



## Braces

*Excerpts reprinted with permission from Understanding Knee Injuries by Bill Morrison, BSc, MSc, PhD, Rehab & Community Care, Fall 2000, Vol. 9 No. 3*

Leg amputees must pay particular attention to the health of their knee(s). Below knee amputees need to take care of both knees. The knee of the residual limb, which may have deficits from birth or an accident, sustains stress from using an artificial limb, and the knee of the sound limb works harder to compensate for the amputation.

Above knee amputees only have one natural knee and that knee takes on a tremendous workload to compensate. Gait deviations often seen in above-knee amputees put a great deal of strain on the entire sound limb, particularly the knee.

These factors mean that knee injuries may be more common for and have a bigger impact on leg amputees than on the general population, resulting in the need for amputees to take special care of their knee joints.

### About Knees

As our knees are not fully developed until we are in our 20s, it can be common to experience an injury before our knees have time to mature. The knee's complexity of motion demonstrates six patterns of simple movement through abduction, adduction, internal rotation and external rotation, in addition to flexion and extension.

These complexities make the knee vulnerable to various degrees of strain or rupture.

The most common knee injuries are the rupture of the anterior cruciate ligament (ACL) and the medial collateral ligament (MCL), and associated with these are usually strains to the posterior cruciate ligament (PCL) and some tearing of the medial meniscus (cartilage). Serious injuries need surgical repair, while less serious ones are treated with rehabilitation. In the long term, the strength of the musculature weakens and the support tissues take on a protective role and subsequently fail, causing more injuries. Knee injuries are slow to heal and can lead to long term problems such as bursitis and arthritis.

### Braces Can Provide Protection

Even though everyday walking is unlikely to cause dramatic knee injuries, general overuse from years as amputees can bring on knee problems because the joints are constantly under extra strain. Being careful not to put undue stress on your knees, and exercising to strengthen the leg muscles are good practices.

Knee injuries can be common when participating in sports that involve a lot of twisting and turning of the legs and knees, such as skiing, skating, soccer, basketball and tennis. Many leg amputees choose to wear a brace on the knee of the sound limb to provide protection and reduce the risk of injury. Some also choose to wear a brace on the knee of the residual limb to provide extra support and stability on that side – this type of brace can be made to fit over the artificial limb.



The C180 Rocket

Some new braces are designed to control all six of the motions mentioned previously and piston braces provide energy management through their shock absorbing aspects. There are so many brace options out there that it is important to consult a specialist to determine whether an off-the-shelf brace will provide the support you need or whether a custom-made brace is required.



The CTi<sup>2</sup>