Which Laser is Right for You?

By Perry Nickelston, DC, FMS, SFMA

Lasers, lasers everywhere! Make no mistake about it; laser therapy is a hot buzzword now in the healthcare industry. High tech help for pain is here to stay, so you must become educated about it to determine if laser is right for your practice. Deciding on which laser to purchase can be an overwhelming process. There is so much conflicting information from laser therapy manufacturers it’s very easy to become confused, not knowing which one to choose. You must remember the primary objective of any laser manufacturer is to sell you a laser. As such, they will attempt to convince you their product is the most effective. Every laser has some therapeutic benefits; however the degree of those benefits will vary greatly. When choosing a laser you must be armed with information so your patients stand to get the best results possible.

Critical Questions

There are four critical questions to ask before selecting a laser. Answer these and you will be empowered to make a sound decision based on practice and patient needs:

1. What types of musculoskeletal pain conditions are you treating?
2. What type of training and support does the manufacturer provide?
3. Who will be administering the laser therapy?
4. What is your budget for purchasing a laser?

Before diving into detail of the four critical questions it’s important to understand laser technology and mechanisms of action before making a purchase. Laser therapy aims to photo-biostimulate chemically damaged cells via specific wavelengths of light. When cells are chemically damaged they stimulate the pain cycle. Laser excites the kinetic energy within cells by transmitting healing stimuli known as photons. The skin absorbs these photons via a photo-chemical effect, not photo-thermal; therefore it does not cause heat damage to the tissues. Once photons reach the cells of the body, they promote a cascade of cellular activities. Laser therapy light can ignite the production of enzymes, stimulate mitochondria, increase vasodilation and lymphatic drainage, ATP synthesis, and elevate collagen
formation substances to prevent the formation of scar tissues. This is a critical step in reducing long term disabling chronic myofascial pain syndromes. Other formative cells are also positively influenced and immune enhancing effects are increased in the number of macrophages. Simply stated, your clients get out of pain faster and heal at the same time.

There are different classes of laser therapy? Class is determined by power and potential to damage the eyes from light exposure. Class III lasers are up to 500 mW of power and Class IV is anything over 500 mW. Safety is of utmost importance with any Class III and IV laser, so eye protection is mandated by the FDA. The US Food and Drug Administration (FDA) approved the first low level Class III laser (LLLT) in 2002 and the first Class IV therapy laser in 2003. Treatment techniques, guidelines, price points, training, and ultimately condition specific results will depend on which class of laser you choose to purchase.

What types of musculoskeletal pain conditions are you treating?

Dosage of sufficient photonic laser energy (Joules) to target tissue is the single most important parameter for success in laser therapy. Dosage is determined by Joules per/cm² and tissue depth.

Too little, or too much laser photonic energy produces suboptimal results. There is an ‘Optimal Window’ of therapeutic dosage. According to the World Association of Laser Therapy (WALT), current recommended dosage standards for optimal effects are 4-6 J/cm² for superficial structures, 6-8 J/cm² intermediate, and 8-10 J/cm² for deep tissue.

For example, a deep tissue structure such as the hip may require up to 1000 J/cm². A 10 watt laser will deliver this dose in less than 2 minutes. A 500mw laser will take up to 45 minutes. The subject of correct dosage is intricate, since a number of factors must be taken into account including laser wavelength, power density, type of tissue, condition of tissue, acuteness or chronicity, skin pigmentation, treatment technique, and depth of target tissue.

The primary factors in laser therapy that determine dosage is power and time. DOSAGE = Laser Power x Therapy Time While power is the amount of energy measured at the source of the beam, dosage is the amount of energy delivered to the skin and target tissue. Dosage may also be referred to as energy density or fluence.
65% of laser energy is absorbed in the skin and subcutaneous tissue layers with the following having a high affinity for absorption:

- Hemoglobin in blood
- Melanin in skin, hair, moles, etc.
- Water (present in all biological tissue)

In order to overcome these factors one must start with large quantities of energy to reach the deeper target cells and myofascial structures with a required dose. If you are going to be treating deep tissue spinal injuries, hips, shoulders and neuropathies your target tissue dose must be higher. Therefore, higher power lasers are optimal in achieving correct therapeutic dosage in minimal time. Superficial conditions such as carpal tunnel, sprains, strains, wrists, elbows, etc can be treated effectively with lower doses. Due to the lower dose, a less powerful laser may be used with good success. Hitting the target dose recommendation is critical.

Laser power delivers deep penetration, high therapeutic dosages, and decreased treatment times. You cannot make up for insufficient power by increasing treatment time. Depth of tissue penetration will not increase with more application time. Positive results require more than increasing time. Can you make a positive change on deep structures with low power? Yes you can, however, more positive results will occur with optimal dose. Think of prescription medication. The dosage of medication is critical for success and is based on the individual. Bigger people need more. Smaller people need less. Bigger body part needs more laser. Smaller part needs less. You may have the right medication, but if the dose is too low you will not get maximum intended benefits.

**What type of training and support does the manufacturer provide?**

A tool is only as effective as the skill of the craftsman using it. You can have the best laser in the world and yet still experience sub-maximal results if you use it incorrectly. There is an art and science to chiropractic; and laser therapy is no different. High end medical equipment must be used with precision and integrated into each practice depending on the current modalities offered. When considering a laser purchase, ask the manufacturer questions regarding training and support. If they can’t provide you with an answer, you should seriously reconsider your intent to purchase. It is very important to have training available for future staff members who will not be experienced with laser therapy techniques.
Sample questions are…

1. Is there on-site clinic training available for you and staff?
2. Do you have access to someone for clinical questions and protocols after laser purchase?
3. Is there a user and safety manual?
4. Do you offer continuing education training?
5. What marketing and patient education materials do you provide?

**Who will be administering the laser therapy?**

Determining who will administer the therapy may play a part in your decision of which type of laser to choose. Some lasers are unattended therapies and others are attended. Unattended therapy lasers can be set to a specific protocol and administered while the doctor or staff is not in the room. This allows you to see other clients or take care of other duties while the patient receives the laser therapy. Attended lasers must be administered by hand. The patient is never left alone with the laser therapy. Pre-set treatments are programmed into the laser for conditions and average treatment times range from 2-10 minutes.

For a high volume practice you can incorporate an unattended therapy with other modalities. Attended therapies in a high volume practice can be done by staff at specific times in your patient flow. Once the doctor prescribes the laser protocol any staff member who is trained can administer therapy from documented notes. Practice flow and management systems must be considered when choosing your laser.

**What is your budget for purchasing a laser?**

The investment for your laser purchase can range from $2,000 to $30,000 depending on which class of laser you choose and how many additional upgrades you select. Why such a big difference in price? Laser diodes. Laser diodes are electrically pumped semiconductor in which electrons and can recombine, releasing the energy portions as laser photons. This amplification process produces heat in the diode. High power capacity diodes are more costly and require larger cooling fans. Low level class 3 laser diodes are less expensive to produce because they do not need as much heat tolerance. Class 4 laser high power lasers release more photonic energy, thus require higher capability diodes.

Most lasers are leased equipment in practice for eventual purchase. Look at your laser as an investment for long term profitability. Laser therapy is not covered by medical insurance and is therefore considered a cash
modality. Treatments may range anywhere from $35-$150 depending on where you are located demographically and the patient base you are treating. How much you charge also depends on which type of laser you choose. For example, if you purchase a laser for $10,000 and charge $100 per session and you do 20 treatments per week, you will have the laser paid off in 5-weeks.

Determine how many clinics have the laser you want in a 50-square mile radius to your office. Ask the manufacturer for this number. This can help you decide about marketing your practice via a ‘unique value’ perspective. For example, if ten doctors have the same laser or class of laser within the 50 mile radius of your office, you are low on the uniqueness factor for practice differentiation. However, if there are few offices with the model or class of laser you want, your services are high in uniqueness value. Why does this matter? People pay more for unique value in the marketplace. What do you offer that others don’t? If you have what everyone else does then it becomes a price war and you never win services on price. So it’s not just a matter of getting a laser, it is critical to get the best one suited for your practice and demographic area.

You may decide to purchase several lasers for your office. Many doctors start with a lower cost unit and trade up to a higher end model with more capabilities. Laser technology will continue to expand in the next decade and patients will be seeking this form of therapy for help. Laser phototherapy, administered by someone trained in the art and science, is beneficial in almost all forms and has no adverse side effects. The difference between available laser units is in the wavelength, power density, manufacturer support and aesthetics. From these parameters, you can purchase the best laser for your patients.

Even if you are on the right track you will get run over if you just sit there. Technological advances have been making healthcare technology better and better every year. Adding laser technology to your office will take you to the next level of practice success and beyond. Your practice deserves it. Your patients deserve it too!

References:

3. Tuner, Jan. Laser Therapy: Clinical Practice and Scientific Background ; a Guide for Research Scientists, Doctors, Dentists, Veterinarians and Other Interested Parties within the Medical Field.
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