

Chartered Physiotherapist Chris Norris MSc  
CAc MCSP with advice on definition, cause,  
symptoms, treatment and prevention of  
common sporting injuries.



part one  
**Knee ligament  
injuries**  
in skiing + snowboarding

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- **Definition** – An injury to the inner (medial collateral) or internal (anterior cruciate) ligament of the knee. The medial collateral ligament (MCL) is a flat band attaching to the inside of the knee joint, the anterior cruciate ligament (ACL) is a thick cord inside the knee travelling from front to back.
- **Cause** – A severe twisting injury to the knee, usually when the foot is fixed to the ground. Because the foot will not move there is no 'give' in the leg, and the knee ligaments are damaged instead.
- **Subjective Findings** – Pain on the inside of the knee over the line of the joint. The knee often gives way, often when coming down stairs or stepping from the curb.
- **Objective Findings** – The knee swells suddenly, the more severe the injury the worse the swelling. A knee which comes up like a balloon often has internal damage. An inability to fully straighten the knee either as a result of swelling or sometimes as a result of torn tissue being displaced and moving between the knee bones.
- **Testing Procedures** – For the ACL physiotherapists often use the Lachman test, where the shin bones are gently drawn forwards relative to the thigh bone when the patient is sitting. A machine called an arthrometer may also be used to provide this test. For the MCL a valgus test is used where the physiotherapist gently pushes against the outside of the straight knee. This causes the inside of the knee to be forced open slightly, a movement resisted by an intact ligament, but not by a severely torn one.
- **Prognosis** – Minor injuries do well with a scientifically applied strength and conditioning program. More major injuries may require surgery.

#### Treatment Plan

- **Activity Levels** – Weight bearing activities on the knee must be stopped immediately. The knee should be supported in a rigid brace, if the injury is severe, or in a flexible brace for more minor injuries. Crutches may be required for a major injury.

- **Alternative Activity** – Gym training can be continued, working on the arms and trunk. Subjects may use an Aqua vest in the swimming pool to maintain fitness with more minor injuries.



- **Support** – With minor injuries, 'collateral' taping on the inside of the knee will support the ligament and prevent the knee from being stressed. This will make the knee more comfortable, and also limit any further ligament damage.

- **Thermal Treatment** – Ice should be applied for 10-15 minutes every 2 hours throughout the first 2-3 days following injury to restrict the formation of swelling and to slow down the damaging effects of the injury on the tissues. After 3-5 days heat may be used to stop the knee becoming stiff. In each case be careful not to apply ice or heat directly in contact with the thin skin covering the knee bones as this may cause a burn. Wrap ice or a hot water bottle in a thin tea towel to provide a protective barrier.

- **Medication** – Pain relieving and anti-inflammatory medication may be given by the GP. For superficial bruising a number of topically applied creams can be bought from the chemist.

- **Surfaces** – With mild injuries the subject will be more comfortable wearing a supported training shoe than a normal leather-soled shoe. The springiness and flexibility of the shoe helps to reduce shock on the knee joint in general and the flexibility of a training shoe allows the foot to twist rather than throwing the twisting stress onto the knee itself.

- **Rehab exercises** – Initially, non-weight bearing exercises are performed sitting in a chair and straightening the leg with no weight at all. This can be progressed to using a leg extension bench, in the gym, with low resistances. Once pain and swelling have eased, the strength and conditioning specialist may give closed chain work – that is with the foot on the floor, such as static cycling exercises, gentle walking forwards and backwards and quarter squat movements. When the joint is pain free and no swelling is visible the stability of the joint is built up with squat movements and lunges providing the forward and backward actions. As this strengthens, lateral movement should begin with side stepping actions and side lunges. Finally after a number of months twisting can be introduced progressively. From early on in the rehabilitation (one week post injury), proprioceptive work should commence. Simple exercises such as standing on both legs with the eyes closed and holding balance progressing to single leg standing with the eyes closed are useful. Exercises using a balance (wobble) board are also helpful. With all injuries resulting from snow sport it is advisable that the individual initially seeks treatment from a physiotherapist and rehabilitation from a personal trainer who specialises in strength and conditioning.



Christopher Norris is a Chartered Physiotherapist who holds a masters degree in sports science. He has a post-graduate certificate in orthopaedic medicine, a certificate in occupational health physiotherapy, and an advanced certificate in Traditional Chinese Acupuncture. He has over 20 years' experience treating soft tissue injuries, and specialises in sports injuries and exercise therapy.

He is the author of six physiotherapy books including a textbook on sports injuries which is a core text on many physiotherapy and rehabilitation courses across the world. His recent book and accompanying CD 'Back Stability' have received rave reviews on both sides of the Atlantic. He has produced two further exercise CDs and two exercise videos. Chris runs two private clinics and is a physiotherapy consultant to several blue-chip industries. He is an external university lecturer and lectures regularly for the British Association of Sports Medicine. He runs back stability and muscle imbalance courses at hospitals and universities in the UK and USA. An active sportsman, Chris is a blackbelt in Ju Jitsu and a coach for the World Ju Jitsu Federation (WJFF).

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