

ACL Injuries

Anatomy of the Knee Joint^{1,3}

- The thighbone (femur), shinbone (tibia) and kneecap (patella) form the knee joint
- The bones are connected by four ligaments

Collateral Ligaments:

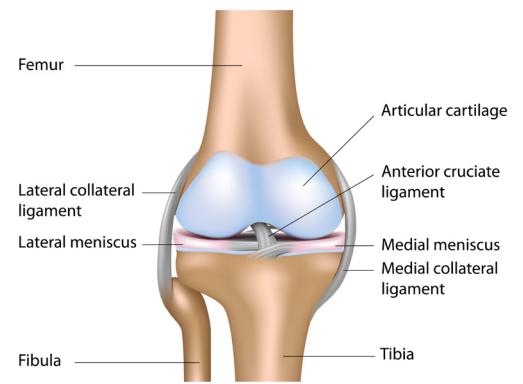
These ligaments stabilize against side-to-side motion of the knee.

1. Medial Collateral Ligament (MCL) - Inside of the knee
2. Lateral Collateral Ligament (LCL) - Outside of the knee

Cruciate Ligaments:

These ligaments are inside the joint and cross each other, forming an 'x'. As a result, these ligaments are able to stabilize against excessive forward and backward motion of the knee.

3. Anterior Cruciate Ligament – Attached from the front of the shinbone to the back of the thighbone
4. Posterior Cruciate Ligament – Attached from the back of the shinbone to the front of the thighbone



The Anterior Cruciate Ligament (ACL)^{1,2,4}

Primary function: to prevent the shinbone from excessive forward movement.

Causes of Injury:

- Sudden change in direction*
- Abrupt stop or slowing down*
- Improper landing from a jump*
- Direct contact or collision

Symptoms of Injury:

- Pain and swelling
- Apparent instability of the knee joint
- Tenderness in and around the knee
- Inability or discomfort while walking

*Non-contact injuries account for 70-80% of all ACL injuries².

CONNECT WITH US:

1.888.977.8143
Halifax, Nova Scotia

twitter.com/springloadedtec
facebook.com/springloadedtechnology

Studies show that teenage and adult females may be 2-8x more likely to experience a non-contact ACL injury compared to males due to a variety of potential differences including^{2,4}:

- Anatomical (e.g., pelvic and leg alignment)
- Neuromuscular coordination and control
- Muscular strength
- Hormones

Injury Diagnosis¹

- Ligament damage is referred to as a sprain

Sprain Severity Scale

Grade 1	Grade 2	Grade 3
<ul style="list-style-type: none">• Mild damage• Still able to keep joint stable	<ul style="list-style-type: none">• Partial tear of the ligament• Ligament becomes stretched	<ul style="list-style-type: none">• Complete tear• Knee joint becomes unstable• *Majority of ACL injuries are complete or severe tears

Physical Examination¹

Your doctor is likely able to diagnose an ACL injury using a physical examination that tests the structures of your injured knee compared to your non-injured knee.

Imaging¹

Your doctor may confirm a diagnosis using:

- MRI Scan – used to image soft tissue structure such as ligaments, tendons and muscles
- X-Ray – may be used to check for associated fractures or broken bones

Treatment^{1,2,4,5}

Unfortunately, an ACL tear will not heal by itself without surgical intervention. In elderly individuals or those who have a low activity level, non-surgical treatment options may be appropriate.

Younger, active individuals likely need ACL reconstruction surgery in order to safely return to their usual activities.

CONNECT WITH US:

1.888.977.8143
Halifax, Nova Scotia

twitter.com/springloadedtec
facebook.com/springloadedtechnology



springloadedtechnology.com

Surgical Treatment

Physical Therapy:

A rehabilitation program with specific exercises and goals will be set. The goal of physical therapy is to restore function and eliminate pain. After surgery, rehab will continue with the ultimate goal of returning to regular activity and sport.

ACL Reconstruction:

Surgically rebuilding the ligament. Torn ligament replaced with graft – often taken from the hamstring or a cadaver (allograft).

ACL Surgery Video:

<http://orthoinfo.aaos.org/topic.cfm?topic=a00297>

Courtesy of Visual Health Solutions, Inc.

Non-Surgical Treatment

Knee Bracing:

Increase stability and mobility while reducing pain

Physical Therapy:

A rehabilitation program with specific exercises and goals will be set. The ultimate goal of physical therapy is to restore function and eliminate pain.

Rehabilitation^{1,4,5}

Duration: 6-9 months post-surgery:

Week 1-2

- Pain and inflammation management
- Gradually restore knee range of motion

Week 3-6

- Progressive weight-bearing
- Gradually restore and increase leg strength

Week 7-12

- Advanced strengthening
- Start activity specific rehabilitation program

Month 4+

- Continue physical therapy and training
- Progress and return to activity after meeting goals and feeling comfortable and confident

CONNECT WITH US:

1.888.977.8143
Halifax, Nova Scotia

twitter.com/springloadedtec
facebook.com/springloadedtechnology



springloadedtechnology.com

References

1. American Academy of Orthopaedic Surgeons. (2016). Anterior Cruciate Ligament (ACL) Injuries. OrthoInfo. <http://orthoinfo.aaos.org/topic.cfm?topic=a00549>
2. Arendt, E., Agel, J., & Dick, R. (1999). Anterior cruciate ligament injury patterns among collegiate men and women. *Journal of Athletic Training*, 34(2), 86–92.
3. Chhabra, A., Starman, J. S., Ferretti, M., Vidal, A. F., Zantop, T., & Fu, F. H. (2006). Anatomic, Radiographic, Biomechanical, and Kinematic Evaluation of the Anterior Cruciate Ligament and Its Two Functional Bundles. *J Bone Joint Surg Am*, 88, 2–10. <http://doi.org/10.2106/JBJS.F.00616>
4. De Ste Croix, M. B., Priestley, M., Lloyd, R. S., & Oliver, J. L. (2015). ACL injury risk in elite female youth soccer: Changes in neuromuscular control of the knee following soccer-specific fatigue. *Scandinavian Journal of Medicine & Science in Sports*, 25(5), e531–e538. <http://doi.org/10.1111/sms.12355>
5. Sports Injury Clinic. (2015). Treatment for ACL injuries. Accessed Aug. 5, 2016. Retrieved from <http://www.sportsinjuryclinic.net/sport-injuries/knee-pain/acl-injury/rehabilitation-acl-injury>

Information prepared by Matthew Kivell, B.Kin.

CONNECT WITH US:

1.888.977.8143
Halifax, Nova Scotia

twitter.com/springloadedtec
facebook.com/springloadedtechnology



springloadedtechnology.com