

Improving Veterinary Medicine

An Non-Invasive Treatment For Luxating Patella

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Introduction

Veterinary Medicine is the branch of medicine that deals with the prevention, diagnosis and treatment of disease, disorder and injury in animals.

This field is prominent in every pet owner's life, as they experience the health conditions and expenses of their pet in order to provide them a healthy life.

Through my internship, I concluded possible solutions to common health conditions that not only improved pet's lives, but also the owner's.



Background

Luxating Patella:

Luxating patella occurs when the knee cap moves out of its natural position. The patella (knee cap) lies in a cartilaginous groove at the end of the femur at the stifle (Small Animal Topics, n.d). When the groove of the femur becomes too shallow, the patella to slides out of place. This friction weakens the ligaments that hold the patella in place, causing the patella to eventually dislocate

Current Treatments:

Different surgeries can correct the condition such as the reconstruction of soft tissues, deepening of femoral groove, correction with a bone plate, and transposing the tibial crest (Small Animal Topics, n.d). Other treatments include joint supplements, adequan injections, and dietary restrictions.

Luxating Patella Surgery:

The cost of luxating patella surgery alone is about \$4000, then pain medications are prescribed (Actual claims and veterinary costs, n.d). If a large dog suffers from hip dysplasia, it can eventually force the patella out of its groove. Due to the size of larger breeds, the cost for this surgery is about \$8000 (Actual claims and veterinary costs, n.d).



Experience

Shadowing Experience:

- I shadowed at Rockspring Veterinary Clinic from December until March for 104 hours
- I was able to observe numerous patients and noticed how mobility issues were most frequent
- Among the patients with mobility issues, I noticed that luxating patella was the most prevalent, especially in small breed dogs
- I remarked that the patients would be in discomfort, limping, difficulty and refused to bear weight on the affected leg(s)



Duties Performed:

- Provided patients with treats as a means to distract them from the examination
- Comfort hospitalized and boarding patients



Determining Current Problems:

- The main treatment for luxating patella is through surgery, which ranges from \$1,500 to \$3,000 per affected knee for small breed dogs
- I noticed that when owners were offered this treatment, majority found the surgery to be too expensive
- Veterinarians can provide other treatments such as joint supplements, adequan injections, or physical manipulation.
- However, the treatments other than surgery are not as effective
- Furthermore, there are no knee braces that are specifically for luxating patella

Innovation

Designing the Innovation:

- The purpose of the innovation is to provide a cheaper, yet effective treatment for patients that suffer from luxating patella
- The goal of the innovation is to suppress the patella from gliding around in the groove in order to prevent dislocation
- As the patient commences physical activity, the compression brace inhibits the patella from shifting
- This mimics the function of a brace by providing stability to the patella to reduce the severity of the condition



Creating the Innovation:

- I utilized a bike innertube to design a prototype that demonstrates how the brace compresses, and put a gel pack underneath to portray how the brace can act as a cooling or heating agent
- I determined the size of the brace by measuring it on a Jack Russell Terrier model for the comfort of the patient
- I then sealed the innertube to prevent air leakage and attached Velcro to the ends to give the appearance of a brace
- Using a pump, I attached it to the valve in order to fill it with air
- If the brace is accidentally pumped up with too much air, there is a button on the side of the pump that will release some air
- Once the gauge reads a certain psi, the pump is detached, and the cap is sealed onto the valve to secure the air
- I created a table that represents the PSI measurement of the brace in accordance to the patient's weight, as well as the length of time the brace is worn

Recommend Brace Support Application*			
Size	Weight	Pressure	Duration
Toy dog	<5 lbs.	1-1.5 psi	<30 mins.
Small dog	5-10 lbs.	1.5 psi	<30 mins.
Small-Medium dog	10-20 lbs.	1.5-2.0 psi	30-60 mins.
Medium dog	20-30 lbs.	2.0 psi	30-60 mins.
Medium-Large dog	30-50 lbs.	2.0-2.5 psi	60-90 mins.
Large dog	>50 lbs.	3.0 psi	<120 mins.

Conclusion

By listening to the complaints of owners and conversing with my mentors, I was able to create an innovation that provides patients an effective treatment for luxating patella.

My innovation not only benefits the health of patients, but complies with owners that cannot afford surgery for this condition.

A compression brace will prevent rapid progression of luxating patella in a patient's life and will allow owners to potentially save up money to afford the surgery. With this compression brace, patients will be able to perform physical activity more in their life without discomfort.



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Citations

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