Talking with Patients

Lasers in Dentistry

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WHAT IS IT?

The word *laser* is an acronym for *light amplification by stimulated emission of radiation*. The radiation emitted by laser devices is nonionizing and does not produce the same harmful effects attributed to x-rays and other forms of ionizing radiation. Lasers were discovered in 1960 by Theodore H. Maiman and are used today in a great variety of applications, from compact disc players to laser eye surgery. Laser devices produce a very strong, coherent, directional, and monochromatic light beam, which can be controlled to perform special functions. The US Food and Drug Administration has approved the use of some types of lasers for medical and dental procedures. The carbon dioxide, neodymium:yttrium-aluminum-garnet (Nd:YAG), and argon lasers are among the most popular approved laser types used today in dental treatments.

WHEN IS IT NEEDED?

In clinical dentistry, lasers can be used to clean cavities and root canals, make incisions during gum surgeries, seal enamel fissures, diagnose hidden cavities, treat hypersensitive teeth, and harden composite materials. Currently, no single laser device can be used for all applications. The type of laser has to be matched to the specific application.

Despite the potential for using laser technology on many fronts, its high cost and the availability of effective (and many times better) alternative devices and techniques have prevented the widespread use of lasers in dentistry. Additionally, lasers are not unanimously accepted among dentists and researchers because there is little sound clinical research supporting the alleged advantages and benefits of laser treatment. Lasers are perceived as "high-tech" devices, and dentists using them can benefit from the marketing appeal perhaps even more than from the real clinical benefits that lasers might afford to patients.

CONCLUSIONS

Lasers can be used in dentistry for a number of different applications. However, owing to the high cost and lack of clear benefits, lasers are not widely used in dentistry. As the cost of the technology becomes more affordable and its uses are refined and supported by clinical research, lasers will have the potential to become part of routine dental care for selective applications. Finally, laser use requires eye protection for both the dentist and the patient.

The following photograph shows a laser unit being used to detect cavities. The results of the laser examination should be used along with clinical and radiographic examinations to confirm the presence or absence of cavities (Figure 1).

Figure 1.

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