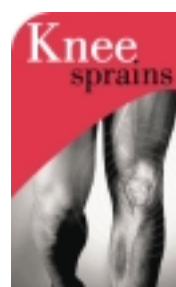


## WHAT YOU'LL FIND IN THIS BROCHURE

- [What is a knee strain?](#)
- [How do knee strains occur?](#)
- [What you should do if a knee strain occurs.](#)
- [What rehabilitation you should do.](#)
- [Example of a return to play strategy.](#)
- [How you can reduce the risk of re-injury.](#)

## What is a knee strain?

- A knee sprain is a stretch, tear or complete rupture of one or more of the knee ligaments
- Knee ligament injuries are particularly common in sports that involve tackling (e.g. rugby) and/or twisting (e.g. netball)
- Some knee sprains also lead to prolonged absence from sport. These injuries are very serious and often require surgery



## How do knee strains occur?

- The knee is subject to large stresses and impact forces
- Damage can occur during contact with another player (e.g. a blow to the outside of the knee while the foot is planted on the ground) or by forces created by the athlete (e.g. a sudden sidestep or twist while running)

## What should you do if a knee strain occurs?

Apply the RICED procedure...

### RICED procedure

#### REST

- Rest reduces further damage - stop activity as soon as the injury occurs.
- Avoid as much movement of the injured part as possible to limit further injury.
- Don't put any weight on the injured part of the body.



#### ICE

- Ice cools the tissue and reduces pain, swelling and bleeding.
- Place ice wrapped in a damp towel onto the injured area - don't put ice directly onto bare skin.
- Hold the ice pack firmly in place with a bandage.
- Keep ice on the injury for 20 minutes every two hours for the first 48 hours.



#### COMPRESSION

- Firm bandaging helps to reduce bleeding and swelling.
- Ensure that bandaging is not so tight that it cuts off circulation or causes tingling or pain past the bandage.
- Bandage the injury between ice treatments.



#### ELEVATION

- Elevation helps to stop bleeding and reduce swelling.
- Raise the injured area on a pillow for comfort and support.
- Keep the injured area raised as much as possible.



#### DIAGNOSIS

- Consult a medical professional (such as a doctor or physiotherapist) especially if you are worried about the injury, or if the pain or swelling gets worse.
- If the pain or swelling has not gone down significantly within 48 hours, also seek treatment.
- An accurate diagnosis is essential for proper rehabilitation of moderate to severe injuries.

## What rehabilitation should follow a knee strain?

The following recommendations serve as a guideline only.

**Always seek the advice of a medical professional for a rehabilitation programme specific to you and your injury.**

### Range of motion

- Restoring normal range of motion will allow proper function of the knee
- Range of motion can be improved by light stretching of the muscles about the knee and by bending and straightening the knee
- Once pain and swelling decrease, cycling activity is also recommended

### Cardiovascular fitness

- Keeping fit will ensure a more comfortable return to training and competition
- Non-weight-bearing activities such as swimming, cycling and arm ergometry (grinding) are good options at the beginning of rehabilitation
- A return to more specific activities (e.g. jogging) can be made as joint strength and stability allow

### Strength

- Lower leg strength is needed to stabilise the knee and prevent further injury
- Following knee injury, muscle weakness is common and can occur very rapidly
- Before starting functional exercises there needs to be adequate strength in the muscles at the back (hamstrings) and the front (quadriceps) of the leg, and in the long calf muscle (gastrocnemius)
- Strength can be measured by contracting against resistance provided by another person. Ask them to make a comparison of strength between legs
- There should be approximately 70% of pre-injury strength or 70% of the opposite leg's strength (assuming it is uninjured) before beginning strength exercises

### Balance

- Balance and coordination need to be restored. Proprioception is the awareness of one's body position and is important in balance
- Injury to the knee joint causes a reduction in proprioceptive ability
- Proprioception exercises (e.g. balance exercises using wobbleboards), mini trampolines and uneven/sloped surfaces help to improve joint stability so the knee can be protected against future injury
- Complaints of the knee 'giving way' during activity indicate a need for further rehabilitation
- Wearing a knee brace or correctly applied taping may also improve proprioception as well as provide protection and support

### Psychological status

- Reduced confidence following a knee injury may prevent an athlete from attempting movements needed for full recovery (e.g. sudden changes of direction and jumps)
- Gradually attempting more difficult agility tasks and setting realistic goals and timeframes may help to rebuild sporting confidence
- Return to competition is not advised until an individual has 100% confidence in their playing ability

### Sport-specific rehabilitation

- Knee injuries may cause difficulties in turning and decelerating
- Rehabilitation should involve some eccentric training of the quadriceps as this places greater strain on the injured tissue and is similar to the demands of sport. Eccentric training of the quadriceps involves the quadriceps developing tension while it lengthens, as in the knee bending movement when landing from a jump
- Running down hills and stairs, sudden decelerations when running at speed and hopping are common methods of eccentric training
- The ability to run a tight figure of eight, cut at both 45° and 90° angles off both feet (first at 1/2 speed then 3/4 speed, then at full speed) indicates an ability to return to play

**Ensure you are completely rehabilitated before returning to competition to minimise the risk of re-injury.**



## Example of a return to play strategy after a mild knee strain

→ NOTE: This is a guide only. Timeframes for rehabilitation and return to play vary depending on the nature and severity of the injury. Always seek the advice of a medical professional for a rehabilitation programme specific to you and your injury.

### DAYS 1-4 POST INJURY

- Have swelling and pain settled?

↓ Yes

↓ No

#### Begin range of motion exercises

- Passive extension/flexion (straightening/bending) of knee joint
- Stretching exercises

#### Begin strength exercises

- Isometric exercises (10-20 seconds) for quadriceps and hamstrings

#### Begin balance exercises

- Partial weight-bearing

#### Continue RICED treatment

If swelling and pain persist, consult a medical professional for further assessment and treatment

### WEEKS 2 - 4

#### Progression

- Passive/active flexion and extension of knee joint
- Continue stretching
- Stationary cycling for increased range of motion - low load
- Partial weight-bearing: stand on one leg, mini squats, calf raises
- Balancing exercises: standing on one leg (eyes open/closed)
- Strength exercises: leg press, leg curl



#### Maintain Fitness

- Stationary cycling, stairmaster, rower - all at low resistance and low speed
- Swimming with buoy between legs, light kicking

### WEEKS 4 - 8

#### Progression

- Stationary cycling for increased range of motion - increase load
- Walking - figure of eight, squares
- Closed chain exercises (where the foot is stabilised or fixed as is the case when the foot is weightbearing on the ground): leg press, squats, calf raises, step-ups and step-downs, lunges
- Balance exercises: wobbleboard/mini trampoline



#### Maintain Fitness

- Walking, jogging, stationary cycling, stairmaster

### WEEKS 8 - 12

#### Progression

- Continue cycling to your tolerance
- Sustained stretches
- Strength exercises: various speeds, directions of movement, contraction types
- Add open chain exercises: leg curl, leg extensions
- Continue balance exercises: wobbleboard/mini trampoline



#### Maintain Fitness

- Walking, jogging, stationary cycling, stairmaster, swimming

Rehabilitation for months 3 – 6 continues on page 5

## MONTHS 3 - 4

### Improve agility

- Jumping, hopping, twisting, straight line running, figure of eight running, zig zag, shuttle runs
- Increased emphasis on strength, power
- Walking, jogging, stationary cycling, stairmaster

## MONTHS 4 - 6 CAN YOU:

- Run forwards and backwards?
- Move knee through full range of motion?
- Slow down and stop suddenly?
- Jump and hop?
- Run up and down hills?
- Cut to the left and right at speed?
- Complete all exercises with 100% confidence?

↓ Yes

↓ No

### Return to training



### Maintain

- Fitness, range of motion, strength, balance

Continue to improve agility and sport-specific drills

## How can you reduce the risk of re-injury?

ALWAYS seek the advice of a medical professional before returning to sport. Inadequate rehabilitation and a premature return to sport will increase the risk of re-injury.

- Continue stretching, proprioception and strengthening exercises as part of a normal training routine
- Work towards a good strength balance in all muscles of the lower limb, particularly those on either side of the knee
- Use good technique when landing from jumps (i.e. knees over toes), tackling, pivoting, etc
- Perform thorough warm-ups and cool-downs
- Most braces are not effective in reducing the risk of re-injury
- If knee injuries continue to occur, consult a medical professional for advice on other possible contributing factors

