CUTTING EDGE™
LASER TECHNOLOGIES

Improving Care and Increasing Profits

An Introduction to MLS® Laser Therapy

Chapters

Industry Insights

From recent changes in healthcare legislation to shifts in demand for different pain management modalities, healthcare professionals have always needed to be agile and adaptive in order to stay relevant and profitable in this ever-changing, competitive landscape.

Now, with the worldwide COVID-19 situation, new challenges, priorities and standards of healthcare delivery have begun to develop. In this lesson, we will discuss current challenges and opportunities within the medical industry.

COVID-19

In order to comply with social distancing recommendations from the CDC, patients and doctors have deprioritized nonessential medical visits during the COVID-19 pandemic, including some surgeries, physical therapy and other procedures relating to pain management. However, the pain these patients experience did not take a break and might have even become worse after being neglected for an extended period of time.

While many clinics have been offering telemedicine as an alternative to in-person visits, many physicians are experiencing difficulty diagnosing and treating conditions that require hands-on attention.

As we emerge from COVID-19 and patients begin to feel more comfortable visiting medical pratices for in-person examinations and procedures, a surge of patients in pain is expected as people start to reschedule their pain-related appointments.

It is important for healthcare providers to use this time to prepare for this anticipated increase in demand for pain management. New technologies that lead to better and faster results with shorter treatment and recovery times may be the answer for healthcare practitioners seeking ways to expedite their patients' healing process without compromising the quality of care.

68% of U.S. overdose deaths involve opioids.

The Opioid Crisis

The United States' drug overdose epidemic began in the 1990s when a dramatic increase in prescription opioids for chronic pain was followed by an increase in deaths involving opioids. In 2010, a spike in heroin-related overdose deaths marked the 2nd wave of this crisis. Wave 3 began in 2013 when overdose deaths involving synthetic opioids, particularly those manufactures with fentanyl, began to increase significantly.

While the opioid prescription rate has declined over the past 10 years, almost 68% of the 70,237 United States drug overdose deaths in 2017 involved opioids—most commonly synthetic followed by prescription opioids (natural and semi-synthetic opioids and methadone)—according to the CDC.

Additionally, new concerns regarding opioid use are surfacing as a result of COVID-19. The pandemic causing a rise in drug relapses and patients who use high-doses of medically prescribed opioids as well as individuals with opioid use disorder are likely to be at an increased risk of catching COVID-19 with more severe symptoms due to the drug's effects on the patients' respiratory health.

As a result of the well-documented opioid crisis, states are taking action to protect patient wellbeing by passing regulations that limit opioid prescriptions. Conjunctly, patients' demands for pain management techniques without potentially harmful side-effects is on the rise. New technologies such as medical therapy lasers are now beginning to fill this gap in treatment plans.

Healthcare Reform

As a result of recent healthcare reforms, reimbursements and payment pressures have become some of the top struggles for healthcare service providers. More specifically, deductibles, co-pays, payer denials, and the shift in risk towards providers were ranked as the top reimbursement-related issues by Medical Economics.

In order to remain successful, it is important for medical providers to seek new streams of revenue with a focus on growing their cash-based income to ease their reliance on insurer reimbursements.

60% of millennials suffer from chronic pain.

Patient Demands

As baby boomers age, the demand for pain management will increase. By 2030, it is estimated that one-fifth of Americans will be over the age of 65 and 38 million of them will suffer from chronic pain.

Older adults are more likely to misuse drugs in an attempt to deal with pain. It is imperative for medical professionals to consider ways to alleviate pain within the senior population with methods that don't rely on potentially addictive substances.

However, older adults aren't the only age group suffering from pain. Recent survey results found that 75% of millennials say they have experienced acute pain while almost 60% experience chronic pain. The source of their pain is commonly related to sports injuries and their technology-heavy lifestyle: pain in the neck, hands, wrists or arms.

While millennials are half as likely to use opioids than Baby Boomers, they are more likely to obtain them inappropriately and less likely dispose of unused opioids safely.

Overall, Millennials are more interested in holistic, natural healthcare options over potentially harmful substances or treatments. This can explain their increasing demand for less invasive pain management alternatives to pharmaceutical pain relievers.

If able to meet these demands successfully, healthcare providers have the opportunity to become trusted pain management partners with patients in the millennial generation. These relationships can span the patients' lifetime, providing ongoing revenue opportunities now and in the years to come.

Opportunities

By leveraging innovative technologies such as laser therapy, healthcare providers can expand their services with an in-demand modality that will differentiate themselves from competitors and grow their cash-based revenue stream.

Years of research has proven that low level laser therapy is an effective, low risk treatment option for pain and inflammation both in conjunction with pharmaceutical therapies and as a standalone modality that can reduce the need for prescription pain relievers.

Laser therapy can be a solution to the growing concerns revolving around prescription pain medication while also meeting patients' demands for effective, non-surgical relief of pain and inflammation.

Introduction to Laser Therapy

Low-level laser therapy (LLLT) uses light to favor and accelerate the body's natural healing processes. The laser beam is moved over the skin so that the light energy (photons) penetrates the tissue where it interacts with various molecules (chromophores) that cause different biological effects to promote tissue regeneration, reduce inflammation and relieve pain.

The Science of LLLT

Laser biostimulation was discovered by Dr. Endre Mester at the Semmelweis University in Budapest, Hungary. After the first laser was invented in the 1960s, he conducted an experiment to determine if laser radiation could cause cancer in mice. After shaving their backs, he divided the mice into two groups and irradiated one group with a low-powered ruby laser of 694nm. The treated mice did not get cancer. In fact, their hair grew back faster than the control group.

Since Dr. Mester published his study in 1967, over 100 phase III, randomized, double-blind, placebo-controlled, clinical trials have been published by over 1,000 laboratory studies investigating the primary mechanisms and secondary effects. Clinical trials with positive outcomes have been published on the treatment of pathologies including osteoarthritis, tendinopathies, wounds, neuropathy, musculoskeletal conditions and many others.

Current research on the mechanisms of LLLT effects focus on the mitochondria. With the ability to convert food molecules into energy in the form of ATP, the mitochondria absorbs monochromatic visible and near infrared radiation. The effects of the therapy laser on the mitochondria include increased proton electrochemical potential, RNA and protein synthesis, oxygen consumption, membrane potential and enhanced synthesis of NADH and ATP.

When treating patients for pain and inflammation, the laser beam is typically applied to the injury for a few minutes at a time for multiple times a week. Patients can expect to see results after several weeks depending on the severity of the condition.

Read More clinical research articles at the Cutting Edge Knowledge Center.

Types of Lasers

The United States Department of Energy's Lawrence Berkeley National Laboratory classifies lasers according to their potential to cause biological harm. The relevant criteria include:

- Output of energy and power
- Radiation wavelengths
- Exposure duration
- Cross-sectional area of the laser beam at the point of interest

Additionally, lasers are classified in accordance with the accessible emission limit (AEL), meaning the maximum accessible level of radiation permitted within a particular class.

Safety thresholds are signified in terms of maximum permissible exposure (MPE), meaning the highest energy or power density that is considered safe or has minimal potential for causing damage.

The Lawrence Berkeley Laboratory recognizes eight classifications of lasers but most LLLT fit within Class 3B.

While LLLT wavelengths vary by product, it has been determined by research that the optimal range is approximately 600nm to 1200nm. This is referred to as the "therapeutic window" because there are no chromophores with the ability to filter the light emission in this range.

While still hazardous for eye exposure, Class 3B lasers are low-power and are not considered a burn hazard. However, this low level of power provides limited biostimulation, often requiring patients to experience long treatment times and many sessions before seeing results.

High-power (HP) therapy lasers are considered Class 4—the highest and most hazardous classification. HP therapy lasers are developed with greater power than LLLT with the intention to be more effective and efficient. However, with higher power comes a greater risk of burning tissue in the treatment area. Most HP lasers cannot be operated at their maximum power without causing damage to the patient.

However, innovations in the laser technology market are surpassing the limits of many low-level lasers while avoiding the hazards associated with high-power lasers.

Class 1

A laser that is safe for eyes under all reasonably anticipated operating conditions, such as barcode scanners.

Class 1 Product

A product that contains a laser of a higher class but is confined so the radiation is prevented.

Class 1M

A laser that is safe for viewing with the naked eye but could be made hazardous with the aid of an optical instrument.

Class 2

In the visible region. Safe for accidental viewing assuming there is an aversion response. Prolonged viewing may be hazardous.

Class 2M

Safe for accidental viewing but could be made hazardous with the aid of an optical instrument.

Class 3R

Five times the emission limit of Class 1 and 2 lasers but risk of injury is low. Produces no more than 5 mW in the visible region.

Class 3B

Eye exposure may be hazardous but can be diffused to non-hazardous levels. Wavelength is above 315 nm but does not exceed 0.5 watts.

Class 4

May cause permanent eye damage or burns. Continuous output levels start at 500 mW. Pulsed systems can produced over 125 mJ in less than 0.25 seconds.

The Unique Benefits of MLS® Laser Therapy

Raising the standard for laser therapy, innovative and patented Multiwave Locked System® (MLS) technology was developed in an effort to produce an efficient and simultaneous effect on pain, inflammation, and edema, exceeding the limits of traditional LLLT and avoiding concerns of high-power therapy lasers, such as burning.

What is MLS?

MLS Laser Therapy is a unique type of Class 4 laser that utilizes a patented emission system to precisely synchronize simultaneous dual wavelengths, as well as simultaneous continuous and pulsed emissions, resulting in optimum clinical effectiveness. The MLS emission provides more efficient biostimulatory results, with less energy, in considerably less time compared to traditional laser therapy.

The FDA-cleared MLS Therapy Lasers use both 808nm and 905nm wavelengths simultaneously as a continuous and pulse emission, respectively.

The 808nm continuous emission reduces inflammation by stimulating blood and lymphatic circulation and inducing re-absorption of fluid build-up. However, this emission only has a secondary effect on pain, which is diminished after reducing the inflammatory process.

The 905nm pulsed emission, on the other hand, has an almost immediate effect on pain since it is able to induce analgesia, interfering with the very transmission of the pain impulse to the brain, but is less effective at treating inflammation and edema.

By synchronizing these two emissions, MLS Laser Therapy takes advantage of each wavelengths' unique benefits. Thus, allowing MLS to provide more effective treatment than traditional therapy lasers that follow the methodology of delivering a single emission and wavelength at a time.

Clinical Research

MLS Laser Therapy has been developed and tested following a strict course of biomedical and clinical research. The effectiveness of the combined emissions that make up the MLS pulse were initially tested in vitro on cellular cultures, then in vivo on animals, and finally by means of controlled clinical trials run by major state-of-the-art health organizations for treating traumatic and degenerative painful diseases.

Italy's University of Turin's biology department as well as Brazil's University of Padova's departments of biology and anatomy have studied and verified that the clinical effectiveness of the MLS impulse provides more efficient biostimulatory results with less energy in considerably reduced times in comparison to traditional LLLT.

In a study conducted by the University of Padua Hospital in Italy, 20 patients suffering from cervicalgia were treated with MLS once a day for 10 days. At the end of treatment, all patients experienced noticeable improvement from painful symptoms—falling from an average of 8 on the pain scale to an average of 2. However, the most significant reduction of pain was observed within the first 5 sessions measuring their pain at an average of 3.5 at the end of session 5.

Read the full research article and others in the MLS Laser Therapy **Scientific Report**

Medical Benefits

Indications for MLS Laser Therapy can include:

- Muscular and skeletal system trauma, including sprains and strains
- Degenerative illnesses of articular or neuromuscular origin
- Inflammatory conditions, including those affecting the elderly
- Oedema due to circulatory stasis, reduced lymphatic drainage or trauma
- Superficial lesions and other painful conditions of various origins

MLS Laser Therapy has been proven to be effective for both acute injuries and chronic conditions, including conditions that have previously failed to traditional treatment methods.

Reduction of response times, and therefore overall treatment times, distinguishes MLS Laser Therapy from traditional laser therapy with reciprocal advantages for both the operator and the patient.

In most cases, six to ten applications are sufficient to obtain excellent results for acute pain and inflammation. Ten applications are typically recommended for chronic conditions.

MLS has also been adapted into a robotic laser. The robotic system automatically provides consistent dosing for each patient and minimizes contamination concerns with its non-contact delivery system. After treatment protocols are set, there is no need for a dedicated technician allowing for more productivity within the practice and compliance with new standards of social distancing.

Primary Biological Effects

Photochemical

Direct transfer of energy to the biological sublayers (endogenous or exogenic chromophores) resulting in:

- Enzyme activation
- Increased ATP production
- Modulation of cellular metabolism
- Effect on pain perception threshold

Photothermal

Conversion of option radiation into thermal energy which, at a microscopic level, occurs through the inelastic encounter between excited molecules following the absorption of photons.

- Increased circulation
- Increased supply of oxygen and nutrients

Photomechanical

Absorption of energy involves the formation of mechanial waves.

- Production of an extracelluar matrix important for tissue repair and regeneration
- Acceleration of lymphatic peristalsis
- Re-absorption of edemas
- Reactivation of microcirculation

Secondary Biological Effects

The combined wavelengths and emissions of MLS Laser Therapy also have secondary biological effects including analgesic, anti-inflammatory and anti-edema effects caused by:

- Blocking pain stimulus conduction
- Increasing endorphin synthesis
- Increasing the caliber and modulation of lymphatic and capillary vessel permeability
- Increasing blood flow to “wash out” algogenic substances and pro-inflammatory molecules.

The biostimulating effects include an increase in the supply of nutrients, oxygen and growth factors (fibroblasts) to the cells as well as cellular function activation, proliteration and differentiation.

In tissues, a modulation of inflammatory processes has been observed, along with the induction of lymphatic and vascular regeneration and the stimulation of endothelial function.

The protection against the formation of scar tissue and hyperkeratosic lesions has also been observed.

The Business of Laser Therapy

In addition to it's medical benefits, MLS Laser Therapy allows physicians to leverage technology to provide higher quality patient care while attracting new clients, generating additional revenue, and ultimately improving the practices' bottom line with a rapid return on investment.

- Superior clinical results in both routine and specialty treatments without the use of pharmaceuticals or surgery
- Automatic treatments with robotic therapy lasers maximize practice productivity by eliminating the need for a dedicated technician
- Short learning curve allows practitioners to build upon preexisting therapy skills
- Practice differentiation by leveraging technology for better medicine
- Rising consumer demand for laser technology

Increase Value to Patients

With increasing competition from other healthcare providers, including hospital-owned practices and outpatient care centers, specialization is becoming increasingly important in order to differentiate your practice and attract new patients.

By increasing the value of their services, physician who specialize out-earn those who don't. By specializing, you have the opportunity to excel at and invest in treatments common for the condition or group of conditions you focus on. Not only does this attract new patients, especially through referrals, but it allows you to charge more for your expertise and heightened quality of care.

Grow Your Patient Base

With laser therapy, you can expand the conditions you are able to treat as well as open new opportunities for treatment options for the conditions you already focus on. With the ability to attend to more conditions with more treatment options, your practice can tap into new markets of patients that are often burdened with pain but embrace alternatives to drugs and surgery.

With over 60 million runners in the U.S., this is a growing and passionate community with participants of all ages. However, 70% of runners will experience a related injury, such as plantar fasciitis. While difficult to treat with traditional methods, plantar fasciitis has been observed to respond exceptionally well to MLS Laser Therapy.

The running community tends to embrace alternative treatments to pharmaceuticals and surgery, especially younger individuals who are much more accepting of and willing to try new methods and technologies. Since running is often a lifelong activity, healthcare providers have the opportunity to build strong relationships with younger patients who could offer loyal, repeat business as they age.

> We challenge the [MLS Therapy Laser] with some of the toughest possible diagnoses in patients available, and routinely we saw surprising results among a large number of them. We have even successfully used it for patients who postoperatively had a 'less than satisfactory' outcome and turned them into painless conditions.
>
> Due to it's success in our practice, a large number of patients have been referred to us specifically for it and now we have three MLS units. Within weeks of beginning the use of the lasers, they have become cash flow positive for their month expense to the practice."

Dr. Ronald D. Gardner, MD
Gardner Orthopedics

Patient Attitudes Towards Cash-Based Modalities

Given the recent changes to insurance reimbursement models and growing pressures on profit margins, it is important for healthcare providers to consider expanding their revenue streams with new technologies that satisfy patient needs while creating new sources of cash-based income.

While laser therapy is typically not covered by health insurance providers, it is an effective in-demand option that many patients are willing to pay for out-of-pocket for hard-to-treat conditions that have not responded well to other methods.

However, laser therapy doesn't need to be a last resort. Patients are becoming increasingly hesitant to take opioids and other strong pain medications due to their potentially harmful side effects.

Many also want to avoid painful injections and invasive surgical procedures that may require downtime. This makes laser therapy an appealing option to patients despite the out-of-pocket expenses.

Additionally, high deductible insurance plans are changing patients' attitudes towards cash modalities. Depending on the condition and necessary procedure, paying cash for laser therapy may be a more cost-effective alternative than the deductible charged by their insurance provider. While every patient's situation will be different, the potential for savings along with the medical benefits are strong selling points for laser therapy treatments.

> "I started by talking to current patients who had conditions that I thought would benefit from the laser. I was actually surprised at how many wanted to get laser treatments, especially because insurance would not cover it. I was even more surprised with the results... My MLS laser has been part of many great success stories in a short time."

Dr. Jason D. Jones, DC
Jones Family Chiropractice

Summary

With steep competition in the medical marketplace and changing reimbursement models, it is important for healthcare providers to seek new ways to differentiate their practive by expanding service offerings and improving patient care while also boosting their cash-based revenue stream and preparing for the anticipated increase in demand for pain management modalitist as we emerge from COVID-19.

With MLS Laser Therapy, medical practitioners can leverage technology to satisfy patient demands for effective drug free, non-surgical pain management options and combat declining insurance reimbursements with an in-demand cash-based pain management modality.

800.889.4184
www.celasers.com

CUTTING EDGE™
LASER TECHNOLOGIES