

## DENTAL LASER BENEFITS FOR YOU

Dear Dr. McCrummen: Please write about the lasers, what they are, their benefits for people, and their uses for dentists. Do you have any experience with them? R.M.

Lasers have improved the quality of my dental treatment, accuracy of diagnosis, and provided much more comfort and health for my patients.

Lasers have been used in medicine for many years and are being used much more now in dental treatment than ever before, but perhaps not for the things you may think they are used for. L.A.S.E.R. is an acronym for Light Amplification by Stimulated Emission of Radiation. Einstein developed the theory in 1916, the M.A.S.E.R. (Microwave A.S.E.R.) was developed in the 1950's but was unreliable, and first laser was introduced in 1960.

The laser works by organizing the path of photons (light energy units) creating focused heat, much like using a magnifying glass to focus the sun's rays to burn things. There are many different frequencies of laser light that are used for different dental applications, most are in the nanometer frequency range (nano is a frequency in billionths of a meter, i.e. ultra-violet is from 1-400 nanometers, or 1-400 billionths of a meter). There are several different types of materials that produce a specific laser light frequency, its power, and color. Some examples are: the cool red-dot pointing-laser for presentations (and irritating people and cats) and for use as gun sights, a laser for reading the micro-pits in regular CD's and DVD's is red, the new BluRay DVD's are read with a blue laser, lasers for skin surgery, lasers for diagnosing small cavities, lasers for cutting through things such as teeth and other materials, deep space penetrating lasers to damage spy satellites. Most surgical lasers are actually invisible so they add a red spectrum frequency to allow us to see where the laser beam is working.

We mostly think of lasers as being the type that sends a long narrow beam far distances, for pinpoint surgery, or hair removal. Many surgical lasers that are invisible spread out rapidly as we move away from the surface, enabling the coverage of a large area with less powerful effects. Some can be used for skin treatment working a few inches away from the targeted area. This is similar to a wide flashlight beam; it is small and bright up close but widens and dims as it goes farther out.

Dental lasers are most often used for treatment, such as biopsies, removal of diseased gum tissue, treatment to destroy microbes and calcium deposits under the gums, making an incision, stopping bleeding, esthetically contouring gums that cover too much of the teeth, cutting a skin attachment (called a frenum or frenulum) that is causing spaces between teeth, pulling on gums or keeping a tongue tied. Dental lasers require moisture to work. The light heats the moisture in the cells and vaporizes it. The dental lasers that cut teeth are not widely used and have a ways to go before they work well. Right now, they have to pulse water fast and hard to cut, cool, and clean off where they are working, and are very limited in their use. Most patients prefer to be numb so they do not have to worry about feeling discomfort, and to remove a silver filling, or deep decay, they are often told they need to be numb and the standard drill must be used. It takes longer to prepare a tooth with a big problem with a laser, it is not efficient at preparing teeth for crowns, is not quiet in full operation, and your costs can go up because they are presently very expensive. There are not enough benefits to choose a tooth cutting laser yet.

We also use special "diagnostic lasers" to help us detect cavities before they become too deep. Before these became available we depended on the visual color changes within teeth (internal darkness of teeth can mean deep cavities), a hole that an explorer can stick into (enamel is strong, so once we find a hole the cavity is usually very deep inside), or for it to show up on x-rays (x-rays show only about 1/2 the depth of a cavity, so much tooth structure has been damaged before it can be seen on x-rays; dental x-rays remain a very safe and important tool). The laser helps us to find a cavity when it is very small, which may lead to a smaller filling and a stronger tooth, and often treatment costs are less. Lasers can help prevent cavities by telling us which teeth we can protect with sealants before they get a cavity.

The benefits of laser use include painless treatment, minimal numbing required or the use of numbing gels instead of shots, often no discomfort after surgery, rapid healing, no stitches, minimal bleeding, destruction of microbes during

treatment, and many more. Ask your dentist about lasers and how they can help improve your health, give you a better dental experience, and save you money.