

Important Considerations When Purchasing A Therapeutic Laser

by Rob Berman



Every day I speak with chiropractors about lasers. Many want to know what is the “best” laser while others are confused about what is critically important and what is marketing fluff. In my experience, there are ten important items for your consideration, and associated questions you should ask before purchasing a laser. You need to fully understand exactly what you are purchasing so that you’re not just getting talked into a purchase.

The first thing to focus on is buying a true laser, and not a “laser-like” device. Many of you may know that LASER is an acronym for Light Amplification by Stimulated Emission of Radiation. Generally, if you can see the light-emitting device then it is not an infrared laser (some human eyes may see up to 820nm). SLD bulbs, LED bulbs or regular light bulbs are not lasers. Hundreds of LED bulbs or regular bulbs together do not make a laser. It is important to remember that a “light therapy device” is not a laser.

A true laser diode may be “supplemented” by LED bulbs to increase the total rated power. However, the scientific documentation and therapeutic effect of the coherent light (laser) remains to be superior to that of non-coherent (LEDs), except for mucosa, open wounds or very superficial skin conditions. In these cases, LEDs may provide a therapeutic effect.¹

Coherence Of Light

Coherence of the light is critical for successful treatment. Diodes are complex semi-conductors that convert an electrical current into light. Let us consider the light waves shown below.

Figure 1: These light waves are white light. They are not coherent and therefore not effective.



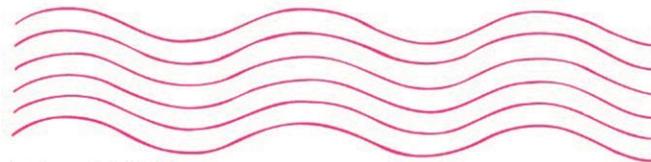
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Figure 2: These light waves are non-coherent, and therefore are not effective.



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Figure 3: These light waves are coherent which is what you want.



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A laser emits photons in a synchronized and directional manner to travel in unison. The coherent beam allows the energy to penetrate further rather than deflecting, reflecting or scattering when hitting the skin. Figure 3 is desirable while Figure 1 and Figure 2 are not.

Please heed this warning: Do not buy even “a true laser” directly from overseas. These are not FDA cleared, and the FDA can confiscate your laser and possibly take action against you.

Questions To Ask

1. Does the unit have SLDs or LEDs?
2. If SLDs or LEDs, how many and what percentage of the peak power is produced by these?
3. Does the FDA consider the unit a laser?
4. Are the light waves coherent (beneficial) or incoherent?

Optimal Wavelength

Lasers work at many different wavelengths; however, there is considered to be a “Therapeutic Window” that is

optimal for different purposes. For laser therapy to treat pain, inflammation, arthritis and other conditions that window is basically between 600 nm and 1200 nm.

Not all wavelengths have equal penetration capabilities. For example, infrared wavelengths have deeper penetration than visible wavelengths. The laser energy needs to pass through the skin, melanin, water and hemoglobin, and then it can be absorbed by bones, muscles, tendons, nerves, and ligaments. We cannot see the infrared wavelengths that the laser produces to treat various conditions; therefore, infrared lasers must have a very low power (≤ 5 mW or .005 watt) red-aiming beam to indicate that the laser is engaged.

Questions To Ask

1. What wavelengths are being utilized?
2. Why were those wavelengths selected?

Optimal Power

Dosage is the key to activate the biological effects of a laser. Energy is measured in joules (Energy = Average Power x Time). Let’s look at two examples:

- a) A 5 mW (.005watt) laser produces 1.5 joules in 5 minutes.
- b) A 10 watt laser produces 3,000 joules in the same 5 minutes.

Even if you used the 5 mW (.005 watt) laser 2,000 times longer to achieve the same 3,000 joules, it will not be as effective. Why? Because depth of penetration is still the same since only 5 mW are being fired at any one time.

And consider these facts: (1) Lasers lose up to 66% of their energy penetrating the skin.² (2) The energy that penetrates through the skin loses approximately 50% of its photon density per centimeter of penetration.³ and (3) Surgical lasers can be Class 4 lasers, but not all Class 4 lasers are surgical lasers.

High peak power is a useful guide; however, the average power that the laser employs is also critical. Energy in joules is calculated using average power, not peak power. When a laser is operating in pulse mode then the average power level does not equal the peak power. The same situation arises in Continuous Wave mode when a lower power level is utilized.

Questions To Ask:

1. What is the Average Power of the laser?
2. What is the Peak Power of the laser?
3. What Power Density can the laser achieve?
4. How many diodes are employed together to achieve the stated Peak Power?
5. What is the Peak Power of each Diode?

Laser Operating Modes

Lasers are either on or off. If the laser is constantly on and emitting a beam, then it is operating in Continuous Wave Mode. If there is a time-on and time-off, then the laser is operating in Pulse Mode. The software in a laser will determine the proper hertz level to operate based upon the parameters you have selected. If you manually change the hertz frequency, then the laser will change your other parameters.

Questions To Ask:

- 1) What operating modes does the laser have?
- 2) Can the laser operate in more than one mode at a time?

The portability of your laser is another factor to consider, i.e. to maximize the usage of your laser you may need to move it between treatment rooms or transport it between offices. Size may not matter. A lower-power laser can easily fit into a relatively small housing. If you are considering a laser with a large housing, or a floor model, make sure that it has the power to make it worth the additional cost, i.e. the added cost of manufacturing the housing. Do not fall in love with just a pretty box or housing!

You need to determine whether or not the laser fits on a standard-sized cart. If the laser does not fit on a cart, then does it have wheels that can be locked in place after moving it to another treatment room? Also, it is important to know whether or not the laser can be easily lifted by your staff members and placed in and out of your vehicle to transport it to another office.

The Cost Factor

Doctors often state that it is very hard to compare lasers. I agree, and I propose you use a metric called “Price Per Milliwatt.” Let us look at examples of some lasers available in the market, and please keep in mind that a lower price does not always equal a “good value.”
(See Table Below)

Essentially, these are the questions to ask. What is the cost per milliwatt to purchase the laser? And does the purchase price include everything? You need to ensure that the quoted price includes all necessary hand pieces, probes, and other such accessories. And after you do your “Price Per Milliwatt” calculation, make an apples-to-apples comparison about what is included in your laser purchase. Consider what else you need to buy to fully operate the laser. And what are the shipping costs?

Maintenance and/or ongoing costs are another im-

LASER PEAK POWER	PURCHASE PRICE	COST PER MILLIWATT
5 mW (0.005 watt) laser	\$12,000	\$2,400.00
10 watt laser	\$13,000	\$1.30
30 watt laser	\$29,000	\$0.97

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port,ant factor, i.e. you need to think about the cost of your laser over its lifetime. A car is a good analogy. The cost of the car is what you pay to purchase the vehicle plus all of the regular maintenance and unexpected repairs. A well-maintained laser diode should provide approximately 10,000 hours of usage.

Questions To Ask:

1. How long will each diode last?
2. If LEDs are also part of the laser how long will these last?
3. What is the cost to replace each LED?
4. What regular maintenance is needed on the treatment head(s) or laser, and what does it cost?

Now let us talk about warranty. Your investment in a laser to help grow your practice and achieve better patient outcomes needs to be protected. Of course, you hope to never need to use your product warranty; nonetheless, you do need a good one to protect you. You must inquire about the length of the warranty period, and know exactly what the warranty covers. You also need to ask where repairs will be done. And what are the qualifications of the technicians?

Training Is Key

A great laser can provide less-than-optimal or poor results if you and/or your staff do not fully understand the equipment and technology and know how to best employ your laser. Do you have a training checklist to make sure all information is covered? Are there generic protocols for "point and shoot" or is there an in-depth explanation about variables like skin color, body weight, muscle density, etc.? And do you have the email and cell phone number of someone who can provide service 7 days a week?

References

1. Page 457 *The New Laser Therapy Handbook*; Prima Books, Tuner and Hode
2. Esnouf A, Wright PA, Moore JC, Ahmed S *Depth of penetration of an 850nm wavelength low level laser in human skin*. *Acupunct Electrother Res.* 2007; 32 (1-2): 81-86
3. Page 104 *Laser Phototherapy Clinical Practice and Scientific Background*; Prima Books, Tuner and Hode

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