

Laser and LED Treatments: Which Is Better?

By Darren Starwynn, OMD, LAc

There is quite a bit of controversy among light therapy proponents about the therapeutic value of lasers, which produce coherent light, versus LED and incandescent sources, which produce incoherent light. Laser enthusiasts, backed by a large body of research, claim that only the intense, highly coherent beam of a laser can penetrate deeply into the body's tissues and meridian system for significant results. Yet some of the most respected names in light therapy research have used gentler, much more diffuse light sources for effective treatment of a staggering range of health disorders. Who is right? The purpose of this article is to explore this question by offering some fascinating contemporary research about coherence and noncoherence of light, and their effects on the human body.

There has been an explosive growth of interest in the uses of light for healing and cosmetic treatments in recent years. Light pens are used for non-needle acupuncture treatments, lasers are used for many common surgical procedures, and some ophthalmologists prescribe color light therapy through the eyes for a wide range of health disorders. "Photo-facials" are also becoming common in beauty salons.

Even the U.S. Army and NASA have gotten into the act, developing LED light therapies for accelerating wound healing, photodynamic cancer treatment and much more. According to Dr. Harry Whelan, a professor of pediatric neurology at the Medical College of Wisconsin, who utilizes the NASA LED technology, "So far, what we've seen in patients and what we've seen in laboratory cell cultures all point to one conclusion - the near-infrared light emitted by these LEDs seems to be perfect for increasing energy inside cells. This means whether you're on Earth in a hospital, working in a submarine under the sea, or on your way to Mars inside a spaceship, the LEDs boost energy to the cells and accelerate healing."¹

One of the first proponents of color therapy in the U.S. was Dinshah Ghadiali. In the early 1900s, he developed the practice of "tonating," which is bathing the entire body, or body segments, in therapeutic

colors of light.² While this remains a highly beneficial practice for a wide range of health disorders, a more modern trend is colorpuncture, developed by Peter Mandel of Germany. Colorpuncture is a specific form of therapy, in which a series of colored light beams are applied to patterns of acupuncture points. The greater sophistication of the colorpuncture system allows targeted beneficial effects on the endocrine, lymphatic, organ, psycho-emotional and central nervous systems.³

Colorpuncture is so effective because acupuncture points are energetic communication gateways, and highly responsive to light. According to acupuncture researcher Ion Dumitrescu of Romania: "The electrodermal points are electrical pores - concerning two-way energy exchange between the body and the environment."⁴

The work of German scientist Fritz Popp proved the existence of natural light communication between all living plants, animals and people. He called this phenomenon "biophoton" luminescence.⁵ Biophotons are carriers of "information," without which our bodies are lifeless collections of molecules. According to Popp, the coherent biophoton fields within the body mainly originate in our DNA.⁶

Coherent and Incoherent Light

There are two forms of light used in therapy - coherent and incoherent. Most visible light on Earth and in the universe is incoherent. This means that photons (light particles) randomly spread out as soon as they are emitted from a light source. Incoherent sources include the sun and light from incandescent fluorescent, and LED sources.

LED stands for **light emitting diode**. An LED is a silicon microchip with various added substances, each of which releases a different wavelength (color) of light when electrically stimulated. LEDs used to be used mainly as low-power indicator lights for electronic devices. Now manufacturers are racing to release LEDs with higher intensities and a greater range of available colors and designs. LED light has been used for acupoint stimulation and wound healing since the 1980s.

Lasers are the only manufactured form of light therapy that does not spread out, but stays tightly collimated (coherent). The difference between coherent and noncoherent light is easy to see. If a bright flashlight with an incandescent or LED bulb is directed toward a distant wall in a dark room, the beam projected upon the wall will be diffuse and widely spread out. Yet if a laser pointer or therapy tool is directed in this way, you will only see a tiny spot on the wall. That is because the beam remains coherent over long distances.

Coherence and Entropy

There is an inverse relationship between coherence and entropy. Entropy is the tendency for any organized system to become chaotic; that is, to break down over time. Examples of entropy are aging and death, stars burning down, and social breakdown in overcrowded cities. According to the pioneering research of Nobel prize-winning physicist Ilya Prigogine, living and evolving systems resist entropy (negentropy) because they are able to take in new, outside energy and dissipate entropic tendencies away from themselves.⁷ This ability to reverse entropy, in fact, may be considered a prime quality of life and consciousness.

There are two kinds of energy systems in regard to entropy: closed and open systems. Closed systems operate in isolation - they do not interact with a greater environment. Open systems are ecological; that is, they are in a continual state of communication and energy exchange with their environment. Only an open system can dissipate entropy as described above, and maintain or increase its coherence. Human beings, and all living things on Earth, are open systems. Therefore, our bodies can take in energy from our environment and maintain coherence. This supports homeostasis and health. It also allows us to evolve into increasing levels of order and expanded consciousness. According to the research of Popp, consciousness is based on this ability to maintain coherence.⁸

A timely application of this principle is the field of so-called "anti-aging" medicine, which is greatly in demand by our huge baby boomer population. Any therapies or supplements that genuinely slow the aging process must do so by increasing the body's ability to dissipate entropy and maintain energetic coherence.

Laser and LED Stimulation

Let's return to the question of the differing values of coherent light (laser) vs. incoherent light in therapy. In support of laser proponents, it can seem intuitive that a highly focused and coherent beam of light would penetrate more deeply into the body than scattered, incoherent photons, and hence have more profound clinical effects. Yet some of the most fascinating contemporary research shows that this may not necessarily be the case! Under many conditions now recognized by modern physics, **incoherent light can transform into coherent light**. A simple example of this principle is in the workings of a telescope. Light emanating from a distant star is incoherent, yet once captured in the collector lens system of the telescope, it becomes coherent.⁹

Our bodies evolved for millions of years in a field of incoherent light (the Sun), as did all of our food sources. Yet the DNA in our bodies produces coherent biophoton emissions.¹⁰ Apparently, our bodies are negentropic (entropy reducing) organisms, and can transform incoherent light into coherent light, as needed.

According to Mandel, it is energetic interference fields in the body that do this.¹¹ They act as "filters" to produce this transformation. According to Mandel, the denser and more complex the interference fields, the greater the capacity to transform incoherent light into coherent light. Acupuncture points are interferences in which two or more energy pathways intersect, and hence have this filtering effect. Mandel also states that repeated use of intense laser light on acupuncture points can eventually weaken or "blow out" the subtle circuitry they regulate.

So, are lasers or incoherent LED light sources superior for therapy purposes? It is clear that laser light more closely resembles the coherent light our DNA produces to transmit and receive the information of life. Yet our bodies have evolved negentropic systems to utilize incoherent sunlight as energy "fuel," and transform it into coherent biophotons, as needed.

It is well-established that both forms of light therapy have demonstrated value. In the opinion of the author, because laser therapies are so much more focused and intense, they are a more invasive form of therapy than incoherent light from LEDs. This is evidenced by the wide use of lasers for hair removal and many forms of surgery. Yet this is not necessarily a negative indictment of laser acupuncture. More invasive therapies are often useful for treatment of acute or recalcitrant conditions, and certainly have their place in the physician's armamentarium. Lasers also enjoy a very positive reputation for treatment of some skin diseases.¹²

It is clear, however, that our bodies have developed sophisticated mechanisms with which to thrive on direct incoherent light from the sun, and secondarily from the light held within the biochemical bonds in food sources. The DNA in our cells possesses the alchemical ability to produce coherent light, carrying the precise information required for growth, functioning and healing of our magnificent bodies. According to Prigogine's pioneering research, open systems such as our bodies are able to take in energy from the environment and make it coherent, thus reversing entropy. Surely, such remarkable life systems respond superbly to the incoherent light they are programmed to process.

Advantages of LEDs
Less invasive, safer
Body is evolutionarily programmed to respond to incoherent light - can transform into coherent light internally
Greater choice of colors
Lower cost
May be used for whole-body or point treatment
Suitable for acute and chronic conditions
Disadvantages of LEDs
Less precise wavelengths
Advantages of Lasers
Coherent - more focused, penetrates well into body
Greater body of research available on laser acupuncture
Disadvantages of Lasers
Invasive - may blow out acupoints over time
Unnatural stimulation to body
Less choice of colors
Much higher cost
Not suitable for whole-body treatment
Eye hazard

As with most forms of energy medicine, therapeutic light is applied in a more intense manner than that which is ambient in the environment, with more precise selection of color (wavelength) that is supportive of the individual condition. A well-designed LED light therapy device is, therefore, a step between generalized bathing of the body in diffuse light and the coherent beam of a laser.

The differing values of laser and LED acupoint treatment, as stated in this article, can be summed up in the chart:

As is clear from this chart, LED acotherapy offers more advantages and less disadvantages than laser use. There may be other considerations on both sides not included in the chart, and, no doubt, there are some laser proponents who will disagree with some of its points. The author welcomes dialogue and additional information on this subject.

I hope this discussion opens interest in further use of and research into light acutherapies. This is a fascinating and valuable healing art in which advanced physics, acupuncture, medicine and spirituality converge.

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 10. As quoted in note 3, above.
 11. Interference fields are intersections of two or more interacting frequencies. Interference fields are a major aspect of brain, nervous system and acupuncture point function, and such fields store memory. Quoted from: course notes, Esoteric Colorpuncture Basic Training by Peter Mandel, ND, 2003.
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