

What is LED Light Therapy and what are the Benefits of Photo-Rejuvenation

The History of LED Light Therapy

LED stands for Light Emitting Diodes. The power of light therapy originates back to ancient times. The Greeks first recorded the healing properties of light in 1500BC, when they suggested that exposure to light was essential for the restoration of health.

In 1805, the Danish Physician, Dr. Niels Finsen, received the Nobel Prize in medicine for his work showing the beneficial effects of various wavelengths of light in the treatment of Tuberculosis. The US space research program has examined the effects of gravity on cellular activity. NASA uses LED technology in space to promote wound healing and tissue growth.

Light Therapy is not a new or fleeting science. The benefits of light on the human body and mind have been recognized in the medical arena for over 30 years. Research at the Paterson Institute for Cancer Research led to the production of a pure red light source that, when combined with a cream, will kill certain types of skin cancer cells. During this work scientists observed that light on its own had a stimulating effect on cell and tissue regeneration, which greatly improved the appearance of the skin. This observation has led to further developments enabling introduction of light therapy to the beauty industry.

How Light Therapy Works

Light therapy has been shown in over 30 years of independent research to deliver powerful therapeutic benefits. Visible red light, at a wavelength of 650nm (nanometers), penetrates human tissue to a depth of 8-10 mm. Skin layers, because of their high blood and water content, absorb red light very readily. It is very beneficial to treating problems close to the surface of the skin. The light is absorbed by the cells, accelerating tissue repair, thus speeding up recovery time. This technology is especially successful in the fields of Dermatology and Neurology and is a must in the world of beauty and fitness. The light affects a group of cells at the cellular level. The light causes these cells to release other cellular products. These products have the effect of dilating (opening up) skin capillary blood vessels. The dilation of these blood vessels leads to an increase in the blood flow. An increase in blood flow carries oxygen and nutrients to the skin. Light therapy restores skins natural cellular activity and promotes tissue regeneration. LEDs are similar to Lasers inasmuch as they can emit the same light but differ in the way that the light energy is delivered. Lasers are focused beam, single wavelength light emitters that can be intense enough to burn/cut tissue. LEDs do not deliver enough power to damage the tissue, but do deliver enough energy to stimulate a response from the body to heal itself. Aside from the great results, the best news is that Light Therapy has no reported side effects. This is a FDA approved Therapy.

What Does Light Therapy Do?

*Increases circulation *Stimulates the production of collagen *Helps to heal wounds *Protects healthy skin
*Helps to repair damaged skin *Decreases pore size *Useful in skin rejuvenation *Increases RNA and DNA synthesis, helping damaged cells to replace more promptly *Stimulates fibroblastic activity *Increases lymphatic system activity *Kills bacteria that causes acne *Comforts sore muscles, aches and pains *Increases moisture retention *Firms skin *Increases oxygenation and restoration of skin's natural cellular activity, which keeps the skin renewed and fresh.

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1. **Increases circulation by increasing the formation of new capillaries**, which are additional blood vessels that replace damaged ones. New capillaries speed up the healing process in damaged skin by carrying more oxygen as well as more nutrients needed for healing and they can also carry more waste products away.
2. **Stimulates the production of collagen**. Collagen is a major component of the connective tissue in the skin that creates strength and flexibility. Over time, the collagen levels in our skin decreases, causing wrinkles to form. External factors such as sun damage and smoking can also accelerate the aging process. Collagen is the essential protein used to repair damaged tissue and to replace old tissue. It is the substance that holds cells together and has a high degree of elasticity. By increasing collagen production less scar tissue is formed in damaged tissue.
3. **Diminishes hyper-pigmentation or age spots**. The photons of light energy enter areas of hyper-pigmentation and destroy or better disperse the melanin, which is gradually absorbed by the body.
4. **Stimulates fibroblastic activity**, which aids in the tissue repair process. Fibroblasts are present in connective tissue and are capable of forming collagen fibers.
5. **Stimulates tissue granulation and connective tissue projections**, which are part of the healing process of wounds, ulcers or inflamed tissue.
6. **Stimulates the release of adenosine triphosphate (ATP)**. (ATP) is the major carrier of energy to all cells. Increases in ATP allow cells to accept nutrients faster and get rid of waste products quicker by increasing the energy level in the cell. All food turns into ATP before cells can utilize it. ATP provides the chemical energy that drives the chemical reaction of the cell. Intense light therapy acts as a "photon supplement" to the cells. It allows cells to bypass the normal digestive and respiratory process to acquire energy to repair and the production of life enhancing enzymes.
7. **Increases lymphatic system activity**. A large number of lymphatic channels lie directly beneath the skin, and play a significant role in maintaining health and beauty of the complexion. Edema, which is the swelling or natural splinting process of the body, has two basic components. The first is a liquid, which can be evacuated by the blood system, and the second is comprised of proteins, which have to be evacuated by the lymphatic system. Research has shown that the lymph vessel diameter and the flow of the lymph system can be doubled with the use of intense light therapy. The venous diameter and the arterial diameter are also increased. This means that both parts of edema (liquid and protein) can be evacuated at a much faster rate. Lymphatic drainage helps the lymphatic systems function more efficiently by facilitating toxin removal and improving skin circulation. The result: healthier, glowing skin and a more beautiful complexion.
8. **Stimulates acetylcholine release**, which regulates parasympathetic effects such as resting respiration rate, heartbeat, digestive process and vascular tissue dilation.
9. **Increases phagocytosis**, which is the process of scavenging for and ingesting dead or degenerated cells by phagocyte cells for the purpose of cleanup. This is an important part of infection fighting process. Destruction of the infection and cleanup must occur before the healing process can take place.
10. **Induces a thermal-like effect in the tissue** even though there is little heat produced by Cold Laser light, the photons do raise the temperature of the tissue enough to kill or disable temperature sensitive bacteria and viruses.
11. **Increases RNA and DNA synthesis**, which helps older or damaged cells to be replaced faster.