

# Universal neuromuscular training an inexpensive, effective way to reduce ACL injuries in athletes

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As participation in high-demand sports such as basketball and soccer has increased over the past decade, so has the number of anterior cruciate ligament (ACL) injuries in teens and young adults. In a study appearing today in the *Journal of Bone and Joint Surgery (JBJS)* (a research summary was presented at the 2014 Annual Meeting of the American Academy of Orthopaedic Surgeons in March), researchers found that universal neuromuscular training for high school and college-age athletes—which focuses on the optimal way to bend, jump, land and pivot the knee—is an effective and inexpensive way to avoid ACL sprains and tears.

The ACL is a critical ligament that stabilizes the knee joint. An ACL injury, one of the most common sports injuries affecting approximately 200,000 Americans each year, often requires surgery and a lengthy period of rehabilitation. Recent research has found that [screening](#) tools such as a "hop test" or isokinetic dynamometer which measure muscle strength to identify neuromuscular deficits, as well as neuromuscular training programs, may reduce ACL injuries.

Researchers evaluated three strategies for young athletes: no training or screening, universal neuromuscular training, and universal screening with neuromuscular training for identified high-risk athletes only. The research used a mathematical model for risk and screening based on published data on real student athletes, ages 14-22. Costs of training and

screening programs were estimated based on existing literature. Anterior cruciate ligament surgical costs were estimated at between \$5,000 and \$17,000, with costs running as high as \$38,000.

Among the findings:

- On average, universal training reduced the incidence of ACL injury by 63 percent (from 3 to 1.1 percent per season), while the screening program, on average, reduced the incidence rate by 40 percent (from 3 to 1.8 percent).
- Out of 10,000 athletes, the model predicted 300 ACL injuries in the no-screening group, 110 in the universal training group, and 180 in the universal training/screening for "at risk" athletes group.
- Researchers estimated the cost of implementing a universal training program, including coach and player instruction, at approximately \$1.25 per day, saving an average of \$275 per player, per season in injury-related costs.

"Use of both preventative measures and screening tools sounds appealing, but often there are significant financial, administrative and social hurdles that have to be overcome before they can be implemented on a widespread level," said lead study author Eric F. Swart, MD, an orthopaedic resident at Columbia University Medical Center in New York.

"While we were not surprised that training was more cost-effective than no intervention, we were impressed at the magnitude of the benefit," said Dr. Swart. "According to our model, training was so much less expensive and so much more effective than we anticipated. In addition, fewer players injured mean fewer surgical reconstruction procedures, which also saves money. The research suggests that widely implementing a universal [training](#) strategy could actually pay for itself in terms of

injuries prevented and surgeries avoided, which makes a very appealing case for primary prevention."

Provided by American Academy of Orthopaedic Surgeons

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