WHAT IS COLD LASER THERAPY?

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Most in the esthetic and medical esthetic fields are familiar with the terms intense pulsed light (IPL), light-emitting diode (LED) and LASER (light amplification by stimulated emission of radiation). Technically, a laser is a source of high-intensity optical, infrared or UV light. The photons involved in the laser-emission process all have the same energy and phase so that the laser beam is monochromatic and coherent, allowing it to be brought to a fine focus.

COHERENT VS. NONCOHERENT LIGHT SOURCES

A laser beam is different from IPL and LED because it is coherent, simply meaning that the beam has the ability to remain focused over a distance. IPL and LED are noncoherent, meaning the light scatters with shorter depth of penetration, while laser is coherent, thus providing a targeted treatment. With coherence, the scattering of light decreases, allowing the light to strike the target at perpendicular angles, increasing its absorption and transmission to deeper tissues.

COLD LASER THERAPY

Cold laser therapy—also known as low-level light therapy—supplies energy to the body in the form of nonthermal light photons, hence the term “cold laser.” Cold lasers use light waves in the near-infrared ranges that penetrate the deepest in the visible spectrum.

Cold laser light:

- Is monochromatic—a single wavelength in the 635–970 nm range;
- Is coherent—traveling in a straight, nondiverging line;
- Has a wavelength in the red portion of the electromagnetic spectrum;
- Is polarized—concentrating its energy as a defined spot; and
- Does not heat tissue.
GENERAL EFFECTS OF COLD LASER

INCREASED CELL GROWTH: Laser light helps accelerate cellular reproduction and growth.

INCREASED METABOLIC ACTIVITY: Laser photons help initiate a higher output of specific enzymes, immune cells, oxygen and nutrition for blood cells.

PAIN RELIEF: Pain relief is due not only to accelerated healing processes, but also is the result of increased release of endorphins.

FASTER WOUND-HEALING: Light from the cold laser helps stimulate cells called fibroblasts, which can speed up collagen synthesis in damaged tissue. Collagen, the most abundant protein in the body, is the building block for muscles, ligaments, tendons, fascia, bones, skin and several other connective tissues. This is why cold laser is used for tissue remodeling treatments.

INCREASED CELLULAR DETOXIFICATION: Increased ATP helps provide increased cellular energy for cellular detoxification.

INCREASED COLLAGEN AND ELASTICITY: Increased collagen and elasticity may occur from cellular stimulation using cold laser therapy.

INCREASED VASCULAR ACTIVITY: Laser photons induce temporary dilation of local blood vessels that can increase blood flow to affected areas. Cold laser may help increase the number of capillaries in treated tissue, thus bringing more blood to the treated area on a longer-term basis.

REDUCED FIBROUS TISSUE (SCAR TISSUE) FORMATION: Lasers have been shown to reduce the formation of scar tissue following tissue damage from cuts, scratches, burns or surgery.

STIMULATED NERVE FUNCTION: Laser photon exposure speeds the process of nerve cell reconnection, and helps bring numb or dysfunctional areas (neuropathy) back to life.

INCREASED TISSUE OXYGENATION: Laser has been shown to help increase oxygenation via increased levels of cellular ATP.

ANTI-INFLAMMATORY ACTIONS: Cold laser therapy helps decrease inflammation.

LASER ACUPUNCTURE: Many studies tout the fact that cold laser therapy actually stimulates acupuncture points in a similar fashion to needles or other methods.

Because of cold laser’s deep penetration, light is transmitted through the skin’s layers—the epidermis, dermis, and the subcutaneous tissue or tissue fat under the skin—and reaches the mitochondria of the cell. This is very important because the mitochondria are the cell’s power producers.

HOW DOES COLD LASER WORK? MITOCHONDRIA!

Mitochondria convert energy into forms that are usable by the cell. Located in the cytoplasm, they are the sites of cellular respiration that ultimately generate fuel for the cell’s activities. The mitochondria is the organelle known as “the powerhouse of the cell,” because of its ability to manufacture a substance called adenosine triphosphate (ATP). ATP is essential, because it is what your body uses for energy—in fact, it is the only substance your body can ultimately use as energy. Without adequate amounts of ATP, living organisms are unable to survive and thrive. On the contrary, abundant supplies of ATP mean that cells have adequate energy to do all the things they must do to not only stay alive, but also to thrive exceptionally. (See Mitochondria.)

If your body could create more ATP in a local area, the implications would be significant. Extra energy in the form of ATP can be used by cells, tissues and organs to do many things beyond simple survival. How can the cells create more ATP? The answer is cold laser therapy.

COLD LASER AND INCREASED MITOCHONDRIAL ACTIVITY

Scientific research has shown that, although many cells have numerous kinds of receptors, the body has at least three specific kinds of receptors in every single cell. Receptors exist for:

- Neurotransmitters (serotonin, dopamine, acetylcholine and others);
- Hormones (insulin, various thyroid hormones, estrogen and others); and
- Light.

Cold laser impacts the light receptors. Each cell can contain thousands of mitochondria, which move about producing ATP in response to the cell’s need for chemical energy. When the infrared light of a cold laser is applied to an affected body area at a frequency of between 600–905 nm (which penetrate up to 5 cm below the skin’s surface), it causes the mitochondria...
to create more cellular energy in the form of ATP.
When various body cells or tissues are presented
with extra ATP, they can use it to detoxify, rebuild,
regenerate, reduce inflammation, produce collagen
and elasticity, and generally aid in the healing process
of injured or diseased tissue.1

In dermatology, cold laser therapy has beneficial
effects on wrinkles, acne scars, hypertrophic scars, and
burns. It can reduce UV damage both as a treatment
and as a prophylactic measure. In pigmentary
disorders, such as vitiligo, cold laser therapy can
increase pigmentation by stimulating melanocyte
proliferation and reducing depigmentation by
inhibiting autoimmunity. Inflammatory diseases, such
as psoriasis and acne, can also be managed.2,3

European and Japanese physicians have been using
cold laser extensively for decades for pain-reduction,
wound-healing, sports therapy and esthetic treatments.
In the United States, cold lasers have been used during
the past several years primarily for pain management,
sports therapy and chiropractic treatments. Now, cold
lasers are gaining popularity in esthetic treatments,
due to their efficacy and healing, stimulating and
restoring ability for the skin at the cellular level. In
addition, cold laser therapy may be used on all skin
types and tones without risk of damaging the skin.4
(Editor’s note: Cold laser is generally within the scope
of practice for estheticians if it is a Class 1 device, but
you should check your specific state regulations before
offering treatments based on the equipment. Complete
contact information for the state boards can be found
on www.SkinInc.com/education/statelicensing.)

Another key benefit of cold laser therapy in esthetic
treatments is that the treatment time is short—10-15
minutes during a facial—and there is no downtime
or pain during the treatment. It is performed on dry
skin that has been cleansed and exfoliated. Using skin
care products with high levels of active ingredients,
such as cosmeceutical-grade skin care that has at
least one bioactive ingredient working at the cellular
level, will have significant penetration and increased
efficacy following cold laser therapy. The results of
cold laser therapy in esthetic treatments improve
with each service. Generally, packages of treatments
are recommended in a series of three, six or nine
treatments, depending on the skin’s damage and needs.
Once a state of skin health is obtained, a maintenance
program of monthly or bimonthly treatments maintain
the results. Given the versatile benefits and safety of
cold laser therapy, it can be an instrumental component of an
overall beauty and wellness program.5

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