



ATHLETE'S EDGE



EDITOR'S NOTE:

In this issue of Athlete's Edge, we take a detailed look at a serious injury that we see in hockey players... ACL tears. These injuries can cause a player to miss a whole season of hockey and can have serious consequences. In the second article, we introduce neuropsychological testing which is becoming the standard for detecting the effects of concussion.

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ACL TEARS OF THE KNEE

"I blew out my knee!" Have you ever yelled out this phrase? Knee injuries are very common in hockey players. One of the more serious injuries involves the **anterior cruciate ligament (ACL)**.

A **ligament** is a rope-like structure that holds two bones together. In your knee, there are four main ligaments (see Figure 1). The ACL acts to prevent the tibia (shin bone) from shifting forward in relation to the femur (thigh bone), and also helps to prevent rotational movements between these two bones.

Sports that involve **pivoting, stops and starts**, or **contact** between players have a higher risk of ACL injuries. Usually, if you tear your ACL, there is considerable pain, swelling that occurs quickly, and occasionally a "pop" sensation.

A **physician** who has experience at diagnosing ACL injuries should be able to tell the extent of injury through physical examination. ACL tears can be complete or partial ("stretching"). Only rarely would special tests such as magnetic resonance imaging (MRI) be required to diagnose an



ACL tear. X-Rays are usually done to make sure that you have not sustained any bone injury.

The **initial treatment** of an ACL tear will consist of measures to decrease the swelling, such as frequent **icing** and non-steroidal anti-inflammatory medications (e.g., naproxen). **Physiotherapy** is very important in regaining your knee range of mo-

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*The sports medicine newsletter for the Region of Waterloo,
supporting the safe pursuit of sports
and physical activity*

ACL TEARS OF THE KNEE (CONT'D)

ACL =
anterior
cruciate
ligament

**High risk
sports for
ACL injuries:**

-contact
sports
(e.g., hockey,
football)
-pivoting
sports
(e.g., soccer,
basketball)

Treatment:
-physiotherapy
-sport-specific
rehab
-bracing
-possibly
surgery

tion and preventing excessive muscle wasting. Occasionally, the physician will prescribe a temporary brace for the first two weeks to protect your knee. Once your knee starts to settle down, the physiotherapist will show you some particular **strengthening** (especially hamstring strength) and **balance exercises** which are very important in the rehab of your knee.

With appropriate treatment of an isolated ACL tear, your knee should be feeling good within six weeks (there will be decreased pain and swelling because the inflammation has settled down). Unfortunately, the torn ACL does not heal or "tighten up". Once an ACL is completely torn, it stays torn.

The big problem with this situation is that an ACL-deficient knee does not function properly. If you return to a contact sport or a sport with a lot of pivoting (hockey, football, soccer, basketball, etc.) your knee will probably give out again. Every time your knee gives out (knee instability), you risk causing other damage to your knee such as cartilage tears, and possibly **long-term problems** such as osteoarthritis. I have seen a twenty year-old soccer player with arthritis in her knee only

three years after initially injuring and failing to treat her ACL tear.

To try to prevent this knee instability, a physician can prescribe a special **custom-fit ACL brace**. This type of brace can be used on a daily basis in the rehab period and later to help to prevent knee instability in high-risk situations such as pivoting or contact sports. In general, these braces are well-tolerated since they are custom-fit and made of strong light-weight materials such as titanium and carbon-fibre.

Depending on your sport or activity level, you may require **surgery to reconstruct your ACL**. Surgical reconstruction comes the closest to getting your knee back to normal. If your sport does not involve any pivoting (e.g., road cycling) then you probably will not need surgery (unless your knee gives out during daily activities, which can sometimes happen!).

Surgery is usually the best option for individuals who play hockey and other pivoting and contact sports. In the realm of sports injuries, ACL surgery is a fairly large procedure and the surgeon has to be skilled at this type of operation. You have to be very dedicated to working hard at

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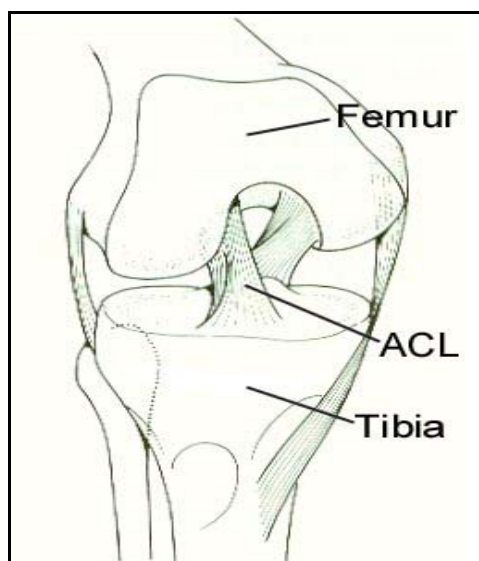


Figure 1: Knee anatomy

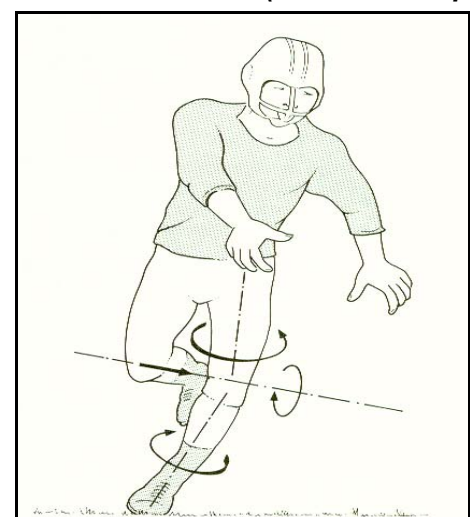


Figure 2: Mechanism of ACL injury (non-contact)

Figures modified from Oxford Textbook of Sports Medicine, 1996.

Neuropsychological Testing for Concussions

Why has every player in the National Hockey League and National Football League undergone **neuropsychological testing**? Although it may sound a little scary, "neuropsychological testing" is quickly becoming the standard for detecting the negative effects of concussions in sports.

A **concussion** is any head injury that results in symptoms such as headache, dizziness, nausea/vomiting and loss of concentration (see previous issues of Athlete's Edge, Vol.1/No.1 and Vol.2/No.5). Over the past decade, the long-term effects of concussions suffered by athletes have become more obvious.

Recent research studies in the United States and Europe have shown decreased cognitive function (e.g., difficulty concentrating, memory problems, learning abilities) in soccer players and football players who have suffered multiple concussions. Some effects can be seen even after a history of only two concussions, and can be made worse if an athlete has a pre-existing learning disability.

In treating numerous athletes with concussions in our practices, we have seen many of the harmful **consequences of multiple concussions**. Along with the concentration, memory and attention difficulties, athletes can suffer from chronic headaches, fatigue, irritability and other mood problems. Not only can these effects put a player's sports career in jeopardy, but they can have severe consequences on school performance, work potential and social relationships.

Neuropsychological assessment involves a series

of tests administered by a neuropsychologist who is a specialist in conducting and interpreting these tests. A typical neuropsychological assessment for athletes usually takes less than an hour to complete and will examine abilities such as memory, attention, concentration, and information processing.

The great use of neuropsychological testing is that it can **detect subtle changes in brain function**. A typical scenario involves a player that has sustained multiple concussions and is worried that he or she may have sustained permanent damage. In the past year, we have found this testing to be very helpful in making deci-

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Common concussion symptoms:

- headache
- dizziness
- light-headedness
- nausea
- memory disturbance
- lack of concentration
- lack of attention
- lack of coordination

Long-term effects of multiple concussions:

- chronic headaches
- fatigue
- learning difficulties
- problems with concentration
- memory problems
- mood disorders



ATHLETE'S EDGE

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Athlete's Edge supports community and amateur sports and activities in the Kitchener-Waterloo region. For more information or to provide feedback, please call or write us at:

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Since 1986, over 30 000 athletes and active individuals have relied on the experience and expertise of the medical and therapy staff of WSM.

The doctors and therapists are now joined by massage therapy, sport nutrition, sport psychology and orthotic services to provide complete care for our exercising patients.

ACL Tears of the Knee (cont'd)

physiotherapy for several months after surgery to help ensure a successful outcome.

In general, the earliest you can **return to contact and pivoting sports** after ACL surgery is six months. Often, this period is closer to nine months. Going back too early can result in re-injuries since the reconstructed ACL will not be strong enough. Usually, you will be using the ACL brace after surgery in the rehab and also for the first year afterwards.

Although an ACL tear is a big injury, it is not the end of the world. For example, Pavel Bure of the Florida Panthers returned from ACL surgery last year. With appropriate treatment, most athletes are able to return to the same level of activity they were at prior to injury.

-by Dr. Trevor L. Hall and Dr. Robert Lee. *Drs. Hall and Lee are sport medicine physicians at WSM.*

Thanks!!! #1

Special thank you to Bryn Harris who contributed her technical writing expertise in the editing of this newsletter

Thanks!!!! #2

We would like to thank the **Waterloo and Kitchener Minor Hockey Associations** for their assistance in distributing this newsletter.

Have a great season!!

Neuropsychological Testing in Hockey (cont'd)

sions on whether a player should risk going back to play following a history of multiple head injuries.

Neuropsychological assessment is more useful if a player has a "**baseline**" test before he or she ever sustains a concussion. Then, if this player sustains a concussion, a follow-up test can be done and compared to the baseline test. This information can then be used to determine when the player can safely return to playing contact sports.

Within the last couple of years, both the National Hockey League and the National Football League have instituted programs of baseline and follow-up neuropsychological testing. Last year, the University of Waterloo instituted a similar program for the varsity hockey players. The Kitchener Rangers have also started a similar program.

Research is on-going in the area of neuropsychological testing. As more information is obtained, the great usefulness of neuropsychological testing in the management of concussions is becoming more and more obvious.

-by Dr. Trevor L. Hall
and Dr. Paula Dimeck

Dr. Dimeck is a registered neuropsychologist at the University of Waterloo. Drs. Hall and Dimeck have been leading the "UW Concussion Project" which endeavours to conduct baseline neuropsychological testing for varsity athletes. If you would like to arrange to have baseline testing done, or if you would like more information about neuropsychological testing, you can contact Drs. Dimeck and Hall through Waterloo Sports Medicine Centre (see side bar for contact information)