

ACL injuries on the rise, but evidence-based program can reduce risk: clinical report

by **Robert Musinski** • Correspondent

When a young athlete collapses in pain because of a knee injury, thoughts quickly turn to the worst-case scenario: an anterior cruciate ligament (ACL) injury.



Thankfully, the outlook for ACL injury recovery has improved, mainly because surgeons are using a less invasive procedure that does not damage the growth plate and allows most athletes to continue playing a high-impact sport after recovery.

Also, specific exercises have been shown to reduce the chance of ACL injuries, especially in young women, according to *Anterior Cruciate Ligament Injuries: Diagnosis, Treatment and Prevention (Pediatrics. 2014;133:e1437-e1450)*, a new clinical report from the AAP Council on Sports Medicine and Fitness and the Section on Orthopaedics.

The report is a comprehensive look at ACL injuries and includes the latest information about risk factors, consequences, diagnosis, treatment and prevention.

ACL a household term

If you say “ACL injury,” most people not only will know what it means, they’ll likely cringe when they hear it. That familiarity is an unfortunate byproduct of the increase in the injuries, especially in young women.

Two of the main theories to explain the rise in ACL tears are that more children are participating in organized sports at an earlier age, and the frequency and intensity of this training has increased substantially.

The ACL is one of the four major ligaments that stabilize the knee joint. Among other things, it provides protection for the menisci during some of the most common jumping and pivoting moves that take place during athletic events and training.

The risk for this injury starts to increase significantly among girls at 12 to 13 years of age and among boys at 14 to 15 years, according to the report. The largest number of ACL injuries is among female athletes ages 15 to 20. Among high school and college athletes, females have two to six times higher ACL injury rates than males in similar sports. Girls also are more likely to have surgery and less likely to return to sports after an ACL injury.

The negative consequences of ACL injuries are many, including possible surgery with seven to nine months of rehabilitation.



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A new AAP clinical report takes a comprehensive look at anterior cruciate ligament injuries and includes the latest information on risk factors, consequences, diagnosis, treatment and prevention.

Long-term health is affected, too: Studies have found 10 to 20 years after an ACL injury, the rates of degenerative knee osteoarthritis are greater than 50% regardless of whether the ACL was surgically repaired.



“This is significant,” said Cynthia R. LaBella, M.D., FAAP, a member of the Council on Sports Medicine and Fitness Executive Committee and lead author of the report. “It means adolescents with ACL injuries will likely be facing osteoarthritis in their 30s. This can limit daily function and participation in physical activities.”

Diagnosis and treatment

The widely used Lachman test is considered the most valid method for physicians to determine ACL tears, according to the report. Doctors also ought to obtain plain radiographs to rule out other causes. Magnetic resonance imaging is not essential but can be a valuable ancillary tool.

Although an ACL tear is not considered a surgical emergency, many patients and their families choose surgery because it can allow the athlete to continue his/her career and make the knee more stable. In the past, it was common to delay surgery until the child reached skeletal maturity.

“In the last five years, the sophistication of the surgery has improved — you don’t touch the growth plate when you do the surgery,” said William L. Hennrikus, M.D., FAAP, immediate past chair of the Section on Orthopaedics Executive Committee and a co-author of the report. The operation is different than the ACL procedure on an adult, he said.



ACL surgery is about 90% successful in restoring knee stability and patient satisfaction, according to the report. Pediatricians can work with surgeons to help families decide on the best option for an athlete.

“It takes a couple of meetings for families to understand the nuances of the decision,” Dr. Hennrikus said. “Talking to a pediatrician and an orthopedic doctor is very helpful. In most cases, once the family had a good discussion of all the pros and cons and different issues, they will make a wise decision.”

Prevention beyond the brace

The most likely predictor of future ACL injury, according to the report, is a prior ACL tear. Even though many athletes wear a brace after surgery, prophylactic bracing is not effective in decreasing the risk of another ACL tear.

The report highlights a better option: neuromuscular training programs that teach athletes to “preprogram” safer movement patterns that can reduce injury risk during activities.

The exercises are most valuable for female athletes 14 to 18 years old. A meta-analysis that pooled data from 11 studies showed a 72% reduction in ACL injury among female adolescents.

“Physicians and the public should know there are evidence-based programs out there that show a reduced risk of ACL injury even if an athlete has never had one, but especially if the athlete has had one,” Dr. LaBella said.

The programs include a combination of strengthening exercises — especially for the gluteal and hamstring muscles — balance training and plyometrics, which are repetitive jumping exercises that build power and strength.

“The most important part is the plyometrics — and to give girls feedback on the position of their hips and knees, specifically which positions are safe/unsafe,” she said.

RESOURCES

- Watch an *AAP News* video for pediatricians, at www.aapnews.org.
- Read a summary of the ACL report’s conclusions and guidance for clinicians at <http://aapnews.aapublications.org/content/35/5/11.1.full>.
- Visit the AAP Council on Sports Medicine and Fitness web page for more video resources on ACL injuries at <http://bit.ly/1k3iufM>.