SPORTS KNEE INJURY

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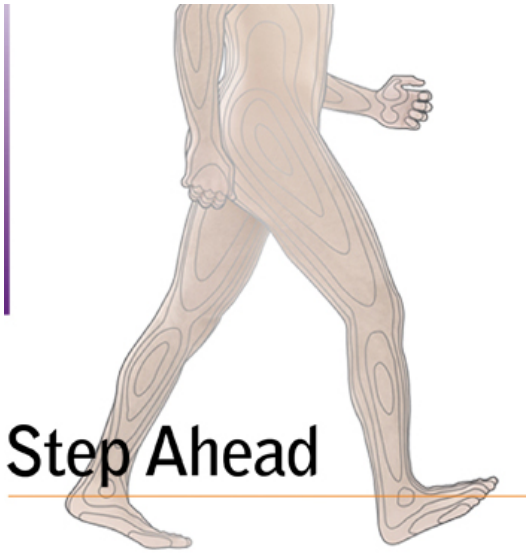

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Introduction

This section is dedicated to sport-specific knee injuries and it will begin with discussing **Running**, **Cycling** and **Skiing & Snowboarding** knee injuries. We will continue to update and expand existing pages and to develop more sport-specific pages.

Although most knee injuries are similar and often related either to the lack of training or to overuse and fatigue, there is no doubt that sports like running, cycling, skiing and snowboarding have very specific biomechanical patterns and thus cause different types of knee injuries. We will discuss sport-specific knee injuries, how to treat them and most importantly how to prevent them. Training, the duration of particular activity, the distances involved, and individual equipment adjustment are significant issues which are often responsible for the onset of many knee problems. Prevention and recognition of early symptoms are therefore very important issues that you should be aware of if you wish to enjoy your sports over a long period of time.

The Effects of Exercise on Human Articular Cartilage

The effects of exercise on articular hyaline articular cartilage have traditionally been examined in animal models, but until recently little information has been available on human cartilage. Magnetic resonance imaging (MRI) now permits cartilage morphology and composition to be analysed quantitatively in vivo. This review briefly describes the methodological background of quantitative cartilage imaging and summarizes work on short-term (deformational behaviour) and long-term (functional adaptation) effects of exercise on human articular cartilage. Current findings suggest that human cartilage deforms very little in vivo during physiological activities and recovers from deformation within 90 min after loading. Whereas cartilage deformation appears to become less with increasing age, sex and physical training status do not seem to affect in vivo deformational behaviour. There is now good evidence that cartilage undergoes some type of atrophy (thinning) under reduced loading conditions, such as with postoperative immobilization and paraplegia. However, increased loading (as encountered by elite athletes) does not appear to be associated with increased average cartilage thickness. Findings in twins, however, suggest a strong genetic

contribution to cartilage morphology. Potential reasons for the inability of cartilage to adapt to mechanical stimuli include a lack of evolutionary pressure and a decoupling of mechanical competence and tissue mass.

- Eckstein Felix, et al.: The Effects of Exercise on Human Articular Cartilage. *J Anat* (2006) 208: 491–512.

Sports Injuries

"Every athlete, regardless of his or her skill level, will go through a grieving process after incurring an injury - without exception. In 1969, Kubler-Ross first outlined the stages of grief a person goes through when facing a serious or career ending injury, death or serious disease prognosis. An understanding of the four stages of managing grief: denial, anger, depression and acceptance will help you in supporting the athlete through them.

- **Denial:** at the beginning, the athlete cannot believe the injury is severe or that it will impact their ability to continue with their sport. They may still believe in the myth that "no pain means no gain". If so, they have been living under a rock for quite some time. Pain is an indicator that something has gone wrong and needs immediate attention. The realization that the pain is stopping them from participating leads to the next stage.
- **Anger:** denial quickly turns to anger as the reality of the situation settles in and the athlete is forced by the circumstances to alter or even stop their participation in their sport. Recovery is often not an easy path and the athlete becomes frustrated and more irritated with the pace of the rehabilitation process. At this point, the coach is in an ideal position to be a sounding board for the athlete's exasperation, and help ease their aggressiveness toward the athletic trainers who are trying to get them back in shape. Realizing the athlete is angry at their loss of ability to perform, their loss of power over what has happened to them and the current situation they now find themselves in are important points to keep in mind while dealing with the individual.
- **Depression:** self worth becomes an issue at this point in the process and depression sets in due to the reality of the situation now being fully realized. The athlete begins to feel as though he or she has no physical or emotional control. The team continues onward without them, which leaves a void in their life and this leads to feelings of isolation, further self-doubt and lowering of their self-esteem. Hope for a successful outcome becomes cloudy and they may not see any good coming from the rehabilitation process. This stage is incredibly difficult, but it's important to remember here the progress they have made and keep them engaged in their recovery. Once they have completed the journey through this stage, they enter the final one, **Acceptance and Recovery** begins in earnest." Source: Peak Performance.

Keep Fit!

"Many committed, hard-working athletes struggle to achieve their very best because they're unable to identify which aspects of fitness they may be lacking in. And that means they can't adjust their training and conditioning to address these weaknesses. The 9 Key Elements of Fitness workbook breaks down the concept of 'fitness' into each one of its constituent parts, devoting a full chapter to describing and explaining each element as follows:

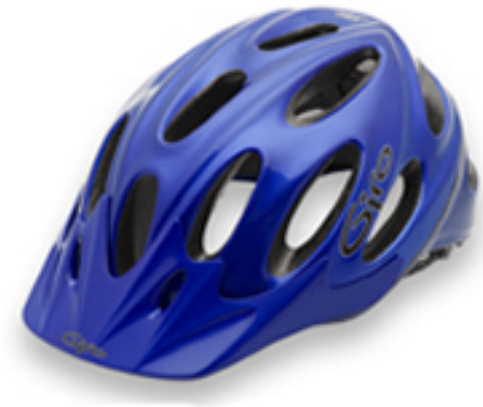
- **Strength** – the extent to which muscles can exert force by contracting against resistance (holding or restraining an object or person)
- **Power** – the ability to exert maximum muscular contraction instantly in an explosive burst of movements (jumping or sprint starting)
- **Agility** – the ability to perform a series of explosive power movements in rapid succession in opposing directions (zigzag running or cutting movements)
- **Balance** – the ability to control the body's position, either stationary (eg a handstand) or while moving (eg a gymnastics routine)
- **Flexibility** – the ability to achieve an extended range of motion without being impeded by excess tissue, ie fat or muscle (Executing a leg split)
- **Local Muscle Endurance** – a single muscle's ability to perform sustained work (eg rowing or cycling)
- **Cardiovascular Endurance** – the heart's ability to deliver blood to working muscles and their ability to use it (eg running long distances)
- **Strength Endurance** – a muscle's ability to perform a maximum contraction time after time (continuous explosive rebounding through an entire basketball game)
- **Co-ordination** – the ability to integrate the above listed components so that effective movements are achieved

The workbook tells you exactly how to train each aspect of fitness in turn, so you can make sure you have all the speed, power, flexibility, endurance, co-ordination, and more, that you need to excel at your chosen sport. This book is a nice blend of clinical and practical information and 'the big picture' that very few people understand." Source: Peak Performance.

And Just One More Thing: Helmets for Cyclist, Skiers and Snowboarders

We do not wish to bore you with any arguments, but what is the point in talking about knee injuries if you end up with a head injury? Wearing a helmet when cycling, skiing and snowboarding makes a lot of sense. Wearing a helmet can prevent or reduce the severity of a head injury. Here are some very basic statistics from many US sources: one in eight of cyclists with reported injuries had a brain injury. A very high percentage of cyclists' brain injuries can be prevented by a helmet, estimated at anywhere from 45% to 88%.

The BHSI (see below) recommends: make sure your helmet fits to get all the protection

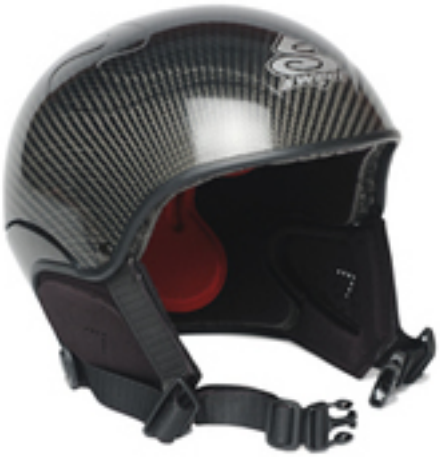


you are paying for. A good fit means level on your head, touching all around, comfortably snug but not tight. The helmet should not move more than about an inch in any direction, and must not pull off no matter how hard you try. Standards are no longer a big issue in the US market, but check inside for a CPSC sticker. Pick white or a bright color for visibility to be sure that motorists and other cyclists can see you. Common sense tells you to avoid a helmet with snag points sticking out, a squared-off shell, inadequate vents, excessive vents, an extreme "aero" shape, dark colors, thin straps, complicated adjustments or a rigid visor that could snag in a fall.

Helmets protect skiers and snowboarders againgst these injuries and may reduce the risk of head injuries by 29% to 56%. A Norwegian study published in February 2006 in the Journal of the Americal Medical Association found that using a helmet was associated with a 60% reduction in the risk of a head injury. The older you get, the harder it is to recover from a concussion. Increasingly, research is discovering long-term effects from head injuries. For example, a study by the Mayo Clinic in Minnesota, published in the May 2003 issue of Neurology, linked head injuries to Parkinson's disease. Just one head injury can quadruple a person's risk of developing Parkinson's disease. Symptoms started an average of 20 years after the incident!

In addition, there is no evidence to date that helmets predispose the wearer to a higher risk of neck injury or cause injury to others. The incidence of serious head and neck injuries in alpine skiing and snowboarding is not as frequent as you might think. However, it must be remembered that wearing a helmet will not protect you if you have a high speed impact - so go carefully, especially if there are trees near the pistes

you're on.
If you wish to learn more about helmets please visit the following websites: for cycling visit The Bicycle Helmet Safety Institute (BHSI) website and for skiing and snowboarding visit Ski Helmets website. You will find useful information on determining your size, proper fitting, and how to wear the helmet. Your helmet should fit you



comfortably and correctly, and it should be certified for adequate impact protection. If you are involved in an accident, it's likely that your helmet will get damaged. Since damage isn't always obvious visually, replace the helmet after any significant impact, even if everything looks good. You should also replace your helmet after five years, even if it hasn't been involved in a crash, since pollution, UV light and weathering can weaken its component materials over time. It pays to invest in a good quality, light-weight helmet. For information on excellent lightweight carbon fibre helmets please see Sweet website.
As 80 percent of heat-loss is through the head, a good helmet also keeps your head (and your ears) warm, which is for a start a good enough reason to wear one. Today's ski helmets are so light, comfortable and stylish that many skiers consider them not only a safety device but also a fashion accessory. Helmet usage increases with ability level, rising from 26% usage by beginners, to 34% by intermediates, to 48% by advanced and expert participants. Following a visit to Engelberg, Switzerland, in March 2008, we were under the impression that most people were wearing helmets while skiing and snowboarding. This was perhaps even more noticeable on the bus and the streets as a lot of people were still wearing their helmets (because it is easier to keep the helmet on your head than to carry it with skis, poles, gloves, etc.).
Therefore, helmets are a good idea and will protect you against many of the common injuries that the head is susceptible too. They are especially important for children, who are at highest risk of snow sport injuries.
And finally, and most importantly, do wear the helmet – don’t leave it at home or in your car boot!

Bostonkneeandhipservice.org.uk

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