

Bitesize Day | CAM Chronic Pain Symposium
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The Case for Laser Therapy

Turning pain down to turn function up

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Presentation Objectives

1. Why laser deserves a place in pain management
2. How laser works
3. How laser fits into multimodal chronic pain plans
4. A practical dosing framework
5. What meaningful change looks like in early treatment

To be able to integrate laser within a multimodal plan and use safe, effective laser parameters for treating chronic pain

The Clinical Reality –

Pain Blocks Rehab

- Acute pain protects; chronic pain restricts (barrier)
- Pain reduces movement quality and confidence
- Pain limits tolerance to hands-on therapy
- Pain limits muscle activation and strengthening potential
- Pain blocks exercise progression

How Laser Therapy Reduces Pain

Cellular & Inflammatory Mechanisms

- Light absorbed by mitochondrial chromophores (e.g. CCO)
- ↑ ATP production (cellular energy availability)
- Modulates reactive oxygen species (ROS) signalling
- ↑ Nitric oxide (NO) → improved microcirculation
- Downregulates pro-inflammatory mediators
- Promotes resolution of inflammation

Clinical translation:

*When pain is controlled, comfort improves, movement improves
and rehabilitation becomes possible.*

How Laser Therapy Reduces Pain

Neural & Nociceptive Effects

- Reduces peripheral nerve excitability
- Modulates C-fibre and A-delta fibre activity
- May influence sodium-potassium channel activity
- Reduces neurogenic inflammation
- Decreases central sensitisation input
- Interrupts pain - spasm - pain cycle

*“Laser doesn’t just inhibit pain - it changes the environment
that creates pain.”*

Indications in Rehab Practice

Common rehab applications

- Osteoarthritis & compensatory overuse patterns
- Spinal pain (cervical / thoracolumbar / lumbosacral)
- Myofascial pain syndromes / trigger points (acupuncture option)
- Adjunct support when neuropathic features suspected



Treat the neurology - nerve root, then dermatome and target tissue

Dose Matters (more than power)

- **The Goal:** appropriate energy delivered to target tissue
- Under-dose = minimal change; Over-dose = reduced response
- Depth achieved is influenced by
 - Wavelength
 - Tissue Type
 - Coat & pigmentation
 - Technique
- Clinical reasoning and consistency of treatment delivery matter

Laser Dosing Framework

(within a chronic pain presentation)

1. Define the goal (pain / inflammation / repair)
2. Identify what target tissue and nerve derivation
3. Anatomy knowledge = determine **tissue depth**
4. Consider thickness of the coat, skin colour, pigmentation
5. Select wavelength(s) and then continuous or pulsed setting
6. Calculate dose (*next slide*)
7. Re-assess clinical changes by session 2-3 (baseline pain scores / functional scales) and adjust based on outcomes

Treatment Dosage Guidelines

- Acute superficial wounds/inflammation 1-2 J/cm²
- Acute superficial pain or injury 2-4 J/cm²
- Acute deep pain 4-6 J/cm²
- Chronic deep pain or injury 6-10 J/cm²

Laser Dosing

– Example calculation

1. Estimate treatment area - say, 25 cm^2
2. Select starting dose - say, 6 J/cm^2
3. Calculate total energy required - $25 \text{ cm}^2 \times 6 \text{ J} = 150 \text{ J}$
4. Calculate the treatment time, based on your device output
 - 1000mW device - delivers approx 60J per minute, so treatment time would be 2.5 minutes $150 \text{ J} / 60 \text{ J per minute}$
 - 500mW device = 5 minutes, etc

“You don’t need to be exact to the decimal, but you do need to be consistent and reflective”

Technique Tips That Improve Outcomes

- Use laser head to push hair aside (clip if possible)
- Use a contact technique, especially for deeper targets
- Use a grid/overlap pattern for even coverage
- Treat nerve supply, primary lesion & compensations
- Preferably, treat from proximal to distal - from the centre of the body towards the periphery
- Hold the laser perpendicular to the body
- Prioritise comfort and adjust if sensitive (reduce dose or change technique)

Safety Essentials (Class 3B)

- Eye protection for everyone present
- Avoid direct eye exposure / reflective risks
- Use signage & controlled treatment area where appropriate
- Common contraindications/cautions
 - Over neoplasia
 - Over pregnant uterus
 - Areas of haemorrhage
 - Use caution: dark pigment, scar tissue, superficial metal implants
- Do not treat through clothing/bandages

Laser Therapy in the #OneTeam pain pathway

Laser therapy works best alongside

- Veterinary care & medication
- Manual therapy
- Exercise and neuromuscular re-education
- Owner education & compliance

“Laser isn’t magic - but used correctly, it’s a powerful enabler of rehabilitation.”

Case Example:

OA with Secondary Myofascial Pain

- 6-year-old female Boxer; bilateral hip dysplasia
- Baseline: reduced LH loading, muscle atrophy, postural compensation, poor tolerance to manual therapy
- Laser targets: nerve root supply to hip region – lumbar, gluteal & hip musculature, hip joint area
- By session 3: handling comfort ↑, posture ↑, functional positioning ↑
- By 4-5 weeks: strengthening tolerance ↑, activity ↑, improved function/ADLs ↑

Take-aways, in summary ...

1. Laser is simple and easy to use
2. Fits safely and effectively within chronic pain protocols
3. Dose and technique matter more than device power
4. Enables rapid clinical changes to enable rehab progression
5. Best outcomes happen within multimodal #OneTeam care

Useful References

- **Effects of low-level laser therapy on impaired mobility in dogs with naturally occurring osteoarthritis** (Nov 2022)
Loris Barale, Paolo Monticelli, Chiara Adami November 2022
- **The combined effect of intra-articular platelet-rich plasma injections and photobiomodulation in canine osteoarthritis – results of a long term, double blinded, cross-over study (Oct 2025)**
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João C. Alves DVM, MSc, PhD; Ana Santos DVM, MSc; Patrícia Jorge DVM; L. Miguel Carreira DVM, PhD
- **The efficacy of low-power lasers in tissue repair and pain control: a meta-analysis study** (Aug 2004)
Chukuka S Enwemeka¹, Jason C Parker, David S Dowdy, Erin E Harkness, Leif E Sanford, Lynda D Woodruff
- **Effect of Laser Therapy on Chronic Osteoarthritis of the Knee in Older Subjects.**
Youssef, E. et al. (2016). J Lasers Med Sci 7(2): 112-119.
- **Therapeutic laser in veterinary medicine**
(Jan 2015) Brian Pryor, Darryl L Millis
- **Use of low level laser therapy to control neuropathic pain: A systematic review** (Nov 2016) Ana Laura Martins de Andrade, Paulo Sérgio Bossini, Nivaldo Antônio Parizotto

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