

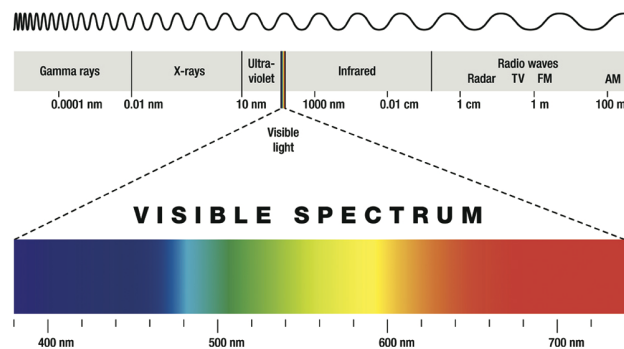
DOES RED LIGHT THERAPY REALLY WORK?

INTRODUCTION

In 1993, NASA commissioned an agency, QDI, to conduct research on red light therapy. After the technology was proven to activate plant growth in space, contracts were awarded to investigate the medical application of Light Emitting Diodes (LEDs) with a specific focus on the transfer of red light energy to human cells.

This research demonstrated the effectiveness of a specific wavelength of 660 nanometers (nm). What began as a way to limit the bone and muscle loss of astronauts had proven its effectiveness so thoroughly that by the late 2000's, the technology had been tested in numerous published studies. For example, in a double-blind, placebo-controlled clinical trial involving bone marrow and stem cell transplant patients at the University of Alabama, participants experienced a 45% reduction in pain compared to the group of control patients.

Several other studies have demonstrated the positive effects of red light therapy as well. Even the FDA has recognized that red light therapy has been "scientifically shown to affect skin structure by reducing wrinkles for months after treatment, which may be the result of new collagen formation or repair of elastin damage." In fact, the FDA has approved red light therapy for the treatment of minor pains, mild arthritis, and many other conditions.



HOW DOES IT WORK?

It's well-known that the human body needs sunlight, which is a combination of the entire visible light spectrum (400- 700 nm) as well as UV (10-400 nm), near infrared (700-1000 nm) and far infrared wavelengths (1000-3000 nm).

Scientists have also discovered that our cells have an incredible response to light in the 600-900 nm wavelength range. This light can pass through human tissue much easier than other wavelengths. Specifically, light at about 660 nm and 850 nm has been shown to provide an ideal biological response. This light energy can penetrate deep into muscle and joint tissue, stimulating the production of ATP (adenosine triphosphate), which is the mode of chemical energy transportation at the cellular level. Cells receive this rejuvenating, anti-aging energy boost that enables them to perform their natural functions at a heightened level.

Here are just a few of the documented benefits of red light therapy:

- **Improves skin clarity, tone, and texture**
- **Stimulates production of collagen and elastin**
- **Diminishes freckles, age spots, and acne**
- **Reduces fine lines, wrinkles, and puffy eyes**
- **Fades scars and stretch marks**
- **Speeds wound healing and reduces joint inflammation**
- **Aids in muscle recovery and enhances athletic performance**

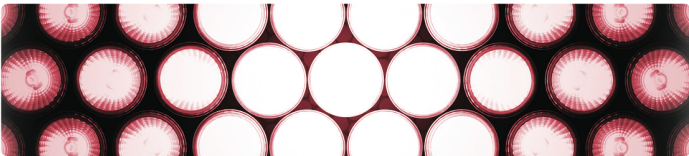
Unlike many other types of treatments, red light therapy is completely safe, non-invasive, uses no chemicals, and has no harmful side effects. It simply harnesses the natural healing benefits of a specific range of light and delivers this energy at a higher rate than the sun. It is a very relaxing and energizing experience that is quickly becoming a revolutionary treatment in numerous medical specialties due to its many applications and benefits.

DO LEDs MAKE A DIFFERENCE?

Incandescent bulbs are so inefficient that less than 5% of the energy is turned into light, while the rest is lost as heat. The actual light output of a 100-watt incandescent bulb is about 1,000 lumens, or roughly 10 lumens per watt. Halogen bulbs are a little more efficient at about 14 lumens per watt. And fluorescent bulbs deliver about 2,600 lumens using only 40 watts, which equates to about 65 lumens per watt. Not too bad, right? Well, there are some drawbacks to be aware of with respect to fluorescent bulbs.

Since the light is evenly distributed around the entire 360 degrees of the bulb, a significant amount of the energy is lost through reflection. When you combine these losses with the quick depreciation of light output, only about 30% of the light reaches the intended surface. This puts the real-world light output back down around 20-25 lumens per watt. Additionally, the mercury content within fluorescent bulbs makes them a real safety hazard if a bulb were to break.

LED fixtures, on the other hand, are uniquely capable of delivering a specific wavelength of light at an efficiency of over 100 lumens per watt, with no UV rays or mercury to worry about. There are no fragile bulbs to break and the average life is about 25 times that of incandescent bulbs and 2.5 times that of fluorescent bulbs. LEDs are the best way to deliver the specific wavelength and intensity of red light in order to induce an optimal cellular response.



WHICH RED LIGHT DEVICE SHOULD YOU CHOOSE?

There are so many red light devices on the market that it can be quite confusing to know which one to purchase. There are many factors to consider, but ultimately, the effectiveness of red light boils down to just a few: the wavelength and the amount of energy delivered to the body.

While there are benefits with a variety of different wavelengths, there are two peak wavelengths that have been proven to be the most effective. The original research funded by NASA, as well as hundreds of other studies, point to an optimal wavelength of about 660 nm. The other peak biological response is in the near infrared range at about 850 nm. This wavelength provides some unique advantages as it can penetrate more easily into deeper tissue.

Although a wide variety of dosing has been studied, researchers have indicated our cells respond best when a total energy of at least 4-6 Joules/cm² is applied during each session of red light therapy. For deeper tissue treatments, some published studies have demonstrated benefits when >100 Joules/cm² of energy was utilized. The amount of time required to apply this amount of energy is dependent on the intensity of the light across a specific treatment area. The intensity of the light is measured in mW/cm². And the amount of energy in Joules is calculated by multiplying the intensity by the time in seconds.

Unfortunately, most red light therapy manufacturers don't publish their output intensity, which makes it nearly impossible to determine how much energy is delivered to the treatment area. Or worse, they deceive you by providing the intensity across the entire surface area of the device, which is misleading when compared to the industry standard measurement of milliwatts per square centimeter.

Some devices are meant for the entire face, but the intensity of the light at the skin is so low that a session time of over an hour would be required to get the best results. For most people, this simply isn't practical. Therefore, it's important to select a product with optimum light intensity that results in a convenient and desirable treatment time.

When we designed the Joovv collection of light therapy devices, we refused to settle for anything less than the optimal wavelengths of light along with unparalleled output. With 120-degree lenses on the LEDs, at a distance of 6", the light rays deliver a minimum intensity of 100 mW/cm², which equates to about 6 Joules of energy per minute!

NOW WHAT?

The clinical and scientific evidence for red light therapy is quite convincing. But it's imperative to choose a device that delivers the right amount of light within an ideal range of wavelength.

With the Joovv light therapy devices, you can reap the rewards of red light therapy in the convenience of your own home in less than a few minutes per day. Check us out. We don't think you'll be disappointed!

