

A SPECIAL ADVERTISING SECTION

Low-level Lasers: Less is More

By Janet Gordon Palm, DVM, CVCP
For The Education Series

By now there are few people who can dispute the observed benefits resulting from low level laser, or what has been termed "cold laser" therapy. Professional sports teams, rehab facilities, burn units, chiropractors and other medical professionals have been using this technology to treat pain and inflammation and enhance wound healing.

Extrapolating this technology to the veterinary field has also shown exciting promise. Animals do not exhibit a placebo effect so we are able to observe and interpret a more objective outcome.

In August 2011 I presented to the Association of Avian Veterinarians on the use of low level laser therapy in avian inflammatory conditions. I was invited back this past August to lead a three hour roundtable discussion on "Integrating Low Level Laser Therapy into Traditional Practice."

In preparing for this presentation, I was surprised at how many laser-owning practitioners were admittedly unaware of what they had purchased. Many have invested heavily in a high powered "cold laser." This is actually an oxymoron. Class IV lasers produce heat deep within the tissues. The definition of cold laser is non-heat-producing, thus Class IV lasers are not technically cold lasers.

This leads me to my concern in what I see as an over-representation of Class IV high power lasers in the veterinary market. It seems that many have bought in to the marketing sound bite that more power is better and is needed to penetrate deep into large muscle groups. I feel a brief refresher on laser science may be helpful.

LASER 101

LASER—light amplification by stimulated emission of radiation—light is composed of photons. Their wavelengths are coherent (polarized) so all the light energy is unidirectional and can focus on a specific site. Absorption of this light energy in the cell results in a photochemical reaction that stimulates the mitochondria to produce ATP.

Albert Einstein's electron volt theory summarized that the energy of a photon is measured in electron volts. The photon is a form of electromagnetic energy traveling in the form of wavelengths.

Wavelengths less than 400 nanometers (ultraviolet end of the spectrum) have so much energy that electrons are ejected from atoms (ionization). These atoms are unable to share electrons with neighboring atoms to cause any beneficial effects.

However, slightly longer wavelengths in the >400 to

660 nanometer range (violet to red spectrum) have enough electron volt energy to excite electrons to a higher state. These enhanced electrons can share with neighboring atoms in a process known as London Dispersion Effect. This is what allows the bio-stimulation occurring in surface cells to contribute to deeper cells in a branch chain effect of energy transference.

Think of a rack of billiard balls being hit by a cue ball. This is how deeper tissues are reached.

Wavelengths greater than 660 will penetrate deeper, but may not have enough electron volt energy in the photons to excite the electrons. More power in the form of increased wattage is needed to effect bio-stimulation. Unfortunately, this increased power can result in heat within the tissues and eventual potential deleterious effects to the DNA.

Interpretation of the Arndt Schultz Law has been used in a tug-of-war by physicists, let alone by different laser companies. Simply stated, it suggests that increased stimuli will eventually cause bio stimulation, but as the intensity or power increases, bioinhibition occurs.

Classification and Safety Restrictions

Lasers are classified based on the risk of retinal damage, which is dependent on the power of the unit. Low level or "low power" lasers possess 1 milliwatt to just under 500 milliwatts (Class II and III); 500 milliwatts and above is considered high power, and significant retinal damage can occur (Class IV). Many high-power lasers can range as low as 0.5 watt, and although this seems low, it is still 500 milliwatts.

High-powered laser usage requires eye protection for the operator, as well as for anyone within a 20-foot radius of the laser in use. This includes the patient. A special protective room is necessary as well as a designated laser officer to document that the restrictions are upheld. Low power lasers have no such restrictions.

I am concerned that practitioners who aren't aware of the science behind their particular device will become lax in the insurance of public safety. In this litigious society, a client or patient who claims vision impairment, whether legitimately due to laser usage or not, may file suit against an unsuspecting veterinarian. Class action law suits could result. The media would not differentiate the different classes of lasers and the entire technology would be brought into question.

Case Versatility

I have done my research into this technology, as has Pat Brown, DVM, Ph.D. The benefits of the use of the low power laser far outweigh any risks. I have personally performed more than 800 laser treatments, on dogs, cats, horses, birds, rabbits and pocket pets using the Erchonia low level lasers.

Studies are showing that optimal results with low level laser therapy occur when the light is of low intensity, short duration, and is pulsed on and off. I have not experienced a client yet that has been unhappy with the investment, as realistic goals and outcomes are explained. Often, the benefits of laser treatments extend beyond the presenting com-



The first treatment was given on May 1, 2010.



This photo was taken on October 1, 2010.

plaint. Skin conditions cleared as osteoarthritic dogs were showing improved mobility; liver enzymes improved after extended protocols for chronic arthritis.

Communication and case selection are essential to a successful outcome. It is imperative that owners understand that the laser is not a magic wand. When it is used along with other modalities for healing, such as good nutrition, OFAs for viable cell membranes, hydration, exercise and mental enrichment, we can see some phenomenal results. Traditional medications can be selected when needed as well.

I encourage veterinarians who have a high-power laser to seriously adhere to the safety restrictions. There is no question that there are beneficial responses initially, when protocols are strictly adhered to.

The controversy that remains and is being studied is whether the benefits of a true low-power laser (some overpriced LEDs are being called cold lasers) outweigh the risks of high power lasers. It all boils down to whether absorption (and the cascade of resulting systemic responses) is more beneficial than more power and deeper penetration (and the resulting heating of tissues).

In my experience, the structural and systemic benefits I have witnessed while using my true low power laser answers that question. It is like comparing a tool box to a hammer.

Let's be responsible for researching and satisfying our own risk/benefit equation. We are in an exciting time in the medical profession for both animals and humans. We can work together to investigate these new modalities and remain open minded to opportunities in the advancement of healing in the years to come. ●

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This Education Series story was underwritten by Erchonia Corp. of McKinney, Texas.

Chloroplast Stroma

