Established target doses are safe starting points for successful treatment design. Variations in target depth, tissue mass, tissue density, and disease process require dose adjustments for best effect. Some conditions require doses between the superficial and deep doses. A small number of conditions require higher than established doses.

Treatments should be designed to achieve a dose appropriate for the condition, and to include an appropriate number of treatments, at appropriate intervals to achieve results. Some conditions require only a single treatment, others require multiple treatments, others require long term maintenance treatment after achieving clinical improvement.

In this eBook you will learn about the specific treatment design and dosing considerations to help you maximize your results with chronic conditions. Included in the eBook are case studies and links to additional educational content.

Target Dosages

**Superficial Conditions**  3-5 Joules/cm²  
(conditions in tissues such as wounds or other dermatologic conditions)

**Deep Conditions**  6-10 Joules/cm²  
(conditions under the skin)

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Chronic conditions require multiple treatments to achieve clinical improvement, followed by maintenance treatments to maintain the effect. These are usually conditions for which there is no “cure”, but in which our goal is usually to minimize clinical symptoms, however many chronic conditions which may require an extended treatment course (such as chronic lick granulomas) are also included in this category. Examples are osteoarthritis, feline asthma, and chronic lower urinary tract diseases.

Successful treatment design for chronic conditions follows accurate diagnosis and assessment of chronicity. Practitioners must avoid having a “one-size-fits-all” treatment design for chronic conditions patients. Patients with chronic conditions are treated in three phases:

1. **Induction Phase**  
   Multiple (6-12) every-other-day treatments until significant clinical improvement is noted. For most patients, this means a reduction in their primary clinical sign or symptom. The degree of tissue abnormality and chronicity dictate the number of induction treatments.

2. **Transition Phase**  
   Gradual reduction in frequency of treatments (twice weekly, then once weekly, and so on) to establish the frequency required for maintenance of desired effects.

3. **Maintenance Phase**  
   Treatment at a frequency that maintains clinical results, and keeps the patient’s primary clinical signs/symptoms to a minimum. Most chronic conditions can be maintained with a treatment every 3 to 4 weeks. Frequency must be adjusted to the patient’s requirements. Very chronic or severe inflammatory conditions may require a maintenance phase treatment of once weekly to every other week.

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**Common Chronic Conditions That Benefit from Laser Therapy**

- Arthritis  
- Bursitis  
- Chronic Pain  
- Degenerative Joint Disease  
- Feline Asthma  
- Geriatric Disorders  
- Gout  
- IVDD  
- Neurological Disorders  
- Orthopedic Disorders  
- Otitis  
- Pyoderma  
- Respiratory Disorders  
- Stomatitis  
- Urinary Tract Disorders  
- And More...
5 Common Musculoskeletal Laser Therapy Mistakes

Author: Jeff Smith, DVM, CCRP, Middletown Animal Hospital, Middletown, California

1 **Not keeping the treatment head perpendicular**

It is important to follow the contours of the body while keeping the treatment head perpendicular to the tissue. If you are seeing the red aiming beam coming into view as you transit the tissue with the contact head, you are likely not staying perpendicular. When the treatment head is not perpendicular, much more light is reflected from the tissue. This can be particularly difficult in distal extremities when treating transversely because it requires a ton of wrist movement. To avoid this, treat only 1/4-1/3 of the circumference of the limb at a time! Much easier!

2 **Not treating the area from 360 degrees**

Whenever possible treating the entire joint or target tissue from 360 degrees will achieve superior results. Sometimes we become focused on the area of visible or suspected pathology, but the truth is that all of the associated tissue is involved—think of an inflamed joint: the entire joint capsule is involved, not just the particular abnormal area identified on x-rays. Hips especially benefit from being treated from the medial aspect. Most dogs will allow this though it may take some patience and encouragement the first time or two. Backs cannot be treated from 360 degrees, but an effort should be made to administer therapy from 270 degrees.

3 **Not treating the involved spinal nerve root segments**

Most animals in chronic pain have a maladaptive or wind-up component that involves the spinal dorsal root ganglia and the associated nerves going to them. Added benefit comes from treating this separate source of pain in these patients. Moreover, the spinal column is often involved in compensatory efforts to guard the injured joint(s) from their normal range of motion, so there is a musculoskeletal benefit as well. Likewise, other joints in the affected limb will likely benefit from therapy since they have also been compensating for the abnormal weight bearing in the affected joints.

4 **Not following an adequate induction period for chronic cases**

I advise clients that induction for chronic conditions will take up to 12 treatments when administered 3X per week. I do not mention other numbers—like 6-12 treatments—because clients always remember the smaller number. If induction takes fewer treatments—fantastic! If induction takes 12 treatments, then the prescription was at least accurate. Most case should improve significantly after 3 treatments and remarkably after 6 treatments. Induction is complete once improvement has plateaued.

5 **Not using adjunctive modalities**

Pain management, like anesthesia, is much more effective when using a multimodal approach. The new AAFP/AAHA Pain Management Guidelines now state that using only pharmaceutical management of pain is no longer adequate. Similarly, using adjunctive modalities to your laser therapy—pharmaceuticals (several may be indicated), cryotherapy, passive range of motion, massage, assistive devices, physical exercises, and underwater treadmill—will deliver superior results to your patients.
**Keys to Reaching Deep Target Tissue for Chronic Conditions**

1. **Minimizing Light Loss Due To Blood Absorption**
   - Applying pressure disperses blood (blanching)
   - Blanching increases photon penetration to deeper tissues
   - The maximum dose is delivered to target tissue
   - Blood absorption is a barrier to photon penetration. The amount of photons available to deeper tissues is reduced.

2. **Minimizing Light Loss Due To Reflection Off The Skin Surface by Treating In Contact**
   - Fused silica composition of deep tissue applicator minimizes loss of light as it passes through lens into skin due to similar refractive index.
   - Depending on the design of the system and procedural application, there is a 5% to >30% loss of photons from reflection when treating off contact due to the refractive index differences between air and skin. When treating off contact, higher power is necessary to deliver the same amount of photons at depth.

3. **Selecting The Appropriate Wavelength**
   - Light losses in dark skin and haircoat are approximately 10 times greater than in light skin
   - Most efficient wavelengths for treating deep tissues in light skin 800-830 nm
   - Most efficient wavelengths for treating deep tissues in dark skin 900-980 nm

*When used on contact and with minimal pressure applied to skin surface.*
When treating chronic conditions laser therapy is a great tool to turn to because it can be used in conjunction with the other tools in your toolkit to accelerate the recovery process.

What vets often ask about laser therapy

By Jeff Smith, DVM, CCPR
For The Education Center

This is the first in a series of answers to frequently asked laser therapy questions originally posed on one of Companion Animal Health’s educational “Ask an Expert” webinars. The names laser therapy (LT) and photobiomodulation (PBM) are used interchangeably.

Do most clinics use laser therapy during and/or after surgery? A

Most veterinarians think of photobiomodulation, or laser therapy, primarily as a modality for musculoskeletal pain and rehabilitation. Nonetheless, superficial conditions like wounds and dermatitis respond definitively and quickly to LT. Postop and intraop use of LT for surgical wounds falls into this category, and this is an oft-used and well-substantiated application of PBM.

Both intraoperative and postoperative treatments are done off-contact with the tissue so that sterility is maintained. Benefits include marked reduction in pain, edema, swelling and adhesions, as well as modest improvements in healing quality. Since these wounds tend to be smaller, more superficial areas, both the time and cost of application are low. PBM also follows the new AAHA/AAFP Pain Management Guidelines, which call for nonsurgical/multimodal management of pain.

Patients exhibit less self-mutilation, more postop comfort and incisions that appear to be 20 to 30 hours more advanced in healing than they actually are. Most often the changes for these applications are incorporated into the cost of the procedure or the cost of the post-op pain management package.

What are the benefits of using laser therapy after dental extractions? A

This question closely parallels the postop/intraop question since extractions are essentially a type of dental surgery. Similarly, benefits include marked reduction in pain, edema, swelling and self-trauma, as well as modest improvements in healing time. (PT/ PBM use postdental or post-extraction is also consistent with the AAHA/AAFP guidelines. Treatment times are relatively brief, and we apply the therapy both open mouth (off-contact) and closed mouth (on-contact) to insure optimal tissue dosing.

How do I know which treatment head to use? A

As a rule, the contact heads—deep-tissue applicators or massage ball handpieces—are used for pathologies not visible to the eye. For example: musculoskeletal conditions, abdominal conditions, closed mouth, deep/ordinal ear canal. Why? Because we know that we get 99 percent better dose delivery to deep tissues with the contact heads due to compression, blanching, hair parting and decreased refection facilitating direct introduction of light into the tissue. The noncontact heads—scanning handpieces, or off-contact heads—are used for pathologies visible to the eye. For example: dermatitis, visible otitis, stomatitis, surgical wounds, granulating wounds. Some conditions benefit from using both methods: otitis (superficial and deep), stomatitis (open and closed mouth), and debridging injuries (open wound and surrounding tissue).

How can I improve laser therapy’s performance in old, arthritic dogs? A

First, let’s establish that you absolutely should be achieving very good to excellent results with LT in these patients. If you are not, four primary areas need to be addressed:
- Proper dosage and delivery of the laser therapy. (Per Dr. Smith’s 10 factors in selecting proper doses and using effective laser delivery techniques, email info@companiathetry.com.)
- Inclusion of all affected structures.
- Accurate diagnosis.
- Consideration of multimodal interventions.

How often is laser therapy recommended to treat significant hip dysplasia/OS? A

A kit. These more-advanced cases of OA/HD require following a six- to 12-treatment induction plan (three times per week) using proper dosing technique until clinical improvement is noted. Prescribing a higher dose (i.e., 20 Joules/cm²) might be considered. As a rule, chronic conditions respond to chronic treatment. Gradually transition to one treatment a week with the goal of maintaining desired clinical effects with one treatment every two to four weeks. Remember that multimodal interventions will allow LT to be maximally effective.

Do you have advice for treating severe DM? A

Yes. Robin Downing, DVM, Dipl. ACVSMR, CVPP, and others have seen promising results dosing DM at 30 Joules/cm². This is three times the normal deep-dosing protocols for the spinal segments but is an example of our ongoing and developing knowledge of treating various conditions. This is definitely an example of a case in which I would underpromise and hope to overdeliver because of its more refractory nature and underlying pathology.

If you follow the protocol and the patient fails to respond, do you increase the frequency of treatments or...? A

The most frequent reason for failure is not following recommended protocols or techniques closely. The second reason is not addressing all the areas or all the pain the patient is experiencing. The third is not disagreeing all the problems present. The fourth is relying on LT alone or not incorporating a multimodal approach to the problem or pathology. If those four reasons have been addressed, then my first choice is to double the energy dose to the refractory area and associated areas. So, if I have a dog with a particularly bad hip, I will double the dose to 20 Joules/cm², and I do that by simply using the protocols to treat that hip twice. I might also choose to treat the LS spine in a similar fashion.

How often should the cold laser be used to treat extensive, infected wounds? A

The terms “cold laser” and “low-level laser therapy” (LLLT) are outdated because when device settings range from 0.5 to 15 watts, neither is accurate. The better term is “higher-powered class IV therapy laser.” Even LT has been superseded by PBM to describe the effects of infrared light on tissue. And that is the most helpful and accurate way to move forward as we employ and discuss this modality. My rule of thumbs for extensive wounds is this: I treat them daily for three to six treatments while they are acutely inflamed. After that, I change to three times a week or every other day. This often correlates with the progression in bandage changes from once daily to every other day, and it reflects the now-chronic stage of wound healing that the injury is in. This interval can continue for weeks or months depending on the size of the area that is healing or epithelializing.

Dr. Jeff Smith owns Middletown Animal Hospital and All Valley Equine veterinary practices in Middletown, California. A past president of the California Veterinary Medical Association and a CCPR graduate, he is a frequent lecturer and a consultant to Companion Animal Health.

This Education Center article was underwritten by Companion Animal Health of Newark, Delaware.
Signalment
26 year old American Quarter Horse Gelding, Rio

Patient Symptoms
Severe bursitis and osteoarthritis of the elbow

Medical History
2 IA injections of steroid + Hyaluronic Acid, systemic NSAID’s and chiropractic, joint support supplement in feed – No improvement noted (All treatments tried over a period of 8-12 weeks)

Laser Treatment
7,500 Joules each applied to left elbow and left shoulder (15,000 Total Joules). (Palpated secondary soreness and swelling d/t weight shifting from lameness), beginning three times weekly, then weaning frequency as patient improved.

Patient Updates
After June 2013 Rio received maintenance laser treatments once weekly to his elbow 4-8 weeks for the following year and then only on an “as needed” basis. He is not on any systemic medications, just a chondroprotectant supplement in his feed daily.

Watch the video of Rio’s recovery at http://www.litecure.com/companion/2014/06/case-feature-26-year-old-american-quarter-horse/
IVDD and Rear Limb Paresis, Lhasa Apso

Signalment
7.5 year old, F/S, Lhasa Apso

Presentation
Owners presented patient to the veterinarian after the dog was reluctant to climb stairs. On physical exam, the patient was painful in T-L spine and had motor ability in rear legs but was weak (paretic). Survey spinal radiographs showed narrowed IV disc space at T13-L1 and multiple calcified discs in lumbar spine (evidence of IVDD).

Treatment Details
Laser therapy, 3600 total Joules delivered at 10W, CW from T10-L7 spine EOD until significant improvement was seen (4th treatment) then twice weekly for 2 weeks, then once weekly, then monthly. Other treatments including 20mg Prednisone P OQ 24 hrs for 4 days.

Treatment Results
Before video taken on initial presentation – patient is severely paretic and unable to stand without support. Post video was taken after 4 treatment sessions. Patient is able to stand and ambulate comfortably on her own.

Watch the recovery video at https://www.youtube.com/watch?v=mAZpqP1WzXg
Severe Spondylosis & Osteoarthritis, Pug

Author: VetMed Animal Clinic, Covington, GA

Signalment
11.5 year old, M/N, Pug, “Guiness”

Presentation
History of CHF, epilepsy (on chronic phenobarbital), repeat urinary tract infections (from laying in urine), osteoarthritis, history of CHF (on chronic heart medications). Patient’s chronic UTI’s and urine scald were from immobility. Chronic medications precluded the use of certain pharmacologics for osteoarthritis pain. Spinal/Pelvic radiographs revealed severe spondylosis and osteoarthritis of both hips.

Treatment Details
Laser therapy, 6W for 2519 total Joules over lumbar spine, both hips; every 3 days for 5 treatments, then weaned to maintenance treatment every 2-4 weeks. Other treatments included Missing Link Joint Supplement and acupuncture.

Treatment Results
“After the 2nd treatment, the owners said he was barking and begging for food and treats while they were cooking! He had not interacted this way for several years. By the 4th treatment he ran across the room at home to greet his owners!” – Dr. Rhonda Ross

Watch the video of Guiness’s recovery at https://www.youtube.com/watch?v=6kCCj3_s6Zw/
Condition Focus: Osteoarthritis

Osteoarthritis, German Shepherd

Author: Maumee Valley Veterinary Clinic, Woodburn, IN

Signalment
9 year old, F/S, German Shepherd, “Dakota”

Presentation
Patient presented with posture that was very poor, maintaining a half crouch most of the time. The left stifle revealed a slight anterior drawer motion. The Cincinnati Orthopedic Disability Index (CODI) was only 47 out of a possible normal score of 100. Radiographs revealed severe bilateral osteoarthritis of the hips and likely partial CCL tear in left rear leg.

Treatment Details
3,600 total Joules administered to each hip and 3,300 Joules to left stifle at 10W of CW; Initially EOD frequency for 7 treatments, then decreased to twice weekly for 1 week, then once weekly, now on maintenance schedule of 1 treatment every 4 weeks. Other treatment included Dasuquin supplement twice daily.

Treatment Results
By 7/20 CODI Score had markedly improved (total score 100) and patient was able to easily rise from laying down and walk up and down stairs comfortably on her own.

Watch the video of Dakota’s recovery at https://youtu.be/jY_euKoR8C8?list=PLgqk8w8r8miZHyl46s3GD9SiMGCdJTrmj
Why Does Power Matter When Treating Chronic Conditions?

Often chronic conditions require energy to reach deep target tissue (for example an arthritic hip). To deliver a therapeutic dose higher power lasers will provide you with the flexibility to deliver appropriate doses in clinically relevent times. The infographic below highlights the benefits of a laser that can deliver over 0.5 Watts of power.

Webinar: Successful Therapy Laser Cases and Contributing Mechanisms of Action

In this 60-minute webinar, presented by Lisa A. Miller, DVM, CCRT see award-winning laser therapy cases. Cases covered include:

- Nasal Aspergillosis
- Equine Lagenidiosis
- Severe Necrotizing Wound
- Severe Trauma, Tendon Contracture, Lymphatic Obstruction with Chronic Edema

Watch it now at: http://www.litecureinfo.com/2015CasesAndMechanismsWebinar
Fee Suggestions

Chronic Treatment Plan Development Guidelines

To maximize clinical results it is essential that you have client buy-in to enhance compliance. Consider the following tips when developing fee guidelines:

- Sell treatments in packages to set the expectation of how many treatments it will take to see results. Collect payment up front to increase compliance.
- Sell treatment packages at a % discount vs. single treatments to build value.
- Consider creating pricing levels based on the number of areas your patient needs treated to ensure you are taking into account the amount of staff time that will be required to administer treatment.
It is crucial to apply proper treatment techniques so that the therapy is not only delivered optimally, but safely as well. When combined, all the small details that the operator adheres to form a treatment which delivers therapeutic benefits to the patient.

The first set of proper treatment techniques apply to the laser therapy delivery platform itself. In order to allow the light energy to travel as efficiently as possible, the fiber needs to be fully unwound and should not be kinked or forcefully bent, this will also provide for minimal resistance when the hand piece is maneuvered by the operator. Selecting the appropriate treatment head is an important factor as well. For maximum patient comfort, the small treatment heads should only be used at a maximum power of 3 watts, never higher. The off-contact (often called “cone”) treatment heads should be held at about 1 to 2 inches from the tissue surface, never in direct contact with the patient’s skin or hair coat. The optical window of each treatment head piece must also be clean, intact, and free of any debris, defect, or scratches. The operator will select the appropriate protocol applicable to the condition / body part / surface area being treated. Once these parameters have been selected, we are then ready to begin treating the patient.

The patient should be allowed to position itself so that it is as comfortable as possible, as long as the target site remains accessible. A soft, fleece-like substrate (such as a pad, blanket, or bedding) also makes for an excellent material to rest on. It will also wick away urine if the patient is incontinent. Whenever possible, in treating musculoskeletal conditions, it is best to make direct contact with the deep tissue applicator (aka “the large massage ball” treatment head) to maximize penetration of the light energy into the tissues. If, however, we are dealing with exposed tissues such as with a hot spot, open wound, or a fresh surgical incision, a non-contact technique is required, holding the treatment head at 1 to 2 inches from the surface of the area being treated. When performing the treatment, the treatment head is held perpendicular to the surface of the target tissues to ensure an even beam spot. The laser beam should make a full excursion, crossing over from the affected tissues into the nearby healthy tissue margins, never hovering over the same treatment area. As the treatment is being carried out, the operator will continuously move the hand piece at 1 to 3 inches per second to fully and evenly illuminate the treatment site. The hand piece should never be kept motionless when the laser is being delivered to the patient. The operator will also monitor the patient and treatment area for any possible increase in warmth, which is especially important when treating tissues which are heavily pigmented or with a dense hair coat. The latter also especially applies to the anesthetized patient, such as when treating dental extraction sites, for the patient will not be able to physically respond to any sensation of discomfort or excessive warmth.

Specific parts of the patient also carry inherent treatment nuances. When treating joints or an extremity, it is optimal to treat as circumferentially as possible, while putting that joint through a gentle passive range of motion (if possible) so that all aspects of
the intra-articular surfaces are well illuminated. Any biomechanically associated structures to the target site should also be assessed and possibly considered for treatment, as secondary sites are often affected due to the deterioration of the primary target structures and compensation changes in biomechanics.

When treating with a contact technique, it is usually to the added comfort and medical benefit to the patient to apply a massage-like technique, but care should be taken to decrease applied pressure when passing over a boney prominence, such as a dorsal spinous process, as this may create discomfort in those areas. The laser operator should use both hands to constantly monitor the patient as the treatment is being carried out - feeling for increased coat temperature, withdrawal and/or muscle spasm during treatment.

Applying these treatment techniques is easily achieved - they are all small facets that together create an optimal treatment delivery of this cutting-edge medical modality. An experienced operator following these guidelines will be able to give the patient the full benefit of a treatment well-designed and well carried out in a non-invasive manner.

Did You Know?

**Companion** Therapy Laser is the only laser available with on-contact delivery capabilities?

When considering adding a therapy laser to practice remember - a Class IV laser can be used to treat like a Class III, and the ability to deliver treatments both in contact and off contact are options you will want to have when you start treating chronic patients.
Delivery System Considerations

Patented Deep Tissue Applicator Handpiece Attachment
On-contact application enables you to reduce scattered energy during laser treatments, compress tissue to reach deep-structures, and deliver laser energy and massage at the same time.

Ergonomic Finger Switch Operation
- Easily start, stop, and pause treatment with on-off finger switch operation.

The Most Durable Fiber on the Market
Rubber-shafted, double-coated fiber ensures that the most delicate part of your laser is safe. Extra-long fiber enables easy movement around the patient.

Every Patient, Every Condition, Every Time
Four application-specific treatment attachments to optimize every treatment.
- Large Deep Tissue Applicator: Edema/swelling, deep tissue injuries, and/or arthritis.
- Small Deep Tissue Applicator: Muscular and deep tissue injuries in tight spaces on smaller patients.
- Small Non-Contact Treatment Head: Oral applications or superficial conditions (such as wounds) in smaller areas.
- Large Non-Contact Treatment Head: Superficial tissue conditions (blisters and dermatological lesions) or for use in areas that may be hypersensitive to touch.

Easy-to-Remove Fiber Optic Cable
Easily remove and replace the fiber optic cable with twist-on-off functionality.
Why Choose Companion®?

Your Innovation Partner

The Company

Innovation
Whether you are considering adding laser therapy, regenerative medicine, or another Companion rehabilitation product - Companion allows you to practice reliable, innovative medicine.

You can elevate your standard of care with confidence. Keep a finger on the pulse of the most innovative therapeutic solutions with Companion.

Partnership
You don’t just purchase a product with Companion - you gain a clinical and business partner. Leverage the Companion CORE business consulting program to realize success with any Companion Product.

Education
Never be left behind - Companion provides you with the most current research and applications through a multi-channel education program.

Versatility
Effectively treat a wide variety of clinical conditions with a Companion product.

Synergy
Realize synergy by leveraging multiple Companion products to achieve the best clinical outcomes for every patient. Every time.

The Therapy Lasers

Outcomes
Backed by scientific evidence and on-going research you can achieve the best results with a Companion Therapy Laser. On-going software updates ensure you are always practicing the most current medicine.

Achieve results on acute and chronic conditions alike. Treat with ease with the most species-specific protocols available on any therapy laser on the market.

Clinical Support
Veterinarians are on staff and available to answer your clinical questions. Receive on-going clinical training with monthly webinars and other Companion University educational opportunities.

ROI
Realize ROI with the Companion CORE implementation program. The program includes one-on-one consulting.

Education
Attend live events or monthly webinars for the latest applications.

Customer Support
Never spend a day without your most versatile tool. Customer support and a loaner program ensures you are always up-and-running.
For more information about how a therapy laser can transform your clinic call 877-627-3858 to set up your in-office demonstration.