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The last page has the latest instruction sheet for our digital hand held controller

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A GUIDE TO COLD LASER TREATMENT

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NEURO-MUSCULOSKELETAL MEDICINE AND OSTEOPATHIC MANIPULATIVE MEDICINE

FAMILY MEDICINE AND OSTEOPATHIC MANIPULATIVE TREATMENT

WORLD ASSOCIATION FOR LASER THERAPY – MEMBER

Introduction

See Important Disclaimer and Additional Information below.

Since purchasing my first 'cold laser' the benefits of this form of treatment were immediately apparent. Further, as an osteopathic physician I found treatment with light to be complementary to osteopathic principles and practice. Dr. A.T. Still, founder of Osteopathy said "use no drug not compounded within one's own body." Since we are exposed to, and processing, light every day on and in our bodies I believe Dr. Still's message can easily refer to laser treatment. Following is a summary of my treatment techniques using Cold Laser. Cold Lasers, Low Level Lasers, Soft Lasers and LLLT are all interchangeable terms for the same type light treatment. This summary is meant as a guide to get you started and is not your ultimate source for information on this subject. You, as the practitioner, are solely responsible during the practice and privilege of treating another human being.

For most patients this type of treatment will be completely new. They will, most likely, want to know much about it before you use it to treat. You might hear something like "how can light treat my problem?", "is it safe to use?" or "will it hurt?". Whatever you hear from your patients it is important to have an informative but concise explanation of what you are using to treat them and how it can help. I tell my patients that laser light has been used safely for 30-40 years but is only 'recently' popular; especially with advanced research and the availability of portable (affordable) equipment. The light is 'cold' in that it will not burn human tissue at the settings and treatment times used; and it is not known to cause or worsen cancer. It will not hurt but there may be a slight tingling sensation during treatment. Many patients know that sunlight can 'produce' vitamin D in the body and certainly can result in a tan. What they might not know is that this is a result of light penetrating the skin and activating a chemical mechanism (photobiostimulation) to produce a result. You are not baking the skin to a golden brown but causing a photochemical reaction! Cold laser light is 'tuned' so that it can penetrate to a level necessary to activate cellular mechanisms of anti-inflammation and pain control. When the 'target' cells receive the proper photobiostimulation, cellular mechanisms are activated and chemical compounds are formed assisting in that control. Even if cells closest to the area of concern are not directly treated there is a proximity effect. Cells closer to the skin surface can affect others that are deeper and further away; effectively, chemically transferring the treatment to the target area. Typically this explanation is more than enough to satisfy my patients' concerns.

Ground Rules and Safety

The most prevalent concern when using laser light treatment is that of eye exposure. The practitioner will typically have no problem understanding this but the patient may not. Eye protection is an absolute must during laser treatment. Use the recommended product rated to block the laser treatment wavelength in use. If your device uses lasers of multiple wavelengths be sure to have eye protection rated for all those wavelengths. Treating the face, especially near the eyes, presents a special challenge because of stray or reflected laser light that may cause eye exposure behind the protective glasses. You might have to get creative by adding solid 'blindings' made of cardboard or other opaque material to the sides of the protective glasses. Use of a hand (yours or the patients) can assist in blocking light as well. I do not use invisible light lasers near the face if at all possible. Typically, a red-light laser will work well on the shallow structures and a patient can tell you if the red light is visible behind the protective glasses. Invisible light would obviously never be detected and could unknowingly be damaging. Lastly, I have a sign posted on the door warning those who may unexpectedly attempt to enter the room during a laser treatment.

Your patients need to know that peeking around the glasses or just closing their eyes is never permitted during treatment. They have to be made keenly aware of the serious consequences that can result from eye exposure to laser light such as retinal damage and possible blindness. If you have any additional concerns regarding your patients' understanding of this issue you may want to have them sign an informed consent including this information. Besides unwanted eye exposure there is also a maximum total body dose to be aware of. The recommended total dose of Cold Laser light daily is between 100 – 200 J. A Joule (J) is standard unit of measure when referring to laser energy exposure. See formulas under CALCULATIONS section for advice on determining exposure in Joules.

During the course of treatment the handheld laser device will possibly touch your patient. Therefore, infection control may be necessary. Because the equipment is electrically powered it cannot be simply washed. When I treat a patient the wand is typically a small, but defined, distance from the skin so contact is not really an issue. If necessary the housing can be cleansed with alcohol prep or other cold cleaning solution with the unit unplugged. Check with your manufacturer for advice. Use of a thin clear plastic bag around the laser wand can act as a disposable barrier. The smaller, single laser wands can be used with dental light curing covers. This is what your dentist uses to cover the dental composite filling curing light. I like to use these especially when there is an absolute possibility of contamination such as treating intra-orally or near open wounds.

Finally, you should not expose the area directly over the thyroid gland to Cold Laser light. It has been shown that laser energy can cause increased release of thyroid hormone which can result in an iatrogenic hyperthyroid condition. Remember that as people age the thyroid gland can have a more inferior position than in a younger person. Palpate carefully or avoid the region altogether!

Equipment

This guide references lasers marketed by Laser-Therapy.US. I started with the original desk top unit with two, single-element laser wands and moved to more powerful and multi functional equipment as it became available. You don't have to get every piece of equipment just to get started. The lower powered, laser wands treat very well but take longer to treat commensurate with the lower wattage output. In any case all the equipment is reasonably priced so even a small practice can typically afford the advanced unit. Following is a summary and description of the available devices from <http://coldlaserequipment.com/>.

There is one digital portable power supply currently available. You may see either the older style portable or desktop unit around but both have been replaced by the vastly superior digital programmable power supply. One of the limitations of the desk top unit is that it can only power the single-element lasers. It is functional but limited in use and not as easy to set-up as the portable type, or to use because it lacks a built in timer. The portable, programmable unit can power any Laser-Therapy wand including the newer units with multiple laser diodes. It has a built in timer that simplifies treatment. It has become my personal choice!

Power	Wavelength	Configuration	Color of Light
5mw	635nm	Single Laser	Visible Red Light
50mw	650nm	Single Laser	Visible Red Light
150mw	808nm	Single Laser	Nearly Invisible
190 mw	635nm	Nineteen Laser	(19 x 10mw 635nm) Visible Red Light
315mw	635nm, 808nm	Five Laser	(3 x 5mw 635nm + 2 x 150mw 808nm)

Exposure and Dosage

There are some generalities that will help you to choose the correct wand. Red light lasers in the 635nm and 650 nm range are shallow-use lasers (< 1"). The 808nm (near invisible) wavelength light can penetrate much deeper (>1" – 1.5" in some instances). Think about a red light meaning STOP, and something invisible can go further undetected, as a memory aide. What really happens is that the red light is scattered and absorbed more by the color and density of the body so the light penetration is limited. The 'invisible' nature of 808nm wavelength light allows it to pass through tissue with less of the obstructive limitations that red light can face.

When I use the laser I hold it so that the red light is in focus and will appear as a pinpoint. This is how I keep my treatment consistent. Some will argue that I lose power this way but it really gives me latitude to adjust power and depth of treatment. If I want more power concentrated a little deeper I move the wand closer to the patient; and for less power over a wider area I move away. As you use this new form of treatment you will develop a feel for it and will know where you need to be. Of course, for nearly invisible laser light you have to find the focal point a different way because the point of light cannot be seen during treatment. While wearing protective glasses turn on the 808nm laser and aim it at the test card provided. You will easily be able to see the focal point because the test card allows the light to be visualized even through the glasses. You will have to remember what this distance is in your mind. However, you will become comfortable with positioning the laser very quickly.

Calculating dosage and remembering the power output of the different laser wands can be daunting for some; for others, easy. I suggest writing down the average recommended power settings and exposure times until you are comfortable with the protocols. You will quickly find what works in certain situations and will adjust your settings and notes accordingly. Eventually, the treatment process will become nearly second-nature and you will need to reference the settings for only the most infrequently treated areas. Others have reported using a line drawing of a human with dosage and settings noted on treatment areas.

Calculations

A Joule is one watt of energy delivered over one second of time. (watt/second)

A milliwatt is one thousandth of a watt. (1000mw = 1 watt)

Therefore you need to use the equivalent of 1000mw/second to deliver one Joule.

Treatment parameters are typically given by stating the energy in Joules delivered over a specific area. The common nomenclature used is Joules per centimeter squared or J/cm². A treatment point is considered to be one square centimeter in area. See the following examples and table showing the calculations for each laser wand.

Generic Equation for Calculation of Total Delivered Energy:

(Laser Power in mw) x (treatment time in seconds) / 1000 = total delivered energy in Joules. If you divide the total energy delivered by the area (cm²) you get the average energy delivered to each point.

Example: (150mw) x (20 sec.)/1000 = (3000 mw/s)/1000 = 3w/s or 3 Joules of energy.

If you evenly provided this energy over 3 cm² you delivered 1J/ cm²

The laser wavelength does not affect the power calculation.

Remember that all your combined totals need to be less than the maximum daily dose!

Wand Power Rating	J/minute	Time in Seconds to deliver 1Joule
5mw	0.3J	200
50mw	3J	20
150mw	9J	~6.6
190mw	11.4J	~5.2
315mw	18.9J	~3.2

These are calculations of energy delivery in a perfect world. However, there are many factors that can affect the actual delivered energy. Some you can control and others you cannot.

Factors That Can Adversely Affect Treatment

Incorrect rate of travel over treatment area: Use slow deliberate movement across the treatment area to evenly expose it. Don't 'scribble' with light... instead paint with it.

Is the problem local or remote? This is commonly seen with such maladies as carpal tunnel syndrome. As an example the chief complaint might be "I have carpal tunnel syndrome". However, the patient may really have cervical radiculopathy. Use your ability to test and diagnose so the appropriate area is treated instead of just pointing your laser towards the complaint. You still have to be a diagnostician!

Depth of target structure: The deeper the structure the more accurate you need to be in your aim. This is due to increased light scatter, absorption and reflectance from increased tissue density. Adjust your dosage based on whether the area is thicker or thinner than 'average', skin color and anatomical barriers.

Poor aim or treatment angle: Generally you should aim at a right angle to the target area. However, sometimes holding the laser at a lesser angle is advantageous especially to avoid having the light strike an anatomical obstruction. Treatment time may be extended due to the indirect path of light.

Incorrect laser wavelength: Generally higher wavelengths (non-visible) penetrate deeper. Visible light like the red laser treats shallow regions better. You can 'overshoot' just as easily as under treat. If I can lightly palpate and easily feel the area I need to treat; a red-light laser of 635nm or 650nm will work most times.

Obstructing anatomy: Any anatomical structure, especially bone, will impede your treatment efforts so adjust your angle and treatment times accordingly.

Skin type and color: Thin or lighter colored skin will be less of a photo-barrier than darker, thicker skin. Calluses and other benign skin lesion can decrease light energy, too. Adjust your treatment accordingly. You can reduce your treatment power by 30-50% for the lighter/thinner skinned person and work up. This is also true when the treatment area is markedly inflamed or exquisitely tender i.e. Fibromyalgia. Darker individuals may need maximum treatment times or more treatments because of the reduction of light exposure due to skin pigment.

Jewelry or clothing: Anything that reflects or blocks light can reduce treatment effectiveness. Have the patient remove the jewelry and store in a safe place. A patient gown may be necessary when clothing is removed.

Light sensitivity: Examples of conditions which can involve light sensitivity include Lupus, and Porphyria. Use of certain medications such as antibiotics (i.e. Tetracycline) and some antihistamines increase light-sensitivity, too. When in doubt, consult with a dermatologist or other specialist involved in the care of the patient who may have made the initial diagnosis. You may need to use an alternate method of treatment. I also avoid areas that appear infected or are suspected of being cancerous.

Hair: Hair is an anatomical obstruction that can directly block or absorb light. Use a thin, single element wand to go between hair strands when treating the head. Other hairy bodily areas will require adjustment of treatment dose accordingly. You should cover your laser to keep it clean.

Skin applications (makeup, oils, sun block): This one should be an easy fix. Clean off the offending agent and remind your patient not to apply these items before treatment. Even makeup remover can pose a problem. Anything that physically blocks or reflects light will hamper your treatment efforts. I clean treatment areas with 70% rubbing alcohol diluted equally with water in a spray bottle, as tolerated by the patient. Other practitioners have found alcohol prep pads to be more convenient. If a chemical peel has been applied or inflammation is present I would not treat with laser until the face has completely healed.

Treatment Procedure

Choose your treatment exposure based on W.A.L.T. treatment suggestions initially and then as your own experience leads you; staying within the safe limits of maximum exposure. Everyone in the room needs to have appropriate eye protection. Turn on the laser and aim the beam at the target area moving it slowly to evenly expose the treatment area for the specified time. You should move over the area several times averaging the exposure based on your J/cm² calculation. Reevaluate!

Treatment Goals

Treatment goals will be different based on the patient's condition. In general you would like complete resolution of the malady but that is not always possible. You can be looking for a decrease in inflammation or pain, improved range of motion, circulation or neurologic function. Whatever your goal is, it is important to compare the result to the original complaint.

Once in a while a patient will say there is little, if any, improvement when really there has been a major change albeit only one. This may be due to the invisibility of, and inability to, feel a Cold Laser treatment. Therefore, your patient may believe nothing has happened! Sometimes, there may be such an improvement in function that the patient starts to over-use the treated body part unconsciously. They might say that the area in question still fatigues easily or has pain after activity. Reminding them that they could do little or were inactive before treatment can provide the reality check necessary to show there has been improvement. Educate your patients on posture, ergonomics, use of assistive devices, or whatever is necessary to prevent injury exacerbation or additional injury. Also, partial resolution of dysfunction is always better than no improvement at all. This is especially true in chronic situations. Use of a pain scale or other objective form of rating function can be invaluable.

Tips, Tricks and Troubleshooting

Even though there may be complete resolution of dysfunction from the first treatment your work may not be finished. Often there will be improvement followed by the same complaint from the patient within a short period of time. Likewise, there may be a time where there is absolutely no improvement. For both these reasons you should treat at least three times. This will provide completeness for the issue that resolved and additional effort for the recalcitrant dysfunction. Maintenance treatments can be given weekly as needed. Chronic complaints may require treatment as often as every day, at least initially. Be sure to evaluate why the treatment may not be working as planned by consulting the 'Common Factors Affecting Treatment' listed above.

Patient position is an important consideration as is your own comfort. Be sure to position the patient such that you can effectively treat the area(s) in question. This means you should be comfortable for an extended period of time while able to move the target area through a range of motion as necessary for anatomical access.

You need to know what power you are delivering to the target area, what area you are covering and what settings to use. If you provide too little or too much light to a given area the treatment effect can be equally inadequate. Resist the temptation to 'just give a little more' unless you are sure that a low-dose is really the problem. My grandmother always said "too much is like not enough"! That is so true when treating with Cold Laser.

I don't believe there are many practitioners who can accurately estimate treatment area in square centimeters. This is an important skill so while you are getting used to treating with a laser, apply a paper ruler marked in cm to the laser wand. I did this by copying a small pharmaceutical information card with a ruler printed on it. Then I cut out the ruler part so it would fit on the wand and affixed it with tape for an easy size reference.

If you use the five element laser it is a good idea to know where the 808nm-150mw diodes are positioned in relation to the 635nm-5mw diodes. I made small marks with white nail polish on the side of the wand denoting the position of the two most powerful lasers in the array since they will do the lion's share of the work. Another colored mark half-way between the white marks, helps me to quickly orient the same two lasers horizontally. You will get used to seeing the other three red lasers in a certain pattern which also can help you with orientation. Flash cards or labels can help to remind you of certain settings and power outputs for each wand. Keep them with the laser.

For the most part you will use the factory established pulse setting of 12Hz. The laser is designed to pulse because the impulse is greater when a laser is first energized so each pulse is stronger than when on continuously. I have found it beneficial to occasionally set the pulse rate to 20Hz especially with the 808nm laser wand and a deep target zone. Tough to treat areas under thickened skin or edematous regions may respond better with this pulse setting.

Be sure that your laser is operating properly. This is especially true when using lasers that are essentially invisible because you cannot be sure if there is light being emitted. Use the test card supplied with your laser to 'prove' it is emitting light. If your laser is powered by a battery, charge it often even if it has only been lightly used. Refer to the manufacturer's recommendations. Some lasers use adapters to retrofit older wands to newer power supplies. Be sure you have the correct adapter in place and consult the manufacturer as necessary.

Summary

Cold Laser Treatment is an exciting modality that I cannot be more pleased to have added to my practice regimen. This guide is extensive and, as such, may make Cold Laser treatment appear too complicated. The information is meant to be as complete as possible to help you through some of the possible pitfalls. However, pitfalls are rare and I believe you will find it is relatively easy to get started and obtain satisfactory results. Soon you will have no trouble developing a gestalt of the patients' complaints as you have done many times before; only this time with Cold Laser in mind. A Cold Laser treatment plan, if indicated, will be as easy to formulate as it was to decide what pain medication to prescribe. Treating without medication, when possible, is an experience that is rewarding for both you and your patient. Only when you run into the occasional difficulty will you have to look to this guide for detailed advice. With enough experience this will become a thing of the past. Start slowly and do not try to cram all the settings into your head all at once. Use the W.A.L.T. table found at this link: (<http://www.walt.nu/images/stories/files/dosage-table-780-860nm.pdf>) to get you started with settings and treatment times. The W.A.L.T table concentrates on common musculoskeletal disorders. This is how I started and had a successful treatment the very first time I used my new laser! Adjust your settings as necessary based on the suggestions made above as well as your own experience. As with anything new you will wonder if you are doing the treatment correctly. Positive results will be realized very soon and you will know you are on your way to using this form of treatment for a very long time.

Finally, continue to enrich your laser therapy knowledge base by joining the *World Association for Laser Therapy*. You will have members from around the world to assist you. You can draw from their experience as well as referencing W.A.L.T.'s amazingly information-dense scientific journal: *Photomedicine and laser Surgery*.

May you find the health within your patients!

JOHN B. CARAMAGNA, D.O., PLLC

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Important Disclaimer & Additional Information

The use of Cold Laser is considered the practice of medicine by certain entities. While a safe approach to treatment it is not completely innocuous and, as such, one should have a thorough understanding of safe practices and techniques involved in the use of laser equipment. This guide should not be considered medical advice and it does not guarantee specific results. The information provided is strictly for informational purposes only and not for the diagnosis, treatment, cure, mitigation or prevention of disease. Also, you must be properly authorized to use laser equipment and comply with local laws of practice. This guide cannot be all-inclusive and is not meant to be fully educational or replace common medical practice. Considering the type of equipment used and your methods of using it cannot be controlled or monitored, the operator of such laser equipment bears full responsibility for its use and results of that use.



Recommended anti-inflammatory dosage for Low Level Laser Therapy

Laser classes 3 or 3 B, 780 - 860nm GaAlAs Lasers. Continuous or pulse output less than 0.5 Watt

Energy dose delivered to the skin over the target tendon or synovia

Diagnoses

Tendinopathies	Points or cm2	Joules 780 - 820nm	Notes
Carpal-tunnel	2-3	12	Minimum 6 Joules per point
Lateral epicondylitis	1-2	4	Maximum 100mW/cm2
Biceps humeri c.l.	1-2	8	
Supraspinatus	2-3	10	Minimum 5 Joules per point
Infraspinatus	2-3	10	Minimum 5 Joules per point
Trochanter major	2-4	10	
Patellartendon	2-3	6	
Tract. Iliotibialis	2-3	3	Maximum 100mW/cm2
Achilles tendon	2-3	8	Maximum 100mW/cm2
Plantar fasciitis	2-3	12	Minimum 6 Joules per point
Arthritis	Points or cm2	Joules	
Finger PIP or MCP	1-2	6	
Wrist	2-4	10	
Humeroradial joint	1-2	4	
Elbow	2-4	10	
Glenohumeral joint	2-4	15	Minimum 6 Joules per point
Acromioclavicular	1-2	4	
Temporomandibular	1-2	6	
Cervical spine	2-4	15	Minimum 6 Joules per point
Lumbar spine	2-4	40	Minimum 8 Joules per point
Hip	2-4	40	Minimum 8 Joules per point
Knee medial	3-6	20	Minimum 5 Joules per point
Ankle	2-4	15	

Daily treatment for 2 weeks or treatment every other day for 3-4 weeks is recommended

Irradiation should cover most of the pathological tissue in the tendon/synovia.

Tendons

Start with energy dose in table, then reduce by 30% when inflammation is under control
(Does not apply for carpal tunnel tenosynovitis)

Therapeutic windows range from typically +/- 50% of given values
Recommended doses are based on ultrasonographic measurements
of depths from skin surface and typical volume of pathological tissue
and estimated optical penetration for the different laser types in caucasians

Disclaimer

The list may be subject to change at any time when more research trials are being published. World Association of Laser Therapy is not responsible for the application of laser therapy in patients, which should be performed at the therapist/doctor's discretion and responsibility

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My Cold Laser Protocols

Revised to August 13,2009

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My Cold Laser Protocols

Revised to August 13,2009

The more people we treat in the clinic the more conditions we find responding to the cold laser. The cold laser is so simple to use - don't over complicate it! Our treatments have been modified over the past couple of years as we have used the cold lasers on more people and treated more conditions. When reading this paper keep in mind we all practice in different states or countries with different scope of practice laws and regulations. Please check your own states laws.

The use of a cold laser, also know as a low level laser can be approached several ways. A great approach to treatment is from the point of the nerves and the blood supply to the area involved as well as the area itself. Another approach is from a "site of injury" or more purely an anatomical perspective, like aiming the laser "through the opening between the femur and tibia, from 5 directions, to treat the meniscus, cartilage, ligaments, and even points of arthritis within the knee joint. One could also treat with the cold lasers from an Acupuncture perspective, replacing the needle with a laser. I personally prefer using a combination of acupuncture needles the cold laser and even microcurrent. I have found cold laser to be very effective for treating the nerves, blood system, "site of injury" treatment and from an Acupuncture perspective.

Use a simple method to communicate cold laser treatment plans to a capable assistant, just like with ultrasound, etc. A full-page blank human line drawing is great for that purpose. Most of the time we use the laser wand with five true pulsed cold lasers (three 635nm 5mw Class 3A and two 808nm 150mw Class 3B) set at 10hz. with a 65 second time. That delivers 20 Joules of energy every time you treat. Remember that the cold laser controller beeps at the end of the programmed time and it also pauses when the button is pushed during treatment.

The treatment time could then be written on the line drawing in the locations treated. The CA can program the per point treatment time into the cold laser controller or just watch the timer, pause and restart. Drawing a line under the number (10s, 15s, 30s, 1m, etc) might indicate to leave a little air gap between the laser and the skin, lowering the "dose" for the more sensitive patient.

Laser Dosage is measured in Joules. There are two dosages to consider. One is "Total Body Dose". Two is dosage to a specific joint or body area. The World Association of Laser Therapy states that between 100 and 200 Joules per six hour period is the total body dose we don't want to exceed in order to avoid exacerbating our patient's condition. Skin color and type is an important factor to consider in treatment. Older or very frail or thin skinned patients and also really light skinned sensitive patients could max out at as little as 30% of the stated numbers, while a very dark skinned person could need double the stated treatment, err on the side of caution. The frail and light skinned can experience a form of burn from a powerful laser but so can the darker skinned patient due to the melanin in the skin offering resistance to the lasers penetration causing heat.

Another consideration is medicines that are “photo reactive”, they may cause the patient to “burn” very easily. If the patient has been advised to stay out of the sun because of some medicine I only treat with a 635nm 5mw laser.

I find it easy to determine the amount of laser light required to deliver a total body dose treatment. About 10 minutes (per six to eight hour period) of treatment will be a maximum (200J total body dose) when using the programmable laser with the laser wand which contains five true pulsed lasers (three 635nm 5mw Class 3A and two 808nm 150mw Class 3B).

The five true pulsed lasers (three 635nm 5mw Class 3A and two 808nm 150mw Class 3B) totals 315 mw and puts out about 18.9 joules per minute.

The 635nm 5 mw puts out about 0.3 joules per minute.

The Five 635nm 5mw totals 25mw and puts out about 1.5 joules per minute.

The 650nm 50 mw puts out about 3 joules per minute.

The 808nm 150 mw puts out about 9 joules per minute.

Now that that is all out of the way lets discuss the use of the “laser wand” on general tissues, and some acupuncture points used for different conditions. Remember, the single 808nm 150mw laser, single 650nm 50mw or the single 635nm 5mw laser can also be used in the same ways as we discuss about the multi laser wand. The human line drawing sheet is a good place to document the dose a patient is treated with then it can be included in the patients file. A copy of the WALT Dosage Chart is good to have visible wherever patients are treated. It is available at:

<http://www.walt.nu/images/stories/files/dosage-table-780-860nm.pdf>.

I make it a practice to keep a box of fold top sandwich bags (bought at a dollar store) in each treatment room. I use them to cover any laser tip or wand for sanitary purposes. I usually put the wand or tip against the patients skin to maximize the effect on the tissue plus it makes reflection less of an issue.

Many patients present with spinal subluxation/degeneration, I believe that when combined with the adjustment the cold laser helps the subluxation heal faster. I often find myofascial restrictions and/or trigger points as well. You can use the cold laser before or after you adjust but if you’re doing soft tissue work like Graston or A.R.T., laser AFTER you’re done.

GENERAL TX and SPINE TX:

When the complaint is of pain and the other factors have been considered and possibly even referrals made, remember we are possibly talking about some very different conditions here and you may want a condition checked out by a medical doctor, it will relieve you of a significant amount of liability if you aren’t comfortable with what you are presented with.

It is good to begin by treating the lower cervical ganglia that is anterior to the C7 TVP bilaterally for 30 seconds each. Remember to stay away from the thyroid gland here - please! If the problem is joint pain like a knee, shoulder or hip the next spot to treat is that joint, treat it with the amount of energy (in Joules) as shown on the WALT Chart <http://www.walt.nu/images/stories/files/dosage-table-780-860nm.pdf> Depending on the amount of energy already used, you could then do the laser treatment bilaterally just lateral to the spine at the involved spinal level as well as just above and just below (posterior aspect of the body, 3 to 5 vertebral levels in all) do 30 sec on each side of the spine keeping the wand moving slowly. For the acupuncture folks this treatment covers the Hua-To points and the Associated points. This basic treatment is for a primary subluxated area that's being adjusting as well. Then move out to the involved extremity for problem areas like muscle spasm or trigger points and treat them.

BLOOD SUPPLY:

When I first learned about lasers I was taught to treat non-healing fractures when the injury was covered by a cast by treating the nail beds and the arterial blood supply to the limb. Many a non-healing fracture has been healed this way, if the patient is compliant to the treatment plan. The blood supply treatment method is somewhat indirect so the energy is spread over a large area allowing more treatment in that involved area. I find this type treatment actually treats the whole body so it can be great for a wellness care approach. In those cases we might treat the abdominal aorta above and below the naval assuming the patient wasn't so obese that the treatment couldn't make it to the abdominal aorta. In that case, remember those lower and middle cervical ganglia, the carotid arteries are superficial to them and they can both be treated at the same time if you direct your laser wand properly. Remember to stay away from the area where there is or might be fetus!

MUSCLE / TENDON / LIGAMENT / NERVE:

Over time I have changed the way I treat tendonitis/osis/opathy. I only use the 635nm 5mw laser on a tendon problems. I found the 650nm 50mw to be too powerful for some people and I can't reliably predict when a patient will experience an exacerbation of symptoms. Why should I? The 635nm 5mw laser is almost always successful and never hurts a patient. Alternatively, (if all you currently have is the laser with three 635nm 5mw Class 3A and two 808nm 150mw Class 3B laser wand) you can cover the two 808nm lasers and still treat with 2 or 3 of the 635nm 5mw lasers. I believe you will find the 5mw 635 nm single laser tip to be much more convenient.

When dealing with sprains/strains and/or nerve irritation it is advisable to keep the laser moving over the area being treated. Covering the entire involved area slowly in a "spray painting" sort of fashion, while the laser head is against the skin is great. I also rotate the wand within the baggie. Keeping the laser stopped on one spot could possibly begin to over treat a single spot which could decrease its effectiveness. This "spray painting" method is also used for neuropathy and phantom limb pain, just "spray paint" the nerve pathways for 30 sec to 2 minutes

depending on the size of the area. For both neuropathy and phantom limb pain I treat the corresponding auricular points with laser, needles and/or microcurrent. As for trigger points, treatment should be 1-4 joules per trigger point. Use of a single 808nm 150mw to get to the small area would be ideal.

JOINTS:

The WALT Chart <http://www.walt.nu/images/stories/files/dosage-table-780-860nm.pdf> gives specific dosages and the number of points to treat according to the World Association of Laser Therapy. Generally I find I am thinking along the same lines. I treat the involved joint, treat the pathway of the involved nerve(s), treat the involved spinal level and treat the auricular point(s) related to the condition.

ACU-POINTS:

I really don't focus on treating acu-points with the laser like I used to. I primarily use needles or a micro current machine. I am including this for completeness sake knowing that some will prefer treating acu-points with the cold laser.

As we discuss treatment of a "point" I am talking about using either a 635nm 5mw, 650nm 50mw or 808nm 150mw. When treating acu-points I would usually begin at the spine by treating the general area of the spine where the nerve roots exit that possibly have a relationship to the complaint. In the neck or low back I commonly treat between each spinous process (Du Meridian) for 2-3 levels above and below the level I believe to be the culprit, then I treat the Hua To Points (1/2 tsun out from center and between each spinous) again treat 2-3 levels above and below the offending, subluxated area. Finally I treat any Associated Points on the Bladder meridian that are within a few levels up or down. I treat each level regardless of whether I've seen it in an acupuncture point manual. I learned this concept from a paper Dr. Amaro wrote a long time ago and it works! You want to apply between 0.5 - 2 Joules per acupuncture point. Please note that the 5 laser wand treats all the points near the spine quite nicely.

OTHER ACU-POINTS:

I find LI 4, ST 44, & ST 43 seem to help reduce pain in general. To relax the stressed out, decrease headaches and sometimes even blood pressure I use GV 20, the Four Points located 1 tsun anterior, posterior and lateral to GV 20 on top of the head, HT 7, BL 62, & Auricular - Shen Men, Tranquilizer Point and Muscle Relaxing Point. To increase the energy levels of "lethargic" patients I've had success with CV 6, CV 8, ST 36, & SP 6.

OTHER CONDITIONS:

We see patients with every condition known and as a general rule neuro-musculo-skeletal complaints will respond to the low level laser, some great some may take a while and it can be difficult to keep the patient motivated. Most conditions are treated with a "common sense" approach. For example it makes sense that you would treat a fibromyalgia patient by using the laser on the tender "fibro" points. But if you think about it you will also recognize fibromyalgia as a condition that also requires you to cut the dose down to 30% of normal in the

beginning of treatment so with only 30-60 Joules to “spend” where will you treat and for how long? If the 315mw laser wand is your only laser, you might think about an air gap to decrease the dose, or covering the two 808nm 150mw infrared lasers. You could just count 1 Mississippi, 2 Mississippi in your head and move off the points quickly.

The digital hand held laser controller can be programmed to a fifteen second treatment time so you can treat without counting. Now we can treat all 18 “fibro points” if we wish and still have a little time left for the anterior C7 ganglia before reaching 50 Joules. One could simply use the 635nm 5mw laser and “spray paint” each point for a minute or so. That keeps the dosage down so you see how the patient responds to care and you’re sure not to exacerbate the fibro. Then you can use the wand for the Ant C7 spot.

The above is the basic way I approach any condition. I don’t need a manual a foot thick with pictures and exact cook book like recipes. As a doctor I know things like, the referred pain patterns trigger points and where the trigger points are that refer, treat the trigger point and the referred pain will likely respond. If you can possibly do it (ie: it is legal in your state and you are trained) needle the trigger point – this one needling technique has made me believe that the trigger point injections really aren’t what help the patient, it is the hole the needle makes, it is just my opinion but WOW do I see amazing results with it!!

Neuropathy has another aspect. Obviously you would think of “spray painting” the entire affected limb, right? Now follow the nerves pathway and “spray” it all the way up the limb to the cord level. Then go to the ear and treat the auricular point for the area. If you don’t have one of the optional small laser tip for auricular points you can use an inexpensive micro current type point locator/stimulator for the auricular points.

To summarize: we treated the area of the complaint, the pathway of the involved nerve, the involved cord level and I might include the entire spine protocol here - Du points, Hua To points & Associated points for about 5 levels, involved + 2 above and 2 below. Keep the dose low - don’t over treat.

For something like TMJ dysfunction do whatever you do other than laser then treat the Tempomandibular joint itself, the general jaw muscle area and the temporalis muscle above the ear. Here is an example of a time it is good to have more than just the large multi laser wand because the TMJ is a tiny joint and a small treatment area sometimes calls for a small treatment tool. Apply according to the TMJ on the [WALT Chart](#) but treat the muscles in addition to the TMJ.

Do NOT over treat the base of the skull with the wand. The occipital nerves are very sensitive. I only use the 635nm 5mw on the upper cervical spine and on the scalp. I made a little cover for the multi laser wand so the two 808nm 150mw lasers are not treating, just the three of the 635nm 5mw lasers in the multi laser wand.

One final thought for patients with multiple complaints. Just like in Chiropractic care, treating the primary problem is most likely to offer relief and give the patient relief for a longer period of time. With that said don't overlook what appears to be a secondary condition because sometimes that's really the problem. Be careful not to get caught up in treating so many things you end up over treating one of the more sensitive conditions and making it worse. Remember any laser treatment affects the WHOLE BODY.

As you can tell the [WALT Chart](#) chart offers you a guideline for muscles/tendons as well as specific recommendations for most joints and you have a standardized guide to determine your own treatment plans. As far as maximum doses are concerned the two 808nm 150mw's in the wand are 300 mw total whereas the three 635nm 5mw's lasers total 15 mw. So with the wand you are really treating two of the points with a lot of energy every time you push the button; for this reason, I recommend you mark your wand so you know where the two 808nm near infrared lasers are located without looking at it during operation. You want to aim into the "openings" of the joint, then you can move the laser wand around during treatment so as to continue to aim into joint, while you simultaneously have the patient moving the joint through its ranges of motion the best they can, this allows you to get to all different angles to treat the joints. You can also rotate the wand head while it is still against the skin in the plastic bag if necessary.

With the single 808nm 150mw laser wand you can direct your treatment a little more specifically to the "openings" and that can really make a difference on small joints where you have to get the treatment done with a really low number of Joules. Finally, if you need to decrease the density (mW/cm²) of the treatment you can just use "air". Just like x-rays need more MAS at 72 FFD the laser loses density if it isn't against the skin. Where it says max 100mW/cm² you could lower the density of your laser wand or single 808nm 150mw laser tip by simply holding it where it is just a millimeter or two from touching the skin.

Thank you for reading this far down, your patients will benefit and pay you well!

Sincerely,

Charles Dixon, DC, FASA
<http://DrCharlesDixon.com>
DrCharlesDixon@DrCharlesDixon.com

Disclaimer:

You are completely responsible for any treatment you decide to offer, as well as your compliance with your state laws and your treatment decisions for patients. I have no knowledge about the exact building or marketing processes of any cold laser product and I make no representations that I do. I use the cold lasers I bought from <http://ColdLaserTherapy.us> in practice every day and with great results, how you use it is your own responsibility. Obviously everyone in any treatment room must wear laser goggles approved for the wavelength of the laser being used.



Recommended anti-inflammatory dosage for Low Level Laser Therapy

Laser classes 3 or 3 B, 780 - 860nm GaAlAs Lasers. Continuous or pulse output less than 0.5 Watt

Energy dose delivered to the skin over the target tendon or synovia

Diagnoses

Tendinopathies	Points or cm2	Joules 780 - 820nm	Notes
Carpal-tunnel	2-3	12	Minimum 6 Joules per point
Lateral epicondylitis	1-2	4	Maximum 100mW/cm2
Biceps humeri c.l.	1-2	8	
Supraspinatus	2-3	10	Minimum 5 Joules per point
Infraspinatus	2-3	10	Minimum 5 Joules per point
Trochanter major	2-4	10	
Patellartendon	2-3	6	
Tract. Iliotibialis	2-3	3	Maximum 100mW/cm2
Achilles tendon	2-3	8	Maximum 100mW/cm2
Plantar fasciitis	2-3	12	Minimum 6 Joules per point
Arthritis	Points or cm2	Joules	
Finger PIP or MCP	1-2	6	
Wrist	2-4	10	
Humeroradial joint	1-2	4	
Elbow	2-4	10	
Glenohumeral joint	2-4	15	Minimum 6 Joules per point
Acromioclavicular	1-2	4	
Temporomandibular	1-2	6	
Cervical spine	2-4	15	Minimum 6 Joules per point
Lumbar spine	2-4	40	Minimum 8 Joules per point
Hip	2-4	40	Minimum 8 Joules per point
Knee medial	3-6	20	Minimum 5 Joules per point
Ankle	2-4	15	

Daily treatment for 2 weeks or treatment every other day for 3-4 weeks is recommended

Irradiation should cover most of the pathological tissue in the tendon/synovia.

Tendons

Start with energy dose in table, then reduce by 30% when inflammation is under control
(Does not apply for carpal tunnel tenosynovitis)

Therapeutic windows range from typically +/- 50% of given values
Recommended doses are based on ultrasonographic measurements
of depths from skin surface and typical volume of pathological tissue
and estimated optical penetration for the different laser types in caucasians

Disclaimer

The list may be subject to change at any time when more research trials are being published. World Association of Laser Therapy is not responsible for the application of laser therapy in patients, which should be performed at the therapist/doctor's discretion and responsibility

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Laser-Therapy.us

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Many of our clients report great success using treatment times of about six minutes per area with the 635nm 5mw wand or if using the 650nm 50mw OR 808nm 150mw wand about two minutes per treatment area. The 5 diode 635nm 808nm laser is usually used about 90 seconds per area. The lasers should be kept in continuous motion around the area(s) being treated. Cleaning the skin area to be treated (prior to treatment) with an alcohol prep pad produces better results.

ONCE A MONTH CHARGE THE UNIT OVERNIGHT (EVEN IF YOU DID NOT USE IT)

Suggested set up:

Put laser goggles on everyone in the room

Plug in laser wand taking care to align the pins when inserting (insert and remove using bullet connector not laser tip).

Insert and turn key - LCD will light up.

Hold "Set" till "Hz" flashes. (try 12Hz to start) Adjust Hz rate with Up/Down Buttons

Press "Set" - "Sec" flashes. (try 90 seconds to start) Adjust Seconds with Up/Down Buttons

Press "Set" to select and wait for the back light to turn off

Press RED Button to start or pause

Sec. counts down & green LED flashes during operation.

Use DC socket to charge battery or power if not charged.

LCD bat. charge lines are proportional to battery charge.

As long as the key is turned on the battery will be depleted. Therefore turn the key off and remove it when the unit is not in use.

LIGHT FROM 808 NM LASERS IS NEARLY INVISIBLE.

TO DETERMINE IF 808NM LASERS ARE WORKING POINT THE LASER AT THE RAISED RECTANGLE ON THE ENCLOSED YELLOW IR DETECTOR CARD (YOU SHOULD SEE AN ORANGE GLOW) OR AT WHITE SHEET OF PAPER IN A DARK ROOM, (YOU SHOULD SEE A SMALL RED DOT).

Equipment and components are distributed by and for Healing Lasers Design Company, Cape Girardeau, MO
FDA Facility Establishment Registration Number: 3004857915 and are sold by Accurate Inspections, Inc., a New Jersey Corporation doing business as Laser-Therapy.US.

DO NOT LOOK INTO THE BEAMS - THEY ARE HARMFUL!

Revised to: Sunday, November 22, 2009 D:\MYDOCU~1\QWRITE~1\HDCINST.QW

We have partnered with a company who can help you become an expert author on Cold Laser Therapy and other topics.

For more information about marketing cold laser treatment and your practice in general to existing and new patients contact Dr. Rob Hamapole at 954-296-8473

Participating doctors can become published expert authors in a short period of time with an affordable monthly payment plan.