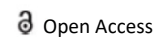




COMMENTARY



## Effects and Applications of Laser Surgery

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### Description

Laser surgery is a type of surgery that cuts tissue using a laser rather than a scalpel. On the eye, laser surgery is often employed. LASIK, a surgery that permanently reshapes the cornea using an excimer laser to remove a tiny amount of human tissue, and photorefractive keratectomy, a procedure that permanently reshapes the cornea using an excimer laser to remove a little quantity of human tissue, are among the techniques employed. Carbon dioxide, argon, Nd: YAG lasers and potassium titanyl phosphate lasers are examples of surgical lasers.

### Effects

Photochemical effect is also known as photodynamic therapy in the medical field. A photosensitizer is given which is absorbed by tumour tissue and then treated with laser light, resulting in highly toxic chemicals and tumour necrosis. In the treatment of cancer, photodynamic therapy is used in palliation of oesophageal and bronchial carcinoma and ablation of mucosal cancers of gastrointestinal tract and urinary bladder.

**Photoablative effect:** Used in eye surgeries like band keratoplasty, and endartectomy of peripheral blood vessels.

**Photothermal effect:** this property is used for endoscopic control of bleeding e.g. Bleeding peptic ulcers, oesophageal varices.

**Photomechanical effect:** This effect used in intraluminal lithotripsy.

### Applications

**Soft-tissue laser surgery:** This employed in a range of human and veterinary medical specialties, including general surgery, neurosurgery, ENT, dentistry, orthodontics, and oral and maxillofacial surgery. In soft tissue surgery, lasers

are used to cut, ablate, evaporate, and coagulate. In soft tissue surgery, a variety of laser wavelengths are used. The tissue is affected differently by different laser wavelengths and device settings (such as pulse duration and power). Erbium, diode, and CO<sub>2</sub> are some of the most often utilised lasers in soft tissue surgery. Erbium lasers are great cutters, but they don't provide much in the way of hemostasis. Diode lasers (hot tip) are fast cutters but give excellent hemostasis. CO<sub>2</sub> lasers are effective at cutting as well as coagulating.

**Dermatology and plastic surgery:** A variety of lasers, including erbium, dye, Q switch lasers, and CO<sub>2</sub>, are used to treat scars, vascular and pigmented lesions, and photorejuvenation. Dermatology laser surgery frequently avoids the skin's surface. SPTL is the basis for laser surgery for dermatological diseases (selective photothermolysis). The laser beam enters the skin until it comes into contact with chromophore, which absorbs it. After the laser beam is absorbed, heat is generated, which causes coagulation and necrosis of the targeted tissue, allowing undesirable tissue to be removed by laser surgery.

**Eye surgery:** Various types of laser surgery are used to treat refractive error. LASIK, in which a knife is used to cut a flap in the cornea, and a laser is used to reshape the layers underneath, is used to treat refractive error. IntraLASIK is a variant in which the flap is also cut with a laser. In photorefractive keratectomy (PRK, LASEK), the cornea is reshaped without first cutting a flap. In laser thermal keratoplasty, a ring of concentric burns is made in the cornea, which causes its surface to steepen, allowing better near vision. ReLEX SMILE is the latest advancement in laser vision correction technology. In SMILE surgery, ZEISS VisuMax ® femtosecond laser is used to make a small incision and to create a pre-calculated mini lens tissue (or lenticule) inside the cor-

nea. Lasers are also used to treat non-refractive disorders such as Photo Therapeutic Keratectomy (PTK), which involves removing opacities and surface abnormalities from the cornea, and laser coagulation, which involves cauterising blood vessels in the eye. Tears in the retina can be repaired with lasers.

**Endovascular surgery:** Laser endarterectomy is a procedure that removes a complete atheromatous plaque from an artery. Laser aided angioplasties and laser-assisted vascular anastomosis are two other applications.

**Foot and ankle surgery:** In foot and ankle surgery, lasers are used to treat a variety of illnesses. They're used to treat benign and malignant tumours, debride ulcers and burns, excise epidermal nevi, blue rubber bleb nevi, and keloids, and remove hypertrophic scars and tattoos.