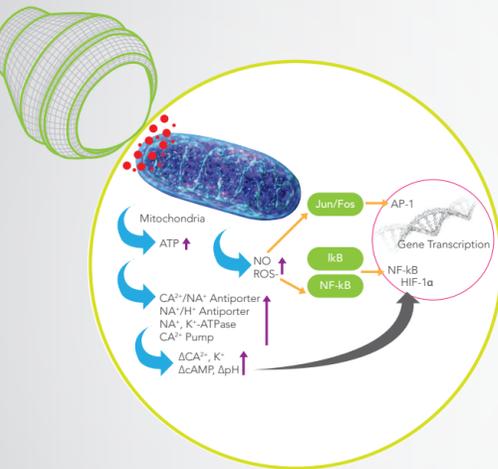


PHOTOBIMODULATION (PBM) THERAPY

A proven way to regenerate tissue at the cellular level

Photobiomodulation therapy (PBMT) is a form of light therapy based on the photochemical process called photobiomodulation (PBM). In photobiomodulation therapy, a light source is placed near or in contact with the skin, the light energy penetrates the skin reaching the mitochondria of damaged or diseased tissue leading to photobiomodulation. This process results in beneficial therapeutic outcomes such as the alleviation of pain, the regulation of inflammation, immunomodulation, and the promotion of tissue regeneration.¹⁻³



PBM Mechanisms of Action

The application of a therapeutic dose of light to impaired or dysfunctional tissue leads to a cellular response mediated by mitochondrial mechanisms that reduce pain and inflammation and speed healing.²

The primary target (chromophore) for the process is the cytochrome c complex which is found in the inner membrane of the cell mitochondria. Cytochrome c is a vital component of the electron transport chain that drives cellular metabolism. As light is absorbed, cytochrome c is stimulated, leading to increased production of adenosine triphosphate (ATP), the molecule that facilitates energy transfer within the cell.²⁻⁴

In addition to ATP, laser stimulation also produces free nitric oxide and reactive oxygen species. Nitric oxide is a powerful vasodilator and an important cellular signaling molecule involved in many physiological processes. Reactive oxygen species have been shown to affect many important physiological signaling pathways including the inflammatory response. In concert, these molecules have been shown to increase growth factor production and promote extracellular matrix deposition. The resultant increase in cell proliferation and motility leads to pro-survival pathways for the cell.²⁻⁴

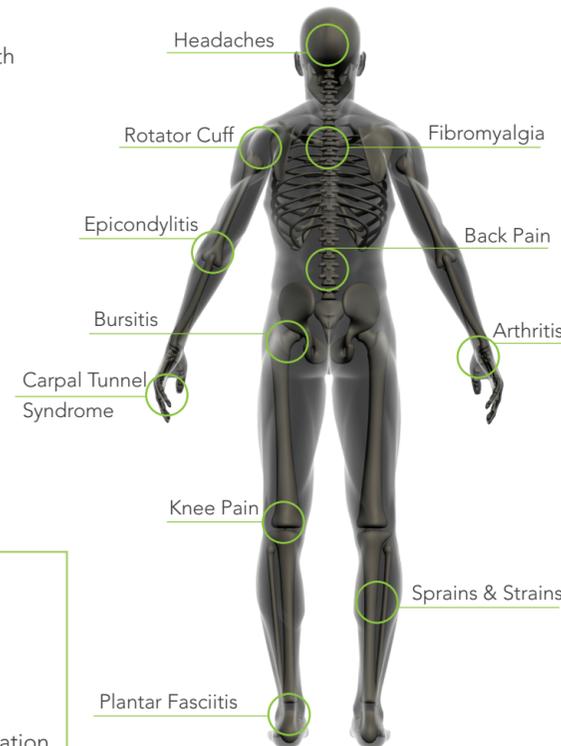
PHYSIOLOGICAL EFFECTS

- Anti-inflammatory, analgesic, and anti-edematous
- Increased synthesis of ATP
- Increased tissue oxygenation and nutrition
- Increased rate of tissue regeneration
- Increased microcirculation

APPLICATIONS & DELIVERY

Versatile applications, maximum results

Improve Recovery For...



Use photobiomodulation therapy in conjunction with other modalities and treatment techniques with no side-effects.

- Acute conditions
- Chronic conditions

Multiple Tissues:

- Nerves
- Tendons
- Ligaments
- Joint Capsules
- Muscles
- And More

The Benefits of the Massage Ball

Maximize clinical results with the benefits of LightForce's patented, on-contact photobiomodulation therapy treatment application.



Compression
Gets you closer to target tissue. Blanching reduces obstacles of superficial absorbers



Collimation
The massage ball acts to collimate the delivery of light to tissue reducing energy loss



Refractive Index
The fused silica composition of the massage ball minimizes light losses as it passes from the massage ball into the skin due to similar refractive indices



Reflection
Contact application of delivery to tissue minimizes energy loss due to reflection



Soft Tissue Work
Allows you to do manual soft tissue work with the massage ball applicator while delivering energy



PHOTOBIMODULATION DOSING

A drug-free, surgery-free, non-invasive pain solution

PBM Dosing - The Key To Results

Dosimetry in photobiomodulation (PBM) therapy is highly complicated - no single "dose" will work for all possible PBM therapies, and in some cases, different dosimetries can be equally effective. Safe and effective PBM dosimetry must consider multiple treatment parameters including: wavelength, irradiance (often called power density or brightness), pulse structure, and irradiation time.⁴

Furthermore, it is important to recognize that PBM is challenged by energy loss that occurs as light enters the skin and travels from superficial to deeper tissues. At the skin's surface this is primarily due to reflection and below the surface by absorption from different tissues competing for different wavelengths of light. Proper configuration of the laser is a key factor in getting sufficient energy to target tissues.

Factors that Impact Dose Delivery at Depth

- Wavelength
- Irradiance (power & beam area)
- Mechanism of delivery (contact vs. non-contact)
- Treatment time
- Size of treatment area
- Type of tissue

Laser Classes - What Do They Mean?

Lasers are classified by the FDA according to their output power. In the field of photobiomodulation therapy, there are two common laser classifications:

- Class IIIb, Maximum power output of 0.5 watts
- Class IV, Maximum power output of over 0.5 watts

Both Class IIIb and Class IV lasers require that safety eye protection be worn during emission.

The Impact of Power on Treatment Times

Power is a key factor when delivering a therapeutic dose to deep target tissues. Not only do LightForce lasers have higher output powers, but they also have larger beam areas, making them more capable of delivering a therapeutic dose to larger treatment areas.

For example, to effectively treat a 300 cm² thoracic spine at 10 J/cm², 3,000 joules of energy are required at the surface of the skin to deliver a therapeutic dose at depth. How long would that treatment take with a Class IIIb laser vs. a Class IV laser?



Class IIIb
3,000 J at 0.5 W = 100 min



Class IV
3,000 J at 15 W = 3.3 min

Deep Tissue Therapy Lasers



EXPi

Facilitates fast and efficient treatments to large treatment areas.

Power: 0.5 - 25 watts
Modes: CW or Pulsed
Laser Type: Class IV



FXi

True portability with long-life battery operation capability.

Power: 0.25 - 15 watts
Modes: CW or Pulsed
Laser Type: Class IV



PRO

Functionally portable, an ideal first step into laser therapy.

Power: 0.25 - 9 watts
Modes: CW or Pulsed
Laser Type: Class IV



EDS

The Empower Delivery System optimizes treatments with patented on-contact treatment heads. Includes 5 application-specific attachments.

What's in a Name?

The evolution of PBM Therapy

"Cold Laser", "Low-Level Laser Therapy (LLLT)", what do these terms mean? In general, such terms refer to "treatment using irradiation with light of low power intensity so that the effects are a response to the light and not due to heat."⁵ Many of the terms used to commonly describe this process do not ideally reflect the mechanisms involved. They also don't adequately distinguish the therapy from other laser-based therapies that rely on heating tissue to achieve an effect. This lack of clarity has led to significant confusion about the modality and a need for better nomenclature.¹

In September 2014, the North American Association for Light Therapy (NAALT) and the World Association for Laser Therapy (WALT) convened and agreed upon the term "Photobiomodulation Therapy" as the preferred nomenclature for this modality. The term was added to the MeSH database in November 2015 and is the preferred name for researchers and key opinion leaders in the field because it more clearly characterizes the modality.^{1,6}



LightForce Compass™

Tools for practice navigation. The LightForce Compass helps you quickly and effectively implement your laser therapy program. The Compass includes comprehensive staff and patient education support materials.

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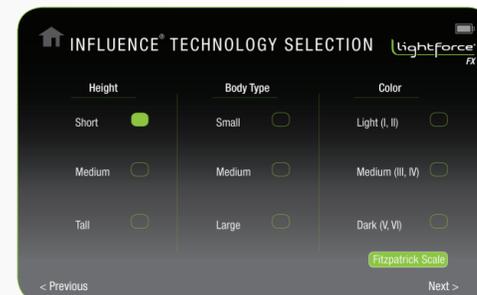
LightForceLasers.com

Photobiomodulation (PBM) Therapy

Reduce Pain & Inflammation, Accelerate Recovery

Influence® Technology

Influence Technology takes into account your patient's unique absorption characteristics and specific clinical condition to provide you with the most effective treatment. The combination of software and hardware advances provide you with custom protocols, consistent treatments, and unparalleled outcomes.



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