

BIOPTRON® 
HYPERLIGHT THERAPY SYSTEM By Zepter Group



HYPERLIGHT TECHNOLOGY

PATENTED

**MEDICAL
DEVICE**

Wound Healing
Pain Treatment
Dermatological
Disorders and Skin
Problems
Seasonal Affective
Disorders (SAD)

NON-INVASIVE
NO SIDE EFFECTS
FOR CHILDREN
AND ADULTS



MEDICAL DEVICE - (93/42/EEC)
**CLINICALLY
TESTED**

TABLE OF CONTENTS

TECHNICAL CHARACTERISTICS	3
BIOPTRON HYPERLIGHT THERAPY IN WOUND CARE	4
BIOPTRON HYPERLIGHT THERAPY IN PAIN RELIEF	5-6
BIOPTRON HYPERLIGHT THERAPY IN DERMATOLOGY & SKIN DISEASES	7
BIOPTRON HYPERLIGHT THERAPY IN ANTI-AGING	8
BIOPTRON HYPERLIGHT THERAPY IN SEASONAL AFFECTIVE DISORDER (SAD)	9
BIOPTRON HYPERLIGHT THERAPY IN CHILDREN AND NEWBORNS	9
BIOPTRON HYPERLIGHT THERAPY IN MUCOSAL LESIONS	10
HOW TO USE IT	10
MORE ABOUT THE CELLULAR MECHANISMS TRIGGERED BY BIOPTRON HYPERLIGHT	11
BIOPTRON HYPERLIGHT THERAPY TREATMENT	11-14
SCIENTIFIC REFERENCE LIST	15



TECHNICAL CHARACTERISTICS

The three models of Bioptron devices - Bioptron MedAll, Bioptron Pro 1 and Bioptron 2 - differ in size, design and settings, but are featuring identical physical characteristics of light.

- **Polarized:** >95% polarized light ensures optimal body penetration.
- **Polychromatic:** includes all beneficial effects of the whole visible and infrared radiation spectrum (wavelengths from 350 to 3400 nm for MedAll and Bioptron Pro 1 and 480-3400 nm for Bioptron 2 excluding the harmful UV light).
- **Incoherent:** ensures a safe application.
- **Low energy:** allows precise, safe, consistent and steady dosing of light.

BIOPTRON MEDALL



BIOPTRON PRO 1 WITH TABLE STAND



BIOPTRON 2



Filter Diameter Aprox.

Bioptron MedAll	5 cm
Bioptron Pro 1	11 cm
Bioptron 2	15 cm

Power Supply

Bioptron MedAll	20 W
Bioptron Pro 1	50 W
Bioptron 2	75 W

Rated Power of Halogen

Bioptron MedAll	20 W
Bioptron Pro 1	50 W
Bioptron 2	75 W

Weight

Bioptron MedAll (without stand)	1.4 kg
Bioptron MedAll (with stand)	2.91 kg
Bioptron Pro 1 (with table stand)	4.6 kg
Bioptron Pro 1 (with floor stand)	10.8 kg
Bioptron 2 (without stand)	4.8 kg
Bioptron 2 (with floor stand)	12 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/cm ²

Light Energy per Minute

~ 2.4 J/cm ²

CE Labelling

CE 1639



For further information
scan the QR code

BIOPTRON HYPERLIGHT THERAPY IN WOUND CARE

Our multiple clinical trials in regenerative medicine show that the use of Bioptron Hyperlight therapy greatly enhances the processes of tissue regeneration, resulting in a faster closing of the wounds with minimal scarring. In addition, Bioptron Hyperlight Therapy reduces the costs of wound care/dressings, shortens hospital stays and relieves the pain and inflammation during the whole healing process.

- venous leg ulcers ^(8, 33, 34, 44, 76)
- pressure ulcers ^(6, 8, 12, 13, 19, 31, 42)
- foot ulcers ^(21, 47, 77)
- burns ^(2, 50, 52, 83, 84)
- grafting ⁽⁵⁰⁾
- post-surgery wounds ^(5, 10, 16, 40, 46, 49, 51, 65, 66)
- injury ^(3, 5, 22, 53, 61)

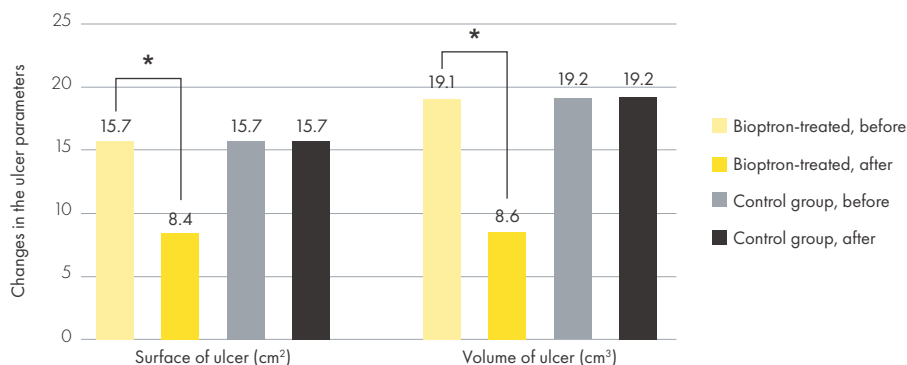


Figure 1. Changes in ulcer parameters in patients treated ($n=15$) and not-treated ($n=15$) with Bioptron Hyperlight devices (Al-Kader et al., 2015) ⁽⁶⁾.

In patients with pressure ulcers treated with Bioptron Hyperlight Therapy, the ulcer surface and volume were significantly reduced after 4 weeks, 10 min/session, twice a day.



Photo 1. Pressure chronic ulcer treated with Bioptron 10 min/day (Patient testimonial, 2019).



Photo 2. Venous chronic ulcer treated with Bioptron 10 min/day. Between day 21 and 42 the treatment was not applied (Patient testimonial, 2019).

BIOPTRON HYPERLIGHT THERAPY IN PAIN RELIEF

RHEUMATOLOGY AND CHRONIC PAIN

Bioptron Hyperlight Therapy helps to alleviate pain and disability in patients suffering from various forms of rheumatism, in combination with other pharmacological and physical treatments:

- Decreases or relieves pain or discomfort around one or more joints
- Decreases movement-evoked pain in the affected area(s)
- Decreases the inflammation in the affected area(s)

Bioptron Hyperlight Therapy can be used in clinics and hospitals, but it is also supportive for home use to control the pain in patients with rheumatic disease and chronic pain. Patients are able to treat themselves everyday in their own homes, even during their vacations, thus increasing adherence and commitment to treatment.

The multiple clinical trials of Bioptron Hyperlight Therapy medically certified its effectiveness in patients with:

- Rheumatoid arthritis [7, 26, 35]
- Osteoarthritis [4, 43]

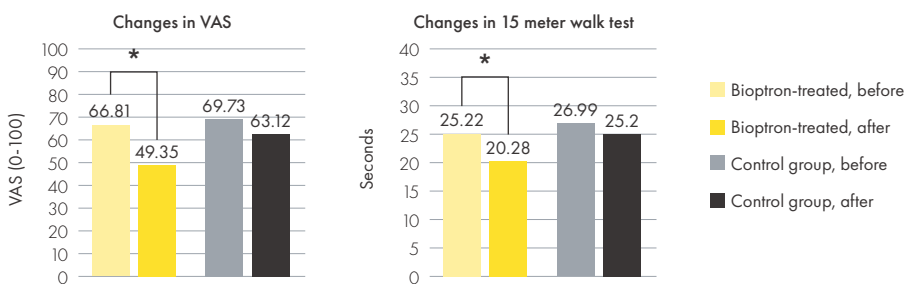


Figure 2. Changes in VAS parameters in patients suffering from osteoarthritis treated (n=34) and not-treated (n=30) with Bioptron Hyperlight devices (Abramovich et al., 2020) [4].

Patients treated with Bioptron Hyperlight Therapy reduced their pain values and improved their motion. Treatment during 2 weeks, 6 min/session, 5 times a week.

PHYSIOTHERAPY AND SPORTS MEDICINE

Bioptron Hyperlight Therapy is compatible with other treatment protocols, being a part of the integral interdisciplinary therapy to accelerate and optimize the rehabilitation of patients. Thanks to the synergic actions, Bioptron devices help patients by promoting their recovery and boosting overall wellness, and support the athletes to shorten the healing time after various sport injuries.

Bioptron Hyperlight Therapy helps the patient during the recovery period and accelerates the healing process by:

- Accelerating tendon and muscle regeneration
- Improving muscle tensile strength
- Reducing inflammation and swelling
- Relieving pain or decreasing its intensity
- Increasing the range of motion in the affected body regions

Bioptron is used in many hospitals and clinics as a certified medical device for treatment of patients and athletes with:

- Low back pain ^(45, 64)
- Neck and shoulder pain ⁽¹¹⁾
- Carpal tunnel syndrome ^(60, 74)
- Tendinopathies in several joints ^(69, 70, 71, 72, 73, 75)
- Musculoskeletal injuries (sprains, strains) ^(58, 82)
- Post-surgery pain ⁽¹⁰⁾

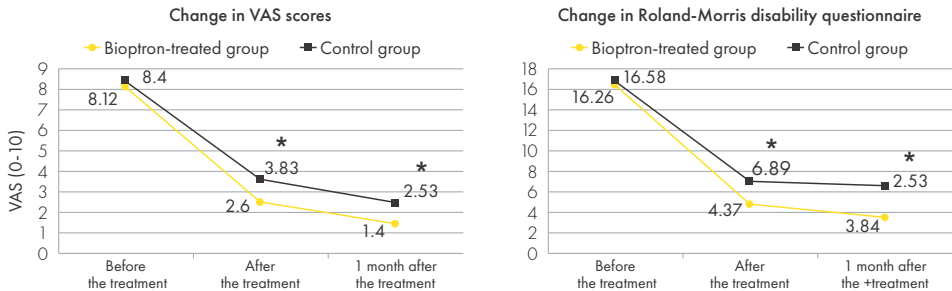


Figure 3. Changes in VAS parameter and Roland-Morris questionnaire (self-rated physical disability caused by low back pain) in patients suffering from low back pain treated (n=30) and not-treated (n=30) with Bioptron Hyperlight devices (Myhailova et al, 2017)⁽⁴⁵⁾.

Patients treated with Bioptron Hyperlight Therapy reduced their pain values and improved their quality of life significantly more than patients not treated with Bioptron. Treatment during 4 weeks, 10 min/session/day.

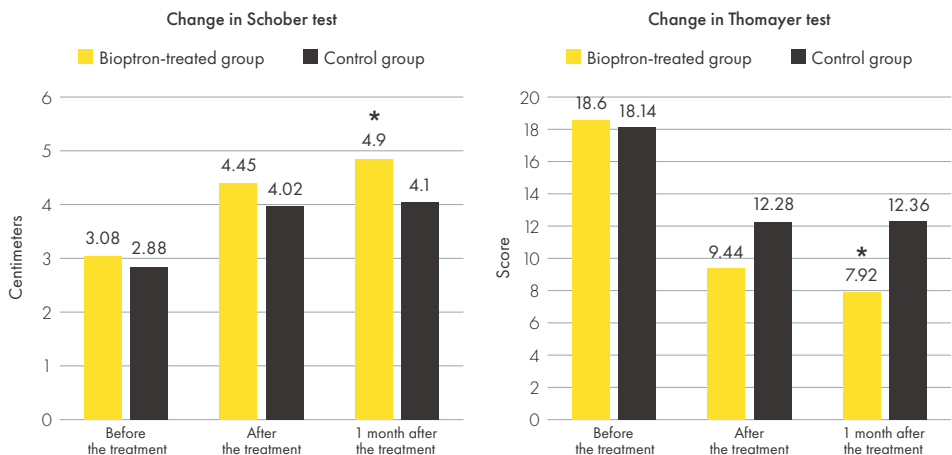


Figure 4. Changes in Schober (measures the flexion of the lumbar spine) and Thomayer tests (declination of the body) in patients suffering from low back pain treated (n=30) and not-treated (n=30) with Bioptron Hyperlight devices (Myhailova et al, 2017)⁽⁴⁵⁾.

Patients treated with Bioptron Hyperlight Therapy improved significantly their capacity to flex and declinate the body, improving overall mobility compared with patients not treated with Bioptron Therapy during 4 weeks, 10 min/session/day.

BIOPTRON HYPERLIGHT THERAPY IN DERMATOLOGY & SKIN DISEASES

Bioptron Hyperlight Therapy is easy, painless and simple, intended to promote skin healing and reduce the pain and discomfort associated with various skin disorders, by:

- Promoting the skin regeneration process by stimulating fibroblast proliferation and migration
- Increasing collagen production
- Improving microcirculation
- Decreasing the inflammation, rashes and redness
- Relieving the pain and discomfort
- Reinforcing the immune system to help the body to fight against external agents

Bioptron Hyperlight Therapy can be used alone or in combination with other treatments as a part of integral treatment aiming to improve patients' quality of life.

Bioptron Hyperlight devices can be used in clinics, but also by patients themselves in their homes, providing easy treatment and patient adherence that ensures its efficacy. The multiple synergic cellular effects of Bioptron Hyperlight Therapy turn Bioptron into the perfect ally in treatment of:

- Acne (rosacea) ^[14,29]
- Psoriasis ^[20, 57, 78]
- Atopic dermatitis/ eczema ^[41, 43, 48]
- Herpes simple & zoster ^[9, 38].



Photo 3. Acne vulgaris (Bioptron Hyperlight Therapy 10 min/day) (Patient testimonial, 2019).

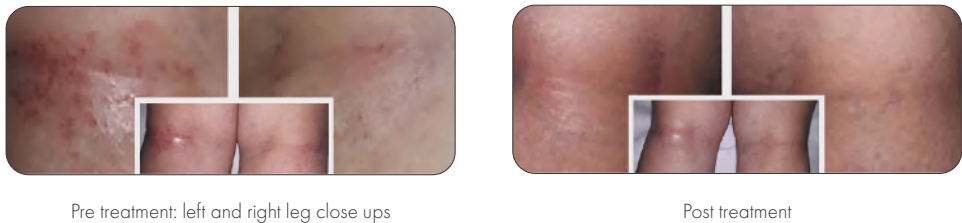


Photo 4. Eczema/ dermatitis (before and after 8 weeks of treatment, Bioptron Hyperlight Therapy 10/min day (Leguina-Ruzzi et al, 2019) ^[41])

BIOPTRON HYPERLIGHT THERAPY IN ANTI-AGING

Bioptron Hyperlight has multiple effects that make it unique in the prevention of skin aging, improving skin tone, reduction of wrinkles and maintaining a youthful skin*.

Bioptron Hyperlight Therapy:

- Promotes the production of collagen
- Improves skin density
- Decreases fine lines and wrinkles
- Increases skin thickness
- Improves skin texture, for firmer and smoother skin
- Restores the natural luminosity of the skin

Bioptron Hyperlight Therapy can be used as a part for daily anti-aging routine, in combination with other serums and creams.

Bioptron is a powerful tool when combined with other anti-aging procedures by decreasing the rash and redness at injection sites, avoiding inflammation, but also potentiating and prolonging the effects of the following techniques:

Facial and Hair Microneedling

- Mesotherapy/Biorevitalization
- Hyaluronic Acid (HA) Fillers
- Botox
- Collagen injections
- Platelet Rich Plasma (PRP) Therapy
- Mesothreads
- Derma rollers
- Various peels

Facial Rejuvenation, Body Treatments

- Fractional CO2 Laser
- Laser varicose vein ablation
- Laser ND-YAG
- Cellulite treatment



Photo 5. Mesotherapy treatment followed by 10 min of Bioptron Hyperlight Therapy



Before

After

Bioptron Hyperlight Therapy is the perfect ally for post-surgery aesthetic procedures. It will decrease edema and inflammation, promote skin regeneration and relieve the pain during the whole process. The patients will recover faster thanks to Bioptron Hyperlight Therapy.



Photo 6. In each pair of images left photo shows one side of the face treated with Bioptron for 5 and 7 days respectively (Colic et al., 2004) ⁽¹⁶⁾.

*Disclaimer: cosmetic effects.

BIOPTRON HYPERLIGHT THERAPY IN SEASONAL AFFECTIVE DISORDER (SAD)

It is accepted by scientific community that SAD is caused by the lack of light, due to shorter days and decrease in sunlight exposure. The decrease in light reception will cause an imbalance in the secretion of specific neurotransmitters in the brain, affecting sleep-wake cycle and other mechanisms.

The main treatment for SAD is bright light therapy, such as Biopton Hyperlight Therapy. The increased light levels may compensate the decrease of sunlight, helping the patients to:

- Decrease their depression symptoms
- Increase motivation
- Improve sleep duration

Biopton Hyperlight Therapy has no side-effects, thus the patients can stop using it during spring and summer without side effects. Biopton Hyperlight Therapy devices provide more than 10,000 lux (indoor light is around 500 lux; midday summer sunlight can reach 50,000 lux), ideally dosed to treat SAD.

Apply Biopton Hyperlight Therapy pointing towards your forehead, while taking breakfast, reading the news or working on your computer, as explained in the flipchart below, to make the most of your winter.

- 20-40 min. = 20 cm distance
- 40-60 min. = 30 cm distance
- 60-120 min. = 40 cm distance

BIOPTRON HYPERLIGHT THERAPY IN CHILDREN AND NEWBORNS

Few medical devices are designed and marketed specifically for children. Children and newborns have special needs and require appropriate healthcare adapted to them. Biopton Hyperlight Therapy is a safe medically certified device to be used in children and newborns, to respond specifically to their needs.

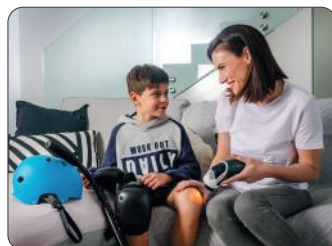
Biopton Hyperlight Therapy can be used in children to reduce the pain and promote healing.

Biopton is especially useful for treatment of:

- Pediatric dermal affections ⁽²⁾
- Endogenous eczema
- Upper respiratory tract infections ^[36, 37]
- Allergic respiratory diseases ^[43]
- Pediatric musculoskeletal disorders ^[83, 84]

In newborns

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



Treatment of children under 6 years old must be performed under supervision of a physician.

Do not apply in eye area and use blindfold included with the device.

BIOPTRON HYPERLIGHT THERAPY IN MUCOSAL LESIONS

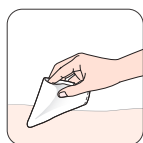
Bioptron® Hyperlight Therapy has proven its high effectiveness in a wide range of applications in oral mucosal lesions, alleviating inflammation, swelling and pain. Bioptron Hyperlight Therapy is an exceptional technology that offers an effective and economical treatment for different mucosal lesions ^[53, 54, 55, 56, 59].

HOW TO USE IT

Bioptron® Hyperlight should be used as it is described in the "Instructions For Use" brochure included with each device.

Each session of Bioptron Hyperlight Therapy lasts between 4 and 10 minutes, once or twice a day. The therapy is non-invasive. Bioptron device should be positioned at 10 cm distance from the area to be treated. Bioptron Hyperlight devices can be easily used for several patients within the same day. Bioptron Hyperlight Therapy can be used for as long as needed until the medical problem is solved.

BIOPTRON MEDALL



Step 1
Carefully clean the area to be treated.



Step 2
Set the treatment time with +/– buttons.



Step 3
Adjust the device according to your needs.



Step 4
Hold the device at 90°, at a distance of 10 cm from area to be treated.

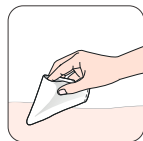


Step 5
Press Start. Relax. Light will switch off automatically at the end of countdown.

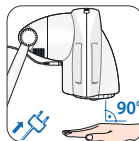


Step 6
Treat target skin areas one by one.

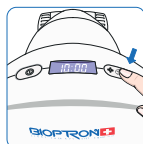
BIOPTRON PRO 1 AND B2



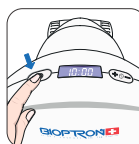
Step 1
Carefully clean the area to be treated.



Step 2
Hold the device at 90°, at a distance of about 10 cm from area to be treated.



Step 3
Set the treatment time with +/– buttons.



Step 4
Press start. Treatment starts. Light will switch off automatically at the end of countdown.

MORE ABOUT THE CELLULAR MECHANISMS TRIGGERED BY BIOPTRON HYPERLIGHT

The unique synergic combination of cellular processes triggered by Biopton offers an effective healing in wound care, pain relief and dermatology disorders:

- Stimulates regenerative processes by increasing collagen production, keratinocyte and fibroblast proliferation ^[31, 62, 76]
- Increases release of growth factors ^[79]
- Favors microcirculation and improves local blood supply ^[27, 63]
- Increases anti-inflammatory cytokine secretion and reduces the release of pro-inflammatory ones ^[24, 25, 80, 85, 86]
- Reduces the release of chemical messengers that stimulate nociceptors, boosting the release of the body's natural pain-killing agents ^[15, 63].

BIOPTRON HYPERLIGHT THERAPY TREATMENT

INDICATION FOR USE	SPECIFIC PROBLEMS/SYMPTOMS	TREATMENT	SUGGESTED APPLICATION SITES
WOUND HEALING			
Wounds after trauma or surgery	Cuts Bruises Pain around the area	2-8 min/ session, 10 cm distance 1-2 sessions/day As long as required	At the site of the trauma 
Burns	Pain around the area Tissue healing	2-8 min/session, 10 cm distance 1-2 sessions/day As long as required	At the site of the burn 
Skin grafts	Pain around the area Tissue healing	2-8 min/session, 10 cm distance 1-2 sessions/day As long as required	At the site of the skin graft 
Venous leg ulcers (stasis ulcers)	Pain around the area Tissue healing	2-8 min/session, 10 cm distance 1-2 sessions/day As long as required	At the site of the ulcer. Repeat same treatment on each ulcer if there are several. 
Decubitus (pressure ulcers)	Pain around the area Tissue healing	2-8 min/session, 10 cm distance 1-2 sessions/day As long as required	At the site of the ulcer. Repeat same treatment on each ulcer if there are several. 
Diabetic foot ulcers	Pain around the area Tissue healing	2-8 min/session, 10 cm distance 1-2 sessions/day As long as required	At the site of the ulcer. Repeat same treatment on each ulcer if there are several. 

BIOPTRON HYPERLIGHT THERAPY TREATMENT

INDICATION FOR USE	SPECIFIC PROBLEMS/SYMPTOMS	TREATMENT	SUGGESTED APPLICATION SITES
PAIN RELIEF			
Rheumatoid arthritis	Pain in any joint of the body	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	At the painful site. Repeat same treatment on each affected joint.
Arthritis	Pain in any joint of the body	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	At the painful site. Repeat same treatment on each affected joint.
Osteoarthritis	Pain in any joint of the body	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	At the painful site. Repeat same treatment on each affected joint.
Low back pain	Pain and stiffness on the back	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	At the painful site.
Shoulder and neck pain	Pain and stiffness on the shoulder or neck	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	At the painful site.
Scar tissue	Pain	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	At the scar tissue site.
Musculoskeletal injuries	Pain	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	At the painful site
Carpal tunnel syndrome	Pain, tingling	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	On the wrist
DERMATOLOGY			
Atopic dermatitis (Eczema)	Alleviate eczema patches	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	On the affected region

BIOPTRON HYPERLIGHT THERAPY TREATMENT

INDICATION FOR USE	SPECIFIC PROBLEMS/SYMPTOMS	TREATMENT	SUGGESTED APPLICATION SITES
Acne vulgaris	Alleviate acne lesions	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	On the affected region 
Psoriasis	Alleviate psoriasis lesions	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	On the affected region 
Herpes simplex (cold sores)	Alleviate discomfort	4-10 minutes 10 cm distance 1-2 sessions/day As long as required	On the affected region 
Herpes zoster	Alleviate discomfort	4-10 minutes, 10 cm distance 1-2 sessions/day As long as required	On the affected region 
Superficial bacterial infections	Alleviate discomfort	4-10 minutes, 10 cm distance 1-2 sessions/day As long as required	On the affected region 
Mucosal lesions (skin or oral mucosa)	Alleviate discomfort Oral mucosa: mucositis, oral pain, peri-implantitis	4-10 minutes, 10 cm distance 1-2 sessions/day As long as required	On the affected region 
SEASONAL AFFECTIVE DISORDER (SAD)			
SAD	Low mood Anhedonia Increased need for sleep Severe tiredness	20-40 min. exposure at 20 cm distance or 40-60 min. exposure at 30 cm distance or 60-120 min. exposure at 40 cm distance.	With the light spot on the forehead or side of the skull. Avoid the eyes and surroundings areas 
PEDIATRICS			
BLINDFOLD USE MANDATORY. ASK YOUR DOCTOR BEFORE USE			
Dermatological disorders	Such as atopic dermatitis, psoriasis, superficial bacterial infections, acne, mucosal lesions, Herpes simplex and Herpes zoster	2-4 minutes, 10 cm distance 1-2 sessions/day	At the lesion site 
Allergic respiratory diseases	Such as asthma	2-4 minutes, 10 cm distance 1-2 sessions/day	On the chest 

BIOPTRON HYPERLIGHT THERAPY TREATMENT

INDICATION FOR USE	SPECIFIC PROBLEMS/SYMPTOMS	TREATMENT	SUGGESTED APPLICATION SITES
Infections of the upper airways	Such as common cold, sinus infections and tonsillitis	2-4 minutes, 10 cm distance 1-2 sessions/day	On the chest 
Minor injuries	Wounds, bruises, rashes, edema, redness and burns	2-4 minutes, 10 cm distance 1-2 sessions/day	At the lesion site 
Muscle and joint disorders	Such as juvenile arthritis	2-4 minutes, 10 cm distance 1-2 sessions/day	At the lesion site 
Sports injuries	Such as sprains, strains, contusions, tendonitis, ligament and muscle tears	2-4 minutes, 10 cm distance 1-2 sessions/day	At the lesion site 
ADDITIONAL INDICATIONS FOR NEWBORNS:			
Dermal affections	Such as intertrigo (diaper rash), omphalitis (infection of the umbilicus) and pustular rash	2-4 minutes, 10 cm distance 1-2 sessions/day	At the lesion site 

BIOPTRON[®] 
HYPERLIGHT THERAPY SYSTEM By Zepter Group

SCIENTIFIC REFERENCE LIST

1. Abd-Elhamed, T. G., Borhan, W. H., Abd-Alwahab, M. G., & Abd Elhameed, M. M. Polarized Light Therapy for Wounds: A Systematic Review. *The Egyptian Journal of Hospital Medicine* (October 2022), 93, 7600-7609.
2. Abdel-Mageed, S. M., Selim, A. O., Ghafar, M. A. A., & Ali, R. R. (2015). A Description of the Effect of Polarized Light as an Adjuvant Therapy on Wound Healing Process in Pediatrics. *International Journal of Biophysics* 2015, 5(1): 18-23
3. Abdou WEM et al, Effect of Biopton in Treating Cracked Nipples in Breast Feeding Women: A Randomized Controlled Trial, *World J. Med. Sci.*, 16 (1): 35-40, 2019
4. Abramovich, S. G., Drobyshyev, V. A., Koneva, E. S., & Makhova, A. A. (2020). The efficacy of the comprehensive use of naphthalan and non-selective chromotherapy in the treatment of patients with gonarthrosis. *Drug Research*, 70(04), 170-173.
5. Ahmed, A. A. E. S. A., Abdel-Aziz, K. S., Ahmed, M., Awad, M., Mahmoud, A. H. A., & Ahmed, A. A. Effect Of Polarized Light Therapy On Incisional Pain After Cesarean Section. *European Journal of Molecular & Clinical Medicine*, 7(10), 2020.
6. Al-Kader, Ahmed Mamdouh Mohamed Abd, Hassan Maha A., Mahran Hisham Galal, Elsayed and Zakaria Mowafy Emam Mowafy. (2015). Efficacy of Polarized Light in the Treatment of Pressure Ulcers. *JMSCR* 3(5):5800-5809.
7. Antonic M The use of polychromatic polarized light BIOPTRON in physiotherapy. pp 2-5
8. Aragona, S. E., Grassi, F. R., Nardi, G., Lotti, J., Mereghetti, G., Canavesi, E., ... & Lotti, T. (2017). Photobiomodulation with polarized light in the treatment of cutaneous and mucosal ulcerative lesions. *Journal of Biological Regulators and Homeostatic Agents*, 31(2 Suppl. 2), 213-218.
9. Aronis E, Braziotis A, Kafourous K, Pagratis N, Papakostas TH, Venetsanos P (1992) The Action of Visible Polarized Light on Skin Diseases. Poster Presentation 1992; 25:
10. Bahrami, H., Moharrami, A., Mirghaderi, P., & Mortazavi, S. M. J. (2023). Low-Level Laser and Light Therapy After Total Knee Arthroplasty Improves Postoperative Pain and Functional Outcomes: A Three-Arm Randomized Clinical Trial. *Arthroplasty Today*, 19, 101066.
11. Ballyzek M, Vesovic-Potic V , He X, Johnston A. Efficacy of polarized, polychromatic, non-coherent light in the treatment of chronic musculoskeletal neck and shoulder pain. Unpublished material, BIOPTRON AG, Wollerau, Switzerland (2005).
12. Białożyty J., Materniak K., Kawecki M. 2018 Use of polarise lighting in support of treatment of pressure ulcers among patients after burns. Preliminary report. *Dermatologia Estetyczna*. vol.20, 1 (114)
13. Chen, B., Liu, Y., Liu, Y., & Xu, S. (2023). Distribution characteristics of pathogens in different stages of pressure ulcers and the therapeutic effect of linear polarized polychromatic light combined with silver sulfadiazine cream. *Medicine*, 102(42), e35772.
14. Choi M, Kim JE, Cho KH, Lee JH. In vivo and in vitro analysis of low level light therapy: a useful therapeutic approach for sensitive skin. *Lasers Med Sci*. 2013 Nov;28(6):1573-9. doi: 10.1007/s10103-013-1281-x. Epub 2013 Feb 10. PMID: 23397274.
15. Chumak AG,. Role of nitric oxide in modulation of afferent impulses in cutaneous branches of somatic nerves by polarized light. *Bull Exp Biol Med*. 2000 Aug;130(8):734-6.
16. Colić, M. M., Vidojković, N., Jovanović, M., & Lazović, G. (2004). The use of polarized light in aesthetic surgery. *Aesthetic plastic surgery*, 28(5), 324-327.

17. De Melo CA, Alves AN, Terena SM, Fernandes KP, Nunes FD, da Silva DF, Bussadori SK, Deana AM, Mesquita-Ferrari RA. Light-emitting diode therapy increases collagen deposition during the repair process of skeletal muscle. *Lasers Med Sci.* 2016 Apr;31(3):531-8.
18. Dimitrios, S., & Stasinopoulos, L. (2017). Treatment of carpal tunnel syndrome in pregnancy with polarized polychromatic non-coherent light (Bioptron light): a preliminary, prospective, open clinical trial. *Laser therapy*, 26(4), 289-295.
19. Đurović, A., Marić, D., Brdareski, Z., Jevtić, M., & Đurđević, S. (2008). The effects of polarized light therapy in pressure ulcer healing. *Vojnosanitetski preglod*, 65(12), 906-912.
20. El-Alfy, A. M. I., Mahran, H. G., Hamed, H. A. A., Abd El-Rashed, N. A., Abd El-khalek, W. O. A., & Bayoumi, M. B. I. (2023). Effect of Low-Level Laser Therapy Versus Bioptron on Psoriasis. *Journal of Advanced Zoology*, 44(S3), 39-49.
21. El-Deen, H. B., Fahmy, S. E. H. A. M., Ali, S. A., & El-Sayed, W. M. (2014). Polarized light versus light-emitting diode on healing of chronic diabetic foot ulcer. *Romanian Journal of Biophysics*, 24(2), 1-15.
22. El Sayed, D. G. (2021). Hyperpolarized Light Therapy Versus Traditional Wound Care On Different Wound Types. *NVEO-NATURAL VOLATILES & ESSENTIAL OILS Journal* | NVEO, 15786-15795.
23. Emam Mowafy, Z. M., Mostafa Ibrahim, I. S., Ibrahim, M. B., & Mohamed Mokhtar Elshahawy, A. M. (2021). Wound Surface Area and Colony Count of Various Modes of Phototherapy. *Egyptian Journal of Hospital Medicine*, 85(2).
24. Fenyö M., Mandl J., Falus A. Opposite effect of linearly polarized light on biosynthesis of interleukin-6 in a human b lymphoid cell line and peripheral human monocytes. *Cell Biology International*, 1992 Volume26, Issue 3, P.265-269
25. Fenyö, M., Mandl, J., & Falus, A. (2002). Opposite effect of linearly polarized light on biosynthesis of interleukin-6 in a human B lymphoid cell line and peripheral human monocytes. *Cell Biology International*, 26(3), 265-269.
26. Gallacchi G (1993) Comparative Study on the Efficacy and Tolerance of Two Different Light Therapy Devices (BIOPTRON Device and Philips Lamp) Used to Treat Patients Suffering From Localized pain States. (Unpublished)
27. Gasparyan LV, Brill G, Makela AM - Activation of angiogenesis under influence of red low level laser radiation *Proceedings Volume 5968, Laser Florence 2005: A Window on the Laser Medicine World*; 596806
28. Internal Report, Begic-Rahic 2005, Appliance of Bioptron Light Therapy (BLT) in the Dermatology, Our Experience. *Dermatovenereology Clinic. Clinical Centte of the university of Sarajevo, Bosnia and Herzegovina.*
29. Internal Report_AMA Laboratories 1991 Investigation into the effects of a new treatment product on acne.
30. INTSAR S. WAKED, Ph.D., R.M., & ASHRAF E.M. ELSEBAIE, M.D., M.B. (2021). Effect of Negative Pressure Therapy versus Polarized Light Therapy on Chronic Wound Healing.
31. Iordanou P. Effect of visible and infrared polarized light on the healing process of full-thickness skin wounds: an experimental study. *Photomed Laser Surg.* 2009 Apr;27(2):261-7.
32. Iordanou, P., Baltopoulos, G., Giannakopoulou, M., Bellou, P., & Ktenas, E. (2002). Effect of polarized light in the healing process of pressure ulcers. *International journal of nursing practice*, 8(1), 49-55.
33. Jankovic, A. (2005). Physical therapy of venous ulcers: effects of electroionotherapy and polarized light. *vascular diseases*, 4, 5.
34. Janković, A., Binić, I., Vručinić, Z., Janković, D., Janković, I., & Jančić, S. (2010). Can you combine herbal therapy with physical agents in the treatment of venous leg ulcers?. *Complementary Medicine Research*, 17(5), 266-269.

35. Karadzic M, The Polarized Light at the treatment of Rheumatoid Arthritis. (Unpublished)
36. Khan MA, Erdes SI (2009) Polychromatic Polarized Light in Prophylaxis and Treatment of Respiratory System Diseases in Children and Adolescents. *Pediatrician's Practice Moscow* Dec 2009: pp 12-14
37. Khan MA, Erdes SI (2010) The Application of BIOPTRON Device Polychromatic Incoherent Polarized Light in Cases of Allergic Diseases in Children. *Pediatrician's Practice Moscow* Mar 2010: pp 70-72
38. Kolenko 2017 Light therapy in complex treatment of patients with herpes zoster. National Medical University named after O.O. Bogomolets, Kiev, Ukraine
39. Kubasova T, Horváth M, Kocsis K, Fenyő M. Effect of visible light on some cellular and immune parameters. *Immunology and Cell Biology* Volume73, Issue3, June 1995, Pages 239-244
40. Kyplova, J., Navrátil, L., & Křížek, J. (2003). Contribution of phototherapy to the treatment of episiotomies. *Journal of clinical laser medicine & surgery*, 21(1), 35-39.
41. Leguina-Ruzzi, A., Raichura, K. R., Tonks, S. K., Kwabi, S., & Leitner, C. (2019). Treatment of non-atopic dermatitis with polarized UV-free polychromatic light: A case report. *Clinics and practice*, 9(3), 1161.
42. Makovskaya, DS, Apolikhina IA, Gorbunova EA, Saidiva AS, teterina Ta, Bychkova AE. [EN] Conservative treatments of decubitus ulcers in women with pelvin organ prolapse. *Medical Opponent* 2023; 2 (22):67-7
43. Marx A (2007) Amendment to the Clinical Evaluation of the BIOPTRON Light Therapy System, Version 01 2007
44. Medenica, L., & Lens, M. (2003). The use of polarised polychromatic non-coherent light alone as a therapy for venous leg ulceration. *Journal of wound care*, 12(1), 37-40.
45. Mihaylova, Mariyana & Ruseva, Zhenya & Filkova, Silvia. (2017). The effect of polarized polychromatic non-coherent light (Bioptron) therapy on patients with lower back pain. *Scripta Scientifica Salutis Publicae*. 3. 23. 10.14748/sssp.v3i1.2165.
46. Mohamed M et al., *International Journal of Therapies and Rehabilitation Research* 2016; 5 (2): 9-13
47. Mohamed, M. H., Selem, M. N., Mohamed, M. S., & Abd EL-Ghaffaar, H. A. (2019). Interleukin-6 response to shock wave therapy versus polarized light therapy in the treatment of chronic diabetic foot ulcers. *Drug Invention Today*, 11(11).
48. Mohamed, M. H., Tabia, A., & Selim, M. N. (2022). Ultrasonographic Response to Polarized Light Therapy in the Treatment of Atopic Dermatitis. *Egyptian Journal of Physical Therapy*, 9(1), 21-28.
49. Monstrey, S. J., Hoeksema, H., Saelens, H., Depuydt, K., Hamdi, M., Van Landuyt, K., & Blondeel, P. N. (2002). A conservative approach for deep dermal burn wounds using polarised-light therapy. *British journal of plastic surgery*, 55(5), 420-426.
50. Monstrey, S., Hoeksema, H., Depuydt, K., Van Maele, G. E. O. R. G. E. S., Van Landuyt, K., & Blondeel, P. (2002). The effect of polarized light on wound healing. *European Journal of Plastic Surgery*, 24(8), 377-382.
51. Mowafy Zakaria Emam 2016_Pain and Fibrous Scarring Response to Polarized Light. *International Journal of PharmTech Research*, 2016,9(5),pp 144-150
52. Mowafy, Z. M. E., Abdelrahman, S. M. E., Ali, K. M., & Ali, A. M. A. (2022). Low level laser therapy versus polarized light therapy on healing of foot burn. *International Journal of Health Sciences*, 6(S2), 13053–13063.
53. Nardi GM, Guerra F, Ndokaj A, Corridore D, Straker MA, Sportelli P, Di Giorgio R, Grassi FR, Grassi R, Ottolenghi L. Phototherapy and Tailored Brushing Method. Personalized Oral Care in Patients with Facial and Dental Trauma. A Report of a Case. *Healthcare (Basel)*. 2021 May 11;9(5):561. doi: 10.3390/healthcare9050561. PMID: 34064547; PMCID: PMC8150812.
54. Nardi, G. M., Grassi, R., Grassi, F. R., Aragona, S. E., Rapone, B., Della Vella, F., & Sabatini, S. (2019). Use of photobiomodulation induced by polarized polychromatic non-coherent light in the management of adult chronic periodontitis. *Journal of Biological Regulators and Homeostatic Agents*, 33(1), 293-297.

55. Nardi, G. M., Mazur, M., Papa, G., Petruzzi, M., Grassi, F. R., & Grassi, R. (2022). Treatment of Peri-Implant Mucositis with Standard of Care and Bioptron Hyperlight Therapy: A Randomized Clinical Trial. *International Journal of Environmental Research and Public Health*, 19(9), 5682.
56. Nemeth, L., Groselj, M., Golez, A., Arhar, A., Frangez, I., & Cankar, K. (2020). The impact of photobiomodulation of major salivary glands on caries risk. *Lasers in Medical Science*, 35(1), 193-203.
57. Nosseir, A. A., Hamed, H. A., Ali, Z. A., & Elwasefy, S. A. (2020). Polarized Light Therapy versus Betamethasone Phonophoresis in Treatment of Psoriasis.
58. Petrovic, D., Zlatkovic-Svenda, M., & Lazovic, B. (2018). Could the complex regional pain syndrome (Sudeck atrophy), emerged as a distal radius at the typical site fracture complication, be prevented by physical therapy?. *Annals of Physical and Rehabilitation Medicine*, 61, e114.
59. Petruzzi, M., Nardi, G. M., Cocco, F., Della Vella, F., Grassi, R., & Grassi, F. R. (2019). Polarized Polychromatic Noncoherent Light (Bioptron Light) as Adjunctive Treatment in Chronic Oral Mucosal Pain: A Pilot Study. *Photobiomodulation, Photomedicine, and Laser Surgery*, 37(4), 227-232.
60. Raeissadat SA, Rayegani SM, Rezaei S, Sedighipour L, Bahrami MH, Eliaspour D, Karimzadeh A. The effect of polarized polychromatic noncoherent light (bioptron) therapy on patients with carpal tunnel syndrome. *J Lasers Med Sci*. 2014 Winter;5(1):39-46. PMID: 25606338; PMCID: PMC4290517.
61. Rutteman B, Borremans K, Beckers J, Devleeschouwer E, Lampmann S, Corthouts I, Verlinde P. Aeromonas wound infection in a healthy boy, and wound healing with polarized light. *JMM Case Rep*. 2017 Oct 16;4(10):e005118. doi: 10.1099/jmmcr.0.005118. PMID: 29188066; PMCID: PMC5692235.
62. Samoilova KI. Enhancement of growth promoting activity of human blood on keratinocytes after its irradiation in vivo (transcutaneously) and in vitro with visible and infrared polarized light. *Tsitologiya*. 2003;45(6):596-605
63. Samoilova, K. A., Zhevago, N. A., Petrishchev, N. N., & Zimin, A. A. (2008). Role of nitric oxide in the visible light-induced rapid increase of human skin microcirculation at the local and systemic levels: II. healthy volunteers. *Photomedicine and laser surgery*, 26(5), 443-449.
64. Shiryan, G. T., Amin, F. S., & Embaby, E. A. (2022). Effectiveness of polarized polychromatic light therapy on myofascial trigger points in chronic non-specific low back pain: a single blinded randomized controlled trial. *Bulletin of Faculty of Physical Therapy*, 27(1), 33
65. Simic, A. (1999) Effects of PILER light therapy on wound healing in patients operated due to stomach carcinoma. 3 rd International Gastric Cancer Congress April 27 – 30, 1999 Korea, SEUL.
66. Simic, A. (2001, May). Importance of Bioptron light therapy in the treatment of surgical incisions. In Second Balkan Congress for PRAS and Bioptron Satellite Symposium, Belgrade, May (pp. 24-26).
67. Simic, A., Pesco, P., Bjelovic, M., STOJAKOV, D., TODOROVIC, M., TODOROVIC, V., ... & KOTARAK, M. (2001). Bioptron light therapy and thoracophrenolaparotomy wound healing in patients operated due to cardiac carcinoma, paper presented at the 4th International Gastric Cancer Congress.
68. Simic, A., Stojakov, D., Sabljak, P., Jekic, I., Bjelovic, M., & Pesko, P. (1999). Piler Light Therapy-Effect on Wound Healing in Esophagogastric Surgery. *EUROPEAN SURGICAL RESEARCH*, 31(1), 225-225.
69. Stasinopoulos Dimitrios S, Antonis C, Dimitrios L (2020) The Effectiveness of Polarized Polychromatic Noncoherent Light (Bioptron Light) In Patients with Chronic Rotator Cuff Tendinopathy. A Clinical sTrial. *J Phy Fit Treatment & Sports* 7(5): 555-724.
70. Stasinopoulos Dimitrios, S. (2019). The Effectiveness of Polarized Polychromatic Non-Coherent (BIOPTRON) Light in the Management of Acute Lateral Elbow Tendinopathy: A Case Report.
71. Stasinopoulos, D. (2005). The use of polarized polychromatic non-coherent light as therapy for acute tennis elbow/lateral epicondylalgia: a pilot study. *Photomedicine and Laser Therapy*, 23(1), 66-69.

72. Stasinopoulos, D. (2020) The effectiveness of polarized polychromatic non-coherent (BIOPTRON) light in the management of acute Patellar Tendinopathy. A case report. *ARC Journal of Clinical Case Reports*. Volume 6, Issue 2, 2020, PP 10-13 ISSN No. 2455-9806
73. Stasinopoulos, D., & Stasinopoulos, I. (2006). Comparison of effects of Cyriax physiotherapy, a supervised exercise programme and polarized polychromatic non-coherent light (Bioptron light) for the treatment of lateral epicondylitis. *Clinical Rehabilitation*, 20(1), 12-23.
74. Stasinopoulos, D., Stasinopoulos, I., & Johnson, M. I. (2005). Treatment of carpal tunnel syndrome with polarized polychromatic noncoherent light (Bioptron light): a preliminary, prospective, open clinical trial. *Photomedicine and Laser Therapy*, 23(2), 225-228.
75. Stasinopoulos, D., Stasinopoulos, I., Pantelis, M., & Stasinopoulou, K. (2009). Comparing the effects of exercise program and low-level laser therapy with exercise program and polarized polychromatic non-coherent light (bioptron light) on the treatment of lateral elbow tendinopathy. *Photomedicine and laser surgery*, 27(3), 513-520.
76. Tada K., Ikeda K., and Tomita, K. Effect of polarized light emitting diode irradiation on wound healing. *J. Trauma*. 2009;67(5):1073-1079.
77. Taha, M. M., El-Nagar, M. M., Elrefaey, B. H., Elkholy, R. M., Ali, O. I., Alkhamees, N., & Felaya, E. S. E. S. (2022). Effect of Polarized Light Therapy (Bioptron) on Wound Healing and Microbiota in Diabetic Foot Ulcer A Randomized Controlled Trial. *Photobiomodulation, Photomedicine, and Laser Surgery*.
78. Waked, I. S., & Abdelhamid, N. D. (2015). The efficacy of linear polychromatic noncoherent light (bioptron light) in the treatment of plaque psoriasis. *World Journal of Pharmaceutical Research SJIF*, 4(5), 366-376.
79. Young S, Bolton P, Dyson M, Harvey W, Diamantopoulos C. Macrophage responsiveness to light therapy. *Lasers Surg Med*. 1989;9(5):497-505
80. Zhevago N.A., Samoilova K.A. (2006) Pro- and anti-inflammatory cytokine content in the human peripheral blood after its transcutaneous and direct (in vitro) irradiation with polychromatic visible and infrared light. *Photomedicine and Laser Surgery*. – 2006. – Vol. 24(2). – P.129-139.
81. Zhevago N.A., Samoilova K.A., Calderhead R.G. (2006) Polychromatic light similar to the terrestrial solar spectrum without its UV component stimulates DNA synthesis in human peripheral blood lymphocytes in vivo and in vitro. *Photochemistry Photobiology*. – 2006. – Vol. 82(5). – P.1301-1308.
82. Stasinopoulos, D., Papadopoulos, C., Lamnisos, D., & Stasinopoulos, I. (2017). The use of Bioptron light (polarized, polychromatic, non-coherent) therapy for the treatment of acute ankle sprains. *Disability and rehabilitation*, 39(5), 450-457.
83. Abd El-Rashid NA, Sanad DA, Ayoub HS, Elhenawy AN. Effect of orange polarized light on Metacarpophalangeal range of motion in pediatric hand burn: a single blind randomized trial. *Bioscience Res*. 2019;16(3):2417–22.
84. Abd Elrashid, N. A., Sanad, D. A., Mahmoud, N. F., Hamada, H. A., Abdelmoety, A. M., & Kenawy, A. M. (2018). Effect of orange polarized light on post burn pediatric scar: a single blind randomized clinical trial. *Journal of Physical Therapy Science*, 30(10), 1227-1231.
85. Falus A, Fenyo M, Eder K, Madarasi A (2011) Polarized light as an epigenetic factor in inhibition of inflammation; a genome-wide expression analysis in recurrent respiratory diseases of children. *Orv Hetil* 2011 Sep 11;152(37): pp 1492-1499.
86. Feehan J, Burrows SP, Cornelius I, Cook AM, Mikkelsen K, Apostolopoulos V, Husaric M, Kiatos D. Therapeutic applications of polarized light: Tissue healing and immunomodulatory effects. *Maturitas*. 2018 Oct;116:11-17. doi: 10.1016/j.maturitas.2018.07.009. Epub 2018 Jul 19. PMID: 30244771.

COMPANY PROFILE

Bioptron AG is a Swiss company that develops and manufactures medically certified light therapy devices. Over the past 30 years, Bioptron has become a global brand that stands for innovative non-invasive medical healthcare products, unrivalled in treatment of many medical conditions. BIOPTRON AG continues to invest in sophisticated research and new product development that is necessary to achieve optimal clinical effectiveness in light therapy treatments. Our vision is to empower people to self-care by taking charge of their health and the health of those they love. We provide safe, easy and effective health solutions to treat illness and improve lives. With our innovative products, we contribute to finding solutions for some of the major challenges of the modern healthcare.



For further information
scan the QR code

BIOPTRON AG

Sihleggstrasse 23, CH-8832 Wollerau, Switzerland

BIOPTRON NZ

Unit C, 5-7 Paul Matthews Road
Rosedale, Auckland, New Zealand
www.bioptron.co.nz
Email: info@zepternz.co.nz
Phone: 09 475 5589

