

# ACL INJURY PREVENTION

## Winter 2009 Update

The Injury Prevention Research Laboratory (IPRL) at Uniformed Services University of the Health Sciences (USUHS) partnered with Montgomery Soccer Inc and National Capital Soccer League for another season this fall. We continue to work hard to implement the ACL Injury Prevention Program with many of their U14-U18 teams. The IPRL also has a new partnership with Bethesda Soccer Club! We're very excited to be partnering with many BSC teams and look forward to decreasing ACL injury risk and the number of injuries during their seasons.

Each participating team follows a 10 minute warm-up program designed to reduce the number of ACL and other lower-extremity injuries during the season. Each player is given the opportunity to enroll in a research study that monitors his/her injuries and evaluates each player for certain risk factors before and after the season. Over the past four seasons, we have worked with 36 teams to reduce injuries and 331 players have enrolled in the research study.

I'd like to provide coaches, parents and players with a brief update about what we have discovered in the past four seasons. We are very pleased to report reduced injury rates overall and especially for ACL injuries. We have seen improvements in how the players land from a jump due to the program, which will result in a future decline in injury. To our knowledge, there are no leagues that currently implement injury prevention programs to boys teams and only a handful of leagues nationally that perform any type of formal injury prevention. Therefore, we hope this program will expand to help all players in Montgomery County and leads to future development of national and international programs.

### **Review of ACL Injuries**

- 200,000 ACL injuries occur annually in the US, resulting in healthcare costs exceeding 3 billion dollars.
- An average ACL reconstruction surgery costs between \$17,000 and \$20,000.
- The majority of ACL injuries happen to male athletes, although female athletes have a slightly higher risk for injury in soccer.
- Over 80% of athletes who sustain an ACL injury develop arthritis in the knee joint within 15-20 years after the injury.

### **Lower Injury Rates**

The following table gives an idea of the effectiveness of the ACL Injury Prevention Program compared with several other exercise programs studied recently. TUSA-ACL is our sister program being implemented by researchers at UNC-Chapel Hill. As you can see, both programs have had great success in decreasing lower-extremity injuries overall and ACL injuries specifically.

Project	Sport	Sex	ACL Injuries per 1000 Practices		Knee Injuries per 1000 Practices		Lower Extremity Injuries per 1000 Practices	
			No Program	Prevention Program	No Program	Prevention Program	No Program	Prevention Program
<b>MSI/NCSL ACL (Fall 2007-Fall 2008)</b>	Soccer	Girls		0.14		0.72		1.88
		Boys		0.00		0.50		1.01
		Total		0.11		0.67		1.68
<b>TUSA-ACL (Fall 2007-Spring 2008)</b>	Soccer	Girls		0.23		0.62		1.28
		Boys		0.00		0.00		1.18
		Total		0.12		0.31		1.23
<b>Mandelbaum (2005)</b>	Soccer	Girls	0.49	0.09				
<b>Steffen (2008)</b>	Soccer	Girls			0.50	0.60	2.60	2.70
<b>Hewett (1999)</b>	Mixed	Girls			0.43	0.12		
<b>Myklebust (2003)</b>	Handball	Girls	0.76	0.57				
<b>Olsen (2005)</b>	Handball	Girls			0.90	0.50		

### Changes in Movement

Certain movement patterns that occur in soccer, such as landing and cutting incorrectly, are considered risk factors for ACL and other lower extremity injury. When we assess the movement of players involved in the research study, we look for things like the knees collapsing toward each other (valgus), toes turning out, and stiff landings. The following pictures are examples of these risky movements.



Keep knees directly over ankles!



Keep toes pointed straight ahead!



Always land softly – bend your knees!

Evaluation of a player's movement is done with the Landing Error Scoring System (LESS), an analysis tool that keeps track of movement "errors," or potential risk factors for injury. Like in golf, a higher score means there is a lot of room for improvement. An evaluation done by fellow researchers at UNC has shown that LESS scores that start off high (more errors, thus higher risk for injury) in the pre-season can be reduced by performing the injury prevention exercises. Even players with moderate LESS scores in the pre-season show improvement at the end of the season.

We are excited about the positive results we've achieved so far with the ACL Injury Prevention Program. We hope that you'll continue to work with us to better define how we can prevent devastating knee injuries for youth soccer players. Ultimately, we aim to develop the most effective and least time-consuming injury prevention program that teams all over the country will benefit from. If you have any comments or suggestions for ways to improve the program for your team, please don't hesitate to contact us!

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