

PHYSIOLOGICAL AND BIOLOGICAL EFFECTS OF LASER THERAPY

- 1. Accelerated Tissue Repair and Cell Growth:** Photons of light from lasers penetrate deeply into tissue and accelerate cellular reproduction and growth. The laser light increases the energy available to the cell so that the cell can take on nutrients faster and get rid of waste products. As a result of exposure to laser light, the cells of tendons, ligaments, bone, nerves, and muscles are repaired faster.
- 2. Faster Wound Healing:** Laser light stimulates fibroblast development (fibroblasts are the building blocks of collagen, which is predominant in wound healing) in damaged tissue. Collagen is the essential protein required to replace old tissue or to repair tissue injuries. As a result, laser therapy is effective on open wounds, scars, and burns.
- 3. Reduced Fibrous Tissue Formation:** Laser therapy reduces the formation of scar tissue following tissue damage from cuts, scratches, burns or surgery by inducing production of more normal type-1 collagen. Scar tissue is the primary source of chronic pain.
- 4. Reducing Inflammation:** Laser light has an anti-edemic effect as it causes vasodilation, but also activates the lymphatic drainage system (drains swollen areas). As a result, there is a reduction in swelling caused by bruising or inflammation.
- 5. Analgesia:** Laser therapy has a highly beneficial effect on nerve cells which block pain transmitted by these cells to the brain and which decreases nerve sensitivity. Also, due to less inflammation, there is less edema and less pain. Another pain blocking mechanism involves the production of high levels of pain killing chemicals such as endorphins and enkephalins from the brain and adrenal gland.
- 6. Improved Vascular Activity:** Laser light will significantly increase the formation of new capillaries in damaged tissue that speeds up the healing process, closes wounds quickly and reduces scar tissue. Additional benefits include acceleration of angiogenesis, which causes temporary vasodilatation, an increase in the diameter of blood vessels. More blood flow equals faster healing and less pain.
- 7. Increased Metabolic Activity:** Laser therapy enhances enzymatic activity within the cell, facilitates oxygen delivery from the bloodstream into the respiratory chain, and increases cell membrane permeability. The damaged cells can repair and regenerate faster.
- 8. Improved Nerve Function:** Slow recovery of nerve functions in damaged tissue can result in numbness and impaired limbs. Laser light will speed up the process of nerve cell reconnection and increase the amplitude of action potentials to optimize muscle action.
- 9. Immunoregulation:** Photons are absorbed by chromophores (molecule enzymes) that react to laser light. The enzyme is activated and starts the production of ATP, which is the major carrier of cell energy and the energy source for all chemical healing reactions in the cells. Long lasting pain relief occurs.
- 10. Trigger Points and Acupressure Points:** Laser therapy reduces muscle trigger points and stimulates acupuncture points on a non-invasive basis providing musculoskeletal pain relief.