

Lasers in Otolaryngology

Lasers are an important advance in medicine and surgery. Otolaryngology-head and neck surgeons use lasers to improve the care of patients in many ways. Because we were one of the first medical specialties to use laser systems, our collective experience with them spans many years.

What is a laser?

L-A-S-E-R stands for Light Amplification by Stimulated Emission of Radiation. Through a complicated electronic process, a beam of light is produced which has special properties. This light is all one wavelength; that is, it is all one color of the spectrum. The light is focused so that all of its rays are traveling in the same direction. In a similar fashion, you might use the lens of a magnifying glass to focus rays of sunlight to a point.

This picture (not shown) shows the optical cavity of a gas laser with its totally reflecting mirrored end and partially reflecting mirrored end through which the laser beam is emitted. The energy source (not shown) is called the pump.

There are many different types of medical lasers. The carbon dioxide, neodymium YAG, tunable dye, KTP, and argon are commonly used in otolaryngology-head and neck surgery. Each of these different lasers has special properties that help the surgeon.

Why are lasers used?

Lasers are used for many reasons. In many instances, they can improve the precision of the surgeon with their finely focused beams of light. Some lasers can reduce bleeding by coagulating blood vessels as they cut tissue. Others can be aimed down narrow passages or sent down fiberoptic channels in endoscopes to reach areas that are otherwise inaccessible.

A new trend in laser surgery is to use the special properties of different wavelengths of laser light to selectively treat different problems. For instance, a yellow laser light absorbed by the red blood cells of a birthmark called a "portwine stain" can result in the selective destruction of the birthmark without affecting the skin cells around it. The result is that scarring of the remaining normal skin is avoided. In another instance of selective laser treatment, drugs that are retained by tumors are injected into the body and activated by lasers to destroy only the tumor, preserving normal structures.

In many instances, the cost of medical care can be reduced by lasers. Through their use, many procedures that previously required hospital admission can be done on an outpatient basis. In some instances, they can reduce pain, enabling a quicker return to work. It is important to discuss the pros and cons of laser use in your particular instance with your doctor.

What can lasers treat?

Otolaryngologists use laser systems for excising skin tumors, cancers, birthmarks and

other disorders of the head and neck. Problems of the voice box, throat, mouth, nose and ear may be amenable to different laser treatments. Nodules or polyps on the larynx and blood vessel defects in the upper airway are disorders that could be treated with a laser. In another instance, laser surgery might be performed to remove the stapes from the middle ear for treatment of otosclerosis.

Lasers may be used also for cosmetic and reconstructive surgery of the face, eyes, ears and nose. Ask your physician if a laser is part of your treatment plan.

Are lasers used for all medical problems?

No. Lasers have distinct advantages in many instances. In others, there are no advantages to using a laser, only added time and expense. In some cases, it is actually better not to use a laser. Check with your otolaryngologist-head and neck surgeon for good advice.