How does it feel?

Paratendinopathy results in pain felt where the Achilles tendon attaches to the heel bone. This may develop either quickly or gradually over a short period. In addition, there may be obvious swelling around the Achilles tendon as well as crepitus or noises. The latter results from the breaking of small adhesions (healing scar tissue), which have developed between the paratenon and enclosed Achilles tendon.

What should you do?

Paratendinopathy generally does not settle if the cause is not addressed and you continue to participate. If you have or suspect paratendinopathy, you should consult your nearest sports medicine professional. Initial treatment involving icing and compression is commenced.

What shouldn't you do?

Pain in the region of the Achilles needs assessment. It is not appropriate to continue activity without intervention, as it has the potential to worsen and the inflammation within the paratenon to become long-term (chronic).

Could there be any long-term effects?

Paratendinopathy does not produce any long-term effects as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the Achilles region arising from possible degeneration and formation of scar tissue, leading to a prolonged lay-off from participation.

Management

The assistance of a sports medicine professional is important in the treatment of paratendinopathy. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, non-impact cross-training, the prescription of anti-inflammatory medications, soft tissue treatment such as massage and stretching, and alteration of your footwear. The sports medicine professional will also be able to assess and determine why you developed paratendinopathy and address this during your recovery to prevent a re-occurrence when you return to full participation.

Partial tear of the Achilles tendon

What is it?

A partial tear of the Achilles tendon refers to a tear within the large tendon which joins the calf muscles (gastrocnemius and soleus) to the heel bone (calcaneus).

How does it happen?

Partial tears of the Achilles tendon occur when the calf muscles are forcibly contracted. The function of the Achilles tendon is to transmit forces produced by the calf muscles to the heel bone. Forcible contraction of these muscle can overstress the Achilles tendon, resulting in an incomplete tearing of a portion of the tendon. This can occur during lunging for a ball in racquet sports or jumping in sports such as volleyball and basketball.

How does it feel?

The immediate sensation when the Achilles tendon is partially torn is pain in the back of the lower leg. There may also be an audible snap, crack or tear. Depending on the severity of the injury, the area around the injured site may swell and you may have difficulty walking due to pain and calf weakness. Swelling may be immediate or occur over a period of hours.

What should you do?

To limit the severity of the injury, it is advised you cease further participation and begin initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. This is when swelling around the injured tissues is most active. Although swelling is a necessary step in the healing process, too much can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the Achilles tendon, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage. Rest involves limiting the amount of weight you put through the injured site. This may require crutches if you are having difficulty walking. Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel. Compression involves the application of a firm elastic bandage around the injured site. It should be firm but not tight enough to cause pain. Elevation involves lying with the injured site resting comfortably on a chair or pillows so that it is above the level of the heart. You should continue the RICE regime until you consult a sports medicine professional. This should be undertaken as soon as possible following the injury.

What shouldn't you do?

Following a partial tear of the Achilles tendon, you shouldn't undertake activities which increase blood flow to the injured site and, therefore, increase bleeding and swelling. These include hot showers, calf-stretching, heat rubs, the consumption of alcohol and excessive activity.

Could there be any long-term effects?

As long as they are appropriately treated, most partial tears of the Achilles tendon heal, although healing is protracted over a matter of weeks to months.

Management

The assistance of a sports medicine professional is important in the treatment of a partial tear of the Achilles tendon. Initially, they can assist in diagnosing the problem and establishing its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve an initial period of rest, the use of electrotherapy (i.e. ultrasound therapy), and the progression through a series of specific tendon strengthening exercises. Non impact cross-training is appropriate with a graded return to activity.

Complete tear of the Achilles tendon

What is it?

A complete tear of the Achilles tendon means the large tendon which joins the calf muscles (gastrocnemius and soleus) to the heel bone (calcaneus) is completely disrupted.

How does it happen?

Complete tears of the Achilles tendon occur when the calf muscles are forcibly contracted. The function of the Achilles tendon is to transmit forces produced by the calf muscles to the heel bone. Forcible contraction of these muscle can overstress the Achilles tendon, resulting in a complete tear. This can occur during lunging for a ball in racquet sports or jumping in sports such as volleyball and basketball.

How does it feel?

A complete tear of the Achilles tendon results in immediate agonising pain at the back of the heel. This pain is often described as a sensation of being hit or kicked in the back of the leg. Associated with this may be a feeling of something tearing or snapping. Following a complete tear of the Achilles tendon, you will be unable to continue participating due to profound weakness in the calf. You will also be unable to walk normally due to pain and weakness.

What should you do?

A complete tear of the Achilles tendon is a serious injury which requires surgical repair. Therefore, if you have or suspect you have a complete tear of the Achilles tendon it is advised you seek the assistance of a sports medicine professional as soon as possible (i.e. on the same day as the injury). In the meantime, you can commence early treatment to limit the amount of bleeding and swelling within and around the torn ends of the tendon. This should involve the **RICE** regime (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby, reducing the extent of bleeding and swelling. Rest involves limiting the amount of weight you put through the injured site. This means using crutches. Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel. Compression involves the application of a firm elastic bandage around the injured site. It should be firm but not tight enough to cause pain. Elevation involves lying with the injured site resting comfortably on a chair or pillows so that it is above the level of the heart. You should continue the RICE regime until you consult a sports medicine professional.

What shouldn't you do?

Following a complete tear of the Achilles tendon, you shouldn't undertake activities which increase blood flow to the injured site and, therefore, bleeding and swelling to the area. These include hot showers, heat rubs, alcohol and excessive activity.

Could there be any long-term effects?

A complete tear of the Achilles tendon is a serious injury which does not heal by itself without appropriate treatment. Appropriate treatment involves surgical repair and the application of a cast. Following surgery, the rehabilitation period is prolonged and it will be six to eight weeks before you can walk on the injured leg. It will be a further number of months, between six and twelve, before your muscle length and joint range of motion return to satisfactory levels to enable a return to participation. However, with appropriate management, there will be an eventual excellent outcome.

Management

The assistance of a sports medicine professional is important in the treatment of a complete tear of the Achilles tendon. Initially, they can assist in diagnosing the problem. This may require the use of imaging techniques such as ultrasound. From this, the sports medicine professional will be able to determine an appropriate treatment plan. In the great majority of cases, this will involve surgical repair and the application of a cast. Following surgery and the removal of the cast, the sports medicine professional will be able to rehabilitate your tendon so that you can return to participation. This may involve the use of soft tissue treatment such as massage and stretching, and the progression through a series of specific tendon strengthening exercises.

Retrocalcaneal bursitis

What is it?

Retrocalcaneal bursitis refers to inflammation of the bursa located between the Achilles tendon and the back of the heel bone (calcaneus). A bursa is a structure found where two tissues rub against each other. The retrocalcaneal bursa works to allow the Achilles tendon to slide smoothly and without friction over the back of the heel bone.

How does it happen?

Retrocalcaneal bursitis occurs when the retrocalcaneal bursa is irritated. This commonly results from excessive friction on the bursa. This can occur when you wear shoes which are excessively tight across the back of the heel. When you wear excessively tight shoes, increased pressure is placed on the Achilles tendon which, in turn, increases pressure on the retrocalcaneal bursa. This can increase wear and tear on the bursa causing microtrauma which, over time, can result in bursal thickening, inflammation and bursitis. Similarly, increased wear and tear on the retrocalcaneal bursa and subsequent bursitis may be caused by an excessively tight calf and Achilles tendon or other biomechanical problems.

How does it feel?

Retrocalcaneal bursitis generally causes pain over the back of the heel. This pain may be associated with swelling around the back of the heel and the lower part of the Achilles tendon.

What should you do?

If you have or suspect you have retrocalcaneal bursitis, it is advised you avoid activities and footwear which aggravate your pain and seek the assistance of a sports medicine professional to establish the exact cause. If the cause is not addressed, the pain may go away if you rest, only to return as soon as you re-commence activity. In the meantime, to help with your pain you may consider using anti-inflammatory medications or ice. These will also help reduce the inflammation within the bursa.

What shouldn't you do?

If you have retrocalcaneal bursitis, you shouldn't continue with activities which aggravate your pain. These will increase friction on the bursa, further irritating it and possibly delaying recovery. Application of heat and massage should be avoided.

Could there be any long-term effects?

Most cases of retrocalcaneal bursitis settle within a matter of weeks when appropriately diagnosed and treated. However, if the cause of irritation on the retrocalcaneal bursa is not addressed, retrocalcaneal bursitis may recur on resumption of activity.

Management

The assistance of a sports medicine professional is important in the treatment of retrocalcaneal bursitis. They will be able to confirm your diagnosis and use a number of treatment techniques to reduce your pain. In some situations, this may involve draining the bursa, taking anti-inflammatory medications or injecting a small quantity of anti-inflammatory agent directly into the bursa. However, more importantly they will be able to determine the cause of the irritation on your bursa. Addressing this as your pain settles will help prevent the re-occurrence of retrocalcaneal bursitis when you return to activity.

Sever's lesion

What is it?

Sever's lesion refers to an injury to the bone growth plate at the back of the heel bone (calcaneus) in young athletes. It is more a condition than a disease.

How does it happen?

The large calf muscles (gastrocnemius and soleus) attach to the heel via the Achilles tendon. The function of this tendon is to transmit forces produced by the calf muscles to the heel bone. In children, the portion of the heel bone into which the Achilles tendon inserts is separated from the bulk of the heel bone by a growth plate. This growth plate enables bone growth to occur. However, it also represents a site of weakness in the bone. Forceful and repeated contraction of the calf muscles can injure the growth plate. This commonly occurs during a period of rapid growth where the muscles and tendons become tighter as the bones grow. This leads to increased pulling of the calf muscles and Achilles tendon on the heel bone and growth plate.

How does it feel?

Sever's lesion is experienced as pain at the back of the heel where the Achilles tendon inserts into the heel bone. This is felt most commonly during activity. The back of the heel may also be tender to touch and there may be localised swelling.

What should you do?

If your child has pain at the back of the heel and you think it may be Sever's lesion, you should consult a sports medicine professional for assistance. In the meantime, you should limit their participation in their chosen sport/s to restrict the amount of damage to the growth plate.

What shouldn't you do?

If you think your child has Sever's lesion, you should not encourage them to exercise and exercise through the pain.

Could there be any long-term effects?

Sever's lesion does not produce any long-term effects. It will not interfere with their growth and the pain will settle. This usually occurs within six to twelve months.

Management

The assistance of a sports medicine professional is important in the treatment of Sever's lesion. Initially they can assist in diagnosing the injury and the extent of the damage. From this, they will be able to determine an appropriate management plan. This may involve an initial period of rest or activity modification, soft tissue treatment such as massage and stretching, correction of your biomechanics using either a simple heel raise or orthoses, and the progression through a series of specific strengthening exercises. In addition, they will be able to advise you and your child on the appropriate time for return to full participation.

Lateral ligament injury (rolled ankle)

What is it?

A lateral ligament injury usually refers to a tear of one or more of the ligaments on the outside (lateral aspect) of the ankle. The lateral ligaments consist of three ligament bands which provide stability to the outside of the ankle joint. These ligaments as a group are referred to as the lateral ligament complex.

How does it happen?

The lateral ligaments are injured when they are overstretched (sprained). This commonly occurs when the foot and ankle are forcibly rolled inwards. This injury is often referred to as a 'rolled ankle'. The ankle may be rolled during rapid changes in direction, on uneven surfaces, or treading on a ball or opponent's foot.

How does it feel?

The first sensation after a lateral ligament sprain is pain on the outside and front of the ankle. There may also be an audible snap, crack or tear. Depending on the severity of the injury, the outside and front of the ankle may swell and you may have difficulty walking due to pain. Swelling may be immediate or occur over a period of hours. The ankle may also feel weak. Over the coming days, bruising may develop which may extend up the leg and down to the toes.

What should you do?

To limit the severity of this injury, it is advised that you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the lateral ligament complex, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby, reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your ankle. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your ankle. It should be firm but not tight enough to cause pain.

Elevation involves lying with your ankle resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within 2 days of the initial injury.

What shouldn't you do?

Following injury to the lateral ligament complex you shouldn't undertake activities which may increase blood flow to the injured site and, therefore, swelling to the area. These include hot showers, heat rubs, alcohol and excessive activity.

Could there be any long-term effects?

Most lateral ligament injuries heal without complication within a matter of weeks. However, a proportion of injuries can result in longer-term effects depending on the severity of the injury and extent of damage. When the ankle is rolled, a number of structures in the vicinity of the lateral ligaments may also be injured. These include bone, cartilage and muscle tendons. Injuries to these structures can produce persistent pain and swelling which can slow recovery. An incorrect diagnosis or poor management of your injury may result in reduced range of movement, weakness and an increased chance of reinjuring the ankle.

Management

After the initial RICE treatment, the aim of subsequent treatment is to restore the ankle to full function. This involves restoration of full range of motion, strengthening the muscles around the ankle, improving the proprioception (balance) with specific exercises and graduated return to full activity. A sports medicine professional will also be able to advise you on other preventive measures such as the use of strapping tape or ankle braces.

Medial ligament injury (ligament tear to the inside of your ankle)

What is it?

A medial ligament injury usually refers to a tear of the ligament on the inside (medial aspect) of the ankle. This strong ligament provides support to the inside aspect of your ankle joint.

How does it happen?

The medial ligament is injured when it is overstretched (sprained). This commonly occurs when the foot and ankle are forcibly rolled outwards. The ankle may be rolled outwards during rapid changes in direction, on uneven surfaces, or treading on a ball or opponent's foot.

How does it feel?

The first sensation after a medial ligament sprain, is pain on the inside of the ankle. There may also be an audible snap, crack or tear. Depending on the severity of the injury, the inside surface of the ankle may swell and you may have difficulty walking due to pain. Swelling may be immediate or occur over a period of hours. The ankle may also feel weak. Over the coming days, bruising over the injured site may develop.

What should you do?

To limit the severity of this injury, it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours. Swelling is a necessary step in the healing process; however too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the medial ligament, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your ankle. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your ankle. It should be firm but not tight enough to cause pain.

Elevation involves lying with your ankle resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within 2 days of the initial injury.

What shouldn't you do?

Following injury to the medial ligament, you shouldn't undertake activities which increase blood flow to the injured site and, therefore, swelling to the area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity.

Could there be any long-term effects?

Although most medial ligament injuries heal without complication within a matter of weeks, a proportion of injuries can result in longer-term effects, depending on the extent of the damage. The medial ligament is a strong ligament. When it is overstretched not only may the ligament itself be damaged, but the bone to which it attaches may also be injured (fractured). In addition, the cartilage within the ankle joint may be damaged. Injuries to these structures can produce persistent pain and swelling, slowing recovery. This may delay return to activity and sport particularly if the injury is not appropriately diagnosed and managed. An incorrect diagnosis or poor management may result in persistent pain and swelling, reduced range of movement, weakness and an increased chance of reinjuring the ankle.

Management

After the initial RICE treatment, the aim of subsequent treatment is to restore the ankle to full function. This involves restoration of full range of motion, strengthening the muscles around the ankle, improving the proprioception (balance) with specific exercises and graduated return to full activity. A sports medicine professional will also be able to advise you on other preventive measures such as the use of strapping tape or ankle braces.

Pott's fracture (ankle joint fracture)

What is it?

A Pott's fracture refers to a break (fracture) in one or more of the leg bones that form part of the ankle joint. The bones fractured are the malleoli. The malleoli are the large bony bumps just beneath the skin on the inside and outside of the ankle.

How does it happen?

A Pott's fracture can occur when the foot and ankle are forcibly rolled inwards or outwards. Although this mechanism commonly injures the ligaments supporting the ankle, it can also fracture the bones forming the ankle joint. A Pott's fracture may occur during rapid changes in direction, on uneven surfaces, or treading on a ball or opponent's foot. A Pott's fracture may also occur when the foot is forcibly twisted on the leg, or vice versa.

How does it feel?

The first sensation felt when a Pott's fracture occurs is immediate and intense pain. There may also be an audible snap or crack as the bone breaks. The ankle may swell immediately or over a period of hours and you may have difficulty walking due to pain. The ankle may also feel weak. If the bones are displaced, there may be an obvious deformity within the ankle.

What should you do?

A Pott's fracture represents a serious ankle injury. If you have or suspect you have a Pott's fracture it is advised you cease your activity or sport, begin initial treatment and seek immediate medical attention. Initial treatment involves immobilising the ankle as soon as possible using splints and bandages. You may raise the injured ankle above the level of the heart once immobilised to help reduce pain and swelling.

What shouldn't you do?

To prevent further damage, you shouldn't undertake any activity which involves taking weight through the injured ankle. This includes walking without crutches. In addition, you should avoid activities which increase blood flow to the injured site and, therefore, swelling to the area. These include hot showers, heat rubs and the consumption of alcohol.

Could there be any long-term effects?

Most Pott's fractures heal in matter of months without complication. However, some fractures do result in longer-term effects. These effects include ongoing pain, stiffness and swelling in the ankle, and an increased likelihood of developing arthritis within the ankle later in life.

Management

Your medical professional will confirm that you have a fracture using X-ray or CT scan. Once the diagnosis is confirmed, surgery may be required to fixate the bones back into their correct position if the fracture is severe. Less severe fractures may only require a plaster or fibreglass cast from the knee down. Either way, a period of non weight bearing (not putting any body weight through your ankle) will be required. The length of time that you are in a cast and/or non-weight-bearing will depend on the severity of your fracture and the opinion of your surgeon/doctor.

When you are able to begin weight-bearing, or when the cast is removed, physiotherapy treatment and rehabilitation will be of benefit. Your physiotherapist will help you regain your range of movement, strength, flexibility and function to allow you to return to your desired activity. Failure to complete a rehabilitation program may result in persistent pain and swelling, reduced range of movement, weakness and an increased chance of reinjuring the ankle.

Osteochondral fracture of the talar dome (bone-cartilage fracture within the ankle joint)

What is it?

The talar dome refers to the upper part of the foot bone (talus) which joins with the leg bones to form the ankle joint. The dome consists of bone (osteo-) covered with a layer of cartilage (-chondral). Therefore, when a portion of dome breaks off (fractures), it is referred to as an osteochondral fracture of the talar dome.

How does it happen?

Osteochondral fractures of the talar dome can occur when the foot and ankle are forcibly rolled or compressed. Although this typically injures the ligaments of the ankle, the osteochondral surface of the talus may also be damaged. This may occur during rapid changes in direction, on uneven surfaces, or treading on a ball or opponent's foot.

How does it feel?

As osteochondral fractures of the talar dome are frequently associated with injury to the ligaments of the ankle, the injury may initially be overlooked and treated as a rolled ankle. If so, initial improvements in pain and a return of function may occur as the injured ligaments heal. However, if an osteochondral fracture is present, the ankle will continue to ache a number of weeks following injury. Pain, swelling and stiffness may increase as you gradually return to your activity or sport. You may also feel occasional catching or locking as the fractured portion of the talar dome gets stuck in the joint.

What should you do?

If you have or suspect you have an osteochondral fracture of the talar dome, you should consult a sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect you have an osteochondral fracture of the talar dome, you shouldn't ignore the problem. Continuing to participate in your sport or activity may indeed worsen your injury. The best guide is pain. If it hurts, stop your activity and seek advice.

Could there be any long-term effects?

Unfortunately, the recovery time associated with an osteochondral fracture of the talar dome can be extensive. It may be a number of months before you can return to full participation in your sport. In addition, a talar dome fracture can increase your likelihood of developing arthritis within the ankle later in life.

Management

The expertise of a sports medicine professional is essential in the treatment of an osteochondral fracture of the talar dome. Confirmation of the diagnosis will usually require scanning your ankle using either a bone scan, CT scan and/or MRI. Once the diagnosis is confirmed, arthroscopic surgery may be required to remove any loose fragments within your ankle joint. Simple fractures (no loose fragments) may only require a plaster or fibreglass cast from the knee down. Either way, a period of non-weight-bearing (not putting any body weight through your ankle) will be required. The length of time that you are in a cast and/or non-weight-bearing will depend on the severity of your osteochondral fracture and the opinion of your surgeon/doctor.

When you are able to begin weight-bearing, or when the cast is removed, physiotherapy treatment and rehabilitation will be of benefit. Your physiotherapist will help you regain your range of movement, strength, flexibility and function to allow you to return to your desired activity. Failure to complete a rehabilitation program may result in persistent pain and swelling, reduced range of movement, weakness and an increased chance of reinjuring the ankle.

Dislocation of the peroneal tendons

What is it?

The peroneal tendons are located in a groove behind the bony prominence on the outside of the ankle. They are held in this position by bands of tissue (peroneal retinaculum). When these bands are damaged, the peroneal tendons can move out of their groove. This is referred to as dislocation of the peroneal tendons.

How does it happen?

For the peroneal tendons to dislocate, there needs to be some form of injury which damages the peroneal retinaculum. Frequently this occurs when the foot and ankle are forcibly rolled inwards. Although this typically injures the lateral ligaments of the ankle, the peroneal retinaculum may also be damaged. This may occur during rapid changes in direction, on uneven surfaces, or treading on a ball or opponent's foot.

How does it feel?

You may feel a popping or snapping sensation as the retinaculum is injured. This may be associated with swelling and tenderness which develops behind the bony prominence on the outside of the ankle. As the peroneal tendons are no longer held down, they may dislocate and remain dislocated following injury. This may be obvious when comparing the appearance of the outside of the injured ankle to the opposite ankle. Alternatively, the peroneal tendons may initially dislocate and then return to their original position. This may result in a sensation that the tendons are slipping in and out.

What should you do?

If you have or suspect your peroneal tendons are dislocating, you should consult your nearest sports medicine professional. To help control the amount of swelling and pain to your ankle, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation).

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your ankle. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your ankle. It should be firm but not tight enough to cause pain.

Elevation involves lying with your ankle resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

If you have or suspect your peroneal tendons are dislocating, you should consult your nearest sports medicine professional.

Could there be any long-term effects?

In true cases where the peroneal tendons dislocate, the injury does not heal by itself. Surgery is required to fix the problem. Following surgery, there are usually no long-term effects.

Management

The assistance of a sports medicine professional is important in the treatment of dislocation of the peroneal tendons. Initially, they can confirm your diagnosis and determine the appropriate treatment. This will usually involve surgery. Following surgery, a physiotherapist will be able to rehabilitate your ankle to return you back to your activity or sport. This may involve soft tissue treatment such as massage, electrotherapy treatment, and progressing you through a series of stretching and strengthening exercises.

Post-traumatic synovitis

What is it?

Post-traumatic synovitis refers to persistent and ongoing swelling following an ankle injury. It results from irritation and inflammation of the synovial membrane, the inner layer of the capsule enclosing the ankle joint. This membrane is responsible for producing fluid which lubricates the joint surfaces. When it becomes inflamed, it produces excessive fluid, resulting in swelling of the ankle joint.

How does it happen?

Following an ankle injury, some degree of synovitis always occurs due to the presence of blood within the joint. Blood actually irritates the synovial membrane. This post-injury synovitis usually resolves relatively quickly. However, it can become prolonged if joint bleeding is prolonged and the injury is not managed correctly. This can occur when excessive weight-bearing is undertaken too early in recovery. For example, when training is recommenced within a few days of an ankle injury. Post-traumatic synovitis may also result from repetitive minor trauma. In athletes who have an unstable or 'loose' ankle, the excessive movement within the joint can irritate and inflame the synovial membrane, leading to joint swelling.

How does it feel?

The most prominent thing you will notice with post-traumatic synovitis is an ongoing swollen ankle despite a number of weeks passing following an ankle injury. The swelling may be aggravated by activity such as running or walking. It may also be associated with ongoing ankle pain.

What should you do?

The best approach to address the problem of post-traumatic synovitis is to prevent its occurrence. This can be achieved by appropriately managing ankle joint injuries. However, to help control the amount of swelling and pain to your ankle, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation).

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your ankle. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your ankle. It should be firm but not tight enough to cause pain.

Elevation involves lying with your ankle resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional.

If, however, you have developed persistent swelling following a previous ankle injury it is also advised you seek the assistance of a sports medicine professional to determine how to best control the swelling.

What shouldn't you do?

If you have suffered an ankle injury or you have post-traumatic synovitis, you shouldn't undertake activities which increase blood flow to the injured site and, therefore, irritation of the synovial membrane. These include hot showers, heat rubs, the consumption of alcohol and excessive activity.

Could there be any long-term effects?

Post-traumatic synovitis does not usually produce any long-term effects, as long as it is appropriately treated.

Management

The assistance of a sports medicine professional is important both in the prevention and treatment of post-traumatic synovitis. Following an injury, they can advise you on your timely return to activity so as to reduce the chance of developing post-traumatic synovitis. If you have already developed post-traumatic synovitis, they can introduce appropriate treatments aimed at reducing the synovial membrane irritation and, therefore, ongoing swelling. Once the problem is under control, they can advise you on an appropriate time for return to your activity or sport.

Avulsion fracture of the base of the fifth metatarsal

What is it?

The fifth metatarsal is a long skinny bone on the outside of the foot to which the little toe is connected. An avulsion fracture of the base of the fifth metatarsal refers to when a piece of the metatarsal is pulled off from the rest of the bone.

How does it happen?

An avulsion fracture of the base of the fifth metatarsal can occur when the ankle is rolled inwards. When the ankle is rolled inwards the peroneal brevis muscle contracts to stop the movement and to protect the ligaments of the ankle. This muscle inserts via its tendon into the base of the fifth metatarsal. If the contraction of the muscle is strong enough, its tendon can pull off from where it attaches to the metatarsal. In doing so, it can also pull off or avulse a piece of the bone.

How does it feel?

An avulsion fracture of the base of the fifth metatarsal results in pain felt along the outside border of the foot. It is usually felt approximately halfway along the foot. It may be aggravated by standing on the injured foot or by trying to turn the foot outwards.

What should you do?

If you have or suspect you have avulsed the base of the fifth metatarsal, you should put no weight through your foot (crutches will be of benefit) and consult a sports medicine professional immediately.

The **RICE** regime may be of benefit (Rest, Ice, Compression, Elevation) to help control the amount of swelling and pain to your foot. However, care must be taken with icing your foot as ice may increase your pain due the injury being a fracture (broken bone).

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your foot. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your foot. It should be firm but not tight enough to cause pain.

Elevation involves lying with your foot resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

If you have or suspect you have avulsed the base of your fifth metatarsal you shouldn't undertake activities which increase weight or blood flow to the injured area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity.

Could there be any long-term effects?

Avulsion fractures of the base of the fifth metatarsal usually heal within a matter of weeks and do not produce any long term effects, as long as they are appropriately treated. However, a proportion of injuries can result in longer-term effects depending on the severity of the injury and extent of damage. When the ankle is rolled inwards it is not uncommon to also injure the ligaments supporting the ankle and other surrounding structures. Injury to these structures may prolong your recovery.

Management

The assistance of a sports medicine professional is important in the treatment of an avulsion fracture of the base of the fifth metatarsal. Initially, they can assist in determining which tissues have been damaged and the extent of this damage. This may require the use of an X-ray to image the bone. From this, a determination of how long the injury is expected to take to heal can be provided and an appropriate treatment plan developed. The latter may involve using crutches for a couple of weeks to enable healing and to control pain, followed by a gradual return to activity and sport as pain permits.

Tibialis posterior tendinopathy

What is it?

Tibialis posterior tendinopathy refers to inflammation within the tibialis posterior tendon which travels behind the bony bump on the inside of the ankle.

How does it happen?

Tibialis posterior tendinopathy results from overuse and/or overstretching of the tibialis posterior tendon. The function of the tibialis posterior muscle and tendon is to control foot movement and support the arch of the foot. Repetitive use of the tibialis posterior muscle and, therefore, the tibialis posterior tendon can lead to microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy.

How does it feel?

Tibialis posterior tendinopathy results in pain felt behind the bony bump on the inside of the ankle. This pain typically develops gradually. Initially, the tendon may only be painful following exercise. For example, it may be first felt on rising the day following participation. Associated with the pain may be stiffness or tightness in the tendon and ankle. Typically, these initial signs of tibialis posterior tendinopathy are ignored, as they disappear quickly with walking about or applying heat (i.e. a hot shower) over the inside of the ankle. However, as you continue to participate, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. For example, it may begin to be present during participation. In the earlier stages, this pain during participation may initially disappear as you warm-up, only to return when you cool-down. However, as you continue to participate, the tendinopathy worsens and your pain may begin to be present for longer periods during participation until it is present all of the time. This may interfere with your performance.

What should you do?

Tibialis posterior tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have tibialis posterior tendinopathy, you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of icing following participation. Icing should consist of applying crushed ice wrapped in a moist towel for 15–20 minutes, or ice in a paper cup massaged up and down over the inside of the ankle until the skin is numb.

What shouldn't you do?

If you have or suspect you have tibialis posterior tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise, however, the exercise you are doing may interfere with the healing process and cause further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout participation. If this occurs, your recovery may be prolonged and it may take a number of months for you to return to full activity and sport.

Could there be any long-term effects?

Tibialis posterior tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the region behind the bony bump on the inside of the ankle and a prolonged lay-off from participation.

Management

The assistance of a sports medicine professional is important in the treatment of tibialis posterior tendinopathy. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, arch support for your feet, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed tibialis posterior tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity and sport.

Flexor hallucis longus tendinopathy

What is it?

Flexor hallucis longus tendinopathy refers to inflammation within the tendon which travels underneath the bony bump on the inside of the ankle and along the inside of the foot. Your flexor hallucis longus muscle and tendon bend your big toe.

How does it happen?

Flexor hallucis longus tendinopathy results from overuse of the flexor hallucis longus tendon. The function of the flexor hallucis longus tendon is to transmit forces produced by the flexor hallucis longus muscle to the big toe to move it. Repetitive use of the flexor hallucis longus muscle and, therefore, the flexor hallucis longus tendon can lead to microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy.

How does it feel?

Flexor hallucis longus tendinopathy results in pain felt underneath the bony bump on the inside of the ankle and along the inside of the foot. This pain typically develops gradually. Initially, the tendon may only be painful following exercise. For example, it may be first felt on rising the day following exercise. Typically, this initial sign of flexor hallucis longus tendinopathy is ignored, as it disappears quickly with walking about or applying heat (i.e. a hot shower) over the inside of the ankle and foot. However, as you continue to exercise, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. For example, it may begin to be present during exercise. In the earlier stages, this pain during exercise may initially disappear as you warm up, only to return when you cool down. However, as you continue to exercise the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Flexor hallucis longus tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have flexor hallucis longus tendinopathy, you should consult your nearest sports medicine professional. In the meantime you can begin initial treatment. This should consist of icing following participation. Icing should consist of applying crushed ice wrapped in a moist towel for 15–20 minutes, or ice in a paper cup massaged up and down over the inside of the ankle and foot until the skin is numb.

What shouldn't you do?

If you have or suspect flexor hallucis longus tendinopathy you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warmup' and you feel it throughout participation. If this occurs, your recovery may be prolonged and it may take a number of months for you to return to full activity and sport.

Could there be any long-term effects?

Flexor hallucis longus tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain in the region underneath the bony bump on the inside of the ankle and along the inside of the foot and a prolonged lay-off from activity and sport.

Management

The assistance of a sports medicine professional is important in the treatment of flexor hallucis longus tendinopathy. Initially, they can assist in diagnosing the problem and its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed flexor hallucis longus tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity.

Tarsal tunnel syndrome

What is it?

Tarsal tunnel syndrome refers to the entrapment of the posterior tibial nerve as it winds around the bony bump on the inner aspect of the ankle.

How does it happen?

Tarsal tunnel syndrome occurs when adhesions develop between the posterior tibial nerve and the surrounding soft tissues as the nerve winds around the back of the bony bump on the inner aspect of the ankle. These adhesions may restrict how much the nerve can slide forwards and backwards as the ankle and foot is moved. This may cause overstretching of the nerve at the site of the adhesions, resulting in the interference of signals being transmitted by the nerve. Alternatively, the posterior tibial nerve may be entrapped by tight or enlarged tissues surrounding the nerve. These may compress the nerve and interfere with the transmission of its signals.

How does it feel?

Tarsal tunnel syndrome produces a sharp pain along the inside and bottom of the foot. This pain is often aggravated by prolonged standing, walking or running and may radiate into the arch of the foot, the heel and even the toes. There may also be some pins and needles or numbness on the sole of the foot.

What should you do?

Tarsal tunnel syndrome generally does not get better on its own if the cause of the nerve entrapment is not treated. If you have or suspect you have tarsal tunnel syndrome, you should consult your nearest sports medicine professional. In the meantime, you should avoid activities which aggravate or provoke your pain. This may lead to the further entrapment and worsening of your pain.

What shouldn't you do?

If you have or suspect you have tarsal tunnel syndrome, you shouldn't ignore the problem. This can lead to your injury getting worse which may prolong your recovery.

Could there be any long-term effects?

Tarsal tunnel syndrome does not usually produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to ongoing pain in the foot and a prolonged lay-off from your activity or sport. In some situations, this may occur despite appropriate treatment. In these cases, surgery may be required to remove the structures which have entrapped the nerve, so as to alleviate your pain.

Management

The assistance of a sports medicine professional is important in the treatment of tarsal tunnel syndrome. Initially, they can assist in diagnosing the cause of the problem and establishing its severity. This may require the use of special nerve conduction tests which assess the transmission of signals along the nerve. From their assessment, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, the correction of your biomechanics using orthoses or shoe inserts, and in some cases the injection of anti-inflammatory into the sore region or surgery.

Stress fracture of the medial malleolus

What is it?

The medial malleolus is the bony bump on the inside aspect of the ankle. It is part of the shin bone (tibia). A stress fracture of the medial malleolus is an incomplete fracture or crack within this bony bump.

How does it happen?

Stress fractures of the medial malleolus result from an imbalance between bone formation and bone resorption. When the leg bone is loaded or stressed, such as during weight-bearing exercise, it responds by increasing its bone turnover. This is necessary for it to live up to the demands placed upon it. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone at the same location. To do this, old bone is resorbed (removed) before it is replaced with new bone. If bone formation cannot keep up with bone resorption areas of weakness can develop within the medial malleolus. These can develop into a stress fracture if the bone is continually loaded. Factors which may contribute to a stress fracture of the medial malleolus include a recent change in training (including frequency, duration, intensity, training surfaces and footwear), the taking up of a new activity, biomechanical abnormalities, muscle fatigue—menstrual disturbances in female athletes.

How does it feel?

A stress fracture of the medial malleolus is characterised by increasing pain developing over a period of weeks. The pain is generally very localised over the site of the stress fracture on the inside of the ankle and made worse by exercise. Initially, it may have only been present following activity. However, with continued loading and stress the pain may progress to be present during exercise. It may also reach a level such that activity is too painful to perform and the inside of the ankle is sore during walking, rest and even at night. When you touch the site where you feel the pain it may be tender, red and warm.

What should you do?

If you have or suspect you have a stress fracture of the medial malleolus, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect a stress fracture of the medial malleolus, you shouldn't continue to exercise or compete. A stress fracture represents an area of breakdown and weakness within the bone. If you continue to exercise or compete, the area of breakdown has the potential to increase weakening the bone further. This can lead to a larger crack in the bone and potentially a complete bone fracture.

Could there be any long-term effects?

A stress fracture of the medial malleolus does not produce any long-term effects, as long as it is properly treated, and the cause identified and addressed. If this does not happen, you may be at risk of a larger crack, a complete bone fracture or further stress fractures when you re-commence participation.

Management

The assistance of a sports medicine professional is important in the treatment of a stress fracture of the medial malleolus. Initially, they can assist in diagnosing the injury and the extent of the damage to the bone. This may require the use of a number of imaging techniques, such as a bone scan, CT scan or MRI. From this, they will be able to provide you with an estimation of how long the injury is expected to take to heal and determine an appropriate treatment plan. If a stress fracture is diagnosed, a period of rest and the use of crutches will be required. Anti-inflammatory medication and icing may also be recommended. A rehabilitation program will be implemented after your period of rest, which should include stretching and a graduated exercise program to facilitate your return to activity. The sports medicine professional will also be able to assess and determine why you developed a stress fracture of the medial malleolus and address this during your recovery to prevent its re-occurrence when you return to full activity and sport.

Peroneal tendinopathy

What is it?

Peroneal tendinopathy refers to inflammation and swelling within the peroneal tendons as they pass around the bony bump on the outside of the ankle.

How does it happen?

Peroneal tendinopathy results from overuse of the peroneal tendons. The function of the peroneal tendons is to transmit forces produced by the peroneal muscles to the bones in the foot. The peroneal muscles run down the outside of the lower leg to attach with the peroneal tendons. The peroneal tendons then travel around the bony bump on the outside of the ankle to attach to the bones in the foot. Repetitive use of the peroneal muscles and, therefore, the peroneal tendons can lead to microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendons is tendinopathy.

How does it feel?

Peroneal tendinopathy results in pain within the tendons as they pass around the bony bump on the outside of the ankle. This pain typically develops gradually. Initially, the tendons may only be painful following exercise. For example, it may be first felt on rising the day following exercise. Associated with the pain may be a feeling of stiffness or tightness in the ankle. Typically, these initial signs of peroneal tendinopathy are ignored, as they disappear quickly with walking about or applying heat (i.e. a hot shower) over the outside of the ankle. However, as you continue to exercise, the tendinopathy progresses and the pain within the tendons becomes more intense and more frequent. For example, it may begin to be present during exercise. In the earlier stages, this pain during exercise may initially disappear as you warm up, only to return when you cool down. However, as you continue to exercise, the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Peroneal tendinopathy generally does not get better on its own if the cause is not addressed and you continue to participate. If you have or suspect you have peroneal tendinopathy, you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of icing following exercise. Icing should consist of applying crushed ice wrapped in a moist towel for 15–20 minutes, or ice in a paper cup massaged up and down over the outside of the ankle until the skin is numb.

What shouldn't you do?

If you have or suspect you have peroneal tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm up' and you feel it throughout exercise. If this occurs, your recovery may be prolonged and it may take a number of months for you to return to full activity and sport.

Could there be any long-term effects?

Peroneal tendinopathy does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain on the outside of the ankle and a prolonged lay-off from activity and sport.

Management

The assistance of a sports medicine professional is important in the treatment of peroneal tendinopathy. Initially, they can assist in diagnosing the problem and establishing its severity. This may require the use of imaging techniques such as ultrasound or MRI. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, correction of your biomechanics using orthoses, and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed peroneal tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity and sport.

Sinus tarsi syndrome

What is it?

The sinus tarsi is a bony canal between the heel bone (calcaneum) and the bone directly above it (talus) which joins with the shin bone to form the ankle joint. This canal contains a number of ligaments which join the two bones together. Sinus tarsi syndrome refers to injury of these ligaments.

How does it happen?

Sinus tarsi syndrome most commonly results from a single incident which injures the ligaments within the sinus tarsi. This may result from a rolled ankle where the foot and ankle are forcibly rolled inwards. Alternatively, sinus tarsi syndrome may result from overuse combined with a biomechanical problem which places excessive stress on the ligaments within the sinus tarsi.

How does it feel?

As sinus tarsi injuries are frequently associated with injury to the lateral ligaments of the ankle, the injury may initially be overlooked and treated as a simple rolled ankle. This may result in initial improvements in pain and return of function as the injured lateral ligaments heal. However, when sinus tarsi syndrome is also present, the ankle may continue to be painful a number of weeks following injury. The pain is felt towards the front of the outside of the ankle. This pain is often most severe in the morning and improves as the area is warmed up.

What should you do?

If you have or suspect you have sinus tarsi syndrome, you should consult your nearest sports medicine professional for treatment.

What shouldn't you do?

If you have or suspect you have sinus tarsi syndrome, you should ignore the problem and continue to exercise. This may lead to your injury getting worse prolonging your recovery.

Could there be any long-term effects?

With treatment sinus tarsi syndrome generally gets better within a matter of weeks with no complications.

Management

The assistance of a sports medicine professional is important in the treatment of sinus tarsi syndrome. Initially, they can assist in confirming your diagnosis and the extent of the damage. Your sports medicine professional will then determine how long the injury should take to heal. In addition, sports medicine professionals can use a number of treatment techniques to assist in reducing the pain and enhance the healing of the injured structures. This will facilitate your return to activity and sport, and limit possible long-term effects. You will be provided and supervised with a rehabilitation program, which will progress you through a series of exercises designed to both limit long-term effects and reduce your chance of reinjury. In some cases, an injection of anti-inflammatory directly into the sinus tarsi may be performed. A sports medicine professional will also be able to advise you on other preventive measures such as the use of strapping tape.

Posterior impingement syndrome

What is it?

Posterior impingement syndrome refers to impingement or compression of structures in the back of the ankle joint.

How does it happen?

Posterior impingement syndrome is caused by impingement of structures between the bottom of the shin bone (tibia) and the foot bone (talus) with which it joins to make the ankle joint. When the foot is plantarflexed, such as when you go up onto your tiptoes, the structures at the back of the ankle can get compressed between the back of the foot bone and the back of the shin bone. This can cause inflammation and swelling of these structures so that they get compressed whenever you point your foot. This can occur in activities that require repeated pointing of the foot such as kicking sports and ballet. Similarly, posterior impingement can occur if you have an enlarged prominence on the back of the foot bone or a bony anomaly in your ankle called an 'os trigonum'.

How does it feel?

Pain is usually felt in the back of the ankle due to the compression of structures between the bones. This is felt when you point your foot.

What should you do?

If you have or suspect you have posterior impingement syndrome, you should consult your nearest sports medicine professional for advice.

What shouldn't you do?

If you have or suspect you have posterior impingement syndrome, you shouldn't ignore the problem and continue to exercise. This may lead to your injury getting worse which may prolong your recovery. In addition, you shouldn't perform any activities which aggravate your pain.

Could there be any long-term effects?

Posterior impingement syndrome does not produce any long-term effects, as long as it is accurately diagnosed and appropriately treated. In some situations, treatment may involve surgery to remove the cause of the impingement.

Management

The assistance of a sports medicine professional is important in the treatment of posterior impingement syndrome. Initially, they can assist in diagnosing the problem and its severity. This may require the use of an X-ray. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the taking of anti-inflammatory medications, and electrotherapy treatment. In some cases, an anti-inflammatory may be injected directly into the region to stimulate healing, or surgery, may be performed to remove the cause of the impingement.

Stress fracture of the talus

What is it?

The talus is the foot bone which joins with the leg to form the ankle joint. A stress fracture of the talus is an incomplete fracture or crack within this bone.

How does it happen?

Stress fractures of the talus result from an imbalance between bone formation and bone resorption. When the talus bone is loaded or stressed, such as during weight-bearing exercise, it responds by increasing its bone turnover. This is necessary for it to live up to the demands placed upon it. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone at the same location. To do this, old bone is resorbed (removed) before it is replaced with new bone. If bone formation cannot keep up with bone resorption areas of weakness can develop within the talus. These can develop into a stress fracture if the bone is continually loaded.

How does it feel?

A stress fracture of the talus is characterised by increasing pain developing over a period of weeks. The pain is generally felt deep within the ankle joint and made worse by exercise. Initially, it may have only been present following exercise. However, with continued loading and stress, the pain may have progressed to be present during exercise. It may also have reached a level such that activity is too painful to perform and the inside of the ankle is sore during walking, rest and even at night.

What should you do?

If you have or suspect you have a stress fracture of the talus, you should consult your nearest sports medicine professional for assistance.

What shouldn't you do?

If you have or suspect you have a stress fracture of the talus, you shouldn't continue to exercise or compete. A stress fracture represents an area of breakdown and weakness within the bone. If you continue to exercise or compete, the area of breakdown has the potential to increase, weakening the bone further. This can lead to a larger crack in the bone and potentially a complete bone fracture.

Could there be any long-term effects?

A stress fracture of the talus does not produce any long-term effects, as long as it is properly treated, and the cause identified and addressed. If this does not happen, you may be at risk of a larger crack, a complete bone fracture or further stress fractures when you recommence exercise.

Management

The assistance of a sports medicine professional is important in the treatment of a stress fracture of the talus. Initially, they can assist in diagnosing the injury and the extent of the damage to the bone. This may require the use of a number of imaging techniques, such as a bone scan, CT scan or MRI. From this, they will be able to provide you with an estimation of how long the injury is expected to take to heal and determine an appropriate treatment plan. The latter may initially involve a period of immobilisation in a leg cast and the use of crutches and the taking of anti-inflammatory medications. You will be provided and supervised with a rehabilitation program, which will progress you through a series of exercises designed to limit both long-term effects and reduce your chance of reinjury. The sports medicine professional will also be able to assess and determine why you developed a stress fracture of the talus and address this during your recovery to prevent its re-occurrence when you return to full activity and sport.

Anterior impingement syndrome

What is it?

Anterior impingement syndrome refers to impingement or compression of structures in the front of the ankle joint.

How does it happen?

Anterior impingement syndrome is caused by impingement of structures between the bottom of the shin bone (tibia) and the foot bone (talus) with which it joins to make the ankle joint. When the foot is brought back towards the head, the structures in the front of the ankle can get compressed between the front of the foot bone and the front of the shin bone. This can cause inflammation and swelling of these structures, so that they get compressed whenever you bring the foot back towards your head. This can occur in activities that require this movement to be performed repeatedly such in kicking sports and plié in ballet. Similarly, anterior impingement may occur if you have any bony spurs on the bottom of the shin bone.

How does it feel?

Anterior impingement syndrome results in pain felt in the front of the ankle joint. This results from compression of structures between the bones comprising the ankle joint and is felt when you bring your foot back towards your head. You may also experience stiffness and a decrease in the amount of movement in your ankle joint when compared to the other side.

What should you do?

If you have or suspect you have anterior impingement syndrome, you should consult your nearest sports medicine professional for advice.

What shouldn't you do?

If you have or suspect you have anterior impingement syndrome, you shouldn't ignore the problem and continue to participate. This may lead to your injury getting worse which may prolong your recovery. In addition, you shouldn't perform any activities which aggravate your pain.

Could there be any long-term effects?

Anterior impingement syndrome does not produce any long-term effects, as long as it is accurately diagnosed and appropriately treated. In some situations, treatment may involve surgery to remove the cause of the impingement.

Management

The assistance of a sports medicine professional is important in the treatment of anterior impingement syndrome. Initially, they can assist in diagnosing the problem and its severity. This may require the use of an X-ray. From this the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, the taking of anti-inflammatory medications, and electrotherapy treatment. In some cases, an anti-inflammatory may be injected directly into the sore region to stimulate healing, or surgery performed to remove the cause of the impingement.

Tibialis anterior tendinopathy

What is it?

Tibialis anterior tendinopathy refers to inflammation and swelling within the tibialis anterior tendon on the front of the ankle joint.

How does it happen?

Tibialis anterior tendinopathy typically results from overuse of the tibialis anterior tendon. The function of the tibialis anterior tendon is to transmit forces produced by the tibialis anterior muscle to a bone in the foot to bring the foot back towards the head. Repetitive use of the tibialis anterior muscle and, therefore, the tibialis tendon can lead to microscopic tears within the substance of the tendon. To repair these microscopic tears, the body commences an inflammatory response. This inflammation within the tendon is tendinopathy. Tibialis anterior tendinopathy may also be caused by excessively tight strapping or shoelaces over the tibialis anterior tendon. This will increase 'wear and tear' on the tendon, leading to microscopic tears and subsequent tendinopathy.

How does it feel?

Tibialis anterior tendinopathy results in pain within the tendon where it crosses the front of the ankle joint. This pain typically develops gradually. Initially, the tendon may only be painful following exercise. For example, it may be first felt on rising the day following exercise. Associated with the pain may be a feeling of stiffness or tightness in the front of the ankle joint. Typically, these initial signs of tibialis anterior tendinopathy are ignored, as they disappear quickly with walking about or applying heat (i.e. a hot shower) over the front of the ankle. However, as you continue to exercise, the tendinopathy progresses and the pain within the tendon becomes more intense and more frequent. For example, it may begin to be present during exercise. In the earlier stages, this pain during exercise may initially disappear as you warm-up, only to return when you cool down. However, as you continue to exercise, the tendinopathy worsens and your pain may begin to be present for longer periods during exercise until it is present all of the time. This may interfere with your performance.

What should you do?

Tibialis anterior tendinopathy generally does not get better on its own if the cause is not addressed and you continue to exercise. If you have or suspect you have tibialis anterior tendinopathy, you should consult your nearest sports medicine professional. In the meantime, you can begin initial treatment. This should consist of icing following exercise and avoiding activities which make your pain worse. Icing should consist of applying crushed ice wrapped in a moist towel for 15–20 minutes, or ice in a paper cup massaged up and down over the front of the ankle until the skin is numb.

What shouldn't you do?

If you have or suspect you have tibialis anterior tendinopathy, you shouldn't ignore the problem. Your pain may get better as you exercise; however, the exercise you are doing may be interfering with the healing process and causing further damage. This can lead to your injury getting worse such that your pain does not 'warm-up' and you feel it throughout exercise. If this occurs, your recovery may be prolonged and it may take a number of months for you to return to full activity and sport.

Could there be any long-term effects?

Tibialis anterior tendinopathy does not produce any long-term effects as long as it is properly diagnosed and appropriately treated. If not, it can lead to prolonged pain and a prolonged lay-off from exercise.

Management

The assistance of a sports medicine professional is important in the treatment of tibialis anterior tendinopathy. Initially, they can assist in diagnosing the problem and establishing its severity. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, soft tissue treatment such as massage and stretching, the taking of anti-inflammatory medications and the progression through a series of specific strengthening exercises. The sports medicine professional will also be able to assess and determine why you developed tibialis anterior tendinopathy and address this during your recovery to prevent a re-occurrence when you return to full activity and sport.

Inferior tibiofibular joint injury

What is it?

The inferior tibiofibular joint is the joint between the shin bone (tibia) and the smaller bone in the leg (fibula) where they meet just above the ankle joint. An inferior tibiofibular joint injury refers to when this joint and its supporting structures are damaged.

How does it happen?

An injury to the inferior tibiofibular joint may occur when the leg is rotated or twisted on the foot. This can occur when pivoting or cutting from side-to-side whilst sprinting. It may also be injured if the ankle is rolled.

How does it feel?

An inferior tibiofibular joint injury results in pain felt just above and on the front of the ankle joint. This is usually brought on by activities which require rotation of the leg. For example, pivoting or cutting from side-to-side.

What should you do?

If you have or suspect you have an inferior tibiofibular joint injury, you should cease your activity or sport and begin initial treatment. To limit the severity of this injury, it is advised you stop your activity immediately and start initial treatment. The most important time in the treatment of any injury is the first 24–48 hours.

Swelling is a necessary step in the healing process; however too much swelling can delay healing and cause further tissue damage. To control the amount of swelling and limit the degree of damage to the inferior tibiofibular joint, the **RICE** regime should be commenced (Rest, Ice, Compression, Elevation). This will help to reduce blood flow to the injured area, thereby, reducing the extent of swelling and tissue damage.

Rest involves ceasing your activity or sport, and limiting the amount of weight you put through your ankle. Crutches may be required if you are having difficulty walking.

Ice should be applied to the injured site for 15–20 minutes every 1–2 hours. Ideally, it should be applied using crushed ice wrapped in a moist cloth or towel.

Compression involves the application of a firm elastic bandage around your ankle. It should be firm but not tight enough to cause pain.

Elevation involves lying with your ankle resting comfortably on a chair or pillows so that it is above the level of your heart. You should continue the RICE regime until you consult a sports medicine professional, preferably within two days of the initial injury.

What shouldn't you do?

Following an injury to the inferior tibiofibular joint, you shouldn't undertake activities which increase blood flow to the injured area. These include hot showers, heat rubs, the consumption of alcohol and excessive activity. These may increase the bleeding and swelling within the injured structures and potentially prolong your recovery.

Could there be any long-term effects?

An injury to the inferior tibiofibular joint usually gets better within a matter of weeks and does not produce any long-term effects, as long as it is properly diagnosed and appropriately treated. In some cases, surgery may be required to join the leg bones back together. If this is not performed in severe inferior tibiofibular joint injuries, arthritis of the ankle joint may develop due to excessive movement of the bones within the ankle joint and, therefore, excessive wear-and-tear of the ankle joint cartilage.

Management

The assistance of a sports medicine professional is important in the treatment of a inferior tibiofibular joint injury. Initially, they can assist in diagnosing the problem and its severity. This may require the use of an X-ray. From this, the sports medicine professional will be able to determine an appropriate treatment plan. This may involve activity modification, icing, electrotherapy treatment, stretching and strengthening exercises, and taping. In some cases, surgery may be required to stabilise the joint.

Plantar fasciitis

What is it?

Plantar fasciitis is pain on the inside aspect of the heel. It is usually an overuse injury that causes inflammation of the plantar fascia at its attachment site on the heel bone.

How does it happen?

Plantar fasciitis occurs as a result of stretching or 'pulling' of the plantar fascia from its attachment on the heel bone. Activities such as running and dancing are commonly associated with the development of plantar fasciitis. This injury is called an overuse injury; it may happen over a long period of time before the patient decides to seek treatment.

How does it feel?

The pain is typically worse in the morning, with the first steps being very tender until the area warms up. Pain is worse with high impact weight-bearing activities. The site of tenderness is localised to the inside aspect of the heel, and is usually described as a dull ache. Over time, combined with the repetitive nature of running or walking, the inflammation can get worse and the intensity of the pain increases.

What should you do?

If you have or suspect you have plantar fasciitis then you should seek treatment as soon as possible. The earlier this injury is treated, the more successful the outcomes. Conservative management is indicated in the form of ice, massage, stretching, footwear modifications, heel cushioning and foot orthoses

What shouldn't you do?

You shouldn't put up with the pain in the hope it will go away. This injury is deceptive in that it warms up and you are able to walk and run on the area. Unfortunately each time you run on it you are causing more problems. With time, the pain will not warm up and your injury is far harder to treat, and may take longer to respond to conservative treatment.

Could there be any long-term effects?

There could be long-term problems with chronic pain in the area. A heel spur can develop secondary to the plantar fasciitis. More importantly, however, the inflammation can become chronic and may require an injection of cortisone (anti-inflammatory drug), or a surgical option.

Management

Sports medicine assistance is important in the diagnosis and management of plantar fasciitis. An accurate diagnosis is necessary to ensure successful management outcomes. This may include radiological examinations, either X-ray or ultrasound. It is important to rule out other possible differential diagnoses which affect this area of the heel. Once the extent of the injury is established, a treatment plan can be prescribed.

The treatment involves a combination of ice, massage, taping, stretching, as well as assessment and correction of biomechanical anomalies which may have caused the injury. Footwear assessment is also important in the successful treatment of plantar fasciitis. The sports medicine professional will also be able to provide assistance in the return to activity program to prevent re-occurrence of the injury.

Fat pad contusion

What is it?

Fat pad contusion is an injury to the weight-bearing surface of the heel.

How does it happen?

Fat pad contusion is a result of increased loading forces and pressure on the heel pads on the feet. The injury can either be due to an acute incident such as landing on the heels (onto a hard surface) from a height, or a chronic overuse injury. A chronic injury may result from a repetitive heel strike in shoes with poor heel cushioning.

How does it feel?

It feels like a bruise on the undersurface of the heel. Walking activities may aggravate the injury.

What should you do?

You should avoid weight-bearing on the painful area and aggravating the injury. Shoes with a softer heel counter would help in reducing the impact forces on the painful area, or the addition of soft foam on the heel strike position.

What shouldn't you do?

You shouldn't try to walk through the pain, because it will not go away without treatment. As the heel is an important weight-bearing structure and necessary for everyday activities, the pain will not abate with time, the load to the area must be reduced, at least temporarily.

Could there be any long-term effects?

Potentially, there aren't any long-term effects associated with fat pad contusion. A chronic pain presents a longer recovery time and is less responsive to conservative management.

Management

Sports medicine professionals may be able to provide padding for the area or cushioned heel cups to wear until the pain has settled. Footwear that provides heel cushioning and midsole support is more appropriate (ie: runners).

Stress fracture of the calcaneus

What is it?

A calcaneal stress fracture is an incomplete fracture or crack in the calcaneum bone (heel).

How does it happen?

Stress fracture of the calcaneus results from an imbalance in bone formation and bone resorption. It is an overuse injury that occurs secondary to repetitive impact loading on a weight-bearing structure. When the calcaneus is loaded or stressed, such as weight-bearing exercise, the calcaneum responds by increasing its bone turnover. This is necessary for it to live up to the body's demand on it. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone in the same location. To do this, old bone is resorbed (removed) before it is replaced with new bone. If bone formation cannot keep up with bone resorption, areas of weakness can develop within the calcaneus. These can then develop into a stress fracture if the bone is continually loaded. Factors that may contribute to a stress fracture of the calcaneum include changes or increases in training load and/or frequency, training surfaces, footwear, biomechanical abnormalities and muscle fatigue. Disturbances in a female's menstrual cycle or an inadequate diet may also be contributing factors in the development of a stress fracture.

How does it feel?

Pain is usually of a gradual onset, with weight-bearing activities such as walking and running exacerbating the pain. Squeezing the back of the heel on both sides simultaneously will elicit the painful symptoms. There may be pain present at rest and/or throughout the night.

What should you do?

If you have or suspect you have a stress fracture or bone damage of the heel, you should consult a sports medicine professional.

What shouldn't you do?

You shouldn't continue to exercise if you have a suspected fracture of the heel bone. Weight-bearing on the area is not advised, as this may exacerbate the area of bone weakness and risk a larger fracture or crack in the bone.

Could there be any long-term effects?

Stress fractures are areas of bone weakness, and as long as this fracture is managed correctly, there should not be any long-term effects. Activity should not commence until complete healing of the fracture has occurred.

Management

Sports medicine professionals are important in the treatment of calcaneal stress fractures. The diagnosis may be made clinically and confirmed with the use of imaging techniques. An X-ray may show the bone changes associated with a calcaneal stress fracture; however, it may be necessary to have a bone scan, as this is a more sensitive test to show early bone changes. Once a diagnosis is confirmed, treatment is usually six weeks partial weight-bearing on crutches. The sports medicine professional will help to plan a return to activity program which suits the patient and will address the factors that may have contributed to the development of the stress fracture.

Stress fracture of the navicular

What is it?

A stress fracture of the tarsal navicular bone is an incomplete fracture or crack of the bone on the top inside aspect of the foot. The navicular bone is at the apex of the arch of the foot.

How does it happen?

Repetitive stress or impact on the navicular bone can overload the balance between bone formation and bone resorption. Activities such as running and dancing require repetitive loading that places increased stresses on the navicular bone in the keystone position of the arch. Overtraining, incorrect training methods, biomechanical anomalies, poor footwear and inadequate diet are contributing factors that may predispose an athlete to developing a stress fracture. Disturbances in a female's menstrual cycle or an inadequate diet may also be contributing factors in the development of a stress fracture.

How does it feel?

Stress fractures of the navicular bone can have vague, ill-defined symptoms. The onset is usually insidious, with increasing pain following activities such as sprinting or jumping. In the early stages of injury, the pain can be quite vague and radiate along the inside arch of the foot. A navicular stress fracture behaves differently from other stress fractures of the lower limb and can vary with individuals. Pain can radiate into the 2nd and 3rd toes, on to the outside border of the foot, on the inside of the heel and through the inside arch. These unusual symptoms relate to the nerve supply of the foot. If rested, the pain will decrease and allow the patient to begin running again. However, the pain usually returns with increased loading activity. A reduction in symptoms at rest does not indicate a healed fracture.

What should you do?

If you have ill-defined symptoms across the top, central, inside and outside areas of the foot, you may have a navicular stress fracture. The navicular bone has a very poor blood supply, with a history of non-union in fracture sites. If you suspect a stress fracture, consult your sports medicine professional as soon as possible.

What shouldn't you do?

If you have a suspected stress fracture of the navicular, you shouldn't continue to exercise or compete. A stress fracture represents an area of bone weakness and may be susceptible to complete bone fracture.

Could there be any long-term effects?

The navicular bone has a relatively poor blood supply and has a history of non-union in fracture sites. The earlier the intervention, the better the prognosis. The management must be aggressive to ensure there are no long-term risks of non-healing and necrosis (dying) of bone. Surgery may be required to ensure the fracture has completely united and healed.

Management

The injury is more commonly associated with running and jumping athletes, and early diagnosis is the key to successful treatment. Sports medicine professionals should have an index of suspicion for patients presenting with pain on the inside, top aspect of the foot. Imaging techniques such as bone scan, CT scan or MRI are important in the diagnosis of navicular stress fractures and enable the professional to determine the treatment plan. In most cases, non-weight-bearing cast immobilization is the treatment of choice. Surgical intervention is also a treatment option. The sports medicine practitioner will be able to devise a plan for your return to activity and competition and this should include changing the factors that may have contributed to the development of a stress fracture.

Lisfranc joint injury

What is it?

Lisfranc's fracture–dislocation is rare in sport but because of its disastrous consequences if untreated, must be considered in all cases of 'midfoot sprain' in the athlete. The eponym Lisfranc's joint refers to the tarsometatarsal joints—the bases of the five metatarsals with their corresponding three cuneiforms and cuboid. Injuries to these joints are given the same eponym, after Jacques Lisfranc, a surgeon in Napoleon's army who described an operation for amputation through the tarsometatarsal joint.

How does it happen?

The most common mechanism of injury is via an axial load applied to a plantarflexed foot, rupturing the weak dorsal tarsometatarsal ligaments. As the injury progresses, the plantar aspect of the metatarsal base fractures, or the plantar capsule ruptures and the metatarsal may displace dorsally. Thus, a fracture at the plantar base of a metatarsal can be a clue to a subtle Lisfranc's injury.

How does it feel?

A patient with this injury may complain of midfoot pain and difficulty weight-bearing. Bony deformity may range from none to the most obvious. The top of the foot is diffusely swollen. The injured joints will be tender. Gentle stressing of the forefoot into plantarflexion, particularly with rotation, reproduces pain.

What should you do?

If there is considerable pain, difficulty weight-bearing and swelling over the top of the foot, you should seek advice from a sports medicine professional. The sports medicine professional may need to perform extra investigations such as X-ray and CT scan to confirm the diagnosis.

What shouldn't you do?

Ignore the injury and pretend it is a minor foot sprain.

Could there be any long-term effects?

There are serious long-term effects if the injury is not recognised early and treated appropriately with either plaster or surgery (see below). Lack of appropriate treatment may lead to prolonged pain and disability, malalignment and failure of the fracture to heal—all of which would be disastrous for a sports person.

Management

Treatment depends on the severity of injury. Precise anatomic reduction is required. If that is present and there is no gross instability on testing, then six weeks below-knee cast immobilization is indicated. In cases of joint displacement, closed reduction with traction is indicated. It can be difficult to maintain anatomic reduction in plaster because of the swelling and the inherent instability of the injury, so surgery using percutaneous wires is often used to stabilize the joint. Some difficult cases require open reduction with internal fixation. This is a significant injury that has a much better prognosis if managed correctly initially, rather than being salvaged once there is prolonged joint malalignment and non-union.

Extensor tendinopathy

What is it?

Extensor tendinopathy is inflammation of the tendons or overuse of the tendons that pass over the top of the foot.

How does it happen?

Typically there are two causes of extensor tendinopathy, one being an overuse injury of the muscles on the top of the foot. The second is caused by tight footwear or shoelaces compressing on the extensor tendons.

How does it feel?

Pain on the top of the foot can be caused by extensor tendinopathy of the muscles which originate in the leg and pass over the foot to supply the midfoot and toes. Thus pain can vary with individuals and is dependant on the tendons affected. Palpation can increase pain, whilst pointing toes to the ground can also initiate painful symptoms.

What should you do?

If you have increased or changed your training load, then this may be contributing to an overuse of the extensor tendons. In this scenario, re-evaluate your training load and perhaps look at developing strength in these tendons. Assessment of foot and leg biomechanics is also important to ensure these anomalies are not affecting the extensor tendons. A change of footwear or lacing technique may also be responsible for this injury, assess this and modify if necessary.

What shouldn't you do?

You shouldn't continue to perform activity if you continue to have pain on the top of the foot. A change of footwear should be encouraged if padding and footwear modifications fail.

Could there be any long-term effects?

If the pain is not reduced with the above-mentioned treatment options, then further examinations may be necessary. Permanent extensor tendon damage is possible if the pain is ignored and not managed correctly. Surgical intervention may be indicated.

Management

Sports medicine professionals can assist in the diagnosis and management of extensor tendinopathy. Athletes more commonly present with this problem associated with tight sporting footwear, hence padding may be necessary on these types of footwear. Sport medicine professionals may need further examinations to eliminate other causes of pain on the top of the foot. These may include an X-ray, bone scan or MRI.

Midtarsal joint sprain

What is it?

A sprain of themidtarsal joint is injury to the joints of the midfoot. There are many joints comprising the midfoot, and some movements may overstretch the ligaments supporting these joints.

How does it happen?

Midtarsal sprains occur when the movements of the midfoot extend beyond the motion available. These movements strain the soft tissue structures, particularly the ligaments which support the bones within the joint. People with unstable foot types are more susceptible tomidtarsal joint sprains. Activities such as gymnastics, jumping and playing football which involve repetitive foot loading increase the strain in the midfoot. Windsurfers who have their feet strapped in and move rapidly forward over one foot commonly experiencemidtarsal joint sprain.

How does it feel?

Amidtarsal joint sprain is painful with weight-bearing and particularly with high intensity running and jumping. The pain may warm up with activity-, however, this is not always the case. There is usually an ache after activity and soreness and stiffness the next day.

What should you do?

If you suspect amidtarsal joint sprain, whether it be following an acute incident or overuse, you should cease intense weightbearing on the affected foot.

What shouldn't you do?

You should not continue to exercise on the foot, and should try to avoid unstable, high-heeled footwear.

Could there be any long-term effects?

If amidtarsal joint sprain is not treated appropriately, there could be long-term damage to the midfoot that may affect the stability of the entire foot. It is important that injuries to this area of the foot are managed correctly, with a gradual return to activity and correction of any biomechanical problems. An assessment of footwear and walking and running patterns is important.

Management

The assistance of sports medicine professionals is important in the treatment ofmidtarsal joint sprains. The midfoot is a complex area of the foot, with many soft tissue structures supporting the midfoot bones and joints. Stability of the midfoot is essential to the athlete competing in high-intensity activities such as running, gymnastics and football. Sports medicine professionals may need the assistance of imaging techniques, particularly MRI, in confirming the diagnosis of sprain and ruling out bone damage.

Stress fracture of the metatarsal

What is it?

Stress fractures of the metatarsal involve the long bones of the forefoot. The most common stress fracture site is the neck of the second metatarsal, as this is a thin bone which is typically the longest metatarsal. However, all the metatarsal bones can experience sites of bone weakness and stress fractures.

How does it happen?

Stress fractures of the metatarsal occur due to a combination of factors. Unstable foot mechanics combined with repetitive loading activity of the forefoot are two of many contributing factors. Bone turnover involves the removal of weakened, damaged areas of bone and the laying down of new bone in the same location. To do this, old bone is resorbed (removed) before it is replaced with new bone. If bone formation cannot keep up with bone resorption, areas of weakness can develop within the metatarsals. These can then develop into stress fractures if the bone is continually loaded. Factors that may contribute to a stress fracture of the metatarsal include changes or increases in training load and/or frequency, training surfaces, footwear, biomechanical abnormalities and muscle fatigue. Disturbances in a female's menstrual cycle may also be a contributing factor in the development of a stress fracture. Tight constrictive footwear or high heels may cause increased workload and stress on the metatarsal bones.

How does it feel?

A stress fracture of a metatarsal is characterised as increased pain with exercise. The pain is usually localised to the site on top of the foot. The area may appear red and swollen at the site of stress fracture and pain may also be present with rest. Squeezing the forefoot or palpating over the top of the foot may exacerbate the pain.

What should you do?

If you have or suspect you have a stress fracture of any of the metatarsal bones, you shouldn't continue to perform activity on the foot. Assistance should be sought immediately, preferably from a sports medicine professional. As stress fractures of the metatarsal usually occur in athletes, the sports medicine professional is the most appropriate practitioner to ensure an accurate diagnosis of these injuries. If they suspect a stress fracture of a metatarsal, imaging techniques can assist in confirming the suspicions.

What shouldn't you do?

You shouldn't continue to exercise if you suspect a stress fracture of the metatarsal. Tight toe boxes and shoes with heels should be avoided.

Could there be any long-term effects?

The management of metatarsal stress fractures must be appropriate to ensure there are no long-term risks of non-healing and necrosis (dying) of bone. Surgery may be required for non-healed fractures to ensure the bone has completely united. If the stress fracture involves the base of the 2nd metatarsal, complications are more likely. Therefore, an early and accurate diagnosis of the stress fracture site is essential.

Management

Sports medicine professionals can help in not only the diagnosis and management of metatarsal stress fractures, but also in the prevention of future stress fractures. This may include dietary advice, footwear modifications, orthotic treatment and training advice. Imaging techniques such as bone scan, CT scan and MRI are important in the diagnosis of stress fractures and enable the professional to determine an appropriate treatment plan. Surgical intervention is also a treatment option for stress fractures which fail to heal. The sports medicine professional will be able to devise a plan for your return to activity and competition. This should include addressing the factors that may have contributed to the development of the metatarsal stress fracture.

Fractures of the fifth metatarsal

What is it?

Three different fractures affect the fifth metatarsal:

1. fracture of the tuberosity at the base of the fifth metatarsal
2. fracture of the diaphysis known as a Jones' fracture
3. acute spiral fracture of the distal third of the fifth metatarsal—'fouette fracture'

How does it happen?

1. The fracture of the tuberosity at the base of the 5th metatarsal is usually an avulsion injury (where the tendon pulls off a small piece of bone) that results from an acute ankle sprain.
2. The Jones' fracture may be the result of an inversion plantarflexion injury (foot rolls inwards when flexed) or, more commonly, as a result of overuse.
3. The acute spiral fracture of the distal third is seen especially in dancers who suffer this fracture when they lose their balance while on demi pointe and roll over the outer border of the foot.

What should you do?

If you have or suspect you have a fracture of the 5th metatarsal bone you should not continue to perform activity on the foot. Assistance should be sought immediately, preferably from a sports medicine professional. The RICE regime is the appropriate initial management.

What shouldn't you do?

You shouldn't continue to exercise if you suspect a fracture of the 5th metatarsal.

Management

1. The avulsion fracture of the tuberosity at the base of the 5th metatarsal usually heals well with a short period of immobilization for pain relief.
2. A Jones' fracture is usually treated with six to eight weeks of non-weight-bearing cast immobilization. When rapid return to activity is required, immediate surgical fixation with the insertion of a screw may be indicated.
3. Undisplaced spiral fractures of this type may be treated with weight-bearing rest, while displaced fractures may require four to six weeks of cast immobilization.

First MTP joint sprain

What is it?

The first MTP joint is the big toe joint (commonly the 'ball' of the foot). This joint experiences lots of loading and bending forces, particularly during sporting activity and with tight footwear. A sprain of this joint is an over extension of the joint, where the toe is extended or flexed past normal ranges of motion.

How does it happen?

First MTP joint sprain occurs when the big toe is extended or flexed past the normal ranges of motion. Vigorous bending forces or stubbing of the toe can result in a sprain to the first MP joint.

How does it feel?

There is pain with movement of the joint and with weight-bearing on the forefoot. With palpation there is tenderness on the top of the joint and usually localised swelling.

What should you do?

If you have or suspect you have an injury, you should ice the area and reduce weight-bearing for the initial 72 hours. If pain has not settled, you should contact your nearest sports medicine centre for further examinations.

What shouldn't you do?

You should not walk on the area and should avoid heat and alcohol in the initial stages of injury.

Could there be any long-term effects?

As long as the injury is properly managed, there shouldn't be any long-term effects. If the injury is not treated appropriately, there may be irreversible degenerative changes in the first¹ MP joint and ongoing stiffness and pain.

Management

Sports medicine professionals can help with the diagnosis and management of the injury. If necessary, sports medicine professionals can refer the patient for examinations such as X-rays and/or ultrasound to confirm the diagnosis and rule out other possibilities. Once the diagnosis is confirmed, a treatment plan can be established and a gradual return to exercise can be achieved.

Hallux rigidus/Hallux limitus

What is it?

Hallux rigidus is a condition which affects the range of motion of the big toe joint. The toe is fixed in a position where there is no motion or flexibility within the structure of the larger toe joint.

How does it happen?

Hallux rigidus occurs when increased stress and forces are placed upon the joint during weight-bearing. The range and quality of motion can be reduced due to walking and running biomechanical anomalies, leading to increased bone formation, which inhibits the joint range of motion.

How does it feel?

Pain may be felt with movement of the joint, in particular at the end of joint range. Activity that requires an increase in the joint motion available may impinge the joint and create painful symptoms (i.e. sprinting, dancing). High-heeled shoes may increase stress on this joint.

What should you do?

The injury should be examined by a health practitioner, in particular a podiatrist or sports medicine physician. The biomechanical anomalies should be assessed and possibly corrected, either using foot orthoses and/or modifications to footwear. Anti-inflammatory tablets may be required, and some will require a corticosteroid injection into the joint. If the pain is not managed using conservative measures, surgery on the joint may be necessary.

What shouldn't you do?

The conditions of hallux rigidus and hallux limitus are degenerative conditions, which are exacerbated by poor footwear, poor foot biomechanics and intense running activity. Eliminating the factors that increase the pressure on the ball of the foot should be encouraged.

Could there be any long-term effects?

As long as the injury is properly managed, there should not be any long-term effects. If the management is unsuccessful, then ongoing stress may cause further bone formation and possibly secondary arthritic joint changes. In alleviating the pain from this condition, surgical fusion may then be another option.

Management

Sports medicine professionals can help with the diagnosis and management of hallux rigidus. Podiatrists can assist with footwear and orthotic adjustments. If conservative management techniques provide no relief, the patient may be referred for a surgical opinion.

Hallux valgus (bunions)

What is it?

Hallux valgus (bunions) is a condition that affects the ball of the foot. It is a deviation of the bones which make up the big toe joint. Hallux valgus is a term that describes the movement of the big toe towards the second toe joint. This deviation creates a more prominent 'bump' on the inside of the foot. After time and pressure from footwear, this 'bump' may get bigger and this is called a 'bunion'.

How does it happen?

Hallux valgus occurs due to a combination of factors. The main contributing factors are poorly fitting footwear, unstable foot biomechanics and high-heeled shoes. It is a progressive condition that may get worse if the causative factors are not addressed and changed.

How does it feel?

Pain may or may not be felt with hallux valgus. Depending on the extent of the joint deviation and soft tissue changes, the amount of pain will be variable between people. The pain may be described as an ache, and may be felt with movement of the joint, in particular at the end of joint range. Activity that requires an increase in the joint motion available may impinge the joint and create painful symptoms (i.e. sprinting, dancing). High-heeled shoes may increase stress on this joint.

What should you do?

The injury should be examined by a health practitioner, in particular a podiatrist or sports medicine physician. The biomechanical anomalies should be assessed and possibly corrected, either using foot orthoses and/or modifications to footwear. If the pain is not managed using conservative measures, surgery on the joint may be necessary.

What shouldn't you do?

Hallux valgus is a degenerative process and will get worse with time and increased weight-bearing. Poor footwear, unstable foot biomechanics and intense running activity should be assessed and possibly avoided. Eliminating the factors that increase the pressure on the ball of the foot should be encouraged.

Could there be any long-term effects?

As long as the injury is properly managed there should not be any long-term effects. If the management is unsuccessful, then ongoing stress may cause further bone formation, increased joint deviation and possibly secondary arthritic joint changes. Early conservative management is important in treatment of this condition. In alleviating the pain from this condition, surgical correction may be necessary.

Management

Sports medicine professionals can help with the management of hallux valgus. Podiatrists can assist with footwear and orthotic adjustments. If conservative management techniques provide no relief, the patient may be referred for a surgical opinion.

Sesamoid injuries

What is it?

The sesamoids are small bones located underneath the big toe joint of the foot. There are two sesamoid bones, usually the size of 'peas'. The sesamoids act as a pulley system for muscles of the foot and legs, and they also provide a structure for muscle attachments. Sesamoid injuries may be either damage to the bones or injury of the surrounding soft tissue or joint.

How does it happen?

There are many different ways to injure the sesamoid area. Repetitive loading and overuse injuries are common, or an acute injury from landing, jumping or twisting on the forefoot. Athletes who perform increased forefoot loading, pivoting, or high intensity running, commonly present with sesamoid injuries (i.e. AFL, running and dancing).

How does it feel?

Injuries to the sesamoid region of the foot are quite painful when weight is put through the ball of the foot. To compensate for the weight-bearing pain, the athlete may walk on the outside border of their foot. If the pain is of inflammatory nature, the pain may warm up during the day. However, the pain may be secondary to a fracture or stress fracture of the sesamoid bone, and this type of pain will not get better as it warms up.

What should you do?

If you have or suspect you have a sesamoid injury, you should seek professional assistance immediately. Sesamoid injuries have a poor prognosis if not managed correctly. The sesamoids have a relatively poor blood supply, thus the earlier the diagnosis and treatment, the better the chance of a full recovery.

What shouldn't you do?

If you have or suspect you have a problem with the sesamoids, you should avoid activities requiring running, jumping and twisting on the ball of the foot. Tight footwear, high heels or tight toe boxes should also be avoided. You should not ignore the pain.

Could there be any long-term effects?

There could be long-term and irreversible effects if a sesamoid injury is misdiagnosed or managed incorrectly. There is a relatively poor blood supply and if the injury is not successfully treated, there may be non-healing of the bone and possibly necrosis (bone death). Surgery may be required.

Management

Sports medicine professionals are very important in the diagnosis and management of sesamoid injuries. These injuries are commonly associated with running and AFL football, basketball and other court sports; however, they are also seen in women who wear high-heeled footwear. Labourers who bend on their forefoot all day may also be susceptible to sesamoid injuries. Sports medicine professionals may need the assistance of imaging techniques. X-ray examination and nuclear bone scan may assist in the diagnosis of a sesamoid injury. CT scan or MRI may be necessary in assessing the extent of bone and soft tissue damage. These are important examinations to ensure the treatment plan is appropriate.

Freiberg's osteochondritis

What is it?

Freiberg's osteochondritis is a condition which affects the head of the metatarsal (long bones of the foot) in adolescents aged between 14 and 18 years. The 2nd metatarsal is most commonly affected, but it may occur in the 3rd and 4th metatarsals.

How does it happen?

Freiberg's osteochondritis is a disease process which primarily affects the growth plates of growing bones. While the exact process of Freiberg's osteochondritis is not well understood, it is believed the loading forces associated with sporting activities can put increased stress on the growth plates of younger athletes. If not recognised and treated earlier, there can be long-term problems with the bones.

How does it feel?

Pain is felt with standing and is exacerbated with walking and particularly running. There is usually localised swelling and tenderness when palpating the undersurface area of the foot.

What should you do?

If you have or suspect you have Freiberg's osteochondritis, you should cease activity immediately and contact a sports medicine professional. Weight-bearing on the affected foot should be reduced until the area is padded and, if necessary, footwear is modified.

What shouldn't you do?

You shouldn't continue to run or play sport on the foot. The pain will not resolve with time and if left without treatment, surgical intervention may be indicated.

Could there be any long-term effects?

There could be long-term effects associated with damage to the joint surface and shape of the bone end. The joint flexibility may be affected, which may have detrimental effects on the forefoot functioning. If conservative management fails or is too late, then surgery may be indicated. Early diagnosis is essential in the management of this disease.

Management

Sports medicine professionals can help with the diagnosis and treatment of the condition. Padding, orthoses and footwear modifications may be necessary. A return-to-exercise program may be needed to assist the younger athlete in participating in sporting activities.

Morton's interdigital neuroma

What is it?

Morton's neuroma is typically described as a compression of the nerve between the 3rd and 4th metatarsals. While this is not considered a true neuroma, it is still considered a nerve compression and is made worse by scar tissue and excessive movement in the forefoot.

How does it happen?

It occurs secondary to an unstable forefoot, where there is a lot of movement between the 3rd and 4th metatarsals. Tight, constrictive shoes can increase the compressive forces on the nerves.

How does it feel?

The pain is usually ill-defined pain localised to the forefoot. It may cause a radiating pain into the toes. Weight-bearing, particularly in tight occlusive footwear, or intense forefoot running may exacerbate the painful symptoms. The pain may be described as 'shooting' and sometimes 'burning'. Pins and needles or sharp pain may be experienced when the forefoot is squeezed together and pressure is applied on the foot.

What should you do?

If you experience these symptoms, removal of the shoes will reduce the pressure on the nerve and abate the symptoms. Changes should be made to footwear that may exacerbate the pressure on the nerve tissue. If the pain continues after these changes, then one should seek a sports medicine professional.

What shouldn't you do?

You shouldn't continue to perform intense activity on feet which are experiencing painful symptoms. Tight footwear, particularly high heels, will increase the pressure on the forefoot—these should not be worn.

Could there be any long-term effects?

If treated appropriately, there should not be any long-term effects of Morton's neuroma. If conservative management fails to relieve the pain, then surgery may be indicated.

Management

Sports medicine professionals are able to diagnose and manage neuromas successfully. The diagnosis is usually based on clinical examination; however, an ultrasound of the soft tissue may confirm the presence of the swollen tissue. Conservative management may consist of ice to relieve acute tenderness, padding to redistribute the metatarsal pressure and foot orthoses for increased foot stability. Injections of local anesthetic or cortisone may be used to relieve the painful symptoms. Failing these management techniques, surgery may be indicated.

Corns and calluses

What is it?

Corns and calluses develop from excessive pressure on the skin.

How does it happen?

They may develop on areas that experience compression from the shoe or from increased weight-bearing on soft tissue prominences.

How does it feel?

Pain is associated with weight-bearing, and particularly increased in tight shoes or shoes which provide very little cushioning from the hard ground. The pain can be a 'burning' feeling; however, if localised, the pain can be quite sharp due to the increased pressure on the nerve supply.

What should you do?

Depending on the amount and thickness of the skin, one could use a pumice stone and rub the affected area with stone whilst in the bath. Moisturisers for the skin are also important. The professional treatment of corns and calluses is debridement of the excess skin and this can be done by a podiatrist.

What shouldn't you do?

You should try and avoid cutting or pulling the skin off yourself as this can cause problems to the healthy tissue. Corn pads from the pharmacy are not recommended, as they can also cause problems to the healthy skin.

Could there be any long-term effects?

The area of dead skin may build up and a blister or ulcer may form underneath the skin. Some people can develop infections underneath the thick/deep callus or corns. This usually creates a lot of pain until the pressure is released.

Management

Podiatrists within the sports medicine centre can help with debridement of the excess skin and can offer footwear advice. If the area is quite prominent, the podiatrist may be able to fit felt padding on the foot or in the shoe to reduce the excessive pressure.

Plantar warts

What is it?

Plantar warts are a viral infection of the skin, commonly associated with the Human Papilloma Virus (HPV). Warts predominantly affect the hands and feet; plantar warts affect the soles of the feet and appear to interrupt the normal appearance of the skin.

How does it happen?

Plantar warts are considered part of the Human Papilloma Virus and are passed on through broken areas of skin, particularly wet or sweaty skin. Swimming pools and public showers are reported as the most common infection site. People walking around with bare feet, particularly wet or sweaty, are the most likely people to be infected with the wart virus.

How does it feel?

Plantar warts are painful with weight-bearing, particularly on bony prominences and without shoes. Pressure, particularly either side of the wart usually increases the painful symptoms. However, warts can occur on the skin with no pain reported.

What should you do?

If you have or suspect you have plantar warts, you should seek treatment immediately to ensure the virus is not spread to other areas of the body. If you share showers, thongs should be worn to prevent passing the virus on to other family members. Treatment is determined by the appearance of the wart, both size and location. There are a variety of antiviral wart preparations recommended, most are available from the pharmacy. Liquid nitrogen or dry ice is a popular treatment option. In most cases, curetting (cutting out) the plantar wart is not recommended due to the risk of scarring on the sole of the foot.

What shouldn't you do?

You shouldn't pick at the warts with your fingernails, as this may spread the virus to the hands. If the wart is not painful, you may choose not to treat the area. It is possible, but not common, for the body to recognise the wart as a foreign object and destroy the virus.

Could there be any long-term effects?

As plantar warts are a viral infection, they may spread on to other areas of the foot, and also the body. Warts can grow in size which may substantially increase the painful symptoms. Therefore, if a wart is recognised or is creating pain, the area should be treated as soon as possible to ensure it does not proliferate.

Management

Sporting club showers and swimming pools are prominent places where the wart virus may spread. Sports medicine professionals are able to diagnose and treat plantar warts whilst ensuring the athlete is still able to compete during the treatment process. There are different treatment options, which vary in their degrees of damage to the skin. The size and location of the plantar warts will decide the best treatment option with minimal time away from sporting activities.

Hypertrophic cardiomyopathy

What is it?

Hypertrophic cardiomyopathy (HCM) is a primary disease of the cardiac muscle and is characterized by a thickened but not enlarged left ventricle. It occurs in up to two per 1000 of the general population. HCM is generally regarded as the most common cause of sudden cardiac death in athletes, accounting for 36% of deaths in one study.

What causes it?

There are two types of HCM, the obstructive and, much more common, non-obstructive. The anatomical features of this condition include an increased heart weight (greater than 360 g) and asymmetrical ventricular wall thickening.

What are the symptoms?

Most athletes had been symptom-free and were not suspected of having cardiovascular disease. Sudden collapse was usually associated with exercise, predominantly in the late afternoon or early evening. Unfortunately, sudden death is frequently the first indication of the presence of HCM. About 90% of athletic HCM deaths occur in males, which partly reflects higher participation rates and more intense activity levels. About 60% of athletes were high-school age at the time of death.

In those who had prodromal symptoms, the most prominent were shortness of breath with exercise (the most common symptom), chest pain, palpitations as well as presyncope and syncope. A number of patients with hypertrophic cardiomyopathy have typical clinical findings at rest; however, the majority have no symptoms because they either have no, or minimal, obstruction to left ventricular outflow at rest. The sensitivity of physical examination is therefore relatively low.

How is it diagnosed?

Patients with hypertrophic cardiomyopathy generally have abnormalities on their ECG. Although the ECG changes are not specific for this condition, a normal ECG makes the diagnosis of HCM unlikely. Chest X-ray may demonstrate an enlarged heart but most patients with hypertrophic cardiomyopathy have normal chest X-rays.

Echocardiography is the investigation of choice in cases of hypertrophic cardiomyopathy and helps differentiate HCM from the more common 'athlete's heart'.

Eligibility for sport

Although not all patients with HCM incur the same risk for sudden death, differentiating subgroups with disparate risks has proven challenging. The 26th Bethesda Conference recommended that 'athletes with the unequivocal diagnosis of HCM should not participate in most competitive sports, with the possible exception of those of low intensity. This recommendation includes those athletes with or without symptoms and with or without left ventricular outflow obstruction'. Patients with HCM judged to be at high risk should be considered for implantation of a cardioverter defibrillator.

Marfan's syndrome

What is it?

Marfan's syndrome (MFS) is a genetic disorder of the connective tissues.

What causes it?

The prevalence of MFS in the general population is estimated at 2 to 3 in 10 000. Family history is negative in approximately one-third of Marfan patients and presumed to be due to a new mutation.

What are the symptoms?

Affected individuals have multisystem involvement including the cardiovascular (heart and aorta), ocular and musculoskeletal. Aortic root aneurysm rupture or dissection is the most common cause of sudden death. The common clinical features are tall stature, wide arm span, pectus excavatum chest deformity, myopia, hypermobile joints and a cardiac murmur.

How is it diagnosed?

The diagnosis depends on the presence of major criteria in a number of organ systems. If a primary relative has Marfan's syndrome, the diagnosis is likely if two organ systems are involved with at least one major manifestation such as lens dislocation, cystic medial necrosis of the aorta resulting in aortic dilatation/aortic dissection, or the central nervous system abnormality, dural ectasia.

To make the diagnosis in the absence of a family history, skeletal features are required in addition to two of the major manifestations listed above. The skeletal features of Marfan's syndrome include a high arched palate, long tubular bones, wide arm span and hyperflexible joints. Note that these skeletal 'abnormalities' may provide a benefit in sports such as basketball and volleyball, so clinicians covering sports with tall athletes should maintain an index of suspicion for this condition.

Investigations that may be helpful in the athlete with suspected Marfan's syndrome include chest X-ray (which may occasionally suggest aortic dilatation) and, more importantly, echocardiography. This should be performed whenever there is clinical suspicion of Marfan's syndrome. Magnetic resonance angiography (MRA) is becoming used more widely as an efficient means of imaging the aortic arch.

If the diagnosis is suspected, the athlete should be referred to appropriate subspecialists, as definitive diagnosis is not straightforward, particularly when there is no family history.

How is it treated?

The athlete with Marfan's syndrome with aortic dilatation should avoid vigorous activities. Cardiovascular abnormalities cause death in 95% of cases. If no aortic dilatation is present, sport should be limited to low-intensity activities.

When the aorta is involved, the primary goal of therapy is to slow or prevent progressive dilatation of the aortic root. The mainstay of treatment is with beta blockers and regular echocardiography to detect progressive dilatation. Early surgical intervention for aortic and mitral valve replacement is warranted when the disease has progressed.

Arrhythmias and conduction abnormalities

What they are and what to do?

There are a number of rare abnormalities which may occasionally cause sudden death in young athletes. They include congenital long QT syndrome (LQTS), Wolff–Parkinson–White (WPW) syndrome, idiopathic ventricular tachycardia (VT), and Brugada syndrome.

Congenital long QT syndrome (LQTS) is a familial disease characterized by a prolonged Q-T interval in the surface ECG, and cardiac symptoms (from minor symptoms such as dizziness, to major events such as seizure, syncope and sudden death) resulting from the precipitation of ventricular tachyarrhythmias. The incidence is estimated as 1 in 7 to 17 000 and usually the heart is completely normal on examination. Treatment with beta-blockers has been shown to reduce the incidence of syncope and sudden cardiac death, but athletes with this condition are advised to participate in low-intensity activities only.

Wolff–Parkinson–White syndrome (WPW) is the result of an accessory pathway between the atrium and ventricle. ECG is abnormal. Treatment of symptomatic patients is with radio-frequency ablation (RFA). If athletes are free of symptoms three to six months after RFA then they can resume sport with no limitations.

Idiopathic VT is a rare cause of sudden death that originates from one of the ventricular outflow tracts. It can also be treated with RFA and, following successful treatment, sport may be resumed.

26th Bethesda Conference Guidelines for athletic participation for selected cardiovascular abnormalities

Hypertrophic cardiomyopathy	Exclusion from most competitive/noncompetitive sports with possible exception of low-intensity sports, regardless of medical treatment, absence of symptoms, or implantation of defibrillator
Coronary artery abnormalities	Exclusion from all competitive sports. Participation may be considered 6 months after surgical correction and after exercise stress testing
Arrhythmogenic right ventricular dysplasia ARVD	Exclusion from all competitive sports
Mitral valve prolapse	Exclusion if history of syncope associated with arrhythmia, family history of mitral valve prolapse and sudden death, documented arrhythmia, or moderate to severe mitral regurgitation
Marfan's syndrome	Exclusion from contact sports. Patients with aortic regurgitation and marked dilatation of the aorta are excluded from all competitive sports. Others may participate in low-intensity sports, with biannual echocardiography
Long QT syndrome	Exclusion from all competitive sports
Myocarditis	Athletes with history of myocarditis in previous 6 months banned from all competitive sports
Wolff–Parkinson–White syndrome	Patients with normal exercise testing +/- electrophysiologic study may be eligible for participation in all sports
Coronary artery disease	Individual risk assessment based upon ejection fraction, exercise tolerance, presence of inducible ischemia or arrhythmias, and presence of hemodynamically significant coronary stenoses on angiography

Shortness of breath

There are a number of causes of shortness of breath when exercising. Although they may be due to lack of fitness, other causes that have to be considered include:

(a) Cardiovascular (heart):

- (i) Myocardial ischemia—lack of oxygen supply to the heart muscle. This is most often due to narrowing of the blood vessels of the heart (coronary artery disease).
- (ii) Cardiac dysfunction/failure—due to a structural abnormality or disease of the heart, the heart does not function properly.
- (iii) Disease of heart valves—either thickening or leaking of one of the valves of the heart. The valves are sphincters within the heart that control the flow of blood between the chambers of the heart and into the major blood vessels leaving the heart.

(b) Respiratory (lungs):

- (i) Asthma—intermittent narrowing of the airways in response to a number of trigger factors.
- (ii) Exercise-induced asthma—narrowing of the airways triggered by exercise.
- (iii) Pneumonia—an infection of the lungs.
- (iv) Pulmonary embolism—sudden onset of shortness of breath due to a clot passing to the lungs.
- (v) Pneumothorax—a hole in the lung, allowing air to leak from the lungs into the chest cavity. This may be secondary to trauma (e.g. rib fracture) or may occur spontaneously without trauma.

(c) Metabolic:

- (i) Anemia—low levels of hemoglobin in the blood. The hemoglobin is required to carry the oxygen to the cells of the body.
- (ii) Disease—a number of diseases, including diabetes and thyroid abnormalities, may result in shortness of breath.
- (iii) Obesity.

(d) Psychological:

- (i) Anxiety
- (ii) Depression
- (iii) Stress

Cough

What causes it?

There are a number of causes of cough.

(a) Respiratory (lungs):

- (i) Asthma—intermittent narrowing of the airways in response to a number of triggers. This may be accompanied by chest tightness, shortness of breath or wheeze. The cough is usually dry and irritating.
- (ii) Exercise-induced asthma—narrowing of the airways in response to exercise. This results in a dry, irritating cough after exercise.
- (iii) Pneumonia—infection of the lungs.
- (iv) Bronchitis—inflammation and swelling of the lining of the tubes of the airways.
- (v) Interstitial lung disease – a disease of the lungs resulting in fibrosis.
- (vi) Inhalation of a foreign body.
- (vii) Lung cancer.

(b) Upper respiratory tract:

- (i) Infection—common cold
- (ii) Post nasal discharge—due to infection or inflammation of the sinuses (sinusitis)
- (iii) Post-infective cough

(c) Cardiac (heart):

- (i) Heart failure—when the heart is not functioning adequately, fluid may collect in the lungs, resulting in a cough.

(d) Gastrointestinal:

- (i) Gastroesophageal reflux—reflux of food or acid from the stomach into the gullet (esophagus).

How is it diagnosed?

If the cough is more than short lasting or the athlete is unwell, assessment by a sports medicine professional is required. A full history and examination are required.

Important questions on history include:

1. Is it acute (new onset) or chronic (present for a long time)?
2. Is it productive, that is, does sputum come up with the cough? If so, what colour? Is it blood-stained?
3. What are the associated symptoms?
4. Investigations and treatment to date?

The required investigations can then be determined by the history and examination, but may include:

1. Chest X-ray—to exclude pneumonia, a restrictive lung disease, a lung cancer, cardiac failure.
2. Lung function tests—to exclude asthma, exercise-induced asthma, chronic bronchitis or a restrictive lung disease.
3. Barium swallow/gastroscopy—to exclude a reflux esophagitis.
4. Echocardiogram – to assess the cardiac function.

Asthma

What is it?

Asthma is a disease characterized by reversible narrowing of the airways in response to a number of triggers.

What causes it?

The narrowing of the airways occurs as a result of inflammation characterized by:

- (a) swelling of the lining membrane (mucosa) of the airways
- (b) increased mucus production within the airways
- (c) contraction of the muscles within the walls of the airways (bronchoconstriction).

Who is at risk?

The prevalence of asthma varies from between 5% to 10% of the population. The prevalence is higher in Australia and New Zealand than in the US and UK.

A family history of asthma increases the individual's risk of asthma.

There are two types of asthma:

1. **Extrinsic asthma:**
Associated with other allergic conditions (e.g. eczema, hayfever).
Usually begins in childhood or adolescence.
Attacks often occur following exposure to individual allergies.
2. **Intrinsic asthma:**
Usually not associated with other allergic conditions.
Begins in adult life.
Often no obvious trigger factors

Trigger factors vary between individuals, but may include:

- a) Specific allergens, e.g. grasses, foods, fungi, moulds, pollens
- b) Non-specific stimuli e.g. cold, dust, smoke, infections, exercise

What are the symptoms?

The main symptoms of asthma include:

1. Chest tightness
2. Shortness of breath
3. Wheeze
4. Cough

How is it diagnosed?

Consultation with your doctor is required. A full history and examination guide to the diagnosis. Confirmatory investigations include:

1. Lung function tests (spirometry)—to measure a reduction in lung function.
2. PEF— a peak flow meter can be used to measure a reduction in lung function if formal lung function tests are unavailable.
3. Skin sensitivity tests—to assess for allergies.
4. RAST tests—blood tests to assess for allergies.

How is it treated?

The treatment of asthma must be individualized for each person. Therefore it is important for individuals to consult their doctor for an ideal management plan.

Self-monitoring of your asthma using a peak flow meter should be performed regularly and at times of increased medication use.

Medications that may be used include:

1. Preventers:
 - a) Inhaled corticosteroid sprays (e.g. Becotide, Becloforte, Flixotide, Pulmicort) are used to try and prevent asthma. They must be taken on a regular basis as prescribed by your doctor.
 - b) Intal/Intal Forte and Tilade—taken a regular basis to prevent asthma.

- c) Long-acting bronchodilators (e.g. Salmeterol, Formoterol) can be taken alone or in conjunction with inhaled corticosteroids.
 - d) Other agents—Theophylline tablets, Atrovent, Singulair.
2. Symptomatic:
- a) Inhaled bronchodilators (e.g. Ventolin, Bricanyl, Respolin) should be taken at the time of symptoms to relieve the symptoms.

NB: It is essential to consult your doctor for a MANAGEMENT PLAN to be used if there is a deterioration in your asthma.

Exercise-induced asthma (bronchoconstriction)

What is it?

Exercise-induced asthma is a form of **asthma**, characterized by reversible narrowing of the airways in response to exercise.

What causes it?

The narrowing of the airways occurs as a result of inflammation characterized by:

- (a) swelling of the lining membrane (mucosa) of the tubes airways
- (b) increased mucus production within the airways
- (c) contraction of the muscles within the walls of the airways (bronchoconstriction).

Who is at risk?

Between 4% and 7 % of the general population suffer from exercise-induced asthma. The risk is increased greatly in those with asthma—approximately 80% of this group experience exercise-induced asthma.

Other risk factors include:

- (a) family history of asthma.
- (b) Allergies—including hayfever and sinusitis.
- (c) elite athletes—see below.
- (d) smokers
- (e) other lung diseases.

What are the symptoms?

The symptoms are fairly non-specific, and cannot be used alone to diagnose exercise-induced asthma. The symptoms generally occur 4 to 8 minutes post exercise or during a period of reduced activity/cool down.

The main symptoms experienced include:

1. Cough
2. Chest tightness
3. Shortness of breath
4. Fatigue
5. Poor performance

A common, but poorly recognized symptom is the inability of the athlete to increase his or her fitness, despite an intense training program. The symptoms are often worse when exercising in cold weather, the pollen season or during a respiratory tract infection. The symptoms generally resolve spontaneously within 1 hour of the activity.

How is it diagnosed?

Diagnosis depends on:

1. *History*

A classical history is that of post exercise cough, chest tightness, shortness of breath or wheeze, usually occurring within 12 minutes of a period of intense physical activity.

NB: it is important to note that exercise-induced asthma cannot be diagnosed on history alone.

2. *Examination*

Examination by the doctor, particularly in the absence of symptoms at the time, is usually normal.

3. *Investigations*

(a) Lung function tests.

At rest, in a patient who does not suffer from chronic asthma, these tests are usually normal. However, in a patient with background asthma, an obstructive defect is usually present.

(b) Challenges.

Challenge tests are essential for the diagnosis of exercise-induced asthma. The current gold standard test is the Eucapnic Hyperventilation Challenge Test (EVH) in which the patient is required to breathe into a special machine at near maximum ventilation for a period of approximately 6 minutes, as if they were exercising at an

intense level. The lung function is then measured for a period of 15 minutes post-challenge, to assess for a fall.

How is it treated?

There are a number of treatment options. The treatments are highly individual, and may involve pharmacological, non pharmacological measures or a mixture of both.

1. Non Pharmacological Measures

(a) Warm-up.

A period of warm-up within half an hour of competition may result in the athlete being **refractory** at the time of the competition, that is, similar exercise does not cause a reduction in lung function.

(b) Face masks.

The use of these masks allows the athlete to re-breathe the warm humidified air that they have exhaled.

2. Pharmacological measures

The main medications for those with exercise-induced asthma in the absence of chronic asthma, is the use of preventative medicines. It is essential that the athlete is assessed by a physician, so an appropriate medication schedule can be advised.

Recommended preventive medications (Tilade, Intal) should be taken approximately 10 minutes prior to exercise.

Symptomatic medicines (Ventolin, Respolin, Bricanyl) should be used only if symptoms are experienced.

Occasionally, inhaled corticosteroids (Becotide, Pulmicort, Flixotide) are required on a twice-daily basis. This is especially so for those individuals with chronic asthma.

Sinusitis

What is it?

Sinusitis is an infection or inflammation of the **paranasal sinuses**, the air-filled spaces within the skull, which communicate with the nose. The infections may be **acute** (new onset and short-lasting), or **chronic** (persistent).

What causes it?

Sinusitis may result from either:

1. Infection—either bacterial or viral
2. Allergy

There are certain predisposing factors:

- a) Local:
 - (i) anatomical abnormalities
 - (ii) nasal polyps
 - (iii) foreign bodies
 - (iv) cigarette smoking
 - (v) barotrauma
 - (vi) local tumours (within the sinuses)
- b) General:
 - (i) medical diseases resulting in a depression in the immune system.
 - (ii) abnormalities in the mucus lining the sinuses.

What are the symptoms?

The symptoms for acute and chronic sinusitis may include any of the following:

1. Acute sinusitis:
 - a) facial Pain
 - b) headache
 - c) toothache
 - d) postnasal drip
 - e) cough
 - f) runny nose
 - g) blocked nose
 - h) fever
 - i) blood nose
2. Chronic sinusitis:
 - a) vague facial pain
 - b) post-nasal drip
 - c) cough
 - d) blocked nose
 - e) toothache
 - f) tiredness
 - g) bad breath

How is it diagnosed?

The diagnosis of sinusitis requires consultation with your local sports physician. A full history and examination by your sports physician will generally lead to the correct diagnosis.

Investigations that may be required in the case of chronic sinusitis include:

1. Sinus X-ray—to confirm the presence of sinusitis.
2. Sinus CT scan—an additional test to confirm the presence of sinusitis.
3. Skin sensitivity tests—assessing for allergies.

How is it treated?

The treatment will be prescribed by your sports physician and may include:

1. Antibiotic treatment—to treat the infection.

2. Decongestants—usually nasal sprays, to clear the obstruction.
3. Antihistamines—both in the presence and absence of allergies, to decrease mucus.
4. Surgery—occasionally required in the presence of an anatomical abnormality, nasal polyps or if there is a failure of medical treatment.

Exercise-induced anaphylaxis

What is it?

Exercise-induced anaphylaxis is a generalised 'allergic reaction' induced by exercise.

Who is at risk?

The risk factors for exercise-induced anaphylaxis include:

1. Previous problems with allergies—hay fever, sinusitis, rashes.
2. Family history of allergies.
3. Ingestion of certain foods—nuts, shellfish, celery, alcohol.
4. Hot, humid weather conditions.
5. Ingestion of aspirin or anti-inflammatory medications.

What are the symptoms?

The main symptoms of exercise-induced anaphylaxis include:

1. Generalized sensation of warmth
2. Generalized 'itchiness'
3. Redness of the skin
4. Swelling of the mucous membranes—mouth, eyes, tongue
5. Weals (raised skin lesions) covering the body
6. Difficulty breathing
7. Collapse (occasional)

How is it diagnosed?

Urgent assessment by a sports physician is required. A full history and examination is required for the diagnosis.

Special blood tests will be required to confirm the presence of an allergic phenomenon. Skin sensitivity tests will also be performed to exclude other allergies.

How is it treated?

Treatment involves a combination of alteration in the exercise program and medications.

1. *Modification of exercise program:*
 - a) Decrease exercise intensity
 - b) Avoid exercise during hot and humid conditions
 - c) Stop exercise at the earliest signs of itching
 - d) Avoid meals 4 hours prior to exercise
2. *Medications:*
 - a) Antihistamines—to prevent the allergic reaction.
 - b) Intal—an inhaled airways medication, to help prevent the reaction.
 - c) Epi Pen—a special pen containing adrenaline that should be carried when exercising. It should be given as an injection at the first sign of a reaction, to stop that reaction.

Exercise-induced angioedema

What is it?

Exercise-induced angioedema is similar to **Exercise-induced anaphylaxis**, but only involves the skin. It results in a non-itchy swollen rash.

What causes it?

Exercise-induced angioedema is an allergic reaction involving the skin that occurs in response to exercise.

Risk factors include:

1. Known allergies
2. Family History of allergies
3. Warm and humid weather conditions
4. Ingestion of aspirin or anti-inflammatory medications

What are the symptoms?

The main symptom is that of a non-itchy swelling of the skin, usually occurring around the face and mouth.

How is it diagnosed?

Consultation with a sports physician is required. A comprehensive history and examination will lead to the diagnosis. Investigations that may be performed include:

1. Special blood tests—to confirm the presence of an allergic phenomenon.
2. Skin sensitivity test—to exclude the presence of other allergies.

How is it treated?

A combination of modification of the exercise program and medications may be required.

1. *Modification of exercise program:*
 - a) Reduce exercise intensity
 - b) Avoid exercise during hot and humid conditions
 - c) Stop exercise at the earliest sign of rash
 - d) Avoid meals for 4 hours prior to exercise
2. *Medications:*
 - a) Antihistamines

Gastroesophageal reflux

What is it?

Gastroesophageal reflux involves the backward movement of fluid from the stomach into the gullet (esophagus).

What causes it?

Gastroesophageal reflux occurs commonly in athletes. Although it may be associated with abnormalities such as a hiatus hernia or other abnormalities resulting in relaxation of the sphincter between the gullet (esophagus) and stomach, in athletes it often occurs in the absence of such conditions. In approximately 20% of athletes, the reflux only occurs with exercise.

The reason for the higher incidence of reflux in athletes is unknown, but may be due to a delay in emptying of the stomach during exercise.

What are the symptoms?

The symptoms vary but may include:

1. Pain—upper abdominal/chest
2. Reflux of acid into the mouth
3. Nausea

How is it diagnosed?

A full history and examination will guide to the diagnosis.

Confirmatory investigations that may be performed include:

1. Barium swallow
2. Gastroscopy

How is it treated?

The mainstay of treatment for gastroesophageal reflux during exercise is aimed at reducing the contents of the stomach during exercise. Therefore, it is advised that such individuals avoid solid foods for 3 to 4 hours prior to exercise. A pre-exercise meal consisting of a high-carbohydrate and low-protein and fat content is advised.

If the above modifications fail, medications that may be used include:

1. Antacids—to reduce the pain associated with reflux.
2. H₂ receptor antagonists (e.g. Zantac)—to reduce the acidity of the stomach.
3. Prokinetic agents (e.g. Propulsid)—to promote emptying of the stomach.
4. Maxolon—to increase the contractility of the sphincter between the stomach and gullet (esophagus).

Gastrointestinal bleeding

What is it?

Gastrointestinal bleeding involves the loss of blood from the gastrointestinal tract. It may occur at a number of sites, including:

1. Stomach
2. Small intestine—uncommon
3. Large intestine—particularly common from the colon

What causes it?

The exact cause of the bleeding is uncertain, but may be related to:

- a) Reduced blood supply with exercise
- b) Trauma, e.g. from the diaphragm
- c) Dehydration
- d) Stress
- e) Anti-inflammatory medications

Who is at risk?

The incidence of gastrointestinal bleeding in athletes is relatively high. Risk factors for gastrointestinal bleeding may include:

1. Dehydration
2. Use of anti-inflammatory medication
3. Being a marathon runner

What are the symptoms?

The symptoms may vary from vague, non-specific symptoms to obvious bleeding.

They include:

1. Vomiting of blood (hematemesis)
2. The passing of bloody stools
3. Lethargy
4. Weakness
5. Reduced exercise tolerance

How is it diagnosed?

Consultation with a sports physician is required.

A comprehensive history and examination should be performed by the physician.

Investigations will be dictated by the history and examination, but in general are required to exclude other causes besides exercise for the bleeding, and to assess for possible complications arising from the bleeding, such as iron deficiency anemia.

Investigations include:

1. Blood tests:
 - a) Full blood examination—to assess for anemia.
 - b) Iron studies—to assess the iron stores (ferritin)
2. Gastroscopy—to exclude an ulcer
3. Colonoscopy—to exclude a colonic (bowel) lesion (eg. polyp, cancer)

How is it treated?

Providing no cause of the bleeding is found, the main treatment involves:

1. Ensuring adequate hydration.
2. Minimizing possible trauma—avoid hard surfaces, change in footwear.
3. Ensuring adequate iron stores—diet, iron supplementation.

Abdominal pain (stitch)

What is it?

Crampy abdominal pain occurring with exercise.

What causes it?

The exact cause is not known, but may be due to:

1. Muscle spasm with exercise
2. Trapping of air in the colon (bowel) with exercise
3. Reduced blood supply to the bowel—due to shunting of the blood to the muscles.
4. Pain referred from the thoracic spine
5. Premenstrual pain

Who is at risk?

Although it may occur in all athletes, risk factors include:

1. Recent meal
2. Dehydration
3. Abdominal muscle tightness
4. Thoracic spine stiffness

How is it diagnosed?

Consultation with a sports physician is required, to allow a full history and examination to be performed. Diagnosis can usually be achieved from history and examination, however investigations are occasionally required to exclude other causes.

How is it treated?

Treatment involves:

1. Avoidance of food for 3 to 4 hours prior to exercise
2. Adequate hydration
3. Massage to abdominal muscles
4. Physiotherapy

Runner's diarrhea

What is it?

Runner's diarrhea is the occurrence of loose bowel actions during exercise.

What causes it?

The exact cause of Runner's diarrhea is uncertain, but may be due to:

1. Reduced blood supply to the gastrointestinal tract as blood is shunted to the exercising muscles.
2. Increased intestinal motility with exercise. This may be associated with reduced absorption from the bowel.
3. Anxiety with competition.

Who is at risk?

Runner's diarrhea can occur in all athletes. Many athletes may complain of the urge to open their bowels with exercise, with approximately half of these athletes experiencing diarrhea.

The incidence of runner's diarrhea appears to be associated with the intensity of exercise, occurring more commonly during competition than training.

Contributing factors include:

1. Anxiety
2. Caffeine consumption
3. Vitamin and mineral supplements

How is it diagnosed?

Consultation with a sports physician is required. Although diagnosis depends on history and examination, investigations are required when the diarrhea is chronic, to exclude underlying inflammatory bowel disease.

How is it treated?

Treatment of this condition is difficult and should be guided by your sports physician. It may involve:

1. Diet—reduction of the fiber intake for 24–36 hours prior to intense competitive exercise,
2. Antidiarrheal medications (e.g. Immodium)—preventive medications may be required prior to competition. These should not be taken on a regular basis.
3. Antispasmodic medications—may occasionally be required prior to competition.

Overtraining syndrome

What is it?

The overtraining syndrome is a neuroendocrine disorder that may result from the process of overtraining and reflects accumulated fatigue during periods of excessive training with inadequate recovery. The overtraining syndrome is a common cause of persistent tiredness in athletes.

The term *overreaching* describes similar symptoms (fatigue, performance decrements, mood state changes) but which are of a more transitory nature.

What causes it?

The overtraining syndrome develops when there is failed adaptation to overload training due to inadequate regeneration. Unfortunately, some athletes react to impaired performance by increasing the intensity of their training. This may further impair performance, resulting in additional training, thereby creating a vicious cycle that leads to overtraining syndrome.

What are the symptoms?

The initial symptom of the overtraining syndrome is usually fatigue but, in time, other symptoms develop. There are a large number of symptoms associated with the overtraining syndrome, both physiological and psychological. However, the only symptoms consistently shown in scientific studies to be associated with overtraining are:

- performance decrements
- persistent high fatigue ratings
- decreased maximal heart rate
- changes in the blood lactate threshold
- neuroendocrine changes
- high self-reported stress levels and sleep disturbances.

Decreases in muscle strength and endurance may be seen in association with fatigue. Overreaching and overtraining can also occur in power athletes, such as weightlifters.

How is it diagnosed?

Unfortunately, there is no single test that can detect overtraining in the athlete. Probably the simplest and most effective means of monitoring overtraining is self-analysis by athletes themselves. Daily documentation should include sources and ratings of stress, fatigue, muscle soreness, quality of sleep, irritability and perceived exertion during training or standardized exercise. The Profile of Mood States test may be a useful predictor of overtraining but is not a reliable diagnostic tool.

Changes in exercise blood lactate concentration and blood lactate threshold have been shown to be good indicators of overtraining but are influenced by many other factors and are probably only useful if assessed repeatedly.

How is it treated?

In patients who present with a relatively brief history of overtraining, complete rest is recommended in the short term and the athlete is advised to get as much sleep as possible over the next 48 hours. Often this can be done over a weekend. If the syndrome is not severe, this may be sufficient and the athlete may recover and begin the week with renewed vigor.

If this brief period of rest does not reduce the athlete's fatigue, the overtraining syndrome has developed. This may take weeks or months to resolve. Treatment includes rest, attention to dietary and fluid intake and psychological support.

Depletion of iron stores

What is it?

Iron deficiency anemia is rare in athletes. A more common problem is depletion of iron stores, which appears to have a detrimental affect on performance. Depletion of body stores of iron is a common cause of tiredness, particularly in swimmers and endurance athletes.

What causes it?

Athletes are susceptible to iron deficiency for a number of reasons, including inadequate iron intake, increased iron loss and inadequate absorption of dietary iron. Special groups with a greater risk of iron deficiency are menstruating females, any athlete who diets, and adolescent athletes. Runners and endurance athletes are at high risk of iron deficiency due to a combination of increased GI and GU blood loss, loss of iron in sweat and an increase in hemolysis in runners, swimmers and rowers. Iron deficiency is further contributed to by an inadequate dietary intake, commonly seen in distance runners and vegetarians.

What are the symptoms?

Tiredness and impaired performance.

How is it diagnosed?

A simple blood test can confirm the diagnosis. The combination of both ferritin and transferrin receptor levels provide the most sensitive measurement of the iron status of an athlete. Both ferritin and transferrin receptor levels should be measured regularly in athletes who are training intensely. Female endurance athletes who eat little or no red meat are particularly susceptible to this condition.

How is it treated?

Athletes with symptoms of lethargy and poor performance, in combination with low ferritin levels and/or increased transferrin receptor levels, should attempt to increase their iron intake. Referral to a dietician may be required. Supplementation with iron tablets may be required and appears to be effective. Absorption is best between meals and may be improved with the intake of vitamin C. Occasionally iron injections may be required.

Chronic fatigue syndrome

What is it?

Chronic fatigue syndrome (CFS) is a controversial condition, the existence of which is hotly debated within the medical profession. A number of definitions of CFS have been proposed. All include the concept of fatigue that interferes with activities of daily living and is of at least six months' duration.

What causes it?

There is no single determinant cause for CFS. Fatigue symptoms might be perpetuated by secondary gain or learned behavior. Acute infectious illnesses are clearly important precipitating factors in many cases.

CFS is more common in females, high achievers and professionals and more common in young adults. CFS is widespread in affluent settings and virtually unreported in developing countries.

What are the symptoms?

The most prominent symptom of CFS is usually overwhelming fatigue especially after exercise. Other common symptoms include headaches, sore throat, enlarged lymph nodes, muscle pain especially after exercise, unrefreshing sleep, chest and abdominal pains.

How is it diagnosed?

The diagnosis of CFS is difficult to confirm in the absence of any definitive sign or test. It is often a diagnosis of exclusion.

The other problem with the diagnosis of CFS is that there are a number of conditions whose symptoms overlap with those of CFS. The two most significant are fibromyalgia and depression. The major presenting symptom in fibromyalgia is usually widespread muscle and joint pain but fatigue is nearly always present. Fibromyalgia is characterized by the presence of multiple tender points in the muscles. Trigger points are also frequently seen in patients with CFS and form an important part of the treatment. Fatigue is often the primary presenting symptom in patients with depression and many of the symptoms described in CFS are found in depressive patients.

How is it treated?

The natural history of CFS is of a very gradual improvement over a period of months and sometimes years. Treatment should be oriented towards psychological support and symptom relief. Exercise is the cornerstone of treatment of chronic fatigue. A slow, graduated increase in activity is an essential part of management. It should commence at a level that the patient can achieve comfortably with minimal or no adverse effects in the 24–48 hours post-exercise. The increase in activity should be very gradual and, if adverse symptoms develop, the patient should return to the previous level of activity and build up even more slowly.

Many drug treatments have been advocated but there is little evidence of their efficacy. Nutritional supplements have also been advocated but again there is no evidence of their efficacy.

Headache

What is it?

A headache is an extremely common complaint, in which both athletes and non-athletes complain of a generalized or specific discomfort in their heads.

A headache is *not* always a migraine—this is only one specific form of headache.

What causes it?

Headaches may result from a number of causes, including:

1. Viral illnesses, e.g. sinusitis
2. Cervical headache—referred from the neck
3. Abnormalities within the brain, e.g. tumor or bleed
4. Exercise-related headache, e.g. 'footballers' migraine'
5. Vascular headache, e.g. migraines
6. Other—trauma, drugs, stress

Exercise-related headache

What is it?

This is a specific type of headache that occurs only with exercise.

What causes it?

The exact cause is unknown, but may be related to a minor disturbance in the functioning of the brain with exertion.

Who is at risk?

Although more common in runners and weightlifters, it may occur in any other sporting activities.

What are the symptoms?

The headache is usually of sudden onset, lasts only seconds or minutes and is associated exclusively with exertion. Following the initial severe headache, dull pain persists for a number of hours.

How is it diagnosed?

Consultation with a sports physician is mandatory. A full history and examination should be performed. Investigations are required to exclude abnormalities of the skull or brain. These include:

1. Skull X-ray
2. CT scan or MRI of the brain

How is it treated?

Treatment involves either avoidance of the activity, or medications to help prevent the headache. If neck stiffness is contributing to the headache, physiotherapy and exercises involving the neck muscles may assist in the treatment.

Vascular headache

What is it?

Vascular headaches refer to the throbbing headaches that occur due to dilation of the blood vessels on the outside surface of the brain. Common types of vascular headaches include: migraine, cluster headache, exertional headache and some types of post-traumatic headache.

a) Migraines:

Vascular headaches that are may be associated with:

- (i) neurological (nervous system) symptoms—visual disturbance, slurred speech, drowsiness, pins and needles, limb weakness, dizziness.
- (ii) Nausea, vomiting, diarrhea.

b) Cluster headaches:

Vascular headaches that occur in 'clusters' or attacks. The headaches are described as an intense burning. They may be associated with:

- (i) a runny nose
- (ii) a blocked nose
- (iii) sweating
- (iv) red, painful eyes

Who is at risk?

Vascular headaches usually begin around the time of puberty and adolescence. There is often a family history of such headaches. Medications such as the oral contraceptive pill and some blood pressure tablets may exacerbate the tendency towards developing such headaches.

What are the symptoms?

The main symptom of a vascular headache is that of a throbbing headache, often beginning in the early morning and reaching high intensity within 2 hours. There are often associated symptoms (see above). The headache may last for a number of hours, but usually resolves within a day; however, they may re-occur daily or several times a week. They are often more frequent in certain seasons.

How are they diagnosed?

Consultation with a physician is required. A full history and examination suggest the diagnosis. Initially, investigations may be required to exclude other causes of the headaches.

How are they treated?

a) Migraines:

- (i) Rest—sleep often ends the attack.
- (ii) Medications—pain-killers, as advised by your physician.
- (iii) Prevention—if attacks are frequent, a preventive medication may be required. Avoidance of trigger factors is important.

b) Cluster headaches:

Treatment depends on the age and health of the patient, and the timing of the attack.

- (i) Inhalation of 100% oxygen, administered by medical staff, often relieves the headache.
- (ii) Medications—pain-killers as recommended by the physician.
- (iii) Prevention—if headaches are frequent, preventive medication may be required.

Cervical headache

What is it?

A cervical headache is a headache occurring secondary to abnormalities of the joints, muscles or soft tissues of the neck.

What causes it?

The exact mechanism of production of the headache from the neck region is unknown, but is thought to be referred from to the head from focal abnormalities or by irritation of nerve and related structures in the neck region.

Who is at risk?

Any athlete or non-athlete may experience cervical headaches. Particular risk factors include:

1. Previous trauma—'whiplash'
2. Poor posture
3. Stress

What are the symptoms?

A cervical headache is typically described as a constant, steady, dull ache, usually occurring on one side, but occasionally on both sides of the head. It is often referred from the base of the head to the forehead.

The onset of the headache is usually gradual, often present early in the morning, improving during the day. They are often present for days, weeks or even months.

How is it diagnosed?

Consultation with a sports physician is required. A full history and examination is required for the diagnosis. Investigations are necessary only if the headaches fail to settle with treatment, or if the presentation is atypical.

How is it treated?

Treatment of the patient with a cervical headache requires correction of the abnormalities in the neck with a combination of physiotherapy, massage and stretching (including nerve stretches). Anti-inflammatory medication may be required in the early stages. Acupuncture may be helpful to relieve muscle tightness. Correction of posture and stress reduction may also be required.

Hyperthermia (heat illness)

What is it?

Heat illness occurs when the internal body temperature rises. It is classified as mild, moderate or severe, depending on the degree of the rise.

What causes it?

Exercise in the heat and humidity can result in an increase in the body temperature secondary to heat production from muscle work. Normally heat is lost through sweating, however, if the athlete is dehydrated or if the environment is too humid, heat loss cannot occur by this means, resulting in an increase in the core body temperature.

Who is at risk?

Any athlete exercising in hot and humid conditions may suffer from heat illness. Risk factors include:

1. Dehydration
2. Lack of fitness
3. Being unacclimatised

What are the symptoms?

The symptoms vary with the severity of the heat illness.

1. *Mild:*
 - a) Heat fatigue—tiredness and weakness, occasionally with an associated headache.
 - b) Heat cramps—muscle tightness and spasm, usually in calf and thigh muscles.
 - c) Heat syncope—a fainting episode usually occurring immediately post-exercise.
2. *Moderate:*
 - a) Heat exhaustion—weakness, headache, dizziness, nausea. Occasionally mild confusion may occur.
 - b) Loss of consciousness—may occur if the athlete continues to exercise.
 - c) Signs: mild reduction in blood pressure and increase in heart rate.
3. *Severe:*
 - a) Reduced consciousness
 - b) Hot, dry skin
 - c) Signs: low blood pressure, rapid pulse rate

How is it diagnosed?

Urgent consultation with a sports physician is required. Diagnosis is usually clinical; however, in severe cases, blood tests may give a guide to the severity and allow assessment of certain electrolytes (minerals) in the blood.

How is it treated?

Treatment depends on the severity of the heat illness. A sports physician should be consulted immediately.

1. *Mild:*
 - a) Stop exercise
 - b) Elevate legs
 - c) Cool drinks
2. *Moderate:*
 - a) Stop exercise
 - b) Shelter from heat
 - c) Cool with ice applied to neck, armpits and groins.
 - d) Cool drinks
3. *Severe:*
 - a) Stop exercise
 - b) Remove from hot environment
 - c) Cool with ice applied to neck, armpits and groins

- d) Fluid replacement:
 - (i) Conscious: cold fluids, usually glucose/electrolyte solutions (sports drinks)
 - (ii) Unconscious: intravenous fluids
- e) Hospitalization may be required.

What are the dangers (complications)?

The major complications of severe heat illness is that of 'muscle melt down' (rhabdomyolysis). When the body temperature becomes too high, the muscles are broken down. This may result in:

1. Kidney failure
2. A bleeding disorder

NB: Urgent specialist treatment is required.

How do you prevent heat illness?

Heat illness may be prevented by:

1. Adequate training.
2. Acclimatization—adaption to the hot conditions.
3. Avoid adverse conditions.
4. Avoid exercise at the hottest time of the day.
5. Wear appropriate clothing.
6. Drink plenty of fluids before the event.

Hypothermia (cold illness)

What is it?

Hypothermia is a reduction in the core body temperature.

What causes it?

Hypothermia occurs when the body loses more heat than it can produce. Heat may be lost through:

1. Direct contact (conduction)
2. Air blowing over the body (convection)
3. Loss of heat energy to nearby objects (radiation)
4. Sweating (evaporation)

Who is at risk?

Hypothermia may occur in any athlete. However, the main athletes at risk are those involved in water sports, alpine sports and endurance events.

What are the symptoms?

The symptoms of hypothermia depend on the severity of the hypothermia:

1. *Mild:*
 - a) Cold extremities
 - b) Shivering
 - c) Increased heart rate
 - d) Increased rate of breathing
 - e) Urgent desire to pass urine
 - f) Slight incoordination
2. *Moderate:*
 - a) Tiredness and weakness
 - b) Increased incoordination and clumsiness
 - c) Reduced shivering
 - d) Slurred speech
 - e) Poor memory
 - f) Drowsiness, poor judgment
 - g) Dehydration
3. *Severe:*
 - a) Total loss of shivering
 - b) Inappropriate behavior
 - c) Reduced consciousness
 - d) Muscle rigidity
 - e) Low blood pressure, low heart rate
 - f) Irregularities of heart rate
 - g) Fluid accumulation in the lungs

How is it diagnosed?

Urgent consultation with a sports physician is required. Diagnosis is clinical. Investigations are normally not required.

How is it treated?

The treatment of hypothermia depends on the severity:

1. *Mild:*

- a) Remove from the cold.
- b) Remove all wet clothing and cover the body with dry blankets.
***if unable to remove wet clothing, place the athlete in a plastic bag from the neck downwards**
- c) Use space blanket if available.
- d) Warm, sweet drinks.

2. *Moderate:*

- a) Remove from the cold.
- b) Remove all wet clothing and cover the body with dry blankets.
***if unable to remove wet clothing, place the athlete in a plastic bag from neck downwards**
- c) Use space blanket if available.
- d) Treat gently with minimal handling.
- e) Transfer to hospital.

3. *Severe:*

- a) Treat gently with minimal handling.
- b) Urgent transfer to hospital.
- c) Admission to an intensive care unit is required for active rewarming, while close monitoring occurs.

What are the dangers (complications)?

The major complications of hypothermia include:

1. Irregular heart beat (arrhythmia)—atrial fibrillation, ventricular fibrillation
2. Fluid accumulation in lungs (pulmonary edema)
3. Aspiration (inhalation of a foreign body into lungs)
4. Increased risk of muscular tears—due to decreased muscular flexibility
5. Numbness and impaired coordination
6. Decreased energy availability—due to inhibition of breakdown of energy stores.

How is it prevented?

The main means of prevention include:

1. Avoid activity inappropriate to fitness levels.
2. Avoid activity to exhaustion.
3. Avoid dehydration.
4. Ensure adequate nutrition.
5. Wear appropriate clothing for weather conditions.
6. Warm up appropriately.
7. Plan activity and communicate plans to others.

Frostbite

What is it?

Frostbite is the actual freezing of tissues due to exposure to extreme cold. It usually occurs in the peripheries (fingers, toes, ears and nose) and may be classified as:

1. Superficial—involving only the superficial layers of the skin.
2. Deep—involving the full thickness of the skin and deeper tissues.

What causes it?

Frostbite is caused by exposure to extreme coldness.

Who is at risk?

Frostbite may occur in any athlete. Those at particular risk are those partaking in activities in extreme cold, e.g. alpine events.

What are the symptoms?

The symptoms of frostbite depend on the severity:

1. *Superficial:*
 - a) burning local pain
 - b) numbness
 - c) pale and grey skin, later becoming red after thawing
 - d) superficial blisters may be present.
2. *Deep:*
 - a) extreme pain
 - b) numbness
 - c) frozen block of hard, white tissue with areas of gangrene and blood blisters if severe

How is it diagnosed?

Urgent consultation with a sports physician is required. Diagnosis is clinical. Investigations are usually not required.

How is it treated?

Treatment depends on the severity of the frostbite:

1. *Superficial:*

Thaw the frozen body part by direct contact with body heat. It is important not to thaw the injured part unless refreezing can be prevented. Do not directly rub the body part.
2. *Deep:*
 - a) Rewarm the frozen part in a hot water bath – a whirlpool bath with antiseptic is ideal.
 - b) Hospitalization is usually required.
 - c) Pain-killers
 - d) Antibiotics if evidence of infection
 - e) Special intravenous fluids may reduce the severity of the frostbite
 - f) Delayed surgery is sometimes required