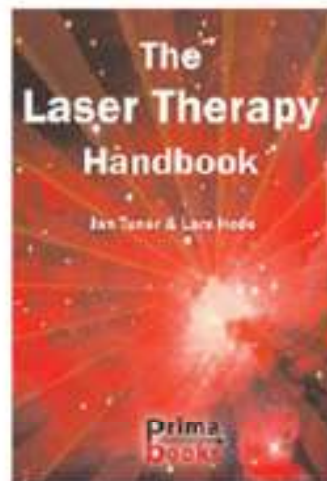


Tunér and Hode's The Laser Therapy Handbook is generally regarded as the most comprehensive and accessible body of research and information on Therapy Lasers.

Both authors are much-published members of the Swedish Laser-Medical Society. Dr. Tunér is also a board member of the World Association for Laser Therapy.



This 589-page compendium details over 1400 scientific references.

The authors themselves state that we all have a lot to learn together - this valuable tool will arm you with the best possible understanding of laser physics, application, and efficacy.

*Following are some excerpts from the 2004 edition...*¹

Mechanisms

Treatment with laser therapy is not based on heat development but on photochemical and photobiological effects in cells and tissue.²

...if laser light is administered in the right dose, certain cell functions are stimulated, and this is particularly evident if the cell in question has an impaired function.³

...secondary effects which have been studied and measured in various contexts: increased cell metabolism and collagen synthesis in fibroblasts, increased action potential of nerve cells, stimulation of the formation of DNA and RNA in the cell nucleus, local effects on the immune system, increased new formation of capillaries by the release of growth factors, increased activity of leukocytes, transformation of fibroblasts to myofibroblasts, and a great number of other measured effects.⁴

Laser therapy also has been shown to act directly and selectively on the autoimmune system, restoring immunocompetence to cells.⁵

Clinical and experimental experience shows that laser therapy has its greatest effects on cells/tissue/organs affected by a generally deteriorated condition, such as in patients suffering from some type of functional disorder, infection or injury to tissue. The light energy seems to produce the greatest benefit where it is most needed.⁶

The regeneration of bone tissue is of central interest in relation to a great number of operations....All wavelengths have been shown to influence bone regeneration, but as always the penetration of the different wavelengths must be taken into consideration...It is suggested that the irradiation can biomodulate non-differentiated mesenchymal cells into osteoblasts and osteocytes.⁷

[re: arthritis treatment] Laser therapy partly seems to influence the synovial fluid and its membranes and the articular cartilage. The PGE₂ activity is also modified, as well as interleukin 1-β.⁸

Improving the microcirculation in tissue is one of the most important aspects of laser therapy. The self-healing capacity of the body will improve considerably if more blood is circulating in the tissue. Improved microcirculation in the region will also enhance the uptake of concomitant pharmaceutical agents.⁹

It is known ... that all light affects the living organism, but in a number of studies in which the effects of light from various sources have been compared, the laser light is shown to give the strongest effect.¹⁰

Safety

Laser therapy offers a safe therapeutic medical modality that is free from side effects. The unique quality of laser therapy is its universal usefulness...After more than 30 years of use, no harmful side effects have been reported.¹¹

It should be emphasized that healthy tissues do not react adversely. Thus, the healthy tissues covering a deep target will not be damaged.¹²

[re: treating human low back pain] High doses are essential. Laser therapy is a risk-free treatment modality.¹³

...These three reports indicate that laser therapy does not cause damage to tissue, even when very high doses are given.¹⁴

Efficacy and Applications

The scientific documentation in the field of veterinary medicine is extensive, with over one thousand published studies on animals.¹⁵

Anyone with medical knowledge can successfully use laser therapy after an introductory course.¹⁶

Laser therapy of wounds is ideal, since it promotes healing and reduces pain at the same time.¹⁷

[re: pre-op use] All irradiation, even of healthy tissue, activates a variety of processes...If trauma occurs immediately after irradiation, however, the tissues' defence systems are in a more favourable state. If the tissue is already in poor condition prior to the operation (oedema, inflammation, etc.), laser energy is even more beneficial pre-operatively.¹⁸

Acupuncture with lasers is one of the most exciting areas within laser therapy.¹⁹

[on why some people are skeptical] It is indeed hard to accept the fact that one single therapy modality can have an effect on so many indications.²⁰

It has been shown to be beneficial to treat at closer intervals in the beginning...and then longer and longer intervals.²¹

It is worth noting that laser light also can penetrate bone.²²

A rule of thumb is that a sports injury takes a little more than half the ordinary healing time if the healing process is stimulated with laser therapy.²³

In the clinical situation, laser therapy is often used in combination with other therapies. While this is not a good research set-up, it is very often advantageous in the clinic. Laser therapy will enhance the outcome of traditional therapies.²⁴

Kaplan, one of the pioneers of CO₂ laser surgery, attributes the excellent healing and lower postoperative pain experienced with CO₂-laser surgery compared to conventional surgery to the simultaneous laser therapy effect. Laser surgery and laser therapy, Kaplan argues, should be regarded as two sides of the same coin.²⁵

It is sometimes the case that pain disappears very quickly after a treatment session. It is then essential for the damaged tissue (e.g. an inflamed tendon) that caused the pain not to be overloaded...It is vital to inform the patient that... (he/she) is responsible for avoiding any stress to the injury.²⁶

The regeneration of damaged nerves is one of the most promising indications for laser therapy.²⁷

Epicondylitis is known to be a difficult-to-treat condition... laser therapy should be one of the first treatment modalities to be used.²⁸

Power and Penetration

Even though it is possible to attain some effects with a 1-2 mW laser, there is no doubt that with a laser 100 times stronger, it is much easier to achieve biostimulating effects, at least if one intends to use treatment periods of the same length. Power density is also very important!²⁹

It is speculated that "high-powered" therapeutic lasers actually can put sufficient energy into much deeper layers of tissue, due to the high power density of the beam. Previous treatment efforts may have been somewhat less successful due to inadequate power density in deeper tissues. Increased treatment time cannot completely compensate for lower power density.³⁰

For the moment, we must rely primarily on our own clinical experience...It would appear that "high-powered" therapeutic lasers will be able to further expand the scope of laser therapy.³¹

...some wavelengths (are) more effective than others, due to better penetration of infrared light in large joints...It is essential that the large and deep-lying joints be given a sufficient dosage.³²

Output power is of great consequence in that a higher output power gives a higher power density, which is often very beneficial. Output power is also of some importance with respect to light penetration in tissue.³³

[re: treating at great depth] Only the GaAs and the high-powered GaAlAs laser can reach to these depths, but the therapist's knowledge of anatomy is also crucial.³⁴

The important thing is not only the nominal output of the diode; the power density is also very important.³⁵

¹ Jan Tuner & Lars Hode, *The Laser Therapy Handbook* (Grangesberg, Sweden; Prima Books AB, 2004)

² *ibid.* p. 65

³ *ibid.* p. 65

⁴ *ibid.* p. 65

⁵ *ibid.* p. 153

⁶ *ibid.* p. 97

⁷ *ibid.* p. 129

⁸ *ibid.* p. 121

⁹ *ibid.* p. 156

¹⁰ *ibid.* p. 111

¹¹ *ibid.* back cover

¹² *ibid.* p. 55

¹³ *ibid.* p. 155

¹⁴ *ibid.* p. 106

¹⁵ *ibid.* p. 284

¹⁶ *ibid.* p. 115

¹⁷ *ibid.* p. 196

¹⁸ *ibid.* p. 83

¹⁹ *ibid.* p. 86

²⁰ *ibid.* p. 111

²¹ *ibid.* p. 81

²² *ibid.* p. 96

²³ *ibid.* p. 178

²⁴ *ibid.* p. 93

²⁵ *ibid.* p. 100

²⁶ *ibid.* p. 105

²⁷ *ibid.* p. 161

²⁸ *ibid.* p. 145

²⁹ *ibid.* p. 53

³⁰ *ibid.* p. 54

³¹ *ibid.* p. 53

³² *ibid.* p. 121

³³ *ibid.* p. 70

³⁴ *ibid.* p. 85

³⁵ *ibid.* p. 55