Introduction

Photonic stimulators are devices that produce infrared light. This light is directed at specific parts of the body to increase blood flow and, allegedly, relieve pain. There appear to be several devices on the market, including the Photonic Stimulator (Computerized Thermal Imaging (CTI)/Bales Scientific, Inc.); the SSIR System (Russian-American Technology Associates, Inc.); the Super Nova/Acubeam systems (Light Force Technology, Inc.), Light Patch (BioScan, Inc.); Nu Photonics Pain Therapist System (Nu Photonics, Inc.); and the Anodyne Therapy System (Integrated Systems Physiology, Inc.)\textsuperscript{1,2} At least one of these devices, the CTI Photonic Stimulator, has received Health Canada licensing authorization.\textsuperscript{3}

This treatment seems to be used by a range of health practitioners, including physicians, physiotherapists, chiropractors and those involved in sports medicine. According to the CTI web site the list price for their Photonic Stimulator is US$6,500 plus tax. A recent news release quotes a CTI representative as saying that the Photonic Stimulator is more powerful than laser equipment used for infrared light therapy. Apparently, the Photonic Stimulator emits 400 milliwatts of power during the treatment, while lasers typically emit 20 milliwatts. "However, it's also safer...because the light is diffused over an area rather than focused, like a laser."\textsuperscript{4} CTI estimates that between 100 and 150 Photonic Stimulators are in use in the US.

Research Question

Is there evidence that photonic stimulation is an effective treatment for chronic pain?

Assessment Process

Preliminary literature searches were run on PubMed, The Cochrane Library and the CRD databases (NHS EED, DARE and HTA). Very little on photonic stimulation for chronic pain was identified in these searches. However, it is possible that further searches, using broader terms, such as infrared laser therapy or phototherapy and additional databases that cover the alternative medicine literature may retrieve some relevant studies. The terminology used for this type of therapy seems to vary and there does not appear to be a standard treatment regimen used in photonic stimulation treatment.
Summary of Findings

There is little high quality controlled clinical trial evidence for these therapies.

A US Food and Drug Administration (FDA) warning letter to Bales Scientific in March 2000, describes claims made by the company's web site regarding the use of photonic stimulation for various clinical conditions. The FDA's 510(k) approval of this device specified that the device was cleared to "emit infrared light that penetrates the skin to promote increased blood flow and circulation, thereby providing safe, temporary relief of minor aches and pains where heat is indicated." The FDA clearance did not include treatment of specific medical conditions. However, various Internet web sites currently promote the use of photonic stimulation for a wide range of conditions including: headache, diabetic neuropathy, wound healing, myofascial pain, temporomandibular joint pain, back pain, reflex sympathetic dystrophy, stress, hiatus hernia, gout and restless leg syndrome.

The FDA approval of the SSIR System outlines the following indications for use:

The SSIR system is intended to emit energy in the infrared spectrum to provide topical heating for the purpose of elevating tissue temperature for: temporary relief of minor muscle and joint pain and stiffness, minor arthritis pain, or muscle spasm; the temporary increase in local circulation; and/or the temporary relaxation of muscle.

An Aetna health insurance coverage policy bulletin entitled Infrared therapy, states that "Infrared light treatment is covered when medically necessary as a heat modality in physical therapy." However, the bulletin also states "There is no evidence that infrared light therapy is any more effective than other heat modalities in the symptomatic relief of musculoskeletal pain. Glasgow…reported on the results of a randomized controlled clinical trial of low-level infrared therapy in 24 subjects with experimentally induced muscle soreness and found no significant differences between treatment and placebo groups."

However, a 1992 randomized trial of 50 patients with degenerative osteoarthritis of the knees concluded that "low-power light therapy is effective in relieving pain and disability in degenerative osteoarthritis of the knee."

Researchers in Japan reported improved outcomes in small studies using another photonic stimulation system, Super Lizer™, in treatment of temporomandibular joint and herpetic pain. A 1981 paper by Lewith et al. reports on a trial of 26 patients randomized and treated with either a placebo treatment or an "Infrared gun". "In the group receiving treatment from the infrared gun (IRS Medtec 100), 75% obtained significant pain relief. In the group receiving mock TNS, 31% obtained significant pain relief."
A systematic review of low-level laser, electrotherapy and ultrasound for various types of musculoskeletal conditions found:

Virtually no conclusive clinically relevant effects of the three forms of physical therapy…Possible exceptions are electrotherapy for osteoarthrosis of the hip or knee, laser therapy for pain treatment and rheumatoid arthritis, and ultrasound treatment for epicondylitis lateralis. But even for these putative indications, further research is clearly needed before implementation in practice is justifiable.¹¹

Similarly, a 1999 trial found no evidence to support the claims of biostimulating effects of low level laser or phototherapy on muscle aches,¹² and a 2001 Australian review concluded that "low power laser therapy appears to be no more efficacious than placebo in relieving musculoskeletal pain."¹³

**Conclusion**

A more comprehensive literature search would be required before definitively stating that there is no reliable evidence of the effectiveness of photonic stimulation for the treatment of chronic pain. However, the results from preliminary searches and the work of others indicate that further searches would not likely find sufficient high quality evidence upon which to base an assessment of this technology.

**References**


