

# Dental Ozone

## The Revolution Is Happening Here!

by Chris Kammer, DDS

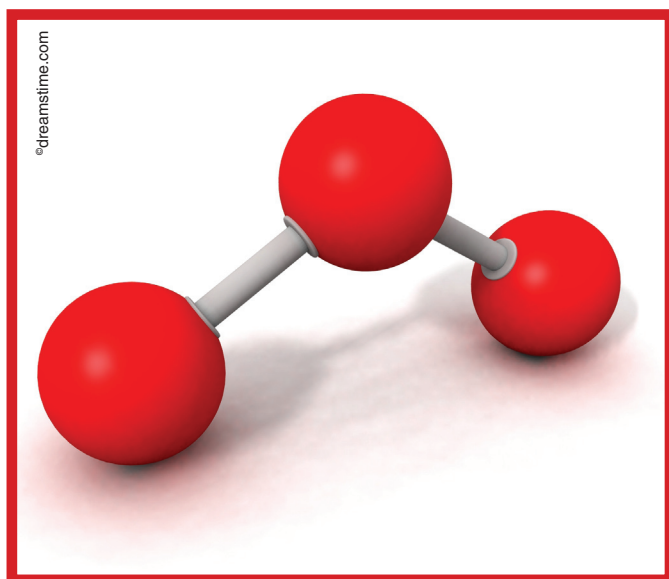
For more on this topic, go to [www.dentaleconomics.com](http://www.dentaleconomics.com) and search using the following key words: *ozone, decay, remineralization, production, cold sores, calcium-rich toothpaste, periodontal therapy, cosmetic dentistry.*

**W**hen you hear the word **OZONE**, the first thing that many people think of is air pollution. Yet ozone protects us from harmful sunlight that causes skin cancers. In fact, many critically important uses of this powerful, naturally-occurring gas are not so well known, but they serve us every day. Major cities throughout the U.S. and the rest of the world use ozone to sterilize their public water systems, and ozone is commonly used to sterilize the fruits and vegetables we eat and the bottled water and sodas we drink. It's used in air purification systems, commercial laundries, and swimming pools and spa baths.

The medical community — especially in Europe — has been using ozone for decades to speed up wound-healing and to treat a variety of diseases. Most of the original research was carried out in the U.S. and Europe in the early 1900s. Controlled ozone application has been found to be extremely safe and free from side effects — far freer than most medications, including antibiotics. What could be more natural since our own bodies produce ozone at the white-cell level to kill offending microorganisms? The ozone molecule is the most powerful agent that we can use on microorganisms. It is deadly to bacteria, viruses, and fungi, yet the more highly evolved human cells are not damaged by ozone in lower concentrations. Ozone's pioneering use in dentistry naturally followed.

### Reversing cavities

Another way of looking at ozone is to see it as an activated, excited form of oxygen. The highly unstable ozone molecule ( $O_3$ ) wants desperately to kick off one oxygen so it can return to the more stable  $O_2$  molecule. So, does that pow-



erful reaction drive oxygen beneath the surface of a tooth through the tubules and kill bacteria in early decay? Does that essentially start a process that removes bacterial waste products, halts dental cavities, and begins a process of repair via accelerated remineralization? Dr. Ed Lynch and Dr. Julian Holmes, coauthors of the book, *Ozone, the Dental Revolution* (Quintessence 2004), say an unqualified “yes.”

Dr. Lynch has been researching ozone for decades and has been involved in almost 100 studies on ozone's effectiveness. One of cosmetic dentistry's pioneers, Dr. Ray Bertolotti, has been touting Dr. Lynch's work for years. The KaVo Company has manufactured a dental ozone delivery unit called the HealOzone, and it is being used by dentists all over the world. Millions of patients have already been treated with the HealOzone worldwide, and not a single adverse side effect has ever been recorded. Estimates are that there are over 100 HealOzone units currently in use in the U.S.

Originally, the HealOzone unit was about to receive approval as a medical device, but then the FDA decided to treat ozone as a new drug and started the slow approval

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process all over again. This has stymied sales of the units in the U.S. There is a common misconception among dentists that using ozone in their practices is illegal. Actually, ozone has been grandfathered into usage in the medical and dental world because it was in use before the 1906 Pure Food and Drug Act. There also have been rulings specifically permitting ozone use, most notoriously with the Dr. Atkins case. We can select many materials for use in our dental practices that have not had FDA approval, such as hypochlorite for endodontics. So FDA approval is not necessary and it is completely legal for dentists to use ozone.

Dentists Phil Mollica and Robert Harris have set up training here in the U.S. to teach other dentists the science of ozone, as well as its applications for their dental practices. They already have trained 150 dentists here in the U.S. Dr. Julian Holmes from England and South Africa also regularly travels to North America to teach and train dentists in the use of ozone in modern dental care.

### Uses in dentistry

Lime Technologies is a new international company with a mission to bring ozone and ozonated products not only to the dental world, but also to other types of practices including veterinary science, skin care, and home and recreation, and to help the HIV-infected community. Ozone, for instance, is ideal to treat diabetic foot ulcerations and the intractable MRSA infections.

Lime Technologies made their official U.S. debut at the IAOMT meeting in February. Estimates are that many hundreds of dentists in the U.S. are now treating patients with ozone, utilizing it in a wide variety of areas including periodontal therapy, decay therapy with remineralization of early lesions, root canal treatment, tooth sensitivity, canker sores, cold sores, bone infections, and more.

My introduction to ozone in dentistry occurred five years ago in Florida at a genR8TNext meeting (now called the Academy of Comprehensive Esthetics — ACE). It was there that Dr. Holmes presented his and Dr. Lynch's ozone research. He also had a KaVo HealOzone unit on hand and demonstrated its uses, treating a participant's sensitive tooth and local infection.

The thought of halting and then healing decay had me fascinated and intrigued. If ozone was going to contribute to the era of keeping people free from the complications of tooth decay, then I wanted this for my children and my patients. I made arrangements with Dr. Holmes to have him sell me one of his units, and then made a return overseas trip to train my team.

### Most minimally invasive

I'm now in my sixth year of using ozone, and I can say without a doubt it has radically changed the way I practice

dentistry. I've become much more "minimally invasive" in my approach to early decay. Since owning my dental ozone unit, I have cut over 1,000 fewer decay-removing holes in teeth, with most of those patients being very young children. That's a very good feeling, and you become a hero in the eyes of toddlers' moms and dads. If I was afraid of losing production income from drilling fewer fillings, I was completely sold on the economics of ozone after the very first referred family I treated generated enough production to completely pay for my ozone unit.

As a general rule, I use ozone therapy on most teeth that read between 20 and 29 on the KaVo DIAGNOdent. As hard as it was to believe, it became clear to me that the ozone was going below the surface of the tooth and causing changes in the early areas of decay. My DIAGNOdent readings routinely dropped 10 or more points following the 40- to 60-second ozone treatments, and those readings held for many months. The researchers confirm this and tell me that ozone molecules effectively penetrate through the enamel into deeper tooth structures. Depending on exposure time and concentrations, several millimeters are not unusual at all. If you or your patients have ever experienced sensitivity following the use of carbamide peroxide during bleaching, then it helps to understand that if that huge molecule can get into a tooth, just think how much better the penetration would be of the tiny, reactive ozone gas molecule.

I experienced a major dental paradigm shift during patient exams while recording the DIAGNOdent readings and reviewing clinical details. The recurring discussion (actually a debate) that would take place in my head sounded like this: "Do I cut or do I attempt to heal?" At first, those decisions did not come easy. Now, after years of treatments, I confidently choose to make all efforts to heal.

Cavities develop as the environment below the surface of the tooth becomes acidic. Ozone not only kills the acid-making bacteria, it also neutralizes their acidic waste. This creates a *new* environment that is hostile to the bad streps and lactobacilli that love the acid niche. A new environment allows healthier bacteria to replace the bad ones. If we just kill off the bacteria, they're back in weeks. But if we get rid of their acid niche, they are gone for two to three months. Ozone treatments at this interval just might keep teeth decay-free indefinitely!

### Allowing repair

The new environment that occurs following the biochemical change in the lesion allows minerals to flow back into the tooth, hardening and reversing the effects of decay. Early cavities can heal. The minerals to assist this repair can come slowly from the saliva or much quicker from mineral-rich solutions soaked into the teeth following the ozone treatment. Research seems to indicate that

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once a tooth is remineralized, it is very unlikely the decay will come back. Multiple ozone treatments over a period of months can improve chances even better.

Now we have to be realistic here. If your tooth has a big hole in it, ozone isn't going to regrow that tooth structure. Not even the tooth fairy can do that! But if there is still structure remaining in the earlier phases of attack, that structure *can* harden. That cavity can heal, and ozone can be a big contributor to this process. Fluorides help; cleaning helps. But these modalities may not be enough compared to the power of ozone.

To improve the chances of staying cavity-free, we can seal challenging grooves of the teeth with glass ionomer such as the fluoride-rich Fuji Triage. To speed up mineralization, we also recommend the use of calcium-rich MI paste Plus or products containing Novamin (GC America). Novamin's remineralization potential shows strong promise, and it is readily accepted by families that prefer an alternative to fluoride.

We also use ozone regularly to comfortably and immediately eliminate canker-sore pain. We have patients who seek us out for ozone treatment at the earliest sign of a developing canker sore or cold sore. You only have to treat patients once to make a believer out of them. Meanwhile, some dentists are also using ozonated water and oils in their practices while they guide their patients to use them at home as well. Mixed into water or plant extracts, ozone allows dentists and patients to use a mouth rinse or agent that eliminates mouth infections, promotes healthy gum tissue, and accelerates surgical healing.

### Differences of delivery

The KaVo HealOzone only delivers the active gas once a seal has been made with the silicone cup at the end of the handpiece. Then, and only then, will the 2,000 ppm concentration of ozone flood the area inside of the cup. If the seal breaks, the ozone ceases to flow, and any ozone that remains in the cup is vacuumed back into the main unit where it is broken down into pure oxygen that is released

back into the room.

The new Lime Technologies CMU3 dental ozone unit utilizes an unrestricted free flow of ozone that requires no seal. This makes it much less complicated to deliver ozone to the teeth and oral tissues that previously presented a challenge in sealing with the HealOzone. The CMU3 utilizes a lower concentration of ozone, and hence, a slightly longer exposure protocol. It is simply used with our normal high speed suction to rid the oral air of over-flow ozone.

We can now bathe carious teeth in ozone and also deliver it directly deep into periodontal pockets and root canals. Full-mouth trays can also be fabricated to bathe entire arches in ozone to offer efficient, rapid therapy for early cavities and

gum disease. We are just scratching the surface of this powerful technology. Look for even more radical potential uses in the years to come as ozone tackles systemic disease and modulates the immune system.

Cosmetic dentists should take note that we have also used ozone to whiten teeth. Ozone sends activated oxygen below the enamel surface, much the same

way as the dental bleaches. So now imagine a day when patients come to the dentist's office and receive a whole-mouth ozone treatment to whiten their teeth, control their gum disease, and reduce carious activity. That day is upon us, and these treatments are happening in thousands of dental offices around the world and in hundreds of offices in this country. Dental ozone is right here, right now, and poised to make us look at traditional dentistry with a new set of eyes! **DE**

We also emphasize strict home care protocols that include mandatory daily use of 6 to 8 grams of 100% pure xylitol products such as gum or mints from companies such as Spry, Zellies, or Omni. Studies show that regular xylitol use can reduce the bacteria levels in your mouth by 80%! Parents should also use xylitol. There's less chance of spreading the decay-causing bacteria to their kids. The chances of raising children who may never have to get a shot or have a drill put to the teeth because of a cavity is higher now than ever before, thanks to these protocols and ozone therapy.

Dr. Chris Kammer is the founder of the Masters of Progressive Dentistry lecture series ([www.DentalProShop.com](http://www.DentalProShop.com)), which features Dental Ozone, Advanced Mini Dental Implants, "Gums of Steel" Hygiene Transformation, and Dental Media Power training. He is a founding member of the AACD and a partner in Lime Technologies. Contact [drchris@thesmileexperts.com](mailto:drchris@thesmileexperts.com).

