

Source Link	Annotation
<p>professional, Cleveland Clinic medical. "What Are Signs You Need a Knee Brace?" <i>Cleveland Clinic</i>, 29 Dec. 2025, <a href="https://my.clevelandclinic.org/health/treatments/21034-knee-brace">my.clevelandclinic.org/health/treatments/21034-knee-brace</a>.</p>	<p>This is a page from the Cleveland Clinic health website for people considering using a knee brace. The article breaks down the uses for a knee brace and the potential risks of using one. What is important to my capstone is the way they explain the function of a brace and the different types. There is a large difference between a brace, a support, and a sleeve. I want to create a combination of all three. Relief comes from compressing the tissue in the knee to reduce stress on the area.</p>
<p>Grande, Anthony. "How Does a Knee Brace Work? - Focusphysiotherapy." <i>Physiotherapy, Rehabilitation &amp; Sports Injury Clinic</i>, 29 May 2025, <a href="https://www.focusphysiotherapy.com/how-knee-support-works">www.focusphysiotherapy.com/how-knee-support-works</a>.</p>	<p>This <i>Focus Physiotherapy</i> article explains how knee braces conduct pain management and even injury prevention. It also examines the three brace types: compression sleeves for support, hinged braces that give stability and stabilizers for aligning the knee cap. The site is important to my capstone because of how it explains the biomedical functions that are best in each design. For example, compression can increase blood flow and reduce swelling but could cause extra pain at times. The article reinstates how important it is to have a knee brace that fits the individual circumstances.</p>
<p>RaleighBoneJoint, and RaleighBoneJoint. "Your Guide to the Types of Knee Braces and Which One Is Best for You." <i>The Bone and Joint Surgery Clinic</i>, 26 Aug. 2025, <a href="https://raleighboneandjoint.com/news/guide-to-knee-brace-types">raleighboneandjoint.com/news/guide-to-knee-brace-types</a>.</p>	<p>This is an article from Raleigh Bone and Joint Surgery Clinic about the six types of braces. The styles they describe are: functional braces, immobilizers, sleeves, patellofemoral braces, prophylactic braces, and unloader braces. This list is longer than the last two sources but many of them can be grouped together. That said, it does present new ideas. What the article dives deepest into is the specific functional differences between sleeve and nonsleeve designs. There are also styles ment to restrict movement and others to limit damage from weight shifting.</p>
<p>Spring Loaded Technology. "The Spring Loaded Solution - Spring Loaded Technology." <i>Spring Loaded Technology</i>, 6 Apr. 2025, <a href="https://www.springloaded.com/the-spring-loaded-solution">www.springloaded.com/the-spring-loaded-solution</a>.</p>	<p>Spring Loaded is a commercial medicine company so some information is biased. The site explains their specific brace and the proven benefits. The brace is a traditional jointed brace with spring loaded elements. This is an interesting prospect for my capstone because it relies on a unique design element that I could exploit to make the brace personal. The technology reduces the pressure across the knee joint by 40% equivalent to 45 lbs.. Unlike other offloader braces, this brace design provides relief and strengthens to the whole leg.</p>
<p>"Unloader Knee Brace   Osteoarthritis Support   Orthotics</p>	<p>This is a page from Orthotics Plus explaining benefits of the unloader knee brace. The article breaks down how</p>

<p>Plus Melbourne.” Orthotics Plus Melbourne, 24 Oct. 2025, <a href="http://orthoticsplus.com.au/orthotics/knee/unloader-brace">orthoticsplus.com.au/orthotics/knee/unloader-brace</a>.</p>	<p>unloader braces work specifically with my specific injury that effects the medial and lateral compartments of the knee. What I will take into my capstone is the three-point pressure system that redistributes the load on the knee. This is especially helpful for preexisting damages but is also beneficial in prevention. There are also fewer negative symptoms than a sleeve brace. The unloader corrects the mechanisms of the leg to give a lasting solution unlike other designs.</p>
<p>Kagan, David. “The Physics of Catchers’ Knees   the Hardball Times.” The Hardball Times, 21 July 2016, <a href="http://tbt.fangraphs.com/the-physics-of-catchers-knees">tbt.fangraphs.com/the-physics-of-catchers-knees</a>.</p>	<p>Fangraphs is a baseball specific site with everything about baseball. This is an article about the physics of catchers knees while squatting and what causes pain. The article uses physics principles and mechanics to explain the stress put on the joint. What is most shocking is the <b>the upward force on each knee increases from 90 pounds when standing to 630 pounds while squatting due to the body’s center of mass being behind the knees</b>. That creates a reacting requiring additional forces that prevent rotation and increase pressure on the knee. This is why strengthening the surrounding muscles is beneficial.</p>
<p>Schattinger, Chris. “Knee Pain in Catchers: A Brief Introduction to Patellofemoral Pain Syndrome by Chris Schattinger M.S., CSCS, CISSN — BRACEUNDER.” BRACEUNDER, 14 Aug. 2017, <a href="http://www.braceunder.com/blog/2017/8/14/knee-pain-in-catchers-a-brief-introduction-to-patellofemoral-pain-syndrome-by-chris-schattinger-ms-cs-cissn">www.braceunder.com/blog/2017/8/14/knee-pain-in-catchers-a-brief-introduction-to-patellofemoral-pain-syndrome-by-chris-schattinger-ms-cs-cissn</a>.</p>	<p>This is a short blog posting that is meant to be an introduction to Patellofemoral Pain Syndrome(PFPS) in catchers. Pain occurs where the kneecap meets the femur bone and is sparked by overuse. There are a few diagrams that will be helpful to my capstone of the differences between standing and squatting. Another thing that is important to the topic is how ground force is distributed throughout the body. When standing, ground force is distributed equally. However when squatting, the pressure is fixated on the knee joint. Spending extended time in a squated position causes an excessive cumulation of force which heightens the chances of PFPS.</p>
<p>Patellofemoral Pain Syndrome - OrthoInfo - AAOS. <a href="http://orthoinfo.aaos.org/en/diseases--conditions/patellofemoral-pain-syndrome">orthoinfo.aaos.org/en/diseases--conditions/patellofemoral-pain-syndrome</a>.</p>	<p>This is the American Academy of Orthopaedic Surgeons website. The article explains Patellofemoral Pain Syndrome. They characterize the syndrome as “pain in the front of the knee caused by issues with kneecap tracking in the trochlear groove.” They also had very helpful information about what causes the pain. Abnormalities in the patellar creates increased pressure between the patella and trochlea which irritates soft tissue. Increased pressure in the knee causes imbalances in the rest of the leg. Quad and hip muscles can be affected which leads to leg alignment problems magnified by more squatting.</p>

<p>“Patellofemoral Pain Syndrome - Symptoms and Causes.” Mayo Clinic,  <a href="http://www.mayoclinic.org/diseases-conditions/patellofemoral-pain-syndrome/symptoms-causes/syc-20350792">www.mayoclinic.org/diseases-conditions/patellofemoral-pain-syndrome/symptoms-causes/syc-20350792</a>  .</p>	<p>This is a page from Mayo Clinic about PFPS symptoms and causes. The article also distinguishes the condition as abnormal pain in the knee around the kneecap. It is also called runner’s knee. Many track and field jumpers and long distance runners have it. This is important because I am able to extend my focus to more than just catchers. The article identifies multiple causes such as overuse but also preexisting muscle imbalance or misalignment. Misalignment forces the knee cap to be out of place allowing buildup and unsmooth joint movement.</p>
<p>Halabchi, Farzin, et al.  “Patellofemoral Pain in Athletes: Clinical Perspectives.” Open Access Journal of Sports Medicine, vol. Volume 8, Oct. 2017, pp. 189–203.  <a href="https://doi.org/10.2147/oajsm.s127359">https://doi.org/10.2147/oajsm.s127359</a>.</p>	<p>This article from the Open Access Journal of Sports Medicine reviews PFPS specifically in athletes. 25-30% of sports medicine clinic visits are from jumping or cutting sports. The best information from the site was about risk factors broken down across the leg. Physical thearapists test with squatting motions and treatment requires individualised approaches that address weakened muscles with strengthening surrounding muscles, tape, braces, and physical therapy.</p>