

# Navigating the Maze of Laser Therapy: 5 Costly Mistakes to Avoid



By Bruce Coren, DVM MS

Over the last few years, laser therapy has been changing the way veterinary practices all over the world are helping their clients manage pain and recover faster from injury, disease and surgery.

Every day, I talk with colleagues who are confused about what is important to consider in selecting and using a therapy laser in a veterinary practice. They hear many conflicting opinions regarding lasers and don't know who or what to believe. I have written this article about 5 costly mistakes to avoid that can help you make the right decision before choosing a laser. As both a veterinarian and also the founder of two medical laser companies, I believe that the laser you choose should be the one best suited for your clinical purposes, and not a manufacturer's bottom line. I have been involved in laser therapy since 2002 and in 2003; I received the first FDA510K marketing clearance for a Class IV therapy laser. Prior to this, the only Class IV lasers were surgical lasers. The original therapy laser approved was a 7.5 watt laser, using a significantly higher power level in comparison to the Class IIIa (5MW) and Class IIIb (500Mw) lasers at that time. Since then, many thousands of Class IV therapy lasers have been sold at these higher power levels, showing greatly improved and more consistent therapeutic outcomes.

## #1 Buy A True Laser, And Not An LED Or Light Therapy Device.

There are many different configurations of light therapy products in the market, some offering laser output only, some offering only LEDs, and other devices combining both lasers and LEDs. These are sometimes deceptively called "laser" with no reference made to other emitter types. It is important to know that LED devices are not lasers. Often the buyer is unaware of the distinction, thinking they have bought a true laser device. While LED light therapy does have some beneficial effect, it is limited to superficial tissue treatment only. A number of studies have been completed that compared the effectiveness of laser light to LED light and the majority have found laser light to be far more effective, particularly in treating tissue of any significant depth.

## #2 Buy a Laser With Higher Power.

Although all lasers biologically stimulate cell metabolism via a similar mechanism, that is where the similarities end. The bottom line when it comes to laser therapy it's all about physics. In order to get penetration you need power. An analogy can be made with X-rays. X-ray penetration is governed by the kVp setting. In laser therapy, penetration is governed by the wavelength which is measured in nanometers (nm) and even more importantly by the power output of the laser. Both kVp and wavelength are affected by tissue density. Every doctor knows that in order to get deeper penetration with x-rays you need to increase the power output and time of exposure. Just like X-rays, laser energy is another form of energy on the electromagnetic spectrum and the key to greater laser energy delivery and penetration is the same principle and is based on the power output of the laser and the time of laser exposure. Without sufficient power you will not penetrate and deliver the necessary therapeutic dosage.

A laser's power is measured at the source of the beam in Watts (W). The higher the power, the lower the treatment time. Dosage is the single most important parameter for a successful outcome in laser therapy. Too little energy produces no effect. The primary factors in lasers that determine dosage is power and time:  $DOSAGE = Power \times Time$ . Power is the amount of energy measured at the source of the beam and dosage is the amount of energy delivered to the skin and target tissue. Dosage may also be referred to as energy density or fluence. Its unit of measure is the Joule. You cannot make up for insufficient power by increasing treatment time.

## #3 Buy a Laser with an Optimal Wavelength.

Whenever light hits tissue, it can be transmitted, scattered, reflected, or absorbed, depending on the type of tissue and the wavelength (color) of the light. However, light absorption must take place for it to have any biologic effect, and a given wavelength of light may be strongly absorbed by one type of tissue, and be transmitted or scattered by another. Infrared light is absorbed primarily by water, while visible and ultraviolet light are absorbed mainly by hemoglobin and melanin, respectively. As the wavelength decreases toward the blue-violet, and ultraviolet, (shorter wavelengths) scatter, which limits the depth

that light may penetrate into tissue, becomes more significant. When light is absorbed, it delivers energy to tissue, and the tissue's reaction depends on the intensity and exposure time of the light. Each type of tissue has its specific absorption characteristics depending on its specific components (i.e., skin is composed of cells, hair follicles, pigment, blood vessels, sweat glands, etc.)

In the Infrared (IR) spectrum, the longer wavelengths penetrate deeper and a greater percentage of the laser light will be transmitted in a forward direction. This means less scatter and better clinical results. Some lasers use a single wavelength, while other use two or more wavelengths combined, with the claim that multiple wavelengths are clinically more effective. However, dual or multiple wavelength lasers can only penetrate as deep the individual wavelength that penetrates the most. This means that a 10 or 15 watt dual wavelength laser will need to cut the penetration ability in half. Our experience over the last ten years, has shown that a single wavelength and at the level of 980nm to be the most effective for the majority of skin types, skin colors and conditions. This wavelength lies at a peak in the light-water absorption curve, as water, not hemoglobin is a strong absorber, which explains the deep penetration ability at this wavelength.

Some laser companies also claim deeper penetration due to its "Super Pulse" emission, often stated at 25,000mW and higher. Although the stated peak power is very high, the average output of super-pulsed lasers is comparatively low. Despite these claims there have been no studies undertaken to compare or confirm the efficacy of super pulsed lasers for bio-stimulation. The bottom line when it comes to clinically effective tissue penetration and concomitant therapeutic stimulation, an important factor to look for in a laser is one that emits in a single wavelength with optimal penetration capabilities for the diverse clients you will treat.

#### #4 Buy a Laser with Training from Clinicians.

Often after a sales rep gets a laser purchase their job is done, as their only priority is selling you a laser. Training usually involves showing you how to turn on the equipment and wishing you good luck. Doctors are left to follow pre-programmed settings with a common misunderstanding that a "point and shoot" method of treatment is adequate. The success rate in laser therapy is directly related to the clinician's ability to diagnose the true cause of a client's problem. Pointing laser light at a painful area is not enough to get the consistent

results that properly trained clinicians can achieve. It is important to get your training from qualified clinicians and learn treatment techniques and what type of conditions they have had success treating utilizing laser therapy.

#### #5 Buy a Laser Based on Results and Not Price.

Don't make decisions on price alone. Don't buy a laser, just to have a laser. When it comes to therapy lasers, you get what you pay for. Are you looking for the best laser to help your clients or the cheapest one? Who cares if the laser has a cheap price if it does not have the technical capability to reach target tissues and treat conditions properly? Can it do what it's supposed to do? Remember, the most expensive laser you can buy is the one that fails to deliver results.

In summary, I wish to stress again that delivering an effective dose to the target tissue is the key to a successful outcome. Whether you are looking at buying a laser and adding it as a service, or already have a therapy laser and want to upgrade and grow your practice with additional lasers, the correct laser can be a vital tool for your practice not only clinically but financially (and even highly profitable). After ten years of experience, I continue to be amazed at the results from Class IV laser therapy. Results truly speak for themselves!

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Dr. Coren is a pioneer in the field of Laser Therapy. Currently he is the co-founder and CEO of Technological Medical Advancements, LLC, launched in January 2012. Prior to this, he was the founder and CEO of the Avicenna Laser, Inc. from 2002 - 2011; receiving the FIRST FDA510K marketing clearance for a Class IV Therapy Laser in 2003. Dr. Coren can be reached via email at [core548@aol.com](mailto:core548@aol.com).



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