



Photobiomodulation and Pain Management (ComfortLase™) using PLLT for Treatment of Shoulder Pain

Tea Osterc Diwersy, MD

Introduction:

The ComfortLase™ protocol consists of cold Piano-Level Laser Therapy (PLLT) and warm PLLT to achieve comprehensive therapeutic effects.

Cold PLLT, utilized for photobiomodulation, induces minimal temperature elevations (typically ranging from 0.1 to 0.5°C). Through photochemical interaction, this activates Cytochrome C Oxidase in mitochondria, thereby increasing ATP synthesis. Additionally, it influences the expression of specific genes that stimulate cell proliferation and fibroblast growth. Conversely, warm PLLT, used for pain management, induces a more pronounced tissue temperature change of several degrees, which can have a direct impact on nerves, inhibiting pain signal transmission by inhibiting action potential and modulating neurotransmitters in central pathways. Furthermore, it aids in diminishing local edema and inflammation by reducing pro-inflammatory cytokines and mediators, stimulating lymph nodes and increasing local blood circulation.

Laser	SP Dynamis			
	Session 1 & 2		Session 3 & 4	
	Step 1: Photobiomodulation	Step 2: Pain management	Step 1: Photobiomodulation	Step 2: Pain management
Wavelength	1064 nm	1064 nm	1064 nm	1064 nm
Handpiece	MarcCo L	MarcCo L	MarcCo L	MarcCo L
Energy density	0.2 W/cm ²	0.5 W/cm ²	0.2 W/cm ²	0.8 W/cm ²
Pulse duration	0.1 ms	0.1 ms	0.1 ms	0.1 ms
Frequency	10 Hz	10 Hz	10 Hz	10 Hz
Time per spot	60 s	60 s	60 s	60 s
Technique	Stamping	Stamping	Stamping	Stamping
Sessions	3 weeks between 1 st and 2 nd sessions, 1 week between 2 nd and 3 rd sessions, 1 month between 3 rd and 4 th sessions			



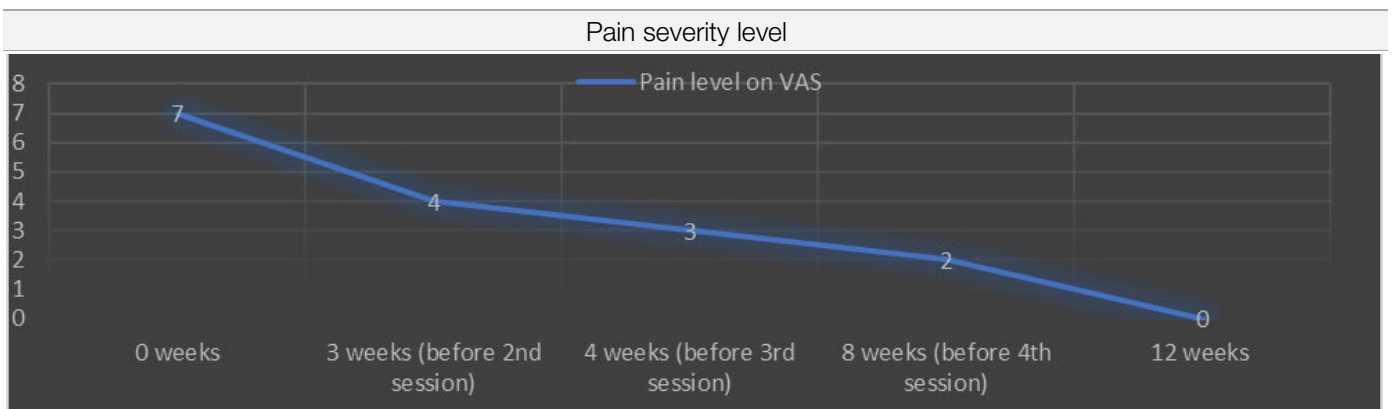
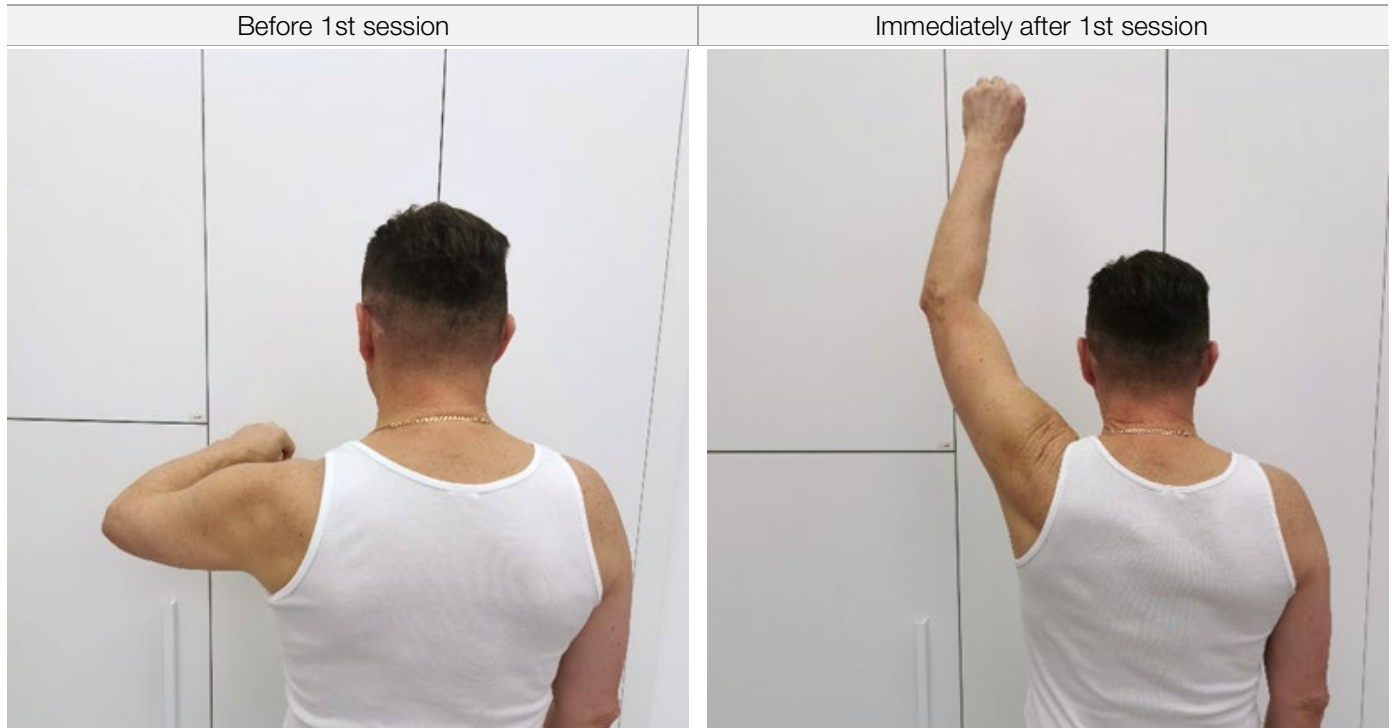
Tea Osterc, MD, is an anesthesiology, reanimation and perioperative intensive care medicine specialist, working in the field of laser medicine and pain management. She graduated with a Doctor of Medicine degree from the Faculty of Medicine, University of Ljubljana in 2015. After finishing her internship at the University Medical Center Ljubljana, she pursued residency in anesthesiology and passed board certification with distinction in November 2023. She has extensive experience in diverse international environments; among others, she underwent further training in regional anesthesia and pain therapy at a renowned orthopedic hospital in Zürich, Switzerland. Currently she is working at Fotona d.o.o. as well as in a private practice setting as a lecturer and clinical expert in the field of laser medicine in aesthetics and pain management.

CLINICAL CASE:

A 57-year-old patient, without any chronic diseases, presented with persistent left shoulder pain for over 4 months. Pain severity was 7 on the visual analog scale (VAS), limiting left arm abduction to 90°. There was no history of injury or any other comorbidities, and while an MRI scan was not conducted, clinical signs and symptoms suggested frozen-shoulder syndrome.

Treatment involved the use of Fotona's SP Dynamis laser with the Piano-Level Laser Therapy (PLLT) pulse mode. Following the initial session, the patient experienced immediate improvement, achieving a full range of motion with only slight discomfort. Over the next three weeks, the pain reduced to occasional discomfort in the morning and during the day, rated at 4 on the VAS scale. A second session, using identical parameters, was conducted after three weeks, resulting in reduced morning pain, rated at 3 on the VAS scale, with no daytime pain anymore. The third, scheduled one week later, involved a slight increase in energy density due to the already reduced inflammation and pain. One month post-treatment, the patient reported minimal morning discomfort with pain rated at 2 on the VAS scale, prompting the final fourth session. One month after the fourth therapy there was still a feeling of slight discomfort in the morning, but the pain was completely gone (VAS 0).

Typically, pain therapy with low-level laser therapy necessitates frequent sessions every other day. However, in this case, effective pain management was achieved with a limited number of sessions utilizing the PLLT pulse mode.



Published by the Laser and Health Academy. All rights reserved. © 2024

Disclaimer: The intent of this Laser and Health Academy publication is to facilitate an exchange of information on the views, research results, and clinical experiences within the medical laser community. The contents of this publication are the sole responsibility of the authors and may not in any circumstances be regarded as official product information by the medical equipment manufacturers. When in doubt please check with the manufacturers whether a specific product or application has been approved or cleared to be marketed and sold in your country.

