FOUR LEG NEWS

Summer / Fall 2025 Vol. 14 / Iss. 2

FUN LASER UPDATES

I meant to get this newsletter out in September... but the video for that month (part 3 of the Myofascial Release series) was more important. So, summer, here in my part of Canada anyways, is long gone. We're in the phase of praying that winter doesn't come early... but this is the Summer / Fall newsletter edition never-the-less! I found a few interesting laser articles, published in the last 5 years and figured they'd make a fun little update - presented in 'bite sized' chunks of information! Enjoy! And, Happy Learning!
Cheers! Laurie

In this issue...

Nine dogs walk into a bar... three with arthritis, two with wounds, and one each with ROM issues, a gastropexy, dementia, and the last one with diarrhea. The bartender asks them, "What'll it be?" They all say, "Laser please!" And at the end of the night, they all felt better... but nobody hung out with the dog with diarrhea, just incase!

Yep, that's what this issue is about! Laser made an impact on all of these conditions! Nifty! The neat thing is that a variety of lasers were used (albeit, most of them were class 4 lasers, but that just seems to be par for the course in university / research labs). That doesn't mean, you can't have an impact with a class 3b laser.

Alves, J. C., Jorge, P., & Santos, A. (2021). The effect of photobiomodulation therapy on the management of chronic idiopathic large-bowel diarrhea in dogs. Lasers in Medical Science, 37(2022), 2045–2051.

Premise: This study investigates the effectiveness of photobiomodulation therapy (PBMT) in managing chronic idiopathic large-bowel diarrhea in dogs, a condition common in working and sporting dogs, often linked to stress or excitability.

Methodology: Thirty dogs, primarily Belgian Malinois, German Shepherds, and Dutch Shepherds, were divided into a control group (CG) receiving psyllium husk (4 tablespoons/day for 30 days) and a treatment group receiving PBMT with a Class IV therapeutic laser. The PBMT protocol involved three sessions in week 1, two in week 2, and one in week 3. Outcomes were assessed using the Canine Inflammatory Bowel Disease Activity Index (CIBDAI), Bristol stool scores, and daily fecal characteristic logs. Additional measures included body condition scores (BCS) and body weight.

Laser Dosage: The study used a Class IV therapeutic laser (12 Watt), with a 910nm/808nm blend of wavelengths. The area treated was 500cm2 (the entire abdomen) with a continuous movement in a grid pattern. Total joules delivered was 4320J.

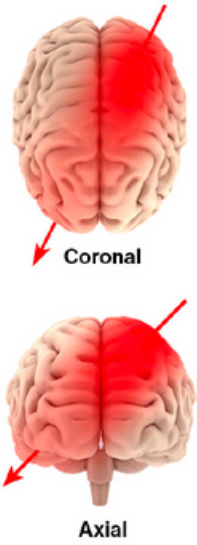
Main Findings for the PBMT group:

- Significant improvements in clinical signs compared to the control group.
- Reduced CIBDAI scores & improved Bristol stool scores, and fewer diarrhea episodes.
- Increased body weight and improved BCS, indicating better overall health.
- A longer time before a second diarrhea episode.
- Activity level was identified as a predictor of defecation frequency and CIBDAI scores.
- No adverse effects were reported.

The study highlights PBMT's potential to reduce inflammation and improve gut health, offering a non-invasive treatment option for this challenging condition.

Cognitive Dysfunction

Dewey, C. W., Rishniw, M., Brunke, M. W., Gerardi, J., & Sakovitch, K. (2024). Transcranial photobiomodulation therapy improves cognitive test scores in dogs with presumptive canine cognitive dysfunction: A case series of five dogs. Open Veterinary Journal, 14(5), 1167–1171.



Premise: This case series evaluates transcranial photobiomodulation therapy (tPBMT) for improving cognitive scores in five senior dogs (>9 years) with moderate to severe canine cognitive dysfunction (CCD), a model for human Alzheimer's disease.
Methodology: Owners applied a Class IM laser device transcranially to both sides of the dog's head three times weekly for one month, then twice weekly for a second month. Cognitive scores were assessed at baseline, 30 days, and 60 days post treatment.
Laser Dosage: A Class IM laser device was used, delivering a specific dose of laser energy in the red to near-infrared range (600–1200 nm). Total power = 0.3564 W; power density = 0.0891 W/cm2; energy density = 16.04 J/cm2.
Main Findings:

- Four of five dogs showed improved cognitive scores at 30 days (27.6% reduction), and all dogs improved by 60 days (43.4% reduction).
- No adverse effects were reported.

Discussion: The study suggests that tPBMT enhances neuronal mitochondrial function, brain blood flow, and reduces β-amyloid accumulation, contributing to cognitive improvement.

Post-Gastropexy

Alves, J. C., Filipe, A., & Santos, A. (2024). Post-surgical photobiomodulation therapy improves outcomes following elective gastropexy in dogs. Lasers in Medical Science, 39, 211.

Premise and Methodology: This study evaluates the effect of post-surgical Photobiomodulation therapy (PBMT) on pain and recovery outcomes following elective gastropexy in dogs, a procedure to prevent gastric dilatation-volvulus.

- Twenty dogs were randomly divided into a control group (CG, n=10, standard anesthesia/analgesia with meloxicam and lidocaine) and a PBMT group (PBMTG, n=10, standard protocol plus immediate post-surgical PBMT).
- Pain was assessed using the Glasgow Composite Measure Pain Scale–Short Form (CMPS-SF) at multiple time points up to 24 hours post-extubation.
- Eating behavior and need for rescue analgesia were also recorded.

Laser Dosage: PBMT was applied immediately post-surgery using a Class IV therapeutic laser (12 W), with a 910nm/808nm blend of wavelengths. The area treated was 500cm2 with a continuous movement in a grid pattern. Total joules delivered was 4320J.

Main Findings:

- No dogs required rescue analgesia.
- The PBMTG showed significantly lower CMPS-SF scores from 1 to 4 hours post-extubation ($p<0.05$) and a higher proportion of dogs eating by 8 hours ($p<0.05$).
- No adverse effects were reported.

Discussion: The study suggests that PBMT enhances post-surgical pain management and accelerates recovery of normal behaviors like eating, likely due to its anti-inflammatory and analgesic effects.

Rico-Holgado, S., Ortiz-Díez, G., Martín-Espada, M. C., Fernández-Pérez, C., Baquero-Artigao, M. R., & Suárez-Redondo, M. (2021). Effect of low-level laser therapy on bacterial counts of contaminated traumatic wounds in dogs. Journal of Lasers in Medical Science, 12, e78.

Premise and Methodology: This pilot study investigates the impact of low-level laser therapy (LLLT) on bacterial loads in contaminated traumatic wounds in dogs, addressing the need for alternative treatments amid rising antibiotic resistance.

- Fourteen dogs with traumatic bites or lacerations were randomly assigned to three groups: Group A (n=5) received LLLT at 6 J/cm², Group B (n=5) received LLLT at 2 J/cm², and Group C (n=4) received placebo LLLT.
- Bacterial burden and clinical wound scores were assessed before and after treatment, with samples collected for bacterial colony-forming unit (CFU) counts.

Laser Dosage: LLLT was administered using four simultaneous wavelengths (660 nm, 800 nm, 905 nm, 970 nm). Group A received 6 J/cm² and Group B received 2 J/cm² per session. Treatments were applied directly to the wounds using a K Laser delivering continuous wave, and pulsed phases. (See table below)

Main Findings:

- Group B (2 J/cm²) showed a statistically significant reduction in CFU counts compared to the placebo group, alongside improved wound scores.
- Group A (6 J/cm²) did not show significant bacterial reduction compared to placebo.
- No adverse effects were observed.

Conclusion: This is the first clinical study to demonstrate LLLT's effect on bacterial loads in canine traumatic wounds, suggesting that a lower dose (2 J/cm²) is more effective than a higher dose (6 J/cm²) in reducing bacterial burden.

Table 1. Study Design: Timeline of Interventions

Day 0	Day 1	Day 2
Microbiology sample named "before treatment"(BT)		Microbiology sample named "after treatment" (AT)
LLLT	LLLT	LLLT
Wound management	Wound management	Wound management
Antibiotic		

Table 2. Treatment Parameters for Each Group

Group	Dose	Wavelength	Frequency	Power
A	6 J/cm2	660 nm 800 nm	CW 50 Hz	2 W Pa 4 W Pp
B	2 J/cm2	905 nm 970 nm	5000 Hz 20000 Hz	
C	Placebo: 5 mW, 660 nm			

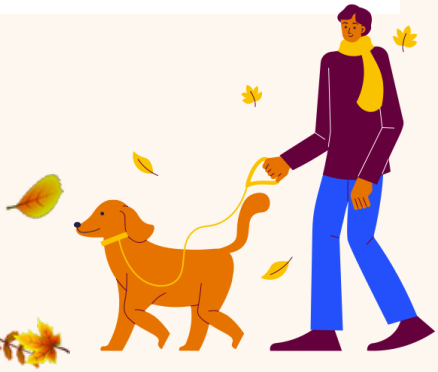
CW, continuous wave; Pa, average power; Pp, peak power.

Hoisang, S., Kampa, N., Seesupa, S., & Jitpean, S. (2021). Assessment of wound area reduction on chronic wounds in dogs with photobiomodulation therapy: A randomized controlled clinical trial. Veterinary World, 14(8), 2251–2259.

Premise: This study evaluates the efficacy of photobiomodulation therapy (PBMT) in reducing chronic wound area in client-owned dogs, comparing 830 nm PBMT and simultaneous superpulsed and multiple wavelength (SPMW; 660, 875, 905 nm) PBMT against a control.
Methodology: Twenty-one dogs with chronic wounds (>3 weeks) were divided into three groups: control (C, n=7, saline irrigation), L1 (n=7, 830 nm PBMT), and L2 (n=7, SPMW-PBMT). Treatments were applied every 2 days for 15 days.
Laser Dosage: L1 used an 830 nm laser with 100 mW power, 4 J/cm² energy density, and 30 seconds/cm² duration. L2 used simultaneous SPMW (660, 875, 905 nm) with 200 mW average power, 4 J/cm² energy density, and 30 seconds/cm² duration. Both were applied every 2 days for 15 days.
Main Findings:

- Both PBMT groups (L1 and L2) showed significantly greater wound area reduction compared to the control group ($p<0.05$), with average reductions of 56.98% (L1), 61.81% (L2), and 42.39% (C) by day 15.
- Significant differences emerged by day 7 ($p<0.05$). L2 (SPMW) showed a slightly higher reduction coefficient (10.01) than L1 (8.95) and C (7.77), though not statistically significant between PBMT groups.
- No adverse effects were reported.

Conclusion: The study demonstrates that both 830 nm and SPMW-PBMT accelerate chronic wound healing in dogs, supporting their use as adjunctive therapies to reduce treatment duration and enhance healing outcomes.



Alves JC, Santos A, Jorge P, Carreira LM. (2022). A randomized double-blinded controlled trial on the effects of photobiomodulation therapy in dogs with osteoarthritis. Am J Vet Res. Jun 28;83(8).

Premise: This study evaluates the efficacy of PBMT in managing bilateral hip osteoarthritis (OA) in dogs, comparing it to meloxicam, a common non-steroidal anti-inflammatory drug (NSAID).
Methodology: Twenty dogs (40 joints) were assigned to either a control group (CG) receiving meloxicam for 21 days or a treatment group (TG) receiving PBMT with a Class IV therapeutic laser over three weeks. Outcomes were measured using joint range of motion, thigh girth, Canine Brief Pain Inventory (pain interference score [PIS] and pain severity score [PSS]), Hudson Visual Analogue Scale, Liverpool Osteoarthritis in Dogs (LOAD), and Canine Orthopedic Index (COI). Assessments occurred before treatment and at days 8, 15, 30, 60, and 90 post-treatment.
Laser Dosage: The study used a Class IV therapeutic laser (6.5 - 8W), with a 980nm/808nm blend of wavelengths (for dogs with light coat colour) or 980nm (for patients with dark coat colour). The area treated was 225cm2 with a continuous movement in a grid pattern over the area of the greater trochanter.
Main Findings:

- PBMT significantly outperformed meloxicam in reducing pain and improving clinical outcomes.
- The TG showed better results at day 8 (PSS, function, COI), day 15 (PSS, PIS, function, COI, LOAD), and day 30 (function, gait, COI, PIS, PSS, LOAD). Joint range of motion improved in the TG from days 15 to 90.
- Kaplan-Meier estimators indicated that PBMT provided longer-lasting improvements in pain and function compared to meloxicam.
- No adverse effects were noted, reinforcing PBMT's safety profile.

Conclusion: The study suggests that PBMT modulates cellular functions, reduces inflammation, and promotes analgesia, making it a valuable non-invasive treatment for canine hip OA, potentially reducing reliance on NSAIDs and their associated side effects.

Duarte, D., & Alves, J. C. (2025). Evaluation of the effect of photobiomodulation on joint range of motion in dogs. Lasers in Medical Science, 40, 296.

Premise: This study assesses whether PBMT enhances joint range of motion (ROM) in healthy police working dogs, focusing on its potential to improve flexibility for rehabilitation exercises.
Methodology: Sixteen dogs had limbs randomly assigned to a treatment group (PBMT) or control group (no PBMT). Elbow, stifle, and tarsal joint flexion and extension were measured in triplicate by an experienced and a novice evaluator before and after PBMT, with a 5-minute rest period post-treatment. Digital thermography assessed joint temperature changes.
Laser Dosage: 980nm wavelength, 10 Watt power, with a continuous movement grid pattern. The elbow treatment area was 250cm2 and received 3750J. The stifle area was 350cm2 and received 5250J. The tarsus area was 125cm2 and received 1875J. PBMT was applied to the treated side's joints in a single session, with measurements taken immediately after and post-rest.
Main Findings:

- PBMT significantly increased ROM in all joints ($p<0.01$) with large effect sizes (0.84–0.96).
- Thermography showed significant temperature increases (up to 5ºC) in all joints post-PBMT ($p<0.01$), with small to medium effect sizes (0.31–0.61), persisting in stifle and tarsus after 5 minutes ($p<0.01$).
- No differences were found between experienced and novice evaluators, indicating reliable measurements.

Discussion: The study suggests that PBMT enhances joint flexibility and tissue temperature, likely due to increased collagen extensibility, making it a valuable tool for optimizing joint mobilization exercises in veterinary rehabilitation. No adverse effects were noted, reinforcing PBMT's safety. These findings support incorporating PBMT before rehabilitation exercises to maximize ROM benefits.

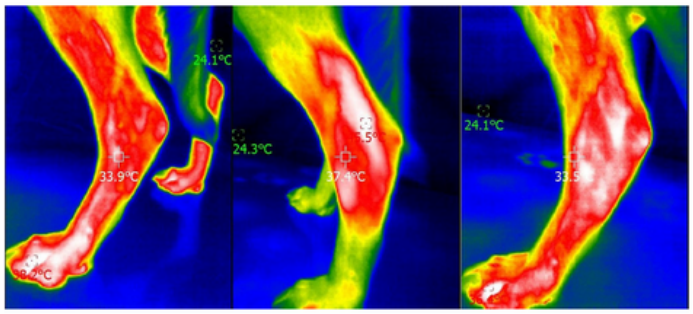


Fig. 3 Lateral thermogram of a tarsus before (left), immediately after photobiomodulation therapy (center), and after 5 min (right). The head of the animal is to the left of the image

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Barale, L., Monticelli, P., & Adami, C. (2023). Effects of low-level laser therapy on impaired mobility in dogs with naturally occurring osteoarthritis. Veterinary Medicine and Science, 9, 653–659.

Premise: This study examines whether low-level laser therapy (LLLT) improves physical activity in dogs with naturally occurring osteoarthritis (OA), a condition causing chronic pain and reduced mobility.
Methodology: Twenty-three dogs with confirmed knee or hip OA were fitted with accelerometers 48 hours before LLLT to record baseline activity, followed by six weekly laser sessions. Activity metrics (daily activities, step count, energy expenditure) were tracked over 44 days. Canine Brief Pain Inventory and Liverpool Osteoarthritis in Dogs scores were recorded weekly to adjust analgesic therapy.
Laser Dosage: LLLT was administered using a LaserVet 1000 (GlobusVet) with 1000 mW potency, 1 W/cm² density, 808 nm wavelength, frequencies of 500–1000 Hz (joints) and 3000–5000 Hz (muscles), and energy of 5 J/cm² (joints) and 4.2 J/cm² (muscles). Treatment duration ranged from 50 seconds to 4 minutes, depending on coat pigmentation and body weight, with 6–10 application points per site.
Main Findings:

- LLLT significantly increased daily activities (from 93,481 at baseline to 161,674 by week 2, sustained at 179,309 by week 6) and step counts (from 1109 at baseline to 4472 by week 1, reaching 8416 by week 6).
- Energy expenditure remained unchanged.
- Systemic analgesic use was reduced in 50% of dogs, indicating improved pain management.
- No adverse effects were reported, supporting LLLT's safety.

Conclusion: The study suggests that LLLT enhances mobility and quality of life in dogs with OA, offering a non-pharmacological alternative to NSAIDs, which may have side effects.

Platelet-Rich Plasma

Alves, J. C., Santos, A., & Carreira, L. M. (2023). A preliminary report on the combined effect of intra-articular platelet-rich plasma injections and photobiomodulation in canine osteoarthritis.

Premise: This study explores the combined effect of intra-articular platelet-rich plasma (PRP) and PBMT on dogs with bilateral hip osteoarthritis (OA), comparing it to PRP or PBMT alone.
Methodology: Thirty dogs were assigned to three groups: PRP group (PRPG, n=10, two intra-articular PRP injections 14 days apart), PBMT group (PBMTG, n=10, laser sessions over 3 weeks), and combined group (PRP+PBMTG, n=10, both treatments). Outcomes were assessed using weight-bearing distribution, Canine Brief Pain Inventory, Liverpool Osteoarthritis in Dogs, and Canine Orthopedic Index at baseline and days 8, 15, 30, 60, and 90.
Laser Dosage: PBMTG and PRP+PBMTG received PBMT with a Class IV therapeutic laser (three sessions in week 1, two in week 2, one in week 3, and monthly follow-ups). Specific parameters = 980nm wavelength, 13J power, 350cm2 area over the hip area, delivering total joules of 5250J, using a continuous motion grid pattern method of delivery.
Main Findings:

- All treatments improved clinical outcomes compared to baseline, but the PRP+PBMTG group showed greater and longer-lasting improvements in pain, function, and quality of life across all measures ($p<0.05$ at various time points).
- No significant differences were found between groups at baseline, and no adverse effects were reported.

Discussion: The synergistic effect of PRP and PBMT likely enhances tissue repair and reduces inflammation more effectively than either treatment alone.
Conclusion: This preliminary study supports the combined use of PRP and PBMT as a superior multimodal approach for managing canine hip OA, potentially reducing reliance on systemic medications.

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