Animal Rehab Division

Marchtember 2020

ARD Mission Statement

The Animal Rehabilitation Division of the Canadian Physiotherapy Association advocates that Physiotherapists are the professionals of choice to provide animal rehabilitation. The ARD is a resource for the best practice of animal rehabilitation through education, professional development and communication within the animal health care industry.

ARD Vision Statement

To improve the neuromuscular health of animals;

To promote the advancement of clinical practice in animal rehabilitation;

To increase the awareness of, and access to, animal rehabilitation by Physiotherapists

Table of Contents

Home Team!

Kim Barrett
Co-Chair & Past Treasurer
Edmonton, AB
kim@pawsanimalrehab.ca

Sandra Oxtoby
Knowledge Translation Rep & Past Chair
Calgary, AB
soxtoby@ualberta.ca

Laurie Edge-Hughes
Lobby & Advocacy Lead
Calgary, AB
physio@fourleg.com

Victoria Renwick
Social Media Rep
Vancouver/Chilliwack, BC
victoriakc@live.ca

Miranda Shumborski
Newsletter Editor
Past Student Rep
Edmonton, AB
mshumbor@ualberta.ca

Courtney DeVries
Past Secretary
Vernon, BC

Carrie Smith
Co-Chair
Kemptville, ON
carriephysio@bellnet.ca

Donna Hennig
Education Lead & Treasurer
Edmonton, AB
donnahennig339@gmail.com

Sue Van Evra
Lobby & Advocacy Committee
Calgary, AB
svanevra@gmail.com

Shauna Slobodian
Secretary
Kingston, ON
shauna@pawsitivelyfit.ca

Annabelle Bissonnette
Student Rep

Jen McNutt
Education Committee
Nelson, BC
kootenaycaninerehab@gmail.com

Nikita Harvey
Communications Committee
Kaslo, BC

We've Grown!

And have done some re-arranging!

WELCOME TO SHAUNA AND ANNABELLE!

ARD CO-CHAIR REPORT

Carrie Smith

What interesting times we live in! Covid, droughts, Vet Colleges…oh my! Here's hoping that the last few months of 2020 are a little better than the first half!

I am grateful that I have a canine clinic as well as a human clinic in these times. Canine rehab clinics follow the Veterinarian College rules, rather than the Physiotherapy College. While our human clinic was closed down for 6 weeks, our canine clinic was able to stay open. Owners stayed in their cars while we collected the dogs, treated them, and brought them back out again. We did crack the car windows a bit for the owners! This allowed us to stay busy, stay in business, and help pay the rent for our human clinic. Here is the power of diversification in your professional practice! This is one powerful motivator to get your canine rehab practice up and running.

If you practice in Ontario, you will have seen (and hopefully responded) to the recent barrage of activity within the College of Veterinarians of Ontario. In a nutshell, the CVO is "modernizing" the Veterinarians Act, and they are re-writing their policies related to animal rehab. The ARD became aware of the new policy regarding "use of energy", and they had moved the use of shockwave and Class 3B and 4 lasers to "direct supervision by a veterinarian". This would mean that physiotherapists would no longer be able to use their lasers or shockwave in their own practice.

The ARD sent out a call to all Ontario physios practicing animal rehab, to all clients and to veterinarians who refer to animal rehab. The response was overwhelming, and the CVO was inundated with emails from the entire province. The CVO initiated a Zoom call with the ARD and other animal rehab practitioners due to this response. We felt that it was a good call, and the right step forward in improving client access to animal rehab, rather than making it impossible for clients to access our services. We are excited about forming a working group with the CVO and to having our voices heard. Our next newsletter will be focused on all of these legislative changes, as things are heating up in BC as well. A big thank-you to everyone who took the time to write in, and a HUGE, MASSIVE THANK-YOU to Laurie Edge-Hughes (Advocacy Lead for the ARD) who spent her entire vacation working on this project!!

As most of you know, all in-person courses have been cancelled for 2020. We are working on tentative dates for 2021, and the good news is that a lot of you have started the Home Study courses (Canine and Equine), which means we are growing in numbers across the country.

We hope you enjoy this newsletter and stay tuned to the ARD e-blasts and social media sites for the latest political developments!

Hope you've enjoyed the Dog Days of Summer ☺
Carrie

Animal Rehab Division
Carrie Smith, BScPT, CAFCI, CCRT, Co-Chair ARD

Wow! Congrats to CPA for hitting a century of physiotherapy! The ARD certainly does not have as long a history, as animal rehab is fairly new to physiotherapists and veterinarians alike. In order to get a good perspective of our past and our future, I collaborated with our most experienced ARD executive member, Laurie Edge-Hughes (Advocacy Lead and previous Chair) and our newest and youngest executive member, Victoria Renwick (Social Media…of course).

The ARD initially formed under the name "CHAP" (Canadian Horse and Animal Physical Therapists Association). The movement towards animal rehab in Canada was piloted by a handful of inspired physiotherapists. One of which, Laurie Edge-Hughes remains on the ARD executive to this day. Here's a note from Laurie's early experience:

Laurie Edge-Hughes, BScPT, MAnimalSt (Animal Physio), CAFCI, CCRT
Thanks goes to the British Royal Family and their personal physiotherapist, Charles Strong. In 1939, Strong was commissioned to use his electrical muscle stimulation unit on two of Lord Louis Mountbatten's lame polo ponies. The ponies showed an amazing recovery, and Strong became a passionate advocate for the application of physiotherapy in animals. When Strong died, his student D.M. Winks Greene continued to treat the musculo-skeletal injuries of horses. In 1984, she founded the UK's ACPAT (Association of Chartered Physiotherapists in Animal Therapy). This was the first special interest group world-wide, dedicated to the promotion of Animal Physiotherapy.

In Canada, we started as a group of Alberta based physiotherapists who were working with animals (mostly horses) or who had a desire to do so. Our inaugural meeting in 1993 was in the kitchen of Lesley Kerfoot, a Scottish physio who had begun treating horses. There were about 8 or 10 of us there. The following year we hosted a 1-day conference and had veterinarian and physiotherapist speakers. It was at that point that the group incorporated and became the Canadian Horse and Animal Physical Therapists Association (CHAP). We were then the 3rd Animal Physio Association world-wide.

We held courses, provided a newsletter, made contacts around the world, and made it our goal to become a division of the CPA. It took a full 10 years to realize that dream. At the time, the constitution of the CPA required that we get a certain number of signatures in order to apply to become a Division. We accomplished the signature goal and had additionally engaged our membership (as well as physio colleagues, friends, and supporters) in a letter writing and form letter campaign to be faxed into CPA head office. CPA actually called us and asked us to stop the campaign. "Yes, they would look into it." At the first meeting we attended of the Division Chairs Committee, Kathy Broughten and I were representing CHAP. The chair asked each Division what their current goals were. When it came to our turn, I exclaimed, "We have no idea! We've been 10 years with the goal of just getting to sit at this table. We don't know what we want to do next. We're just so happy to be here!"

There are more than 13 countries that boast Animal Physiotherapy Associations, and Animal Physiotherapy is now a recognized sub-group of the World Confederation of Physical Therapists.

It's not been easy however. We've not had full support. Not all people are animal lovers, and if they're not, they don't understand why we would want to use our skills and knowledge to help animals. Of course, if they are animal lovers, they 'get it'! It's really no different than specializing in any area of practice. Some people are absolutely passionate about that area of practice while others might think that *they'd never want to spend a minute engaged in that area. Our members are passionate about animals AND being physiotherapists!*

And let's be clear about this, we continue to have people within CPA and the Board who still do not think we should be a Division, but things are slowly coming around. For example, 2019 was the first time that an animal was included in the marketing campaign for National Physiotherapy Month, and 2020 will be the first Congress to allow animal rehab education lectures.

Some of you who are not familiar with the treatment of animals may be wondering why we are the Animal REHABILITATION Division rather than the Animal Physiotherapy Division. The terms "Physical Therapy, Physiotherapy, Physical Therapist and Physiotherapist" are all protected terms and refer to human health care only. This means they cannot be used when applied to non-human assessment or treatments. Even though we ARE physiotherapists using all of the same physiotherapy assessment and treatment techniques on a 4-legged patient rather than a 2-legged patient, we must call it "Animal Rehabilitation". But aye, here's the rub….veterinarians and veterinary technicians ARE calling their treatments "Animal Physiotherapy" because they are not regulated by the Physiotherapy Colleges. So a NON-Physiotherapist can say they are performing physiotherapy on animals, but a Physiotherapist can't!! Think that might confuse the public a bit? And on another note, every other country is allowed to call their practice Animal Physiotherapy. Except us.

Despite our many challenges in introducing Animal Rehab to mainstream physiotherapy, we feel we are making some headway. The ARD has been dealing with different provincial bodies and governments to start to make some changes in how physiotherapists can assess and treat animals, and how we relate to veterinarians. Several universities have started to allow Animal Rehab placements for physiotherapy students.

100 years from now, we have no doubt that Canadian Universities will have "Animal Physiotherapy" programs. We can envision a future where we are allowed to use the term "Physiotherapy", where all physio students can opt for animal placements and are free to become Animal Physiotherapists. We will be regulated by our own Colleges, not by the Veterinary Colleges. Here's what our youngest ARD Executive member thinks:

<u>*Victoria K.C. Renwick, BKin, MPT, Dip. Canine Rehab (C), Dip. Sport Physio (C)*</u>
As a fairly new Physiotherapist (2 years into both my human and animal practice), I have perhaps naïve, but high hopes for the future of our field. Over the next decade I hope to see the terms Physiotherapy and Physical Therapy expand to apply to animal rehabilitation, ensuring qualified and professional standards for our pets and working animals. I foresee Veterinarians and Physiotherapists working harmoniously across all provinces – just as we see in human medicine.

The sky is the limit and with ever improving best practices, knowledge translation and collaborative multidisciplinary care, I can't wait to see what the next century will hold for our field. Hey, I might still be around a century from now (and I promise to read this article again!).

I envision our present education and specialization streams expanded. What if you could specialize in animal sport physio, equine paediatrics, feline neuro rehab or canine manual therapy? Imagine collaboration across CPA's many Divisions and the potential reach of our field and elevation of care for our patients. With open minds and plenty of ambition behind us, the future of Physiotherapy and animal practice sure is bright!

Now is a great time to do the Canine & Equine Home Study Courses!

Introduction to the Canine Patient Home Study Course

- Covers anatomy, physiology and common conditions
- Great for pet owners and those interested in canine rehab
- Pre-requisite for all other ARD canine courses

Always Available

Introduction to the Equine Patient Home Study Course

- Covers anatomy, physiology and common conditions
- Great for pet owners and those interested in equine rehab
- Pre-requisite for all other ARD equine courses

The ARD executive has been monitoring the situation regarding COVID-19 and given the unpredictability, rapidly changing restrictions, CPA and Health Canada's recommendations we have been forced to cancel all in-person courses and meetings for the immediate future.

We will continue to monitor the situation and evaluate when the course can safely be offered again as things progress.

Keep your eyes peeled for updates on our Instagram and Facebook social media platforms, as well as our newsletters, and webpage.

In the meantime we suggest that you enjoy the many on-line learning opportunities including the amazing back issues of the ARD newsletters

Laurie's Blog

FourLegRehabInc

CANINE REHAB EDUCATIONAL RESOURCES

Let Them In!

Covid has changed everything we do. However, during this whole crisis, my clinic has managed to stay open. We implemented policies on the fly, changed things day by day as we learned more about the virus, stayed open, let clients come in (with masks), and are thriving! I feel bad saying that last part, knowing that some other types of businesses have shut down completely… but it's the truth of what's happening for us! Apparently, the wine delivery people are doing great as well (I heard this from a client)!

Anyways, the point of this blog is to actually convince those of you that are not yet allowing clients into your business, to do so! Here's what your missing:

Laurie's Blog
FourLegRehabInc
CANINE REHAB EDUCATIONAL RESOURCES

You can find this blog and other blogs by Laurie HERE

Most of my clients are very upset that they are unable to go into the vet clinic with their dogs. Their comments: "Enough is enough, we know how to work with this virus now." "Mandate masks. I'd be okay with that." "Human practitioners that actually 'touch' people are obviously allowing patients in the doors. That has been deemed safe with precautionary measures!" "I want to be there. I want to ask questions and give information as the vet is looking at my dog. A phone conversation is not the same." "It's no different than taking a child away from their parent for an assessment." I chose the word 'upset' in the first sentence of this paragraph, but if I choose not to 'sugar-coat it', they are getting angry! They are vet shopping. Not all vets are keeping clients out, and they are finding those that will let them in.

What about the 'less friendly' dogs? I have a handful of patients that I would never, ever, ever see without their owner. One client said to me about her male Rottweiler, "What if he needs healthcare? I can't hand him off to anybody? He's not that kind of dog!" Very true! He would have to go without… or maybe I would be without my arm. One or the other! I know, if you're reading this, you're likely a rehab practitioner, but let's talk about emergency veterinary medicine. This is another area where not letting clients in, is doing a HUGE disservice to the animal and animal owner. Three times through all of this, I've heard of clients asked to make a choice about treating or euthanizing a dog without first being able to SEE their pet (which could help with the decision making). Yes, if they chose to euthanize the dog, then they are allowed in… but they are asked to make that decision in an emergency situation without actually seeing their pet. That one hurts my heart! A client that was just in this past Saturday recounted his dog's last vet visit. He was in for his annual check-up and the owner told the vet that he wanted her to look at the new lumps his dog had acquired. It took 4 phone calls back and forth with the vet. V: "I can't find the one on his leg, it must be gone." O: "No. It was there this morning. It's at the front of his thigh." V: "Are you sure you mean the right hind leg? I'm not finding it." O: "Yes right thigh." All in all, the vet finally found it. But the owner told me. "He also has one in his mouth, but after all of that I decided it wasn't worth it to even mention that one!" ACK! I'd be way more concerned about a lump in the mouth! So now, this dog's well-being is compromised because of faulty communication due to curb side pick-up veterinary medicine.

It's not just about holding their dog for you. Yes, that's a huge help. I don't have assistants to hold dogs for me, so I need owners. Plus, they're free labour in that department! Additionally, having the owners present give you the opportunity to ask questions as you are going through the assessment (i.e. What kind of flooring do you have? How are his bowel movements? Does he have a command or hand signal for 'back up'?). Having the owners present is also imperative for educating them! You may need to tell them about what you've found and what the means. Prove to them that 'here' is where it hurts. Show them exercises. Modify those exercises based on feedback. Have them practice the exercises in front of you. Discussion is key to creating a solution tailored specifically to the individual pet-human duo… especially in rehab! Now, the next point to bring forth is one that I tried so very hard to get across to the students I taught coming from the veterinary industry back when I was teaching core curricula canine rehab courses. Owners matter. Owners are your biggest advocates. Owners that believe that you care about them = continuance as a client. = more referrals. = better compliance to your advice. = trust. = respect. Read all of that again! Read the part where I say that owners want to know that you care about THEM! THEM! Yes, you care about their dog. (You had better, that's why you got into this area of practice in the first place!) You need to care about the owner as well. You need to get to know the owner. You need to find ways to like the owner. Sure, some will be harder than others to like, but 'learning to like the person' is a trick I learned back when I did physiotherapy on people. Find what you have in common with someone. Find out what makes them interesting. Everyone is interesting somehow… you just have to find that thing, and it will make all of the difference in the world! Compliance elevates and results even elevate when you make a human connection! Owners matter to your business in more ways than just being the chauffer and wallet for their pet! Your business is missing out if you don't tap into the potential that a relationship with the client can bring.

So, consider this my plea on behalf of all of the dog owners out there. They want in! There are ways to keep everyone safe. Wear the damn masks folks! It's time to start 'living' in the new world order!

Want to get in touch with like minded individuals who are passionate about physiotherapists providing Animal Rehab services?

Be sure to join these Facebook Groups!

(invite your ARD loving physio friends too)

- *Small Animal Vetrehabbers*
- *Canadian Animal Rehab Support*
- *Veterinary Rehab Management*
- *Canine Physical Therapists*
- *Animal/Veterinary Physiotherapists & Other Professions*
- *Alberta Association for Animal Owner's Rights*
- *Alberta Animal Physios*
- *BC Animal Physios*
- *BC Animal Owners Association*
- *Ontario Animal Physios*
- *Ontario Animal Owners Association*
- *New Brunswick Animal Physios*
- *Physical Therapists in Animal Rehabilitation*
  (ask an executive for an invite)
- *Vital Vet*

Coffee With Mocha

Trivia!

Q: What does your dog have in common with vampire bats, pit vipers and black fire beetles?

Answer to Last Month's Trivia:

For Active Dogs! Trivia

Q: Which two prominent eyelid moving muscles are present in dogs but not usually in wolves?

A: Levator Anguli Oculi Medialis or LAOM (lifts medial eyebrow) and Retractor Anguli Occuli Lateralis or RAOL (pulls lateral eyelid toward ear)

Found in For Active Dogs! Volume 2 I Issue 10 I September 2019 - The Eyes Have It

Let's check out some articles!

Open Veterinary Journal, (2020), Vol. 10(1): 116–119
ISSN: 2226-4485 (Print)
ISSN: 2218-6050 (Online)
Short Communication
DOI: *http://dx.doi.org/10.4314/ovj.v10i1.16*

Submitted: 22/07/2019 Accepted: 05/03/2020 Published: 30/03/2020

Preliminary clinical experience of low-level laser therapy for the treatment of canine osteoarthritis-associated pain: A retrospective investigation on 17 dogs

Loris Barale[1], Paolo Monticelli[2], Massimo Raviola[3] and Chiara Adami[2*]

[1]*Freelance Veterinarian, Carmagnola, Turin, Italy*
[2]*Department of Clinical Sciences and Services, Royal Veterinary College, University of London, London, UK*
[3]*Clinica Veterinaria Europa, Turin, Italy*

Abstract
Background: Osteoarthritis (OA) is common in dogs and causes chronic pain that affects the quality of life and may not respond to analgesics.
Objective: The objective of this study was to determine whether low-level laser therapy (LLLT) would improve the quality of life and help reducing systemic analgesics, in dogs with OA.
Methods: Seventeen client-owned dogs diagnosed with OA and associated pain were included. The diagnosis of OA was confirmed by orthopedic and radiographic examination. Pain was evaluated in each dog with the canine brief pain inventory (CBPI), compiled by the dog owners, as well as with a visual analog scale (VAS) and the colorado state canine chronic pain scale, used by the clinician. The LLLT was performed weekly in each study dog, for a total period of 6 weeks. The CBPI was then repeated at 2, 4, 6, and 8 weeks after the first laser session, whereas the VAS was reassessed at weeks 2 and 6. The dogs were observed for the occurrence of laser-related side effects.
Results: Both CBPI and VAS were significantly reduced after the first laser session (9.2 ± 3.8 and 5.2 ± 1.1, respectively) compared to pretreatment values (11.8 ± 3.6 and 7.6 ± 0.9, respectively; and $p = 0.018$ and $p < 0.001$, respectively) and continued to decrease over time until the end of the therapy. Based on these results and improved function, as assessed by the orthopedic surgeon, the pharmacological analgesic therapy was reduced by the clinician at week 2 in 13 of 17 dogs. Laser-related side effects were not observed.
Conclusion: This retrospective report provides a basis for future investigations, needed to clarify whether laser therapy may be beneficial to treat canine OA-associated pain. The preliminary findings are promising and suggest that LLLT may help reducing the analgesic administration and improving client satisfaction and the quality of life of dogs with OA.
Keywords: Canine osteoarthritis, Chronic pain, Low-intensity laser therapy, Orthopedic pain.

Introduction

Osteoarthritis (OA) is a progressive, degenerative disease that, in the US, affects as many as 20% of dogs aged 1 year or more (Cimino Brown, 2017). The condition causes chronic pain and decreased joint function, which on the long term severely affects the quality of life. The common treatments for OA-associated pain include long-term administration of nonsteroidal anti-inflammatory drugs (NSAIDs) and nutraceuticals, potentially with the addition of gabapentinoid and opioid analgesics to address unresponsive pain (Pettitt and German, 2015). NSAIDs are associated with gastrointestinal, hepatic, and renal side effects and, often, to inadequate pain relief. The chronic use of opioids in client-owned pets, on the other hand, carries the risk for human drug abuse and, therefore, raises a number of ethical concerns.

Within the past decade, there has been an increasing interest in nonpharmacological therapy of both human and canine OAs. Among these therapies, electroanalgesia techniques have been raising a great interest among human doctors and veterinarians.

In human medicine, the most promising electroanalgesic techniques to treat OA are those that imply the use of laser. Within the past decade, both low-level laser therapy (LLLT) and high-level laser therapy have been used to treat human OA-associated pain with no adverse effects (Huang *et al*., 2015; Youssef *et al*., 2016; White *et al*., 2017). High-level laser therapy was first introduced only in 2011, and a recent systematic review that included the first six studies conducted in people found that it was effective in reducing pain and providing functional improvements in humans with knee OA (Wyszyńska and Bal-Bocheńska, 2018). Regarding the veterinary literature, one trial performed in 12 dogs investigated the effects of LLLT on bone healing and acute surgical pain after tibial plateau levelling osteotomy (TPLO), with disappointing results (Kennedy *et al*., 2018). To the best of the authors' knowledge, only one study carried out in 20 dogs with elbow OA reported the successful

***Corresponding Author:** Chiara Adami. Department of Clinical Sciences and Services, Royal Veterinary College, University of London, Hawkshead Campus, AL97TA, Hatfield, UK. Email: *cadami@rvc.ac.uk*

http://www.openveterinaryjournal.com
L. Barale et al. *Open Veterinary Journal*, (2020), Vol. 10(1): 116–119

use of laser to treat canine OA-associated chronic pain (Looney *et al*., 2018).

The aim of this retrospective study was to investigate the clinical usefulness of LLLT, in terms of both improvement of quality of life as perceived by the animal owners and reduction of pharmacological analgesic therapy as decided by the primary clinician, in a population of client-owned dogs diagnosed with OA and presented with pain.

Materials and Methods

Before commencing the laser therapy, all dogs underwent an orthopedic and radiographic examination to confirm the diagnosis of OA and pretreatment baseline pain assessment with the visual analog scale (VAS; range: 0–10 cm; McCormack *et al*., 1988). For a more comprehensive evaluation of pain and functional impairment, the dog owners were asked to compile the canine brief pain inventory (CBPI; range: 0–100; Brown *et al*., 2007), before the beginning of laser therapy and then 2, 4, 6, and 8 weeks after that. Each time, the dog owners evaluated their own dogs independently, and the score sheet was handed to the veterinarian immediately after completion to prevent the owner from recording the results and comparing them to previous or subsequent assessments. The VAS was repeated at weeks 2 and 6 to evaluate the response to pain therapy.

For the laser therapy, a device designed for veterinary use was used (LaserVet 1000; GlobusVet, Italy). Before the treatment, the dogs were left undisturbed for 10 minutes in the examination room, to allow acclimatization and minimize stress and discomfort. The dog owners paid regular charges for the treatment and did not receive any compensation for their dog's participation in the study.

The areas of the body treated with laser were the affected joints and the associated skeletal muscle complexes, namely, the semitendinosus and semimembranosus for the stifle, the iliopsoas for the hip, and the triceps and the brachialis for the elbow. The laser probe was applied directly on the skin of the area to be treated; the joints were always treated first, before the muscles. Each area was treated weekly, for a total of 6 weeks. By using the predetermined programs, the duration of laser exposure ranged from 50 seconds to 4 minutes, depending on coat pigmentation (light or dark), and body weight (from 1 kg to >25 kg). Other variables were set by the software as it follows: 1000 mW potency, 1W cm^2 density of potency, 808-nm laser beam wavelength, frequencies of 500–1000 (joints) and 3,000–5,000 Hz (muscles), energy of 5 (joints) and 4.2 (muscles) J cm^2, and spot laser diameter varying from 3.5 to 11.5 mm, depending on the surface area to be treated. Both continuous and pulsate emittance were used with an alternate pattern, with cycles of the same duration.

The dogs were observed after each treatment for the occurrence of side effects, namely, itch, redness, swelling, changes in skin/coat pigmentation, and any kind of discomfort perceived by either the dog owners or the clinician. After 2 weeks from the beginning of laser treatment, on the occasion of the first posttreatment pain scores, and then again at Week 8, the pharmacological therapy was reassessed, based on the results of pain assessment, owner interview, and orthopedic examination of each dog, and adjusted, if needed, at clinician's discretion.

The Kolmogorov–Smirnov test was used to assess the data distribution. Following, the pain scores were analyzed using one-way analysis of variance, with the time point set as a grouping factor, followed by all pairwise multiple comparisons with the Holm–Sidak method. Commercially available software was used (SigmaPlot 10 and SigmaStat 3.5, SYSTAT Software Inc, CA, USA). The p values < 0.05 were considered to be statistically significant.

Ethical approval

This study was conducted under the approval of the Social Science Ethical Review Board of the Royal Veterinary College (license number: URN SR 2019–0238). A verbal consent for data publication was obtained by all dog owners.

Results and Discussion

The data are represented as means and SD. Seventeen dogs, 11 females (of which, 10 were neutered) and 6 males (of which, one was castrated), aged 134 ± 34 months and weighing 21 ± 11 kg, were included in this report. The represented dog breeds were mixed breed (n = 6), Beagle (n = 2), German Shepherd (n = 3), Border Collie (n = 1), Pug (n = 1), Shetland (n = 1), Cane Corso (n = 1), Labrador Retriever (n = 1), and Pinscher (n = 1). At the time of pretreatment examination, all dogs were on pharmacological analgesic treatment since at least 2 weeks, which included meloxicam, gabapentin, and amantadine in one dog, meloxicam and gabapentin in 5 out of 17 cases, meloxicam alone in 10 out of 17 cases, and gabapentin alone in one dog. The treated joints were the hips (n =16), stifle (n = 7), elbow (n = 1), and lumbosacral junction (n = 1); 7 dogs presented with more than one affected joint. One dog, a 16-year-old mixed breed male castrated dog weighing 9 kg, affected by chronic renal disease which suddenly deteriorated, died before Week 4 for causes unrelated to OA.

Both CBPI and VAS decreased after the first laser session compared to pretreatment baseline values and continued to decrease over time until the end of the therapy. For the CBPI, pretreatment baselines (11.8 ± 3.6) were significantly higher than the values recorded at weeks 2 (9.2 ± 3.8; $p = 0.018$), 4 (7.6 ± 3.3; $p = 0.001$), 6 (6.8 ± 3.5; $p < 0.001$), and 8 (4.4 ± 4.0; $p < 0.001$) after treatment (Fig. 1). Similarly, the baseline VAS scores (7.7 ± 0.8) were higher than those recorded at Weeks 2 (5.2 ± 1.1; $p < 0.001$) and 6 (3.4 ± 1.4; $p < 0.001$) after the beginning of laser therapy.

http://www.openveterinaryjournal.com
L. Barale et al. *Open Veterinary Journal*, (2020), Vol. 10(1): 116–119

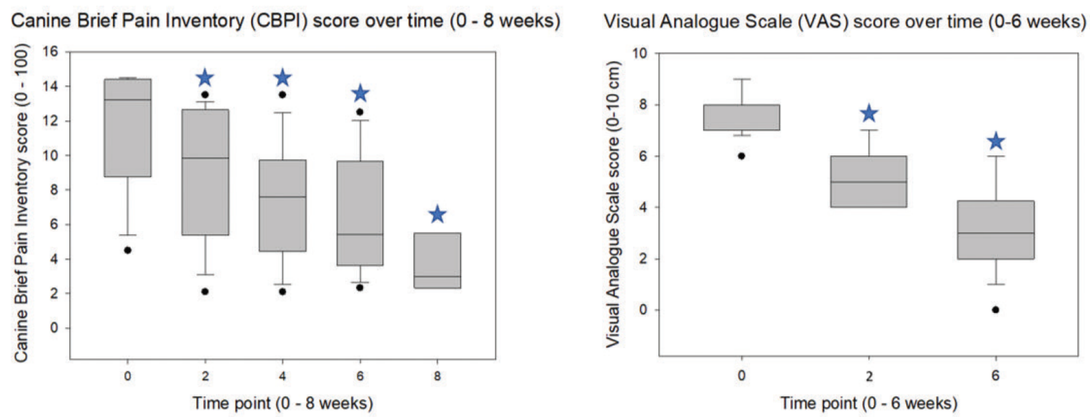


Fig. 1. The box plots represent the scores for CBPI, as evaluated by the dog owners, and VAS, as assessed by the clinician who performed the treatment, in 17 dogs with OA-associated pain undergoing laser therapy. The interquartile range boxes represent the data higher (upper quartile) and lower (lower quartile) than the medians, accounting for 50% of the total data. The whiskers are indicative of the ranges for the bottom 25% and the top 25% of the data values. The outliers are represented by the dots, and the stars indicate statistically significant differences ($p < 0.05$) between the baseline pretreatment values (0) and the values recorded at the subsequent time points (2, 4, 6, and 8 on the X-axis are weeks after the first laser therapy session, respectively; data at time point 8 are from 6/17 dogs only).

After 2 weeks from the first laser session, based on the outcome (pain scores, repeated orthopedic examination, and client satisfaction), the primary clinician changed the pharmacological analgesic therapy in 15 of 17 dogs. This change consisted of a reduction in 13 of these 15 dogs, an addition in one dog, and a replacement in another one. Systemic analgesics administration was suspended in 6 out of 17 dogs and decreased in 7 out of 17 dogs; of these, four dogs previously receiving meloxicam and gabapentin had the NSAID withdrawn, whereas, in another dog, the daily dose of meloxicam was halved. In one dog previously receiving only meloxicam, the clinician added gabapentin. Finally, in another dog previously on meloxicam, the clinician replaced the NSAID with gabapentin alone. In two dogs, the administration of analgesics remained unchanged.

Only six out of 17 dogs were brought to the practice at Week 8 for a follow-up. Of these, three dogs that at Week 6 were still receiving meloxicam and gabapentin alone, respectively, and had their therapy withheld; one dog in which meloxicam dose had been halved at Week 6 had the NSAID withheld, and the remaining two dogs remained on gabapentin as at Week 6. The owners of the dogs that did not return to practice were phone interviewed and were satisfied with the clinical improvement of their pets.

No side effects of laser therapy were observed at any time in any of the study dogs.

The most relevant finding of this study was that laser therapy was effective in improving the dogs' quality of life as perceived by their owners, and it also helped decreasing the administration of systemic analgesics. Interestingly, these positive effects could be seen immediately after the first laser therapy session and were enhanced by the repetition of the treatment over the 8-week study period.

Overall, the clients appreciated that their dogs seemed to enjoy life more and showed increased general activity and, in most cases, that the systemic administration of analgesics could be reduced. In one patient, a 30-kg mixed breed dog with unilateral hip OA, the clinician added gabapentin to meloxicam 2 weeks after the first laser session. Based on both CBPI and VAS scores, this dog had neither improved nor worsened compared to his pretreatment condition; nevertheless, the therapy was re-evaluated and adjusted on request of the dog owner, who perceived the need for further improvement.

Despite there is convincing evidence that LLLT has a limited efficacy in improving human OA-associated pain (Huang *et al*., 2015), this seemed not to be the case for the dogs of this report. One reason for this may be that although the laser output used in the study dogs still falls, by definition, within the classification of low-level, the device was set to deliver its output at the highest ranges of "low-level" emittance. By definition, LLLT implies an output whose wavelength is within 600–980 nm and with a power less than 1,000 mW, whereas the output used in this report had a wavelength of 808 nm and a power of 1,000 mW (White *et al*., 2017). This seems to suggest that high-level laser therapy may produce even more satisfactory results in canine OA and potentially further improve pain management and function.

This study has important limitations, and the lack of objective outcome measures, such as dynamic gait analysis and potentially mechanical thresholds, is the most important one. The positive effects of laser therapy were evaluated mostly based on pain scores, which are subjective and may vary depending on the observer. Moreover, the investigator who performed the VAS was aware of the treatment, and his judgment could have been biased. Unfortunately, due to the retrospective nature of this report, a randomized assignment of the dogs to different treatments, including a placebo or negative control group, as well as blinding of the clinician performing the pain assessments, was not a suitable option.

As it was evaluated by the owners and not by the clinician who performed the treatment – and considering that this scale is validated for OA-associated canine chronic pain – the CBPI might have functioned as a more reliable tool than the VAS in the dogs of this report (Brown *et al*., 2007). Although dog owners may have been driven by their desire to see their pet improving after therapy, owing to both the expenses incurred and psychological-affective implications, the unavailability of previous scores for comparison should have decreased this bias. Moreover, despite the administration of systemic analgesics was reduced in the majority of the dogs after the first laser session – a variable which may potentially have caused a subsequent worsening of the pain, the owners' satisfaction continued to increase, which further supports the hypothesis that laser therapy did produce some positive results in the study dogs.

Although the prospective study from Looney *et al*. (2018) could overcome the aforementioned limitations, it included a small number of subjects and was based on the subjective outcome measures. Therefore, laser therapy in dogs should still be regarded as a mostly unexplored field, and more prospective clinical trials are needed to prove the usefulness of laser therapy to treat OA-associated pain and to refine case-specific protocols. In this perspective, the findings of the current, preliminary retrospective study contribute to provide a basis for future prospective investigations and may be used as a starting point by clinicians who aim to introduce laser therapy to their practice until more evidence is published.

Author's contribution

LB: study design, data collection and interpretation, and preparation of the manuscript; PM: intellectual contribution to manuscript preparation and critical revision; MR: contribution to data collection and revision and approval of the manuscript; CA: study design, data analysis, manuscript preparation, critical revision, and editing of the manuscript.

Conflict of interest

The authors declare that there is no conflict of interest.

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

References

Brown, D.C., Boston, R.C., Coyne, J.C. and Farrar, J.T. 2007. Development and psychometric testing of an instrument designed to measure chronic pain in dogs with osteoarthritis. Am. J. Vet. Res. 68, 631–637.

Cimino Brown, D. 2017. What can we learn from osteoarthritis pain in companion animals? Clin. Exp. Rheumatol. 107, 53–58.

Huang, Z., Chen, J., Ma, J., Shen, B., Pei, F. and Kraus, V.B. 2015. Effectiveness of low-level laser therapy in patients with knee osteoarthritis: a systematic review and meta-analysis. Osteoarthr. Cartilage 23, 1437–1444.

Kennedy, K.C., Martinez, S.A., Martinez, S.E., Tucker, R.L. and Davies, N.M. 2018. Effects of low-level laser therapy on bone healing and signs of pain in dogs following tibial plateau levelling osteotomy. Am. J. Vet. Res. 79, 893–904.

Looney, A.L., Huntingford, J.L., Blaeser, L.L. and Mann, S. 2018. A randomized blind placebo-controlled trial investigating the effects of photobiomodulation therapy (PBMT) on canine elbow osteoarthritis. Can. Vet. J. 59(Suppl. 9), 959–966.

McCormack, H.M., Horne, D.J. and Sheather, S. 1988. Clinical applications of visual analogue scales: a critical review. Psychol. Med. 18, 1007–1019.

Pettitt, R.A. and German, A.J. 2015. Investigation and management of canine osteoarthritis. BMJ. 37, 1–8.

White, P.F., ElvirLazo, O.L., Galeas, L. and Cao, X. 2017. Use of electroanalgesia and laser therapies as alternatives to opioids for acute and chronic pain management. F1000Res 21(Suppl6), 2161.

Wyszyńska, J. and Bal-Bocheńska, M. 2018. Efficacy of high-intensity laser therapy in treating knee osteoarthritis: a first systematic review. Photomed. Laser. Surg. 36, 343–353.

Youssef, E.F., Muaidi, Q.I. and Shanb, A.A. 2016. Effect of laser therapy on chronic osteoarthritis of the knee in older subjects. J. Lasers Med. Sci. 7, 112–119.

PAPER

The Finnish Canine Stifle Index: responsiveness to change and intertester reliability

Heli K Hyytiäinen,[1] Mikael Morelius,[1] Anu K Lappalainen,[1] Anna F Bostrom,[1] Kirsti A Lind,[2] Jouni J T Junnila,[3] Anna Hielm-Björkman,[1] Outi Laitinen-Vapaavuori[1]

Abstract

Background The responsiveness and the intertester reliability of the Finnish Canine Stifle Index (FCSI) were tested, and a cut-off between compromised and severely compromised performance level was set.

Methods Three groups of dogs were used, 29 with any stifle dysfunction (STIF), 17 with other musculoskeletal disease except stifle (OTHER) and 11 controls (CTRL). All dogs were tested with the FCSI by the same physiotherapist at three occasions, at baseline, at six weeks and 10 weeks, and once also by another physiotherapist.

Results Dogs in the STIF group demonstrated significantly higher ($P<0.001$) FCSI scores than in OTHER or CTRL groups at baseline. Only the STIF group showed a significant ($P<0.001$) change in FCSI score at all time points, indicating responsiveness to change. There were no significant differences between the evaluators ($P=0.736$), showing good intertester reliability, supported by moderate to good (0.78) intraclass correlation coefficient (ICC). The evaluator performing the FCSI did not have a significant effect when comparing the groups of dogs ($P=0.214$). The 95 per cent confidence intervals of the ICC per group were 0.79 (0.60, 0.91) for STIF, 0.83 (0.53, 0.96) for OTHER 0.78 (0.64, 0.88) for all dogs. A cut-off differentiating a severely compromised from a compromised performance was set at 120, having sensitivity of 83 per cent and specificity of 89 per cent.

Conclusion The FCSI is a recommendable measure of dogs' stifle functionality.

Introduction

The Finnish Canine Stifle Index (FCSI)[1] was generated to provide professionals working with canine stifle patients with a new outcome measure for assessing the level of stifle function, including a functional as well as an objective aspect. The testing battery was composed of several individual items,[2] and it was aimed at quantifying the level of dysfunction in stifle diseased patients. Dysfunction is defined as an abnormality or impairment in the operation of a specified bodily organ or system.[3] Although the individual items comprising the battery have been validated previously, the testing battery still has to be assessed as a whole.[4] Moreover, it is important for the user of a measure or a test to be aware of the measurement properties of that test. This is to ensure appropriate use of test and reliable results, which, unless reliable and correctly interpreted, can lead to distorted knowledge of the patient's situation, and thus have an adverse effect to the patient through misled treatment decisions.

The FCSI has not yet been tested for its responsiveness nor for its reliability. When the testing battery is meant to measure the effect of treatment, it is important to study its ability to detect change over time corresponding to the recovery process, that is, the responsiveness.[5] Responsiveness includes both internal as well as external aspects. The first is based on differences in groups over a prespecified time frame.[6] The latter, in turn, is about the amount of change in a measure in comparison with the change in another measure.[6] This also relates to minimal clinically important difference (MCID),[7] which is an important factor to consider when quantifying a dysfunction in a patient. The MCID is the smallest change that is meaningful to the patient, that is, the smallest change in a treatment outcome that

Veterinary Record (2019) doi:10.1136/ vetrec-2018-105030

[1]Department of Equine and Small Animal Medicine, Faculty of Veterinary Medicine, University of Helsinki, Helsinki, Finland
[2]Veterinary Teaching Hospital, University of Helsinki, Helsinki, Finland
[3]Statistics, 4Pharma, Helsinki, Finland

E-mail for correspondence: Dr Heli K Hyytiäinen; heli.hyytiainen@helsinki.fi

Provenance and peer review Not commissioned; externally peer reviewed.

Received May 22, 2018
Revised October 8, 2019
Accepted October 18, 2019

would be considered important and would indicate a change in the patient's status. A common criterion, by which testing batteries are evaluated, is the intertester reliability. This tests whether several evaluators obtain similar results using the same testing battery on the same patient at the same time.[8] Some evaluators may be stricter in their judgement, and the level of the evaluator's experience may affect the results.[9] The test–retest reliability can be relative, meaning the ratio of total variability between measurements, or absolute, which means the variability of scores between measurements.[10]

The hypothesis of the study was that the FCSI would be responsive to change in stifle diseased patients' level of stifle function. Another hypothesis was that the FCSI would have a good[11] intertester reliability, where the experience level of the evaluator would have no effect on the FCSI result. In addition, a cut-off between compromised and severely compromised performance level, that is, MCID measured with FCSI, would be defined.

Materials and methods

The study was an experimental, longitudinal prospective clinical study, performed on June 1, 2013–April 1, 2014. Dog owners were free to discontinue the study at any time point.

Three groups of dogs were included in the study: dogs with any stifle dysfunction (STIF), dogs with some musculoskeletal disease other than stifle dysfunction (OTHER) and control dogs with no known musculoskeletal disease (CTRL). The group descriptions are presented in table 1. Recruitment of the STIF and OTHER dogs was done by asking all physiotherapy patients of the Veterinary Teaching Hospital of University of Helsinki, meeting the inclusion criteria, to participate in the study. CTRL dogs were recruited by an advertisement on the veterinary students' intranet.

Dogs with dysfunction

All dogs in the STIF and OTHER groups were clients referred by veterinary surgeons to the physiotherapy department of the Veterinary Teaching Hospital of University of Helsinki. The referral letters included the diagnosis, the orthopaedic history, and the clinical and radiographical findings of the dog. A full orthopaedic examination was performed on all dogs at baseline. Inclusion criterion for both groups was a referral from the veterinary surgeon, for the STIF group a diagnosis of a stifle disease and for the OTHER group any other but stifle-related orthopaedic disease. Dogs with neurological deficits were excluded from the study.

For STIF group dogs, the reasons for referring the patient to physiotherapy, as described by the referring veterinarian in the medical record, were surgical treatment of patellar luxation (n=9), surgical treatment of cranial cruciate ligament rupture (n=14), surgical treatment of a combination of the patellar luxation and cranial cruciate ligament rupture (n=1), surgical treatment of the caudal cruciate ligament (n=1), surgical treatment of both cranial and caudal cruciate ligament and meniscal injury (n=1), conservative treatment for bilateral patellar luxation (n=1), conservative treatment for unilateral patellar luxation (n=1), and stifle osteoarthritis (n=1).

For the OTHER group dogs, the reasons for referring the patient to physiotherapy, as described by the referring veterinarian in the medical record, were femoral head ostectomy (n=2), front limb lameness (n=2), *musculus gluteus medius* injury (n=1), painful back (n=1), avulsion fracture of the tarsal malleolus (n=1), radius and ulna fracture (n=1), spondylosis and a sprained toe in the front limb (n=1), tarsal arthrodesis (n=1), glenohumeral arthroscopy (n=1), bilateral hip dysplasia (n=1), bilateral hip dysplasia and a hemivertebra in thoracic spine (n=1), hip dysplasia and osteoarthritis (n=1), hip osteoarthritis and spondylosis (n=1), hip and glenohumeral osteoarthritis (n=1), and bilateral osteoarthritis of the elbow joint (n=1).

Control dogs

The dogs in the CTRL group consisted of 16 dogs owned by veterinary students and were subjectively healthy. All dogs were evaluated by radiographs and by pressure-sensitive walkway.

Radiological evaluation

Dogs were sedated with dexmedetomidine (0.005 mg/kg) and butorphanol (0.1 mg/kg), and a ventrodorsal hip radiograph with hindlimbs extended was taken according to the radiographic procedure of Fédération Cynologique Internationale (FCI).[12] The images were evaluated and graded (AKL) according to FCI, where grade A is given to a normal, grade B to a nearly normal, grade C to a mildly dysplastic, grade D to a moderately dysplastic and grade E to a severely dysplastic hip joint. Only dogs with grade A or B hip joints were eligible for the study. Stifle joints were radiographed in mediolateral and craniocaudal projections to rule out osteoarthritis and osteochondrosis.

Pressure-sensitive walkway analysis

A pressure-sensitive walkway (GAITRite Electronic Walkway, Peekskill, USA) was used to determine whether the dogs in the CTRL group had any temporospatial

Table 1 Description of the dogs participating in the study

Study group	n	Sex (male/female)	Age (years), mean±sd	Weight (kg), mean±sd
STIF	29	17/12	5.7±2.9	16.0±14.3
OTHER	17	8/9	5.2±3.2	21.5±9.1
CTRL	11	6/5	3.7±2.6	18.5±5.8

Breeds in each group are presented in online supplementary appendix 1.
CTRL, control dogs with no known musculoskeletal disease; OTHER, dogs with some musculoskeletal disease other than stifle dysfunction; STIF, dogs with any stifle dysfunction .

asymmetries in their movement. The walkway has an active area of 60.96 x 609.6 cm (90 x 700 cm total area), and an inactive 90 x 125 cm mat was placed at each end of the walkway to minimise any surface change effect on movement. Accompanying software recorded and interpreted the pressure changes in the walkway sensors (GAITRite Manual V.3.9, CIR Systems, Sparta). A scan rate of 240 Hz was used.[13]

The dogs were first acclimatised to the walkway during one to three passes over it. All dogs trotted four to six times over the walkway at a comfortable trotting speed, with no eye contact with the owner, no pull on the leash, and as freely as possible, led by their owners. Runs in both directions were recorded and data of at least 12 full gait cycles from three separate valid runs were collected. The results of the walkway analysis were used to verify that the dog was not lame. Total pressure index, stance time as well as step length were evaluated for obvious asymmetries.

All dogs

For all three groups (STIF, OTHER and CTRL), an orthopaedic examination was done at the time of referral (STIF and OTHER) or at the same time as the initial physiotherapeutic examination (CTRL). Also, all groups were tested with the FCSI at their first physiotherapy appointment (baseline). All dogs were then retested at six weeks and 10 weeks after initial scoring, according to standard orthopaedic veterinary re-evaluation schedule used in the Veterinary Teaching Hospital of University of Helsinki for surgically treated cruciate ligament rupture patients treated with osteotomy techniques or for fracture patients.

Orthopaedic examination

In the subjective clinical lameness examination, the dogs were walked and trotted on a straight line and on a circle in both directions. The surface of the floor was even and non-slippery. The palpatory examination was performed on a standing and a laterally recumbent dog, evaluating muscle symmetry, joint effusions, range of motion and pain. The examinations were scored as follows: lameness on a scale from normal (0) to non-weightbearing (4),[14] and the rest of the evaluations as mild, moderate or severe. To ensure the patient's safety during examination and handling of the patient, the examiners were not blinded to the patient's disease.

Finnish Canine Stifle Index

The FCSI consists of eight tasks, which are the evaluation of the positions of the dog's hindlimbs in sitting and lying positions, the subjective evaluation of the symmetry of the thrust of the hindlimbs in relation to each other as the dog rises from sitting and lying positions, subjective evaluation of the symmetry of the thigh circumference of the dog's hindlimbs in a standing position, measurement of the symmetry of the static weightbearing with bathroom scales, and the measurement of the passive range of motion (flexion and extension) of the dog's stifles with a universal goniometer. In each task the dog's performance is scored with a final result of 0–263. The total score has a cut-off at 60, dividing the scores to adequate and compromised performance level.[1]

Study protocol

The FCSI was used by all three physiotherapists working at the physiotherapy department at the Veterinary Teaching Hospital of University of Helsinki. All of them are specialised in animal physiotherapy, two with over 10 years of experience (HKH, AFB) and one with one-year experience (KAL). One of the therapists (HKH) was very familiar with the FCSI, whereas the others were not. All physiotherapists were taught how to use the testing battery and score the performances in a standardised manner. Both written instructions and a practical introduction session were provided before commencing the study. Each dog was tested using the FCSI at their first physiotherapy appointment (baseline) and after six weeks and 10 weeks from baseline by the same physiotherapist. In addition, at one of the three evaluations, another physiotherapist performed the test as well. The selection of the other physiotherapist was random, based on the physiotherapist's availability. In some cases the test was not performed by another physiotherapist due to either unavailability of another physiotherapist or because physiotherapy was ended before the end of the study period. Therapists were blinded to each others' results, as well as to their own previous results. For patients' safety, they were not blinded to the disease of the patient they were evaluating. The equipment used for the FCSI items (bathroom scales and goniometers) during the trial was the same between all evaluators and times.

Statistical methods

The internal responsiveness was evaluated as follows: the differences between groups (STIF, OTHER, CTRL) in total FCSI score were assessed using a linear mixed effects model for repeated measures, where group, visit and interaction term between group and visit was used as fixed effect and dog as a random effect. Between-group and within-group comparisons were estimated from this model using contrasts.

The relationship and differences between the three evaluators, that is, intertest reliability, were evaluated in three ways. First, to validate the primary group comparisons, a similar linear mixed effects model was fitted as above for the full data, added with the fixed effect of the evaluators (an insignificant tester effect shows that no significant bias is introduced to the group comparisons due to the evaluator evaluating the dog). Secondly, using only the data where two parallel ratings had been made, an analysis of variance model was fitted, where the sole fixed effect was the tester pair for the corresponding dog. Thirdly, a random effects model was fitted to estimate the variance component related to the evaluator. The model included the dog as a random effect and the group as a fixed effect (to avoid overestimation of the variation between dogs). The variance components related to dogs and evaluators were estimated from the model and the proportions of total variation were calculated for the components, that is, intraclass correlation coefficient (ICC). The random effect modelling was repeated separately in the STIF and OTHER groups to investigate the variance components within group. These models included only the dog as random effect with no fixed effects. For the CTRL group, this within-group evaluation was not possible due to low variation between the dogs.

The diagnostic ability of the FCSI total score in differentiating severely compromised and compromised dogs (namely, STIF v OTHER) was investigated using receiver operating characteristic (ROC) curve. The optimal cut-off value for the FCSI score was defined as the point where the sum of sensitivity and specificity of the score reached its maximum value. In addition, the previously set cut-off level between adequate and compromised performance level in the FCSI was retested in the present study population.[1]

A P value of less than 0.05 was considered statistically significant, and 95 per cent confidence intervals (CI) were calculated for the estimates of group differences in FCSI score and for the estimated ICCs. All statistical analyses were done using the same statistical program (SAS System for Windows, V.9.3, SAS Institute, Cary, North Carolina).

Results

Initially, 16 dogs were enrolled into the CTRL group, but five of them were excluded due to findings in their radiographic evaluation, which were hip osteoarthritis with hips graded as C/C (n=3), hips graded C/C with no osteoarthritis (n=1) and asymmetrical lumbosacral transitional vertebra (n=1). In addition one of the excluded five dogs had also mild findings in the orthopaedic examination and two in the pressure-sensitive walkway evaluation. The remaining 11 dogs were finally included into the study as the CTRL group. The changes in the group sizes between three testing times and the reasons leading to the changes are presented in table 2.

Of the dogs in the STIF group, 26 had had a surgical treatment of one of their stifles. The time from surgical treatment to the FCSI baseline measurement was a median of 17.5 days (minimum 10, maximum 78 days). Two of the STIF dogs were treated conservatively, and the time from diagnosis and start of treatment to the FCSI baseline measurement was a median of 48 days (minimum 1, maximum 95 days). In the OTHER group, the diseases were treated surgically in four cases, with a median of 17.5 days from diagnosis to the first FCSI measurement (minimum 9, maximum 44 days). Thirteen of the OTHER dogs were treated conservatively. However, three dogs had no information on the actual date of diagnosis, so only 10 of the dogs' timeline from diagnosis and start of medical treatment to the start of physiotherapy and the first FCSI measurement could be counted. In these dogs, the median was 13 (minimum 5, maximum 55) days.

Table 2 Description of the groups during the study

	STIF	OTHER	CTRL
Number of dogs at baseline	29	17	11
Number of dogs at six weeks	25	11	10
Number of dogs at 10 weeks	19	11	11
Physiotherapy ended before the end of the study period due to relapse of the disease or complications	1	1	NA
Physiotherapy ended before the end of the study period due to owner decision	6	4	NA
Acute trauma front limb lameness	NA	NA	1
Intertester reliability not tested due to logistical reasons (ie, unavailability of another physiotherapist or physiotherapy aborted before the end of the study period)	7	8	1

CTRL, control dogs with no known musculoskeletal disease; NA, not applicable; OTHER, dogs with some musculoskeletal disease other than stifle dysfunction; STIF, dogs with any stifle dysfunction.

The mean FCSI score at baseline was 154.7±60.9 in the STIF group, 59.4±54.3 in the OTHER group and 17.0±22.9 in the CTRL group, respectively. The difference between all groups was significant (P<0.001). All of the mean scores can be seen in table 3.

Dogs were tested at a mean of 5.7±1.9, and 10.3±1.4 weeks from the baseline. The largest change in mean±sd total score between baseline and at six weeks and 10 weeks was in the STIF group: 48.8±44.6 and 93.3±62, respectively. Only the STIF group showed a significant (P<0.001) change at both six weeks and 10 weeks (figures 1 and 2).

When evaluating the internal responsiveness, a significant difference between the STIF and the other two groups was seen both at baseline and at six weeks. At 10 weeks the difference was significant only between the STIF and the CTRL groups (P=0.002) (table 4). Differences in the FCSI total score between groups were consistently highest when STIF and CTRL groups were compared (table 4).

Based on the baseline results, a cut-off point to differentiate a severely compromised from a compromised performance level was set to 120, which had a sensitivity of 83 per cent and specificity of 89 per cent (figure 3). The previously set cut-off value of 60 between a compromised and an adequate performance level[1] resulted in a sensitivity of 72 per cent and a specificity of 91 per cent in this study population (figure 3). A receiver operator curve also illustrates the above-mentioned specificity and sensitivity values (for differentiating severely compromised (STIF) from compromised (OTHER) dogs) as well as the AUC: 0.905 (95 per cent CI 0.829, 0.982) (figure 4).

Table 3 Means of the FCSI scores at all measurement points		
Measurement/group/ dogs (n)	Mean of FCSI score (±sd)	Change from baseline score (±sd)
1. STIF/29	154.7 (±60.1)	NA
2. STIF/25	108.7 (56.9)	−48.8 (±44.6)
3. STIF/19	58.6 (±44.9)	−93.3 (±62.0)
1. OTHER/17	59.4 (±54.3)	NA
2. OTHER/11	43.2 (±52.8)	−26.1 (±38.1)
3. OTHER/11	39.8 (±37.0)	−29.5 (±39.6)
1. CTRL/11	17.0 (±22.9)	NA
2. CTRL/10	15.4 (±13.9)	−3.34 (±13.6)
3. CTRL/11	5.3 (±11.9)	−11.7 (±21.0)

CTRL, control dogs with no known musculoskeletal disease; FCSI, Finnish Canine Stifle Index; NA, not applicable; OTHER, dogs with some musculoskeletal disease other than stifle dysfunction; STIF, dogs with any stifle dysfunction.

No significant differences were observed between the different evaluators (P=0.736). The evaluator performing the FCSI did not have a significant effect when comparing the groups (P=0.214). The random effects model showed that the proportion of total variance was 78.4 per cent due to variation between dogs (within each problem group) and 21.6 per cent due to variation between the evaluators, calculated as an ICC of 0.78. The 95 per cent CIs of the ICC per group were 0.79 (0.60, 0.91) for STIF, 0.83 (0.53, 0.96) for OTHER and 0.78 (0.64, 0.88) for all dogs.

Discussion

Based on the results of this study, the FCSI was seen to be responsive to changes in the dogs' level of dysfunction in the STIF group. The change over time in the FCSI score was significant (P<0.001) and largest in the STIF group. It is noteworthy that all dogs in STIF and OTHER groups received physiotherapy, and although the effect of therapy was not studied here a change seen in the STIF group (93.3 (±62)) was clearly more evident than the one in the OTHER group (29.5 (±39.6)). This indicates that the FCSI is sensitive to stifle

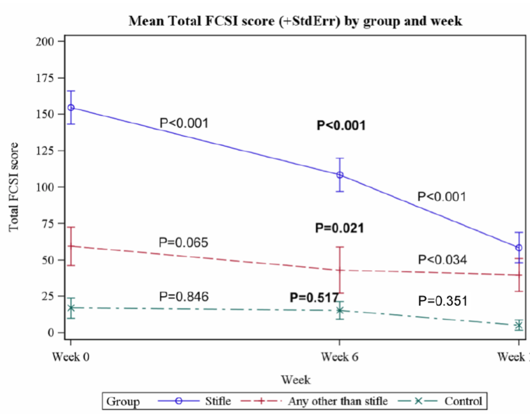


Figure 1 Descriptive statistics for the mean total FCSI score for the three groups at baseline and after six weeks and 10 weeks. Significance of change within group between two testing times is marked above each corresponding line. The significance of change from baseline to 10 weeks is marked with bold above the line of the group. FCSI, Finnish Canine Stifle Index.

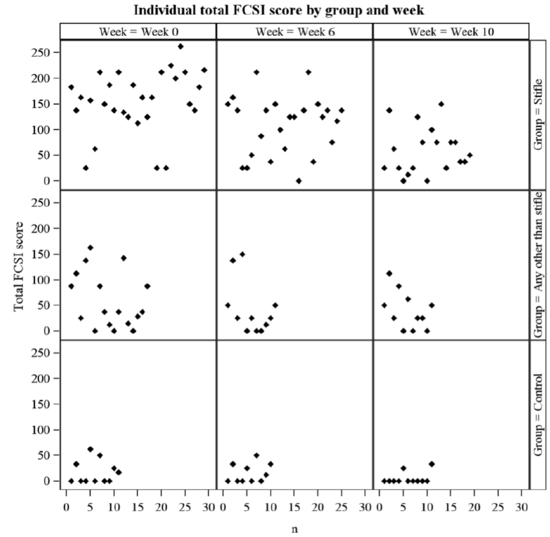


Figure 2 Total individual FCSI scores per group at three different testing times. FCSI, Finnish Canine Stifle Index.

dysfunction over other dysfunctions, and that there are more stifle-related than other joint-related items in the FCSI. Nevertheless, the possible effect of others, such as tarsus or hip-related disease, should be kept in mind, as they might affect the FCSI. However, as the FCSI is not used to diagnose a disease, this should not be a problem. The evaluation of internal responsiveness is based on differences between groups over a specified time frame. This leads to assumption of treatment effect over time in studies like this, as is the case in the present study too. No other research-related outcome measures were used to verify the change of stifle functionality over time than the FCSI, but progress was assumed to happen. The possible other measures used with the patients as part of their treatment were not recorded nor compared with the results of the present study. Previous studies have shown the positive effect of physiotherapy on postoperative rehabilitation on surgically treated cranial cruciate ligament patients' outcome.[15–18] Towards the final testing, the results of STIF dogs started to resemble the results of the OTHER

Table 4 Differences between groups in FCSI score by testing times

		Estimate of difference in FCSI score	se	95% CI Upper	Lower	P value
Difference between groups at baseline	STIF v OTHER	95.2	15.2	64.9	125.5	‹0.001*
	STIF v CTRL	137.6	17.6	102.5	172.8	‹0.001*
	OTHER v CTRL	42.4	19.3	4.0	80.8	0.031*
Difference between groups at six weeks from baseline	STIF v OTHER	70.4	16.9	36.8	103.9	‹0.001*
	STIF v CTRL	92.6	18.2	56.5	128.7	‹0.001*
	OTHER v CTRL	22.2	20.7	−18.9	63.3	0.287
Difference between groups at 10 weeks from baseline	STIF v OTHER	29.9	17.4	−4.5	64.3	0.088
	STIF v CTRL	57.9	18.3	21.6	94.3	0.002*
	OTHER v CTRL	28.0	20.4	−12.6	68.7	0.174

*Denotes significance.
CI, confidence interval; CTRL, control dogs with no known musculoskeletal disease; FCSI, Finnish Canine Stifle Index; OTHER, dogs with some musculoskeletal disease other than stifle dysfunction; STIF, dogs with any stifle dysfunction.

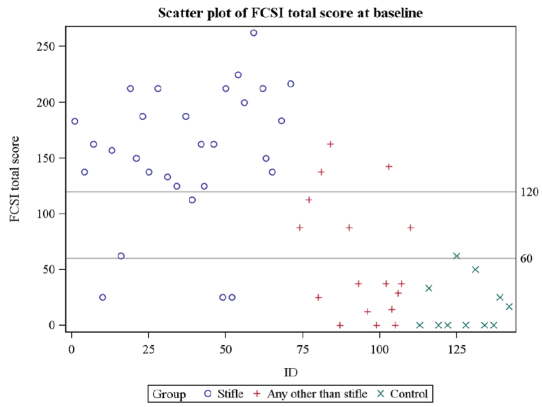


Figure 3 Scatter plot of the mean FCSI score at baseline. The figure presents the two cut-off lines for the three performance levels at the FCSI total score: adequate below 60, compromised between 60 and above 120, and severely compromised above 120. FCSI, Finnish Canine Stifle Index.

dogs and were almost even with the results of the CTRL dogs. The results may have been even clearer had the testing times been even wider apart, or if there had been a fourth measurement time. This, however, would not have been realistic due to owner compliance.

A thing to consider is the ceiling effect, which means that the maximum result of the test is often reached. This, based on the results of the present study, does not seem to be a problem with FCSI. Of all tested dogs, only one was near maximal score, despite several severely dysfunctional patients being included. This tells that the upper scale of the test is sufficient to be used with this type of a patient group. Floor effect, in turn, means that most of the subjects would score the minimum result. This would not seem to be a problem

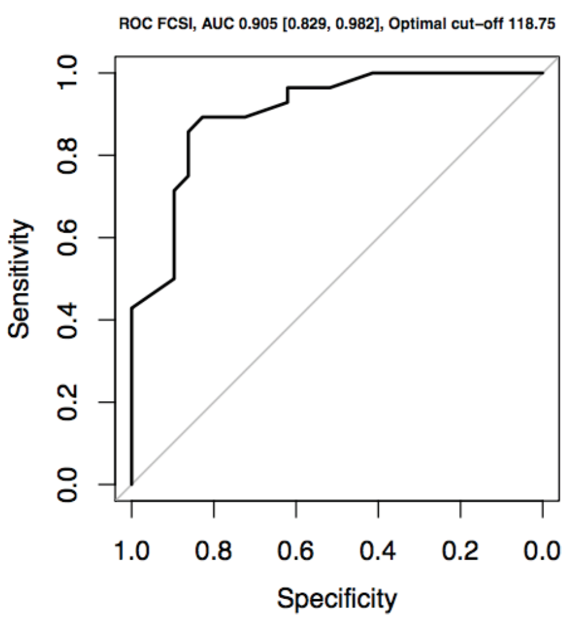


Figure 4 ROC curve representing the sensitivity and specificity of FCSI. FCSI, Finnish Canine Stifle Index; ROC, receiver operating characteristic.

either, with FCSI, when testing stifle patients. That being said, when the patients reach ‘near normal’ functionality, there may be some level of floor effect, and the responsiveness to change may decrease and the amount of change gets less. This can already be seen in the results of the present study, in the CTRL group and to an extent with the OTHER group. However, clinically, this would no longer be a problem to a rehabilitating stifle patient, as at that stage the level of functionality would be acceptable.

A cut-off between ‘adequate’ and ‘compromised’ performance according to the FCSI total score had been set in a previous publication,[1] and it was confirmed in this study, separating the CTRL dogs from the others, with moderate sensitivity (72 per cent) and high specificity (91 per cent). In addition, the cut-off between ‘compromised’ and ‘severely compromised’ was set with high sensitivity (83 per cent) and specificity (89 per cent). The total score of the testing battery now has a descriptive aspect to it, as the result is not merely numerical, but also describes the clinical state of the patient qualitatively. Similar cut-offs and definitions have been used in human knee testing batteries.[19–21] The importance of these values does not lie only in their statistical significance, but primarily on the clinical significance. The concept of MCID is of great value to the patient itself, and thus at the core of functionality. Although this concept is often applied in human patients’ quality of life questionnaires, in animals, where assessment of clinical signs is left to human interpretation, FCSI could represent an equivalent through defining levels of dysfunction. One method of establishing the MCID is through equal sensitivity and specificity, and the ROC curves,[22] like the one presented in the present study. The cut-off line presented is the point of MCID. Based on the surface below the ROC curve, one can identify the probability of correct discrimination between the improved and not improved stifle patients. In the present study, the AUC was within the reference values of 0.8 and 0.9, meaning excellent discrimination ability[22] for FCSI.

The intertester reliability of the FCSI (0.78) was found to be good,[11] and as ICC over 0.70 is considered to represent adequate degree of reliability in a clinically used test[23] this demand is clearly met. Further, no differences were seen between the experienced and unexperienced evaluators, nor was there a difference in the results between the evaluator who was previously familiar with the testing battery and the ones who were not. Although some lower limb-related human testing batteries have been studied for their intertester reliability,[24–26] many have not.[26] The CIs of the ICC were rather wide in the present sample of dogs, for example, the lower CI for the STIF group being 0.6, implying only moderate reliability. Most probably the wide intervals were mainly due to the low number of dogs used in this study. Had there been more dogs enrolled, the intervals might have been narrower. Nevertheless, based on the present study, physiotherapists specialised in animal physiotherapy would be able to use the FCSI testing battery after familiarisation with the protocol.[27]

The FCSI has been developed based on studies on dogs weighing over 17.5 kg,[1 2] and it was unclear whether or not the test would work on smaller sized dogs. The population in this study therefore was chosen to be heterogeneous. Although size was not considered to be a factor *per se*, the results of the FCSI's reliability and responsiveness are explicit, even with dogs weighing between 2.7 kg and 58.4 kg.

Having both surgically and non-surgically treated dogs in the STIF group may have influenced the results of the present study. The non-surgically treated dogs may have been slower to improve, thus possibly inhibiting the improvement seen in the STIF group's FCSI score over time. Further, the fact that there were more surgically treated dogs in the STIF group (26) in comparison with the OTHER group (6) may also have affected the results. However, as this was a clinical study, and all available patients during the study period were included, we had no control over the proportions of surgically or conservatively treated patients. The time interval from surgical treatment or time of diagnosis and start of medical treatment in conservatively managed cases was equal in both groups. However, the nature of disease as well as the treatment (conservative v surgical) were different. In the OTHER group the diseases can be considered to have been generally more chronic in nature, in comparison with the STIF groups' postsurgical stage, and this may have increased the difference between the groups at the baseline. Presumably surgically treated patients will show a steeper healing curve than the conservatively treated ones. Thus, in addition to making the conclusion that the test is more sensitive to change in 'stifle' than 'other' diseases, one could also argue that it is actually more sensitive to change in postsurgical patients than patients with more stable orthopaedic disease. However, despite the nature of diseases being different, it could be assumed that even the chronic orthopaedic diseases are likely to have been painful and in an acute phase at the time when the owner sought veterinarian help and when a diagnosis was made and treatment started.

The dogs with bilateral problems in their hindlimbs may also have affected the results of the study. It should be emphasised that some of the FCSI testing battery's items (thrust up from sitting and lying, and thigh circumference symmetry) are comparative, giving a score only to the weaker of the hindlimbs, and therefore always scores at least one of the limbs as 'adequate'. Other items (hindlimb position in sitting and lying, static weightbearing, range of motion) score both limbs, independently of each other, meaning that both limbs can get a score. This may be confusing when there is a bilateral problem. Although one can, to an extent, score both limbs, only the total score of the limb that is worse at that time will be reliable. This is because the better hindlimb may provide misleadingly good results due to the comparative items. Therefore one should always be aware that the FCSI is a test for one hindlimb, comparative in nature, and works most accurately on dogs whose other hindlimb is healthy or at least clearly better than the diseased one.

Another factor to consider are the dogs in the OTHER group with dysfunction in their hip or tarsus. They also may have affected the results to some extent, as the tarsal and hip joints are connected to the stifle joint both anatomically and biomechanically, and dysfunction in either of these would, potentially, affect the stifle—as would therapy of these joints. Nevertheless, a significant difference in total FCSI score was seen between the groups, although half of the dogs in the OTHER group did have a dysfunction in either their hip or tarsal joints.

Relying on the referring veterinarians' diagnosis and to accurately exclude any concurrent pathologies, for example any stifle disease in the OTHER group, does introduce a random factor to the present study. In addition, the STIFLE and OTHER groups' treatment response was not confirmed by any gold standard measurement. It was expected that they would improve over time and due to rehabilitation. The authors do recognise these factors as weaknesses of the study. However, at baseline the FCSI scores in the STIF group were significantly higher than in the other two groups, suggesting that FCSI is able to differentiate the dogs with stifle dysfunction from other dogs. Moreover, dogs in both study groups were referred to physiotherapy, and therefore progress of rehabilitation was at all times controlled by the veterinarian during routine veterinary controls, such as for the tibial plateau levelling osteotomy patients at eight weeks. In case of unprogressive rehabilitation, the therapist would have reacted by contacting the referring veterinarian. This was a clinical study, and the situation corresponds to the one with which physiotherapists work daily.

The FCSI is a responsive measurement method with moderate to good intertester reliability in all dogs and moderate to excellent intertester reliability in dogs with stifle disease. A cut-off point for MCID has been defined. The FCSI can be recommended as an outcome measure and an assessment method when evaluating the level of stifle functionality in stifle diseased dogs.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Ethics approval The study protocol was approved by the University of Helsinki Viikki Campus Research Ethics Committee, and written consent was obtained from all owners.

Data availability statement All data relevant to the study are included in the article.

► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.1136/vetrec-2018-105030).

ORCID iDs
Heli K Hyytiäinen http://orcid.org/0000-0002-7903-1672
Jouni J T Junnila http://orcid.org/0000-0003-2703-0798

References

1 Hyytiäinen HK, Mölsä SH, Junnila JJT, *et al*. Developing a testing battery for measuring dogs' stifle functionality: the Finnish Canine Stifle Index (FCSI). *Vet Rec* 2018;183.
2 Hyytiäinen HK, Mölsä SH, Junnila JT, *et al*. Ranking of physiotherapeutic evaluation methods as outcome measures of stifle functionality in dogs. *Acta Vet Scand* 2013;55:29–37.
3 . Available: https://en.oxforddictionaries.com/ [Accessed 12.12.2018].
4 Cook DA, Beckman TJ. Current concepts in validity and reliability for psychometric instruments: theory and application. *Am J Med* 2006;119:166.e7–166.e16.
5 Stratford PW, Binkley JM, Riddle DL. Health status measures: strategies and analytic methods for assessing change scores. *Phys Ther* 1996;76:1109–23.
6 Johnston BC, Ebrahim S, Carrasco-Labra A, *et al*. Minimally important difference estimates and methods: a protocol. *BMJ Open* 2015;5:e007953.
7 Husted JA, Cook RJ, Farewell VT, *et al*. Methods for assessing responsiveness: a critical review and recommendations. *J Clin Epidemiol* 2000;53:459–68.
8 Bartko JJ, Carpenter WT. On the methods and theory of reliability. *J Nerv Ment Dis* 1976;163:307–17.
9 Blonna D, Zarkadas PC, Fitzsimmons JS, *et al*. Accuracy and inter-observer reliability of visual estimation compared to clinical goniometry of the elbow. *Knee Surg Sports Traumatol Arthrosc* 2012;20:1378–85.
10 Serbetar I. Establishing some measures of absolute and relative reliability os a motor tests. *Croat J of Educ* 2016;17:37–48.
11 Koo TK, Li MY. A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *J Chiropr Med* 2016;15:155–63.
12 Flückiger M. Scoring radiographs for canine hip dysplasia – the big three organisations in the world. *EJCAP* 2007;17:135–40.
13 Light VA, Steiss JE, Montgomery RD, *et al*. Temporal-Spatial gait analysis by use of a portable walkway system in healthy Labrador Retrievers at a walk. *Am J Vet Res* 2010;71:997–1002.
14 Mostafa AA, Griffon DJ, Thomas MW, *et al*. Morphometric characteristics of the pelvic limbs of Labrador Retrievers with and without cranial cruciate ligament deficiency. *Am J Vet Res* 2009;70:498–507.
15 Marsolais GS, Dvorak G, Conzemius MG. Effects of postoperative rehabilitation on limb function after cranial cruciate ligament repair in dogs. *J Am Vet Med Assoc* 2002;220:1325–30.
16 Monk ML, Preston CA, McGowan CM. Effects of early intensive postoperative physiotherapy on limb function after tibial plateau leveling osteotomy in dogs with deficiency of the cranial cruciate ligament. *Am J Vet Res* 2006;67:529–36.
17 Baltzer WI, Smith-Ostrin S, Warnock JJ, *et al*. Evaluation of the clinical effects of diet and physical rehabilitation in dogs following tibial plateau leveling osteotomy. *J Am Vet Med Assoc* 2018;252:686–700.
18 Romano LS, Cook JL. Safety and functional outcomes associated with short-term rehabilitation therapy in the post-operative management of tibial plateau leveling osteotomy. *Can Vet J* 2015;56:942–6.
19 Lequesne MG, Mery C, Samson M, *et al*. Indexes of severity for osteoarthritis of the hip and knee. Validation--value in comparison with other assessment tests. *Scand J Rheumatol Suppl* 1987;65:85–9.
20 Lequesne M. Indices of severity and disease activity for osteoarthritis. *Semin Arthritis Rheum* 1991;20:48–54.
21 Lequesne MG. The algofunctional indices for hip and knee osteoarthritis. *J Rheumatol* 1997;24:779–81.
22 Copay AG, Subach BR, Glassman SD, *et al*. Understanding the minimum clinically important difference: a review of concepts and methods. *Spine J* 2007;7:541–6.
23 Tickle-Degnen L. Communicating evidence to clients, managers, and funders. In: Law M, MacDermid J, eds. Evidence based rehabilitation. A guide to practice. 2nd edn. New Jersey, USA: SLACK Incorporated, 2008.
24 Frohm A, Heijne A, Kowalski J, *et al*. A nine-test screening battery for athletes: a reliability study. *Scand J Med Sci Sports* 2012;22:306–15.
25 Mikkelsen LR, Mikkelsen S, Søballe K, *et al*. A study of the inter-rater reliability of a test battery for use in patients after total hip replacement. *Clin Rehabil* 2015;29:165–74.
26 Haitz K, Shultz R, Hodgins M, *et al*. Test-retest and interrater reliability of the functional lower extremity evaluation. *J Orthop Sports Phys Ther* 2014;44:947–54.
27 Finch E, Brooks D, Stratford PW, *et al*. Physical rehabilitation outcome measures. A guide to enhanced clinical decision making. 2nd edn. Ontario, Canada: BC Decker, 2002.

THE NEW ARD Student Scholarships

The Animal Rehab Division is promoting student involvement in both animal rehab and our division by introducing a new student scholarship program.

The ARD will award up to 4 scholarships per year to Canadian Physiotherapy students. Successful submissions have a choice of the following 2 scholarships:

Scholarship 1

- Canine or Equine Home Study Program ($317)

Scholarship 2

- $250 pre-paid Visa card, copy of Successful Practitioners in Canine Rehabilitation and Physiotherapy

Requirements

- Successful completion of ONE of the following tasks
- Currently enrolled in a Canadian University Physiotherapy Program or new Physiotherapy graduates who have completed their course work in the last year. Maximum of one award per applicant.
- Be creative and have FUN!!

Completed electronic applications should be submitted to: carriephysio@bellnet.ca

Deadline for submissions: January 31st annually (winners announced in February)

Applications will be scored on content, style, use of video/You Tube (if appropriate), pictures and originality.

Successful applications will be published in the ARD newsletter.

Choose 1 of the following tasks, be creative and have fun!

1. Create a YouTube Video about Animal Rehab
2. Shadow a practicing ARD member and create a video or article about your experience.
3. Complete a summary of 2 veterinary research papers related to rehabilitation.
4. Perform a literature review on anything related to canine or equine rehab.
5. Develop hand-outs for owners illustrating at least 5 commonly used exercises for a variety of conditions (canine or equine), in conjunction with videos of the same exercises available to ARD members via YouTube.
6. Write a 2-3 page article for the ARD newsletter on any topic of your choice. Article must be referenced, have corresponding photographs and may have a YouTube link.

Jordan Berger

Master of Science Physical Therapy Student

Congratulations

to our 2019 Student Scholarship Recipient!

Jordan Berger – MScPT Student, U of A

Veterinary Research Paper Summaries

I've always had a passion for animals, especially dogs. Growing up as a kid, some of my favourite memories were with my miniature schnauzer, Ozzie. When I found out that the Canadian Physiotherapy Association (CPA) had an animal rehab division, it made me that much more excited to become a physiotherapist. I'm currently in my second semester of my Master of Physical Therapy (MScPT) at the University of Alberta, and my excitement to become a physiotherapist, and eventually an animal rehab specialist, has made learning about the profession easy for me. That's why I wanted to take this scholarship opportunity to further expand my knowledge about animal rehabilitation.

Prior to searching for veterinary research papers, I familiarized myself with some common conditions that occur in canines. My interests were particularly sparked with cranial cruciate ligament (CrCL) injuries and intervertebral disk herniations (IVDH). For both conditions, I was interested in seeing how the rehabilitation process related to the coinciding human version of the injury. Specifically, in the treatment of human ACL injuries, evidence-based guidelines for rehabilitation have been implemented. However, in canines there has been no implementation of clear guidelines. Considering this difference, I was interested in finding out what the consensus was, if there was any, on the rehabilitation process of canines following a CrCL and IVDH injury.

Recommendations for rehabilitation after surgical treatment of cranial cruciate ligament disease in dogs: A 2017 survey of veterinary practitioners.

The purpose of this study was to identify current recommendations made by veterinarians for rehabilitation after surgical treatment of cranial cruciate ligament (CrCL) disease. CrCL insufficiencies are one of the most common injuries in dogs, however the ideal treatment for the disease is unknown. In order to report the current formal and informal recommendations for postoperative rehabilitation by those performing CrCL surgery, an electronic survey was created and sent out to approximately 3,000 veterinarians. All respondents were veterinarians performing stifle stabilization surgery and the survey had to be completed in its entirety. The survey that was distributed was composed of 18 questions related to background information of the respondents, general recommendations for post-operative rehabilitation, and recommendations of therapeutic modalities and bandaging. A total of 376 veterinarians and veterinary surgeons completed the survey (13% response rate) from around the world (USA, Canada, and Europe).

The results showed that the majority (55%) of respondents recommended formal (therapist guided/clinic-based) post-operative rehabilitation for all CrCL cases, while 23% of the respondents recommended postoperative rehabilitation in specific cases only. The remaining percentage recommended "other" which included informal rehabilitation only, or no rehabilitation at all. According to authors Eiermann, Kirkby-Shaw, Evans, et al. (2019), the main factors that influenced the likelihood of recommending postoperative rehabilitation were severe muscle atrophy, decreased stifle and/or tarsal range of motion (ROM), geriatric and/or very inactive dog, sporting dog, and working dog. The type of surgery also influenced whether rehabilitation was recommended or not. Postoperative rehabilitation was recommended more often after extracapsular stabilization compared to tibial osteotomies. Regarding the postoperative bandaging and therapeutic recommendations, a higher percentage of respondents did not bandage beyond 24 hours compared to those that did and the most applied therapies postoperatively were ice pack with and without compression, passive ROM, massage and laser.

The survey was intended to reach a large number of veterinarians performing stifle stabilization surgery, but because of the low response rate, there was likely bias for responses from those with specific interests in rehabilitation. The study concluded their findings by stating most respondents recommended either formal or informal postoperatively rehabilitation therapy. However, there was high variability regarding the specific recommendations. In addition, the study recognized that less than 25% of respondents based their recommendations on published evidence. These findings exemplify the lack of available evidence surrounding rehabilitation within the veterinary community. Out of the 376 respondents, 92% said future evidence-based guidelines on postoperative rehabilitation therapy after CrCL surgery in dogs would be helpful. Numerous veterinarians around the world are all in agreement that future work should be devoted to evaluating the efficacy of postoperative rehabilitation therapy after CrCL surgery in order to identify and establish evidence-based guidelines for postoperative rehabilitation.

Canine thoracolumbar intervertebral disk herniation and rehabilitation therapy after surgical decompression: A retrospective study.

The intervertebral disks play an important role in acting as shock absorbers, regulating slight movement, flexibility, and maintaining stability of the spinal column. Each intervertebral disk is composed of an outer fibrous ring and an inner nucleus pulposus. When the central nucleus pulposus begins bulging through a damaged portion of the outer ring, it's called an intervertebral disk herniation (IVDH). If the injury gets large enough, it can begin to press on adjacent spinal nerves resulting in severe pain and neurological abnormalities. IVDH is a common condition experienced in dogs that usually ends up resulting in surgery and rehabilitation therapy. In author's Jeong, Piao, Rahman, et al. (2019), study, the purpose was to evaluate the clinical outcome of surgical decompression and rehabilitation therapy in dogs with thoracolumbar IVDH.

In order to identify the success rate of rehabilitation therapy on improving neurological function after surgical decompression of thoracolumbar IVDH, a clinical record database of a neurology unit at the Royal Animal Medical Center (RAMC) was used to search for dogs diagnosed with IVDH from 2012 to 2017. The dogs were categorized based on the pre-operative clinical severity grading system. Authors Jeong, Piao, Rahman, et al. (2019), outlined the clinical severity grading scale from 0-4, where 0 is normal; 1 is single or occasional mild, moderate, or severe back pain, present or absent slight conscious proprioception (CP) deficits, no motor weakness; 2 is persistent and severe back pain, CP deficits, ambulatory paraparesis; 3 is uncontrolled severe back pain, CP deficits, weak ambulatory paraparesis, or non-ambulatory paraparesis; and 4 is paraplegia with or without deep-pain perception. Only the dogs classified as grades 2-4 were recommended for surgical decompression and included in the study. A total of 186 dogs were selected from the hospital records and divided into two groups: the rehabilitated group (RC), which contained 96 dogs, and the non-rehabilitated group (NRG), which contained 90 dogs.

Jeong, Piao, Rahman, et al. (2019) used three types of physical examinations to establish a baseline for all of the dogs prior to the surgery: assessment of muscle strength of the hind limbs and tonicity with the MyotonPRO technique to measure muscle tone in hamstring and quadriceps, assessment of superficial and deep pain in the limb by a needle or finger, and assessment of the patient's ability to stand. Following the surgical decompression, the RC group received rehabilitation therapy through a combination of electrotherapy, infrared therapy, training for standing, balance training, deep tendon reflex, and aquatic treadmill exercise. The intensity and duration of rehabilitation therapy was determined based on the animal's condition.

The results showed that 83 out of the 96 dogs (86.5%) in the RC group had successful neurologic outcome, which was significantly higher than the NRG group, where only 47 out of the 90 dogs (52.2%) showed successful neurological outcomes. When taking into consideration the clinical severity grading system, the success rates were increased when the pathological condition was considered severe. In conclusion, the results clearly show the supremacy of rehabilitation therapy compared to no therapy in dogs rehabilitating from surgical decompression.

Work Cited

Eiermann J, Kirkby-Shaw K, Evans RB, et al. Recommendations for rehabilitation after surgical treatment of cranial cruciate ligament disease in dogs: A 2017 survey of veterinary practitioners. *Veterinary Surgery*. 2019;49(1):80-87. doi: 10.1111/vsu.13294.

Jeong IS, Piao Z, Rahman MM, Kim S, Kim NS. Canine thoracolumbar intervertebral disk herniation and rehabilitation therapy after surgical decompression: A retrospective study. *Journal of Advanced Veterinary and Animal Research*. 2019;6(3):394-402. doi: 10.5455/javar.2019.f359.

ARD BROCHURES!

For ARD Members!

The ARD has new, personalized, Canine Rehabilitation Brochures available for purchase.

A professional and informative way to introduce canine rehab to your clients. This brochure is designed to give information to the public about your rehab services. Printed in colour, on high quality paper, these individualized brochures can help to promote your practice.
Your name, contact and clinic information included.

Cost:

25 Brochures - $40 + applicable tax

50 Brochures - $60 + applicable tax

100 Brochures - $100 + applicable tax

Canine Rehab Brochure Order Form

Name: ____

Name and Credentials as you want them to appear on the brochure:

____

Other Information as you want it to appear (clinic name, hours, fees, if applicable):

____

Contact Information as you want it to appear (phone, fax, e-mail, website, etc):

____

Mailing Address:____

E-mail: ____

Phone: (Home)__________________________ (Cell)____________________________

A pdf proof will be sent to you electronically to ensure all information is accurate before printing.

I am ordering:

25 Brochures - $40 + applicable tax __________

50 Brochures - $60 + applicable tax ___________

100 Brochures - $100 + applicable tax ___________

Payment:

1. Credit Card: Visa/MC #_____________________________ Expiry________ CV_______

Name on Credit Card__________________________________

2. PayPal: ____ *Please invoice me through PayPal (secure online banking).*

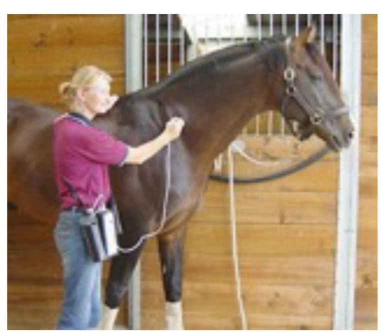
Fax form to (613) 258-7661or Email to carriephysio@bellnet.ca

SpectraVET™ Therapeutic Lasers offer reliable, effective and affordable treatment of musculoskeletal injuries and conditions commonly suffered by performance animals, pets and wildlife alike.

Designed for portable operation, SpectraVET's PRO-series and ZEUS laser control units are lightweight and simple to operate, yet rugged and powerful enough for the most demanding user.

SpectraVET designs and manufactures a wide and growing range of continuous wave and super-pulsed hand-pieces, each designed specifically for a particular application, such as multi-diode probes for covering large areas more quickly, and single-diode probes for precisely targeting pathologies, trigger points, acupuncture points, and for intra-oral/-aural applications.

Large or small animal, general or specialty practice, we can configure a SpectraVET system to best suit your particular clinical and budgetary needs. We even cater for exotics, and can customize our probes' powers and wavelengths to accommodate unique clinical, research and OEM requirements.



HERO

CCL Tears: Discover a New Option for Conservative Management

There's no question that surgery is the gold standard in treating a ruptured CCL. But surgery is not always possible. Now there is another option you can offer. Stifle bracing.

A biomechanically designed custom stifle brace provides the counter force needed to stabilize the stifle joint by stopping forward motion of the tibia. With a stable stifle joint, the body's natural healing processes take over and work to repair the CCL, allowing the pet to return to its regular daily activities as soon as the brace is in place.

Bracing is also a good adjunct to surgery, providing stability and support to a repaired joint as it heals. Doctors have been using braces for post surgical support for human cruciate ligament repairs for several decades. Veterinarians and rehabilitation therapists are now starting to report better surgical outcomes with this treatment protocol.

BRACING BENEFITS FOR

Your Patient:

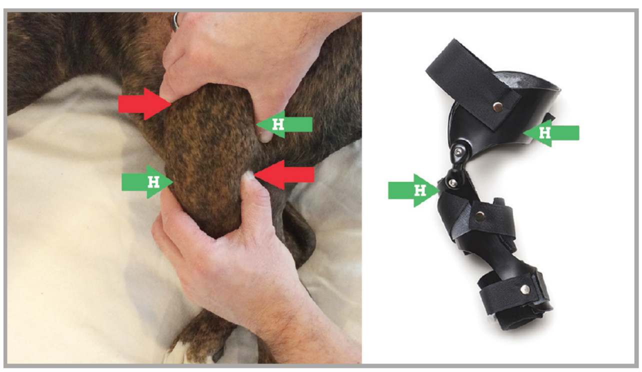
- Immediate return to daily activities after being fit with custom brace
- Eliminates the risks of surgery
- Facilitates healing
- Reduces fatigue on non-injured limb

Your Client:

- Another option when surgery isn't an option
- Avoids the inconvenience of limiting pet's activity
- Allows pet to remain an active member of family
- Peace of mind

Your Practice:

- Minimal time investment by veterinarian: 30 minutes to cast leg, and two 15 minute follow-ups for fitting
- Profit that more than compensates for your time
- No need for referrals to other/specialty practices



To understand the brace design, think about your diagnostic cranial drawer test. The test involves pushing forward with the thumb on the tibia and pulling backward with the fingers on the femur (red arrows.) The Hero Brace applies opposite forces to limit the cranial drawer. To ensure those forces are applied properly, the Hero brace is the only design to use plastic in those specific areas (green arrows). You no longer have to guess if owner has the strap in the proper place.

With a Hero brace steps are no problem for Cooper.

SIMPLE, 3 STEP PROCESS

1. Measure and Cast Leg: Follow instructions in Hero's easy-to-use casting kit and send to Hero's lab with the prepaid shipping label.
2. Brace Fitting: Hero manfuactures a custom-fitting brace in 2 weeks and ships to your clinic. We provide fitting videos to help you train your client on how to use the brace.
3. Follow-up: We recommend a third appointment approximately 2 weeks post-fitting to evaluate fit. Contact Hero with fitting questions. We back up our braces with a perfect fit guarantee.

Our website can answer your clients' questions, at goherogo.com

ABOUT HERO

Hero was founded by a partnership between a certified orthotist and a veterinarian who have a special passion for helping injured pets return to their daily activities and important roles as beloved, valued family members, the heroes of their owners' hearts.

Ben Blecha

Founder

Ben received his training in orthotics and prosthetics at the University of Texas Southwestern Medical Center. As a Certified Orthotist-Prosthetist on the human side, his work experience includes a stint at Shriners Hospitals for Children-Greenville. Ben's personal experience with osteosarcoma bone cancer and amputation feed his drive to help others.

When introduced to Dr. Robert Taylor of Animal Planet's Emergency Vets show, Ben was asked to consult on a project for a dog name Triumph. Ben learned of the limited options available for animals with limb injuries and deformities, inspiring the founding of Hero braces.

Ben continues to work and consult in human orthotics and prosthetics, and has been invited to speak at conferences on both human and animal orthotics and prosthetics, including the annual meeting of the American Orthotic and Prosthetic Associations and the International Association of Veterinary Rehabilitation and Physical Therapy.

Wayne Watkins, DVM

Veterinarian/Co-Founder

Dr. Watkins is a mixed practice veterinarian with more than 30 years of experience successfully treating limb and joint injuries and deformities in more than a half dozen species. His ability to merge the science of biomechanics with the clinical applications of bracing has been invaluable in fine tuning the construction of Hero braces for practical application by veterinarians. He joined the Hero team because he believes that bracing offers better outcomes.

A FULL LINE OF BRACES

Stifle Brace:

The Hero stifle brace addresses cranial cruciate ruptures. The unique geometrical design of the stifle brace uses biomechanical principles to stabilize the joint, preventing the cranial drawer action that contributes to arthritic changes.

Carpal Brace:

The Hero carpal braces are recommended for hyperextension and other wrist deformities. Carpal braces use a "fail-safe" geometry design to limit the dropped carpus during stance.

Hock Brace:

The Hero hock brace is used for Achilles tears, neuromuscular deficiencies and tarsal involvement. The hock brace limits crouched gait by providing a corrective force on the cranial tibia with its unique "fail-safe" geometry.

Contact us today to learn more at 877-684-5659 or visit our website goherogo.com

Winter 2020 Newsletter

Our next newsletter will be available in December/January 2020/2021! If you have an idea about what you would like to see in upcoming newsletters, we would love to hear from you!

Newsletter Editor: Miranda Shumborski— mshumbor@ualberta.ca

Animal Rehab Insurance

Members should be aware that AON is no longer our insurance carrier. The ARD has changed companies along with CPA to the BMS Group. Information on new policies can be found on the CPA/ARD website.

A BIG THANK-YOU!

The ARD would like to say a big thank-you to our course sponsors,

Dr. Buzby's Toe Grips, FourLeg Rehab Inc., SpectraVet Lasers, and Hero Braces

Who have graciously donated to our Intro and Advanced Canine Rehab courses which allows us to continue to run courses for our members.

Follow us on Facebook

For all kinds of great clinical ideas and to keep up with what's happening in the ever-evolving world of animal rehab, follow us on Facebook.

https://www.facebook.com/pages/Animal-Rehab-Division

We are also on Instagram!

Follow us @animalrehabdivision