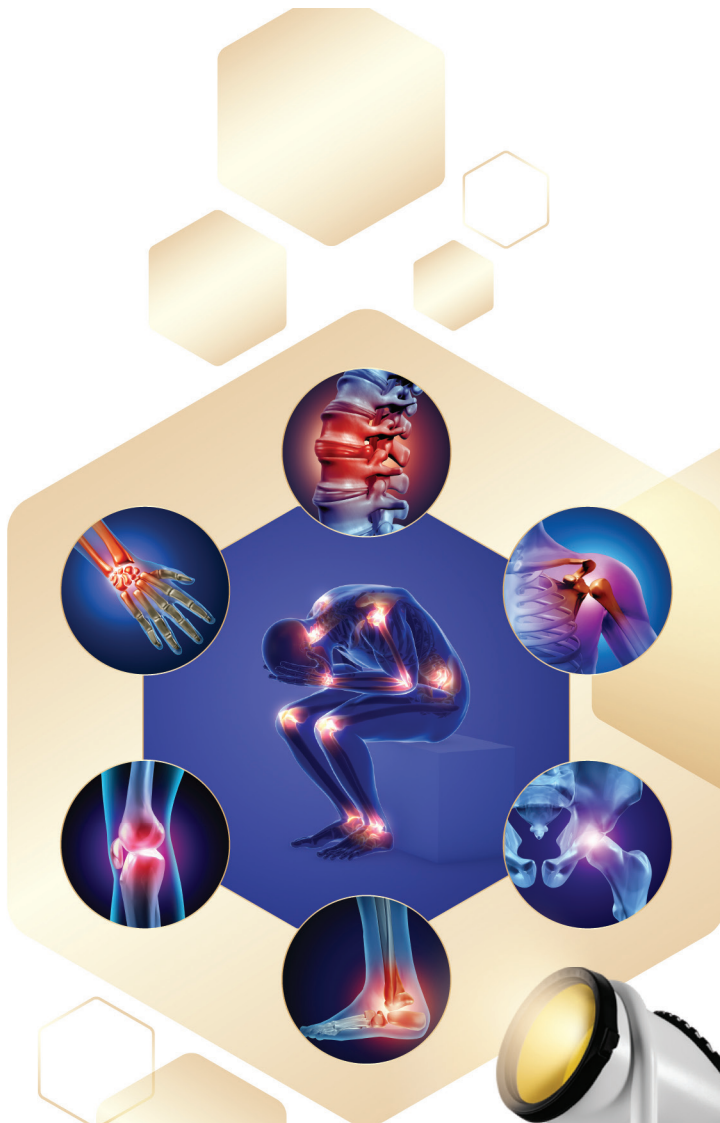




HYPERLIGHT IN PAIN MANAGEMENT

- PATENTED TECHNOLOGY
- CLINICALLY TESTED, PROVEN & CERTIFIED
- SWISS-MADE
- REGISTERED AS A MEDICAL DEVICE UNDER:
EU (93/42/EEC)
CANADA (HC CERTIFICATE)
USA (FDA (510 (K))




BIOPTRON[®]
HYPERLIGHT THERAPY SYSTEM
By Zepter Group

zepter[®]
INTERNATIONAL
LIVE BETTER • LIVE LONGER

HYPERLIGHT THERAPY SYSTEM

Swiss-made BIOPTRON® Hyperlight therapy is a non-invasive, drug-free treatment modality that stimulates the body's natural healing processes, resulting in minimal heat generation, no skin damage, and no reported side effects.

This therapy has gained acceptance as a valuable approach for disease prevention, treatment, and recovery.



BIOPTRON® HYPERLIGHT THERAPY IN PAIN MANAGEMENT

Pain is a complex, subjective phenomenon involving the nervous system and various psychological factors. Pain serves as a protective mechanism, alerting us to injury or illness. However, when pain becomes chronic or is associated with persistent wounds, its effects extend far beyond the individual, impacting society in numerous ways.

BIOPTRON® has been successfully employed as an adjuvant in numerous clinical trials, proving its versatility when integrated into global pain management strategies.

BIOPTRON® effectively reduces pain associated with acute wound healing (post-surgery, burns, etc.) and diverse chronic conditions, such as carpal tunnel syndrome, low back pain, or arthritis.



BIOPTRON® is medically certified to treat:

Rheumatology

- Osteoarthritis (Abramovich et al., 2020; Kyplova et al., 2013; Marx et al., 2007)
- Rheumatoid chronic arthritis (Gallacchi G et al., 1993; Karadzic M, 2001)
- Arthrosis

Physiotherapy

- Shoulder pain (Ballyzek et al., 2005)
- Neck pain (Ballyzek et al., 2005)
- Low back pain (Shiryan et al., 2022; Mihaylova et al., 2017)
- Carpal tunnel syndrome (Stasinopoulos et al., 2017 [1 & 2]; Raeissadat et al., 2014)
- Scar tissue (Abd El-Rashid et al., 2018 & 2019)
- Musculoskeletal injuries (Petrovic et al., 2018)

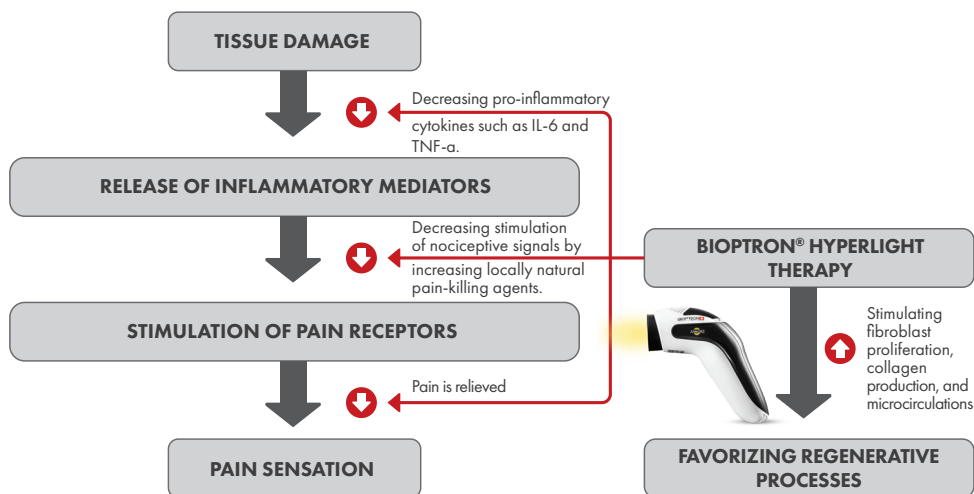


Sports medicine

- Muscle spasm
- Sprains ^(Stasinopoulos et al., 2017)
- Strains ^(Stasinopoulos et al., 2017)
- Tendonitis (including tennis elbow) ^(Stasinopoulos et al., 2017, 2019, 2020, 2005, 2006, 2009)
- Contusions
- Desmorrhesis (ligament tear)
- Myorrhesis (muscle tear)
- Pain due to muscular contraction

Post-surgery pain ^(Ahmed et al., 2009; Bahrami et al., 2023; Kyplova et al.,)

HOW BIOPTRON® HYPERLIGHT HELPS TO ALLEVIATE PAIN RELIEF ^(See scientific reference list)



BIOPTRON® Hyperlight diminishes inflammation:

Inflammatory processes, driven by trauma in peripheral tissues, are a common source of pain. Excessive or prolonged inflammation can impede healing, leading to tissue damage and delayed recovery. BIOPTRON® Hyperlight decreases the production of pro-inflammatory cytokines such as il-6 and tnf-α, reducing the local inflammation of affected epithelium.

BIOPTRON® Hyperlight stimulates pain relief:

Constant and intolerable pain is disabling and devastating for patients. BIOPTRON® Hyperlight therapy helps to mitigate excessive inflammation, a key contributor to pain and delayed healing. BIOPTRON® Hyperlight reduces the stimulation of nociceptors (the pain-sensing receptors), by increasing the release of local nitric oxide (NO). This dual action, targeting both inflammation and pain signalling pathways, contributes to BIOPTRON®'s efficacy by providing significant pain relief during the whole wound healing processes.

BIOPTRON® Hyperlight increases fibroblast proliferation and migration:

Fibroblasts play an important role providing structural support to muscles, through their ability to synthesize collagen, form granulation tissue, and remodel the extracellular matrix. BIOPTRON® Hyperlight increases the proliferation of newly formed fibroblasts, promoting muscle regeneration, in addition to extracellular matrix production and remodelling.

BIOPTRON® Hyperlight boosts collagen production:

BIOPTRON® Hyperlight stimulates the production of endogenous collagen, providing the structural framework and scaffolding necessary for tissue repair. Collagen deposition helps to repair the damage, providing tensile strength and elasticity.

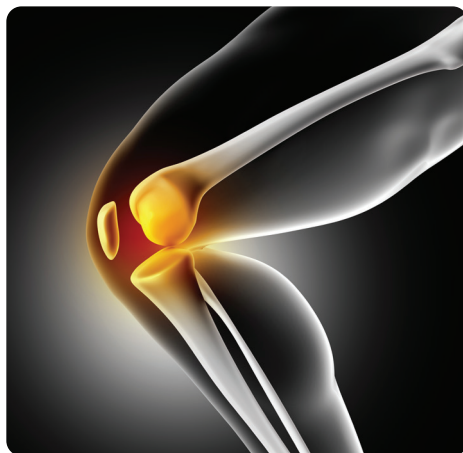
BIOPTRON® Hyperlight improves microcirculation:

Impaired microcirculation can significantly delay tissue repair. BIOPTRON® Hyperlight increases the blood flow in capillaries, creating an optimal environment for regenerative cellular mechanisms by ensuring adequate oxygen and nutrient delivery, waste removal, immune response, and tissue regeneration. BIOPTRON® Hyperlight therapy provides newly formed cells with everything they need to stimulate the reparative process.



RHEUMATOLOGY

After a tissue injury, pain plays a protective role, alerting the body to damage and inducing rest to allow tissue regeneration. If this pain becomes persistent, this physiological function may be compromised. Patients with chronic pain may experience significant pain relief and improved functionality through BIOPTRON® Hyperlight therapy. BIOPTRON®'s efficacy in pain relief is significantly enhanced when integrated with established treatment protocols, making it a valuable component of a comprehensive pain management strategy.



Osteoarthritis

Osteoarthritis is a degenerative joint condition. It causes pain, swelling and stiffness, affecting a person's ability to move freely. Patients with osteoarthritis often experience restricted activity, decreased well-being, and psychological distress. Osteoarthritis symptoms can usually be managed, although the damage to joints cannot be reversed. Significant pain relief and improved functionality in chronic conditions have been observed when BIOPTRON® Hyperlight is used as an adjunct to current pain management treatments, with great success.

Sixty-four patients aged 40 to 69 years, diagnosed with stage I to III knee osteoarthritis, took part in a study. They were divided in 2 groups: 1) Control: treated with naftalan cream (anti-inflammatory) and 2) patients treated with naftalan cream and BIOPTRON® Hyperlight 5 days/week over 2 weeks.

The study employed a range of assessments to evaluate knee osteoarthritis, measuring pain, mobility, function, and stiffness through VAS (Visual Analogue Scale for pain), the 15-metre walking test, the WOMAC index (widely used in the evaluation of hip and knee osteoarthritis), and the Oxford Knee Score (to assess pain and function of their knee).

The results of all tests performed indicated that patients treated with BIOPTRON® experienced a significant decrease in pain and a notable improvement in both knee mobility and function. Pain levels decreased in around 25% in patients treated with BIOPTRON® Hyperlight therapy. The mobility and function of the knees improved by 13%–20% in all tests. This was achieved without any reported side effects, leading to an improved quality of life for these patients.

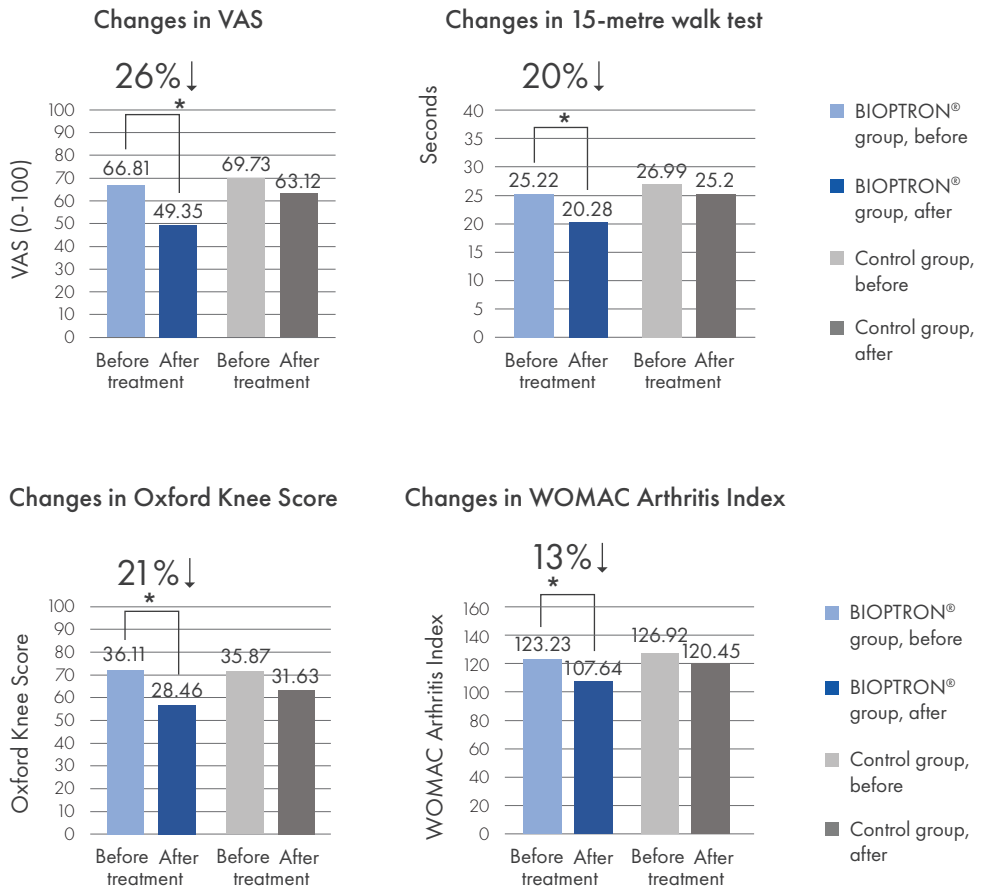


Figure 1. Changes in the different tests performed in patients treated ($n=32$) and not-treated ($n=32$) with BIOPTRON® Hyperlight devices (* $p<0.05$; Abramovich et al., 2020)

PHYSIOTHERAPY

BIOPTRON®'s devices offer extensive versatility in physiotherapy, encompassing a wide array of medical applications across various body regions to decrease pain, restoring movement and function. Its successful integration as an adjuvant therapy alongside diverse treatment modalities underscores its safety and performance. BIOPTRON® Hyperlight devices enhance the efficacy of other treatments, often creating a synergistic effect that further amplifies pain relief and significantly improves patient mobility and function.

This ability to complement existing therapies makes BIOPTRON® Hyperlight therapy a valuable tool for physiotherapists seeking to optimize treatment outcomes.



Low back pain

Low back pain describes pain between the lower edge of the ribs and the buttock. It can last for a short time (acute), or a long time (chronic). It can affect anyone. Low back pain makes it hard to move and can affect quality of life and mental well-being, and is a major cause of absence from work.

Rehabilitation is essential to reduce the pain, support recovery, and improve function. Specialized care pathways are needed to treat low back pain. Thanks to their capacity to reduce pain and inflammation, along with convenient short treatment times and easy application, BIOPTRON® devices have been successfully incorporated into overall strategies for alleviating pain and increasing spinal mobility.

Sixty patients between 18 and 55 years old suffering from low back pain received low-frequency magnetic field (LFMF) and ultrasound. Thirty of them were additionally treated with BIOPTRON® Hyperlight therapy for 10 min/day. "Visual analogue scale (VAS) was used for a subjective evaluation of the pain, before and after treatment. The changes in the quality of life were assessed using the Roland-Morris questionnaire.

To monitor the treatment's impact, clinical assessments of motor activity were conducted using two functional tests: Schoeber (lumbar flexion) and Thomayer (anteflexion (finger-to-floor distance, in cm)).

A statistically significant improvement of pain (VAS) (* $p < 0.05$) was observed in both groups. Furthermore, the treatment group exhibited statistically superior outcomes compared to the control group (# $p < 0.05$).

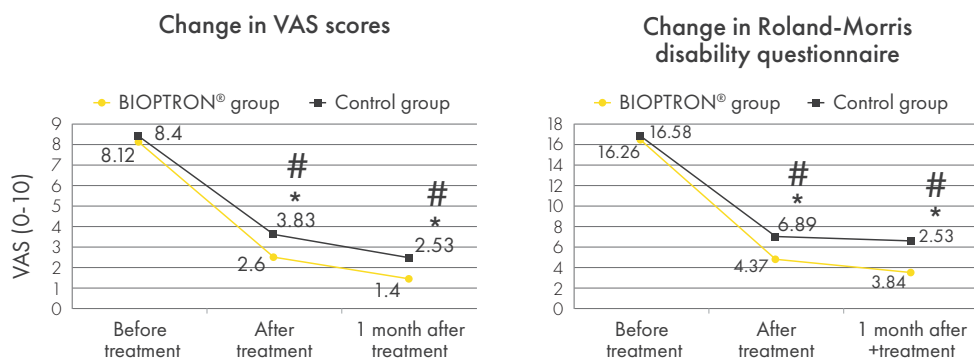


Figure 2. Changes in pain levels (measured by VAS) and quality of life (assessed by the Roland Morris Disability Questionnaire) for both treatment groups following the intervention and at the 1-month follow-up assessment ($p < 0.05$ * compared to before the treatment, # compared to control group) (Myhaylova et al., 2017).

The Schober test showed a statistically significant ($p < 0.05$) improvement of mobility in the group treated with BIOPTRON®, with a 1.82 cm improvement compared to the control group's 1.22 cm increase. The Thomayer test also revealed statistically significant ($p < 0.05$) improvements in both groups, but the patients treated with BIOPTRON® showed a significantly greater increase in body declination (10.68 cm; $p < 0.05$) than the control group (5.78 cm).

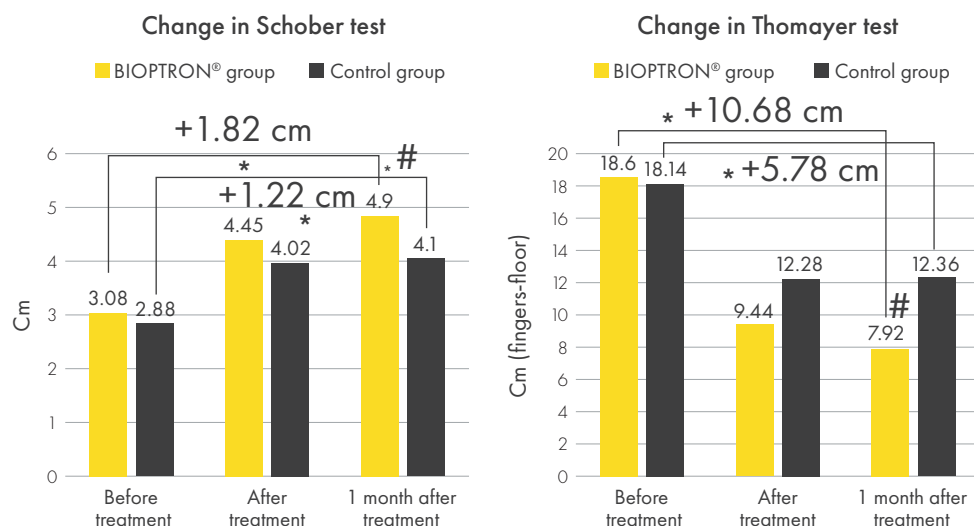


Figure 3. Dynamic of the index of Schober test (expressed in cm) and Thomayer test (finger-to-floor distance expressed in cm) for both treatment groups following the intervention and at the 1-month follow-up assessment ($p < 0.05$ * compared to before the treatment, # compared to control group) (Myhaylova et al., 2017).

While both groups benefited from reduced pain and improved body alignment, leading to a better quality of life, the BIOPTRON®-treated group exhibited significantly greater improvements. This demonstrates that incorporating BIOPTRON® is crucial for achieving superior results in managing pain and enhancing mobility and function.

Carpal tunnel syndrome

Carpal tunnel syndrome comes with numerous symptoms including numbness, paresthesia (tingling), and diminished strength in the thumb and adjacent fingers. The key objective for carpal tunnel syndrome management is to provide pain relief from symptoms and enable the patient to regain full use of their hand.

A multitude of clinical trials employing BIOPTRON® Hyperlight devices have indicated strong efficacy in alleviating both pain and tingling sensations, alongside a notable increase in wrist mobility and hand grip strength.



In this clinical study, 46 pregnant women in their third trimester who were experiencing carpal tunnel syndrome received BIOPTRON® Hyperlight therapy as their sole treatment. The therapy was administered twice daily, 5 days a week, for a duration of 2 weeks. The study aimed to evaluate the impact of this therapy on the women's pain levels, paresthesia (an abnormal sensation, often described as tingling, prickling, numbness, or burning), and pinch strength (the force exerted by the thumb and fingers when pinching an object). Clinically significant reductions in pain and paresthesia were achieved with BIOPTRON® within a 2-week treatment period, reducing the pain and discomfort by more than a half. These benefits were sustained for at least 4 weeks, indicating a lasting therapeutic effect. Along with reduced pain, patients experienced better hand function. Pinch strength saw an initial increase after 2 weeks of treatment, but the clinically significant improvement continued and even amplified during the subsequent 4 weeks.

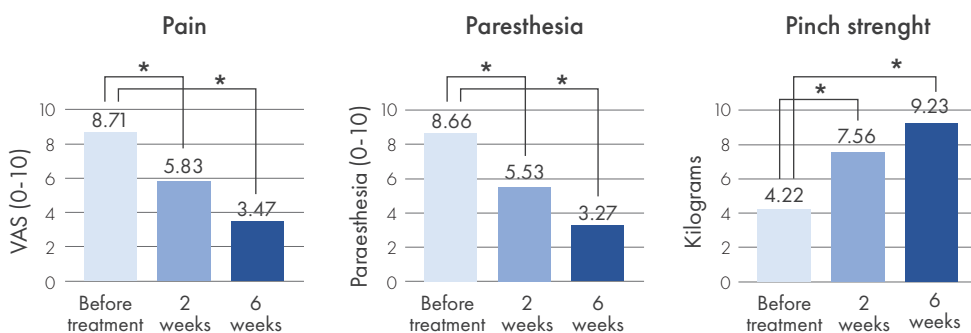


Figure 4. Changes in pain (VAS), paresthesia, and pinch strength from baseline to 2 weeks post-treatment and a 4-week follow-up. Significant reductions (* $p < 0.05$) in pain and paresthesia were observed at both follow-up times. Pinch strength demonstrated a continuous increase across the study period (* $p < 0.05$) (Stasinopoulos et al., 2017).

BIOPTRON® Hyperlight therapy offers an effective and side-effect-free approach to treating the bothersome symptoms of carpal tunnel syndrome while simultaneously improving the hand's functional abilities.

SPORTS MEDICINE

BIOPTRON® Hyperlight therapy offers significant advantages as a complementary treatment for sports injuries and rehabilitation. Perfectly suited for integration with standard physiotherapeutic procedures, it can be a crucial component of comprehensive rehabilitation programs for common sports ailments such as ankle and knee injuries, tendonitis, and muscle pain.

Beyond aiding recovery from specific injuries, BIOPTRON® devices serve as an ideal ally in promoting the regeneration and recovery of muscles, tendons, and ligaments, supporting athletes in their overall physical well-being and performance.



Ankle sprains

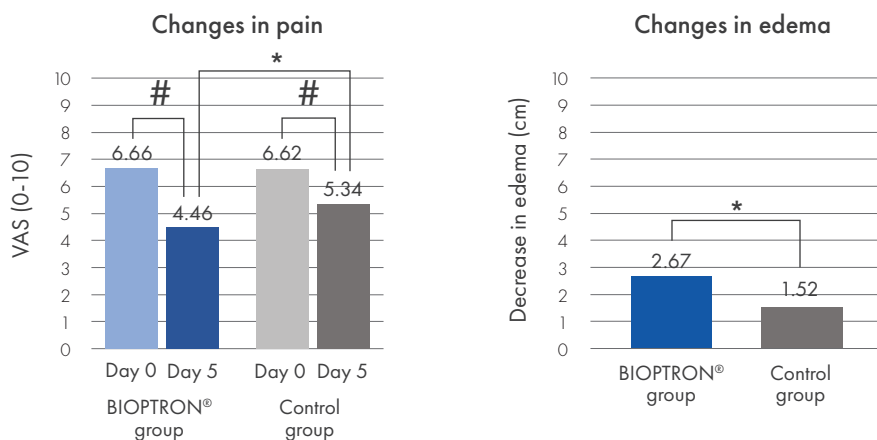
Ankle sprains are among the most common acute injuries in sports. The main symptoms of ankle sprain are pain, swelling, and loss of function. The treatment goals are to reduce pain and swelling, promote healing of the ligament, and restore function of the ankle.

BIOPTRON® Hyperlight devices are particularly well-suited for healing ankle sprains by specifically addressing key recovery requirements. They effectively reduce both pain and inflammation while simultaneously promoting the regeneration and repair of ligament tissue, ultimately strengthening its tensile force.



Fifty patients with ankle sprains received cryotherapy for 20 minutes every 2 hours over 5 days. In addition to cryotherapy, 27 of these patients also underwent BIOPTRON® Hyperlight therapy for 10 minutes once daily for the same 5-day period.

Pain levels, changes in ankle edema (measuring ankle circumference), and ankle motility (ankle range of motion using goniometry) were assessed in both groups before and after the treatment period. While both groups experienced a reduction in pain, the group receiving BIOPTRON® in addition to cryotherapy reported a significantly greater level of pain relief. Similarly, both groups showed a decrease in ankle edema, but the BIOPTRON®-treated group exhibited a significantly more substantial reduction in ankle circumference (2.67 cm reduction vs 1.52 cm in control group, $p<0.0005$). Both groups demonstrated a notable increase in ankle motility, encompassing both plantarflexion and dorsiflexion. However, the improvement in motility was more substantial with the patients treated with BIOPTRON®.



The range of motion improvement was almost the double for the patients treated with BIOPTRON® Hyperlight, achieving an increase of 2 degrees in both movements, while the control group achieved around 1 degree ($p<0.0005$). This indicates that individuals using BIOPTRON® experienced not only greater reductions in pain and inflammation but also a faster recovery of ankle function, suggesting a strong pain-relieving effect and accelerated ligament healing.

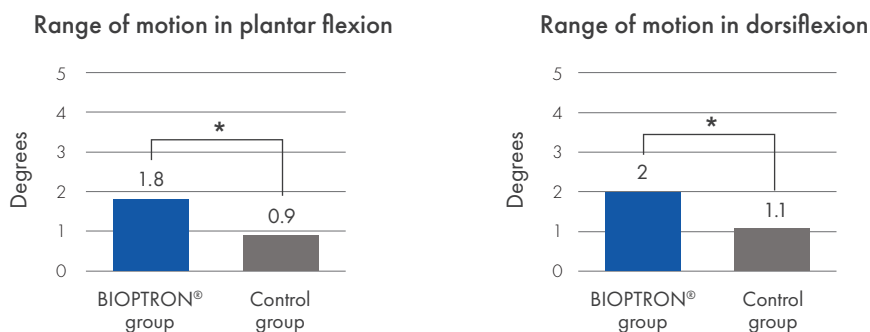


Figure 5. Changes in pain (VAS), edema, and range of motion before the treatments and after 5 days. Both groups experienced a decrease in pain before and after the treatment (# $p<0.0005$) but this relief is significantly more pronounced in the group treated additionally with BIOPTRON® Hyperlight (* $p<0.0005$). The range of motion increased in both groups for both movements, nevertheless the motion improvement was significantly increased in the group treated with BIOPTRON® Hyperlight (* $p<0.0005$). (Stasinopoulos et al., 2017)

Tendonitis

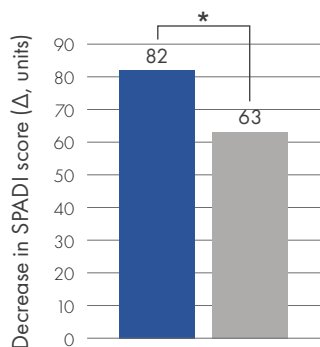
Considering its significant pain-relieving and anti-inflammatory properties, alongside its ability to optimize regenerative and reparative processes, integrating BIOPTRON® Hyperlight therapy into standard treatment protocols offers an opportunity to treat tendonitis more effectively. This is particularly important as it can enable the application of other necessary treatments that might otherwise be intolerable due to excessive pain.



Studies have demonstrated the positive impact of BIOPTRON® Hyperlight on tendonitis in different parts of the body. Fifty patients with chronic rotator cuff tendinopathy took part in a 4-week exercise program designed to reduce pain and improve shoulder mobility. In addition to the exercise program, 25 of these patients received daily 10-minute sessions of BIOPTRON® Hyperlight therapy, 5 days a week for the same 4-week period. Pain and function were evaluated using the Shoulder Pain and Disability Index (SPADI), while strength was measured using a handheld dynamometer.

Participants receiving the exercise program combined with BIOPTRON® light therapy demonstrated statistically significant improvements in treatment outcomes. Specifically, patients in the BIOPTRON® group experienced a significant reduction in pain and a significantly greater increase in shoulder strength compared to the exercise-only group. This reinforces that BIOPTRON® effectively decreases pain, thereby facilitating a more complete functional recovery of the area affected by tendonitis.

Changes in pain and function score



Change in pain-free grip strength

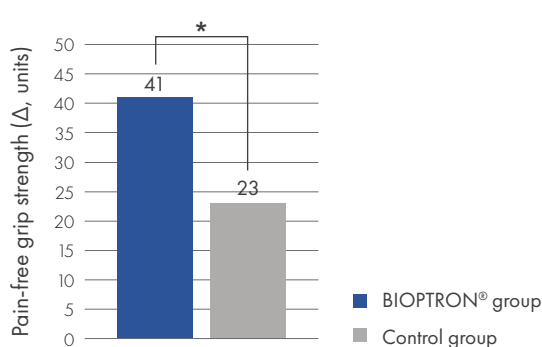


Figure 6. Pre- and post-treatment changes in pain levels (SPADI score) and grip strength. While both groups reported reduced pain, the BIOPTRON® Hyperlight therapy group demonstrated a significantly more pronounced pain relief (* $p < 0.0005$). Functional improvement, as measured by grip strength, was also significantly greater in the BIOPTRON® Hyperlight group (* $p < 0.0005$) (Stasinopoulos et al., 2020).

BIOSTIMULATIVE EFFECTS OF BIOPTRON® HYPERLIGHT THERAPY

Thanks to its multiple biostimulative effect, BIOPTRON® Hyperlight therapy is effective for a long list of conditions. (See scientific reference list)

- Triggers regenerative cellular mechanisms
- Accelerates healing process
- Stimulates release of growth factors
- Improves micro-circulation and improves local blood supply
- Diminishes the risk of infection by reinforcing immune system
- Increases anti-inflammatory cytokines and reduces the release of pro-inflammatory cytokines
- Reduces the release of chemical messengers that stimulate nociceptors
- Relieves the pain



EXTENDED SPECTRUM OF CARE

BIOPTRON® Hyperlight has been accepted as a form of DISEASE PREVENTION, THERAPY, and RECOVERY for various medical indications: (See scientific reference list)

Wound healing

- Venous leg ulcers (stasis ulcers)
- Pressure ulcers
- Foot ulcers
- Burns
- Grafting
- Post-surgery wounds
- Injury

Dermatology

- Acne
- Acne rosacea
- Psoriasis
- Dermatitis (Eczema)
- Herpes simplex
- Herpes zoster (Shingles)
- Superficial mucosal lesions

Pediatrics

- Pediatric dermal affections
- Endogenous eczema
- Upper respiratory tract infections
- Allergic respiratory diseases
- Pediatric musculoskeletal disorders and neurological disorders and deficits

In newborns

- Dermal problems (e.g. phlebitis, decubitus, intertrigo)

Seasonal affective disorder (SAD) and depression

- Typical winter depression symptoms
- Chronic fatigue syndrome
- Lowered motivation
- Asthenic conditions
- Nervous breakdown

Veterinary care

- Skin problems (e.g. trichophytia, alopecia, bacterial and allergic dermatitis, demodicosis, eczema)
- Allergies
- Arthritis
- Pain
- Cramping syndrome
- Inflammatory disorders (e.g. otitis externa, mastitis, etc.)
- Acute inflammation after surgery and injuries
- Wound healing after surgery and injuries
- Saddle sores (horses)
- Muscular diseases (Eosinophilic myositis)
- Cat flu

Oral care

- Superficial mucosal lesions

TECHNICAL SPECIFICATIONS

The 3 BIOPTRON® devices, BIOPTRON® MedAll, BIOPTRON® Pro 1, and BIOPTRON® 2 differ in size, design, and settings, but feature identical physical light characteristics.

1. Polarized: ensures optimal body penetration. Fullerene C₆₀-mediated light modification optimizes photobiomodulation of tissues.
2. Polychromatic: includes all beneficial effects of all visible and infrared radiation (wavelength from 400–3400 nm excluding the harmful UV light).
3. Incoherent: ensures a safe application.
4. Low energy: allows precise, consistent, and steady dosing of safe light.

BIOPTRON® MEDALL



BIOPTRON® PRO 1 WITH TABLE STAND



BIOPTRON® 2



Filter Diameter Approx.

BIOPTRON® MedAll	5 cm
BIOPTRON® Pro 1	11 cm
BIOPTRON® 2	15 cm

Rated Power of Halogen

BIOPTRON® MedAll	20 W
BIOPTRON® Pro 1	50 W
BIOPTRON® 2	75 W

Protective Class

BIOPTRON® MedAll	Class II, IP 20
BIOPTRON® Pro 1	Class II, IP 20
BIOPTRON® 2	Class II, IP 20

Weight

BIOPTRON® MedAll (without stand)	0.4 kg
BIOPTRON® MedAll (with stand)	1.9 kg
BIOPTRON® Pro 1 (with table stand)	3.5 kg
BIOPTRON® Pro 1 (with floor stand)	8.1 kg
BIOPTRON® 2 (without stand)	4.2 kg
BIOPTRON® 2 (with floor stand)	11.5 kg

Ambient Temperatures

Operation	+10 °C to +30 °C
Storage	0 °C to +40 °C

Wavelength

480-3400 nm with edge filter
350-3400 nm with H0 filter

Degree of Polarization

>95% (590-1550 nm)

Light Intensity

min. 10,000 lux

Specific Power Density

~ 40 mW/cm²

Light Energy per Minute

~ 2.4 J/cm²

CE Labelling

CE 1639

