

[IMAGE]

## Low-Level Laser Therapy

By Dr. William J. Kneebone

*With FDA approval and more than 30 years of research on its side, lasers might soon become a frontline treatment option for doctors looking to relieve patients' pain and accelerate injury healing.*

Laser/phototherapy has been used worldwide to treat more than 150 different conditions. What conditions usually respond to laser therapy? The list is long and includes joint sprains, muscle strains, swelling and inflammation in joints, pain associated with wounds and burns, muscle spasm, nerve pain, carpal tunnel syndrome, low back and neck pain, and various knee and elbow injuries.

Physics researcher Theodore Maiman and his team gave the first public presentation of laser technology to the press at Hughes Research Laboratory in California on July 7, 1960. Its first medical application was for laser surgery in 1970. Dr. Anton Mester, a Hungarian physician, was the first to observe the tissue-healing effect of low-level laser irradiation while attempting to use a laser to treat cancerous tumors in rats in 1967. His unexpected observations opened up a whole new world of possibilities for wound healing, pain relief and many other exciting applications. This has come to be known as *low-level laser therapy*.

Low-level laser. - Copyright © Stock Photo / Register Mark LASER is an acronym for Light Amplification by Stimulation Emission of Radiation. Laser and other non-laser light therapies are collectively known as *phototherapy*. Low-level laser therapy has been researched for more than 30 years, with more than 2,500 published articles from all over the world. Low-level laser therapy has a specific *photobiomodulation* effect on body tissues. This is a term used to describe the chemical changes that occur in the cells and tissues in response to exposure to laser and non-laser light therapies. These effects have been described as primary tissue effects, secondary tissue effects and tertiary tissue effects.

Medical lasers are regulated by the Food and Drug Administration (FDA). They are classified into one of five categories or classes. Classification is related to the potential for causing eye damage. Class 1 lasers are used in such things as television remotes or CD players and can't cause eye damage. Class 2 lasers are therapeutic and have a very low potential for eye damage. Class 3-A lasers are considered safe, but with some potential for eye damage possible. Class 3-B lasers are considered safe, but have more potential for

eye damage. Class 4 lasers are very powerful and have significant potential for eye damage. It's important to note that when using any class of lasers, both doctor and patient wear laser safety glasses to filter out harmful infrared light. Thus, all therapeutic lasers are safe when used following established protocols.

Therapist using low-level laser therapy on his wrist. - Copyright â Stock Photo / Register Mark In short, laser therapy has very few contraindications and is an extremely safe therapy. The FDA recommends that low-level laser therapy not be used for the treatment of a cancerous tumor, direct treatment to the thyroid, or when treating a patient with photosensitivity. Laser/phototherapy can be used when other electrical modalities are contraindicated, such as a patient with any type of metal joint implant, prosthesis or screws. It can be used safely on patients of all ages. Your doctor can tell you more about the benefits of laser therapy and if this exciting treatment technique is right for your condition.

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**Primary tissue effects** are direct chemical effects on cells. They include increasing the production of **ATP** (adenosine triphosphate), which is the cellular fuel our body uses to function. The more ATP in our cells, the faster healing occurs. Laser irradiation of the cells also increases cell membrane permeability. This means waste products within the cell can be removed more efficiently and nutrients can move into the cell more quickly and efficiently.

**Secondary effects** are chemical "chain reaction" effects that occur in response to the primary cellular effects. They include a decrease in nerve irritability, anti-inflammatory effects, and an increase in circulation at the site of injury or chronic pain.

**Tertiary effects** include a variety of whole-body effects, such as increased immune cell production (*lymphocytes*); increased production of the body's own pain relievers, called *endorphins*; and improvement of nerve function.

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