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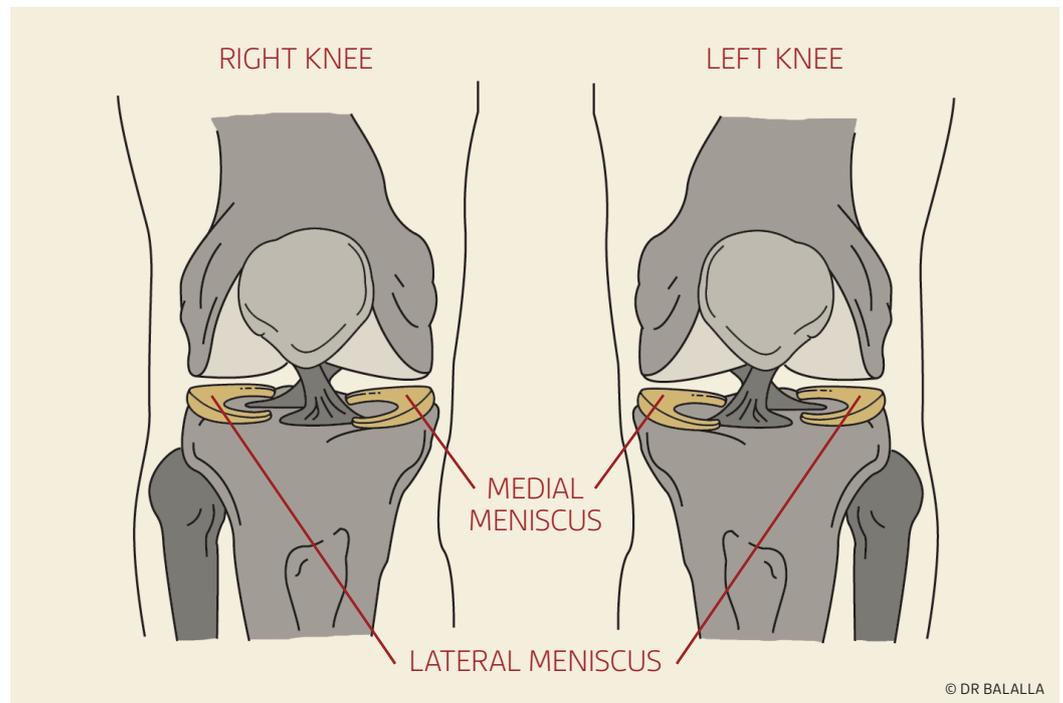
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Meniscal Injuries

What is the meniscus?

There are two types of cartilage within the knee. The first is called hyaline cartilage, and is the white, tightly adherent cartilage that is on the ends of bones within a joint. The second type is called fibrocartilage, which is rubbery and pliable. The meniscus is a crescent shaped structure that lies between the femur and the tibia on each side of the knee, and is made of fibrocartilage.



The principal functions of the meniscus are load sharing and shock absorption. The intact fibrocartilage meniscus spreads load away from the hyaline cartilage of the bones, thereby protecting it. Damage to the hyaline cartilage leads to arthritis in the knee.

The menisci transmit 50-90% of load over the knee joint, depending on knee flexion angle, femoral translation and rotation. The meniscus contributes to knee joint position sense, and also to joint stability.

The outer third of the meniscus, known as the "red zone" is well supplied with blood, and has healing capacity. The inner two-thirds is known as the "white zone" and has no blood supply and have diminished ability to heal.



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How is the meniscus injured?

There are two main types of injury to the meniscus. In younger patients it can be torn during a twisting injury of the knee, when it becomes forcefully entrapped between the femur (thighbone) and the tibia (shinbone). It can happen in association with other injuries to the knee, such as rupture of the anterior cruciate ligament.

As a person ages, the meniscus becomes subject to degenerative change, and becomes less pliable. A degenerate meniscus is prone to tearing, even with minimal trauma.

What are the symptoms of a meniscal tear?

Acute tears are associated with a tearing or popping sensation at the time of injury, with swelling peaking some hours after the injury.

Meniscal tears are frequently associated with pain in a well-localized region along the joint line, either on the outside or inside part of the knee. They are also associated with knee swelling, catching, clicking, or locking of the knee. The pain is often a sharp, sudden stabbing pain, which comes on and then disappears rapidly, particularly with deep bending or twisting activity.

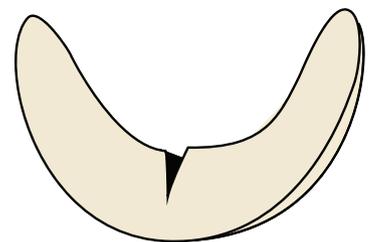
How is the diagnosis made?

Usually, a careful history and examination are sufficient to make a diagnosis. X-rays can help to exclude a fracture or knee arthritis as the cause of the pain. The diagnosis can be confirmed with an MRI scan, which can also identify the pattern of the tear, its exact location, and the presence of any other injuries.

What are the different types of meniscal tear?

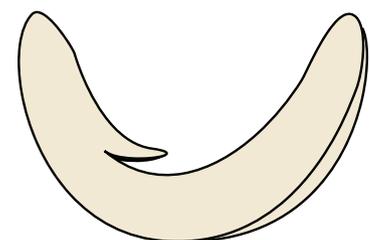
› Radial Tear

A radial tear is a sharp split on the edge of the meniscus. These tears are often trimmed to produce a smooth edge which doesn't catch.



› Parrot Beak Tear

Parrot beak tears are similar to a radial tears, but more extensive. They can frequently catch and click. These tears are not repairable and are trimmed to smooth the edge.





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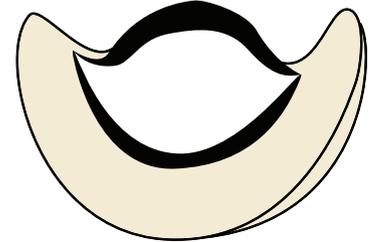
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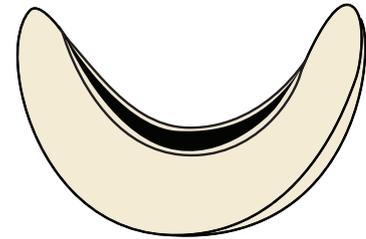
› Bucket Handle Tear

Bucket handle tears are commonly found in association with ACL injuries and instability episodes. They occur more commonly in young patients and should be repaired whenever possible.



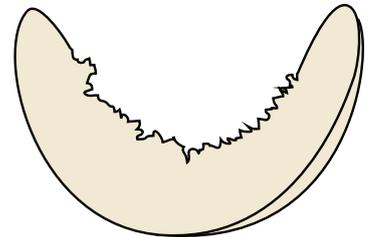
› Horizontal Cleavage Tear

Horizontal Cleavage tears occur in menisci which are undergoing degenerate change. They split the meniscus into two leaves. The tear usually extends to the periphery of the meniscus. They are treated with removal of one of the leaves.



› Degenerate Tear

Degenerate tears are complex, irregular tears in menisci which have undergone degenerative change. These are prone to re-tearing, and function poorly. Simple trimming may help.



What are the treatment options?

Initial treatment of meniscal tears is rest, ice, elevation, and compression (RICE). This is usually combined with simple analgesia such as a non-steroidal anti-inflammatory medication. Some tears, particularly those near the outer rim, can heal naturally. Patients with ongoing meniscal symptoms can be treated with surgery. The surgical options are dependent on the pattern of the tear.

The outer third of the meniscus has a good blood supply (the "red zone"), but the inner two thirds has no blood supply. This means that injuries to the inner parts of the meniscus have a low capacity to heal. Preserving as much meniscal tissue as possible is highly desirable as absence of the meniscus can lead to arthritis in the adjacent hyaline cartilage with time. Younger patients have a greater capacity for healing, and also benefit the most from meniscal repair. Bucket handle tears of the meniscus which run parallel to the edge of the meniscus are the most readily repairable.



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When the tear is irreparable, the margins of the tear can be resected to eliminate any unstable flaps causing pain. However, care is taken to resect the most minimal amount of tissue possible.

What happens if I lose my meniscus?

Loss of a large portion of the meniscus can lead to increased stress on the articular cartilage. This results in an increased risk of arthritis in the adjacent areas of the joint. This risk is much higher in younger patients, in lateral sided injuries, and in patients with an unstable knee. If the adjacent cartilage is already worn, then the likelihood of progressive arthritis is high. Thus the function and integrity of the meniscus needs to be preserved at all costs, and all suitable meniscal tears should be repaired.

However, most people seeking help with a symptomatic meniscal tear are affected by significant meniscal pain which limits their day-to-day function. This pain usually does not resolve spontaneously. In order to relieve these symptoms, some meniscus may need to be removed. A balance needs to be struck between the need to address the acute problem, and the potential for arthritis in the future.

Will it heal by itself? Can it be repaired?

Tears which run along the periphery of the meniscus in the red zone, such as bucket handle tears or separations of the meniscus from the capsule of the knee can heal spontaneously. This is less likely in a knee with other injuries such as a torn anterior cruciate ligament. Due to the importance of the meniscus, I advocate surgical repair to increase the likelihood of healing. Any stabilisation procedure such as ACL reconstruction is best performed at the same time, and has been shown to increase the likelihood of healing.

This capacity to heal diminishes with age. After around 40 years of age the success of meniscus repair is reduced, but in an active individual attempted repair may be worthwhile.

What is the recovery time and return to function following meniscal surgery?

This will depend of whether the meniscus is repaired or trimmed. Meniscal repairs must be protected for 3 months to minimise motion and stress while they heal. I generally don't use a brace, but limit bending to 90° for 6 weeks, and don't allow weight bearing. After 6 weeks, weight bearing is permitted, as is full bending of the knee, but loaded squatting past 90° is not allowed for another 6 weeks. Office workers will generally be able to work a week following surgery, but manual workers may be unable to work for up to 3 months. Driving is allowed when the limb which is operating a pedal is pain free and able to weight bear.

Meniscal trimming is associated with a much faster return to function. Immediate weight bearing is allowed, with no restriction on bending the knee. Most office workers return to work within a week, and manual workers in 1–2 weeks. The limb is usually fully recovered within 4 weeks.



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What are the risks of meniscal surgery?

There are general risks associated with knee arthroscopy, as well as specific risks for meniscal trimming and repair.

General risks of surgery:

- › These include adverse reaction to medications, pain, bleeding, infection, stiffness, blood clots in the calf (deep venous thrombosis or DVT), blood clots traveling from the calf to the lungs (pulmonary embolus).

Risks specific to meniscal repair:

- › There is a 20% incidence of mild pain around the repair site which may persist for several months.
- › The repair may not heal, requiring further surgery to either re-attempt repair, or to remove the meniscus if it is too damaged.

Risks specific to meniscal trimming:

- › Tears may recur, particularly in degenerate menisci.
- › There is an increased risk of arthritis following removal of meniscal tissue.
- › Meniscal surgery in the presence of arthritis may not result in resolution of symptoms.

This resource is provided by Dr Balalla for the information of his patients. Every patient's condition is unique and this information should not substitute for a full consultation with a qualified orthopaedic surgeon.

To arrange a consultation or to discuss any of the information above, please phone Dr Balalla's rooms on (02) 9680 1315, or email enquiries@drbalalla.com.au.

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