

# Photobiomodulation Therapy: A Possible Answer to the Opioid Crisis

Gerald Ross, DDS

## Introduction

PHOTOBIMODULATION THERAPY (PBMT) FOR pain control is not something new. In the 1660s, Andre Mester in Hungary was using a Ruby Laser for better healing as well as for pain control. The article “Biphasic Dose Response on Low Level Light Therapy,” by Huang et al.,<sup>1</sup> discusses the Arndt–Schultz curve, whereby low dose produces a stimulatory effect and high doses give an inhibitory effect. It is this inhibition that provides the ability of PBMT to reduce pain.

There is an ongoing crisis throughout the world; a huge spike in deaths caused by people overdosing on opioids. According to the National Institute on Drug Abuse (a branch of the National Institute of Health-NIH), every day >130 people in the United States die from an overdose on opioid narcotics. In 2017 alone, there were 70,237 drug overdose deaths in the United States and, of those, 47,600 were due to opioid overdose.<sup>2</sup>

The Center for Disease Control (CDC) estimates the total economic burden of prescription opioid misuse alone in the United States is \$78.5 billion a year.

In Canada, Statistics Canada released a report indicating that life expectancy rates in Canada have stopped increasing for the first time in four decades. The report blames opioid-related overdoses for this.<sup>3</sup>

The vast majority of those addicted to opioids started with a medical prescription for painkiller. This has resulted in a number of multibillion-dollar class action lawsuits against various drug manufacturers for their contribution to the opioid crisis.

Under U.S. President Trump’s orders HHS unveiled a new Five-Point Opioid Strategy<sup>3</sup>:

- Improve access to prevention, treatment, and recovery support services.
- Target the availability and distribution of overdose-reversing drugs.
- Strengthen public health data reporting and collection.
- Support cutting edge-research on addiction and pain.
- Advance the practice of pain management.

It is this last initiative that represents an opportunity for PBMT to strengthen its acceptance in mainstream medicine.

On October 11, 2018, Congress held its first-ever briefing on ending opioid use through innovative medical technologies for pain management, with PBMT being the featured technology.

James Carroll (CEO, Thor Photomedicine), Professor Praveen Arany (State University of New York at Buffalo and president of WALT), and Annette Quinn, RN (Radiation Oncology, University of Pittsburg Cancer Center) introduced the science and promise of PBMT therapy to a capacity crowd of senior policy officials from the House and Senate, the Executive Branch and leading think tanks.

As a practicing dentist for >48 years, I have seen a dramatic difference in how PBMT has eliminated use of narcotic pain prescriptions in my practice. I still do some very difficult dental surgeries; however, never prescribe opioids for pain. At most I will give a prescription for an NSAID and tell the patient to take one when they get home. In 90% of the cases, patients report that one is all the patients felt they needed to help manage the postsurgical pain. In a randomized placebo-controlled split-mouth study on 60 patients, Kahraman et al. compared the use of PBM, applied intraorally on 30 patients and extraorally on the other 30, after extraction of full bony impacted wisdom teeth.<sup>4</sup> The other side of each group was treated with a sham laser. The laser treatment was applied immediately before and after the surgical procedure using 3 J/cm<sup>2</sup>. The study evaluated postoperative pain and healing of the sockets, with the intraoral application showing superior results to the extraoral application and the placebo.

Approximately 50% of my treatment time is spent treating facial pain on a referral basis. These are temporomandibular disorder cases, temporomandibular joint arthritis, myopathic pain, neuropathic pain, and trigeminal neuralgia. These are cases in the past where I often had to use opioid prescription to control the pain. I no longer prescribe opioids for these patients and have found PBMT to be effective in allowing patients to manage their pain. In the cases of neuropathic pain and trigeminal neuralgia, I often collaborate with their physician or neurologist to help get them off the use of opioids.

Another area that shows promise in clinical studies and literature reviews is the use of PBM in the treatment of mucositis in cancer patients. Medicine had no answer for treating this problem and PBMT has prevented so many patients from starting on opioids.

Chow et al. in their review *Photobiomodulation: Implications for Anaesthesia and Pain Relief* concluded that her review provides strong evidence neuroscience identifying inhibition of neural function as a mechanism for the clinical application of PBM in pain and anesthesia.<sup>5</sup>

The door is now open, showing PBM can reduce the number of opioid prescriptions; it is up to the researchers to complete the story.

#### Author Disclosure Statement

I am paid a fee for conducting diode laser and PBMT courses, but have no financial interest in any of these companies.

#### References

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Address correspondence to:  
*Gerald Ross, DDS*  
22 Queen St N Box 190  
Tottenham, Ontario, Canada  
LOG 1W0

E-mail: ddsross@rogers.com