Over the last few decades, the use of ozone in dentistry has been established as an effective, minimally invasive therapeutic modality with an increasing number of applications. Sixty years after Dr Joachim Hänsler patented his OZONOSAN, the first medical ozone water generator with an exact dosage output, family-owned company Dr. J. Hänsler has become a leader in ozone technology with applications in medical and dental hygiene. We interviewed Managing Director Dr Renate Viebahn-Hänsler, who is also a board member of the European Committee of the International Ozone Association, and Yvonne Hoffmann, Managing Director of Hoffmann Dental Manufaktur, which took over the global sales and distribution of the OZONOSAN dental water unit in 2017.

What is ozone used for in dentistry?

Dr Renate Viebahn-Hänsler: The use of ozone in dentistry extends back to the 1930s, which is when scientists first discovered its properties and started to use it for a number of applications, such as wound cleansing, mouth rinsing and disinfecting. Ozone is also notably effective in accelerating pre- and postoperative healing of the oral mucosa. Nowadays, ozone therapy in dentistry is mainly used in clinics for holistic dentistry, but owing to its disinfectant properties, ozonised water could be of great help after dental implant surgery and should be introduced in periodontal treatment, as well as any form of oral or dental surgery, in the future.

How did you become aware of ozone’s potential?

Viebahn-Hänsler: I have been in the medical ozone business for over 30 years. In this time, a significant amount of research on the topic has been conducted, including much research specifically related to dentistry. Those who are interested can find these publications listed on our website, www.ozonosan.de.
Yvonne Hoffmann: In 2014, Hoffmann Dental took over Proxidentis Dentale Biomaterialien, a producer of natural oral health products, including ozone oil for periodontal treatment. After learning about ozone oil, it was only a small step towards developing ozone water rinses.

**What are the differences in application between ozone as a gas mixture and ozone dissolved in water?**

Viebahn-Hänsler: Gaseous ozone cannot possibly act as a disinfectant. Owing to its polar molecular structure, ozone has great solubility in a polar solvent like water. As hydrogen bonds stabilise ozone, ozone’s half-life in water far exceeds that of its gaseous version. As such, we recommend ozone water or oil for disinfecting wounds, not an ozone–oxygen gas mixture. Moreover, the gas mixture cannot be used safely in dentistry owing its toxicity to the respiratory epithelium. Ozone water, however, can be used as a mouthwash to rinse wounds and periodontal pockets. Owing to its pronounced disinfectant and healing effects, ozone is a perfect alternative to tooth cleaning with sugar alcohols or sodium bicarbonate.

Ozone water must be generated on-site. Is training necessary?

Viebahn-Hänsler: Our ozone water generator is subject to the Medical Device Act and requires instruction and training by a medical device consultant. Nonetheless, its handling is very simple.

**How does ozone inhibit anaerobic periodonto-pathogenic bacteria? What advantages does it have over conventional periodontal treatment?**

Hoffmann: Rinsing with ozone water followed by the application of ozone oil is a great complement to conventional periodontal treatment or professional dental cleaning.

Viebahn-Hänsler: Ozone water does not distinguish between aerobic and anaerobic bacteria. It destroys the cell membrane and ultimately the DNA/RNA of bacteria and viruses that come into direct contact with the ozone molecules. Additionally, ozone water improves healing processes by activating the cellular metabolism.

Hoffmann: Ozone oil works differently in that it only kills anaerobic bacteria, which are the bacteria specifically linked to periodontal disease. Because of its density, ozone oil easily adheres to interdental spaces and periodontal pockets, where it is retained for longer than ozone water.

Unlike chlorhexidine, ozone water and ozone oil in excessive amounts cannot possibly lead to altered taste or tooth discoloration. They do not provoke any allergies, have no known side-effects and are a safe, effective way to reduce the postoperative use of antibiotics and cortisone.

**What are the benefits of ozone beyond dentistry? Is it used elsewhere?**

Viebahn-Hänsler: Medical ozone is used for wound disinfection and treating chronic inflammatory diseases. Other therapeutic applications are self-haemotherapy, in which the patient’s blood is exposed to ozone and then reinjected, or rectal insufflation.

Hoffmann: Ozone is also used in water purification in municipal waterworks to destroy bacteria and parasites such as Cryptosporidium and Giardia. Unnoticed by most of us, it is also used in public swimming pools to reduce the total chlorine level needed to improve the water quality.