

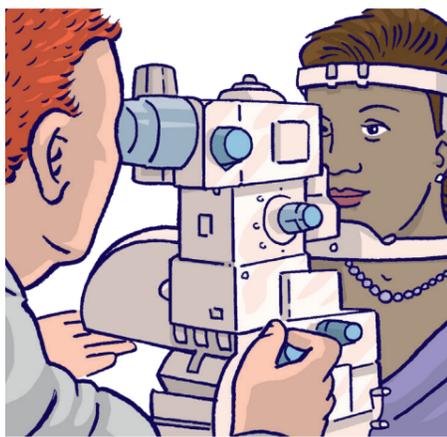
Lasers in medicine

Only a few years after the first demonstration of a working laser in 1960, the unique properties of laser light were being utilised in the world of medicine.

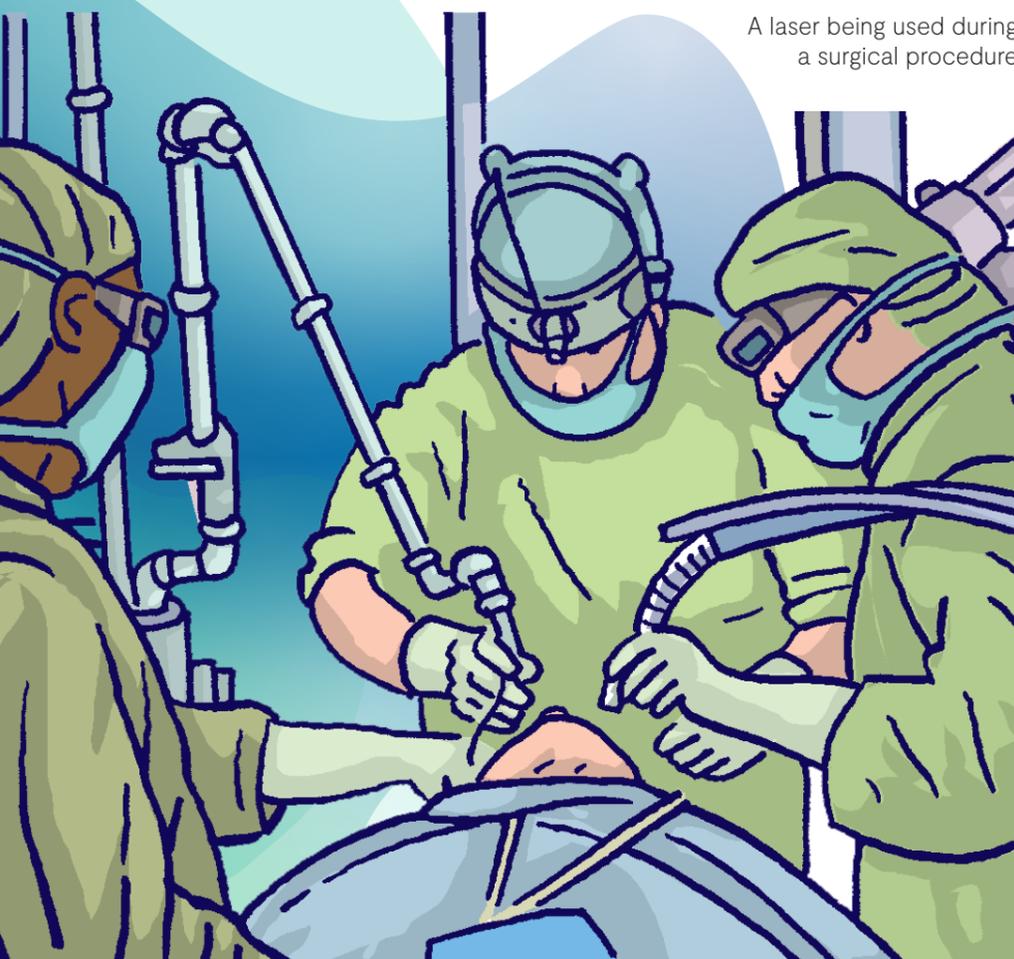
As well as being used in a variety of applications, lasers are also used for several investigative roles in medical diagnosis such as Optical Coherence Tomography, spectroscopy and imaging.

Laser light has many special properties arising from its method of generation that sets it apart from an ordinary light source like a lamp. The laser light is monochromatic, directional, and coherent. These properties mean the laser wavelength can be selected to target specific chemical groups within the structure of the human body (chromophores).

Additionally, the laser light can be focused to a very small spot with potentially very high-power densities, and the coherent nature of the light can be used in many diagnostic applications.



A slit lamp delivered laser



A laser being used during a surgical procedure

Some of the conditions that can be treated.

Laser light can be used in a wide variety of applications and in a wide range of procedures in the medical sector. Some examples are:

Ophthalmology

Photocoagulation, selected laser trabeculoplasty, capsulotomy

Urology

Stone fragmentation, treatment for benign prostatic hyperplasia

Surgery

Used in many areas, for example, photodynamic therapy of carcinomas within the body such pituitary adenocarcinoma, buccal and bladder cancers

Dermatology

Treatment of vascular and pigmented lesions

Cardiology

Removal of faulty pacemaker leads, angioplasty

Physiotherapy

Mitochondrial stimulation, wound healing

Photodynamic Therapy (PDT)

Lasers can play a role in activating light sensitive medicine to destroy abnormal cells

**Plus many more –
new applications are being developed all the time!**

Clinical Scientists play an important role in delivering laser treatments and investigations. They help to ensure lasers are used correctly and safely, which includes inspecting operating theatres and procedure rooms to make certain they are suitable for laser use and ensuring all controls are in place so that any harmful laser radiation is contained within the theatre.

They check that staff in other areas where lasers are used, such as urology or dermatology procedure rooms, are adequately protected and systems are in place to restrict access when the laser is operating. They also ensure suitable controls are available and will advise on the purchase of personal protective equipment (PPE) and check adequate systems are in place to prevent other problems such as surgical fires and smoke plume issues.

Clinical Scientists are also involved in writing administrative controls and protocols to inform the users of the procedures they must follow for safe and correct operation of the laser. Training users in aspects of the safe use of lasers is an important part of their responsibilities, as is undertaking practical measurements on the laser output and alignment.