

**2024 PSBR High School Essay Contest**  
**3<sup>rd</sup> Place**

**Allie B.**

Schuylkill Haven Area High School  
Schuylkill Haven, PA

Prior to my teenage years, I never gave much thought to knee pain. I could go about my day completely pain-free, and my favorite physical activities were easy to manage. Then, in eighth grade, my knees started to become slightly bothersome. The pain was minor, so I believed it was merely an injury from dance class and the pain would disappear with a day or two of rest. I was mistaken. The pain started getting worse, and eventually, I went to see a doctor. That was when my life was changed forever.

Patellofemoral syndrome is a condition of anterior knee pain, caused from high levels of cartilage stress and strain on the patellofemoral joint. It can also be caused from weakness in the quadriceps, or thigh muscles. Muscles in the thighs are designed to help hold the patella, or kneecap, in place, and when these muscles weaken, the placement of the kneecap can shift. Patellofemoral syndrome can also arise due to excess fluid in the knees, which can cause pain by harming the muscles. Extra fluid can also be linked to weaker thigh muscles, as high amounts put more pressure on these muscles. This condition is common in athletes who partake in activities that require heavy use of the knees, such as running and dance. Simple tasks, such as climbing the stairs, are a high risk factor for this condition.

A version of this syndrome is also found in dogs. Patellar luxation occurs when the kneecap shifts out of place. This is often found in smaller dog breeds, such as Pomeranians, Chihuahuas, and French Bulldogs. As in humans, this usually occurs from high strain on the patella. Dogs with patellar luxation suffer pain from a malalignment of the upper leg bones, such as the thigh, knee, and hip. Pain may also arise from having a shallow thigh bone groove, which, once found, can be corrected through surgical procedures. This operation involves deepening the end of the femur, or thighbone, loosening any muscles that are causing excessive strain on the knee, tightening the tissue that holds the kneecap in place, and finally, adjusting the position of the knee. In almost all cases, this surgery has no complications and the outcome is a permanent correction of the knee.

Several treatment options are currently available for both patellar luxation and patellofemoral pain syndrome. Humans affected by this knee pain can ease discomfort through the RICE method: rest, ice, elevation, and compression. This method allows the knee and thigh muscles time to heal, while also focusing on decreasing any swelling caused by excess fluid. Physical therapy can also be a way of correcting this issue for both affected humans and dogs. With humans, this ailment requires around six weeks of treatment, during which the focus will be strengthening the thigh muscles and working on flexibility to shift the kneecap back into place. In dogs, physical therapy treatment usually occurs after the surgery, and focuses on strengthening the knee for normal usage of the limb.

Research on patellar luxation and its effect on dogs can assist in better understanding the effects of patellofemoral syndrome on humans and how to effectively treat this condition. From 2009 to 2014, a study was conducted in England on patellar luxation. This study was done for further awareness of patellar luxation and how it affects dogs, because prior to this, there was not much information widely available. A total of 210,824 dogs from eleven different breeds were used in the study, from 119 clinics throughout England, in which 751 cases of patellar luxation were found, or about 1.3%. Out of these cases, nearly 100 dogs were referred to surgical treatment. Following the study, it was decided that when breeding specific dog breeds, especially smaller ones who are more prone to patellar luxation, breeders should be wary that this disorder could occur. While humans are obviously not bred, doctors can still use this study to their advantage. Similar to what was done in the study, physical therapists and orthopedic surgeons who handle knee injuries can search for any genetic trends in those with patellofemoral pain syndrome. With all hope, this study will assist doctors with finding even more effective treatments for this condition, and potentially preventative measures for those at risk.

Patellofemoral syndrome is something that is a large part of my life, but further research can help ease my pain. Perhaps one day, I will be completely pain-free again.

#### Works Cited

Bump, Jared M, and Lindsay Lewis. "Patellofemoral Syndrome." Nih.gov, StatPearls Publishing, 13 Feb. 2023, [www.ncbi.nlm.nih.gov/books/NBK557657/](http://www.ncbi.nlm.nih.gov/books/NBK557657/).

Cohen, Aly. "Patellar Luxation." Cornell University College of Veterinary Medicine, 24 Feb. 2023, [www.vet.cornell.edu/departments/riney-canine-health-center/canine-health-information/patellar-luxation#:~:text=Patellar%20luxation%20occurs%20when%20the](http://www.vet.cornell.edu/departments/riney-canine-health-center/canine-health-information/patellar-luxation#:~:text=Patellar%20luxation%20occurs%20when%20the).

O'Neill, Dan G., et al. "The Epidemiology of Patellar Luxation in Dogs Attending Primary-Care Veterinary Practices in England." *Canine Genetics and Epidemiology*, vol. 3, no. 1, 8 June 2016, [cgejournal.biomedcentral.com/articles/10.1186/s40575-016-0034-0](http://cgejournal.biomedcentral.com/articles/10.1186/s40575-016-0034-0), <https://doi.org/10.1186/s40575-016-0034-0>.

Sisk, Daniel, and Michael Fredericson. "Update of Risk Factors, Diagnosis, and Management of Patellofemoral Pain." *Current Reviews in Musculoskeletal Medicine*, vol. 12, no. 4, 26 Nov. 2019, <https://doi.org/10.1007/s12178-019-09593-z>.

Veterinary Surgical Centers. "Medial Patella Luxation (MPL)." Veterinary Surgical Centers, 29 Oct. 2014, [www.vscvets.com/surgery/surgery-procedures/medial-patella-luxation-mpl](http://www.vscvets.com/surgery/surgery-procedures/medial-patella-luxation-mpl).