

Ozone Efficacy in the Treatment of Dental Unit Water Lines

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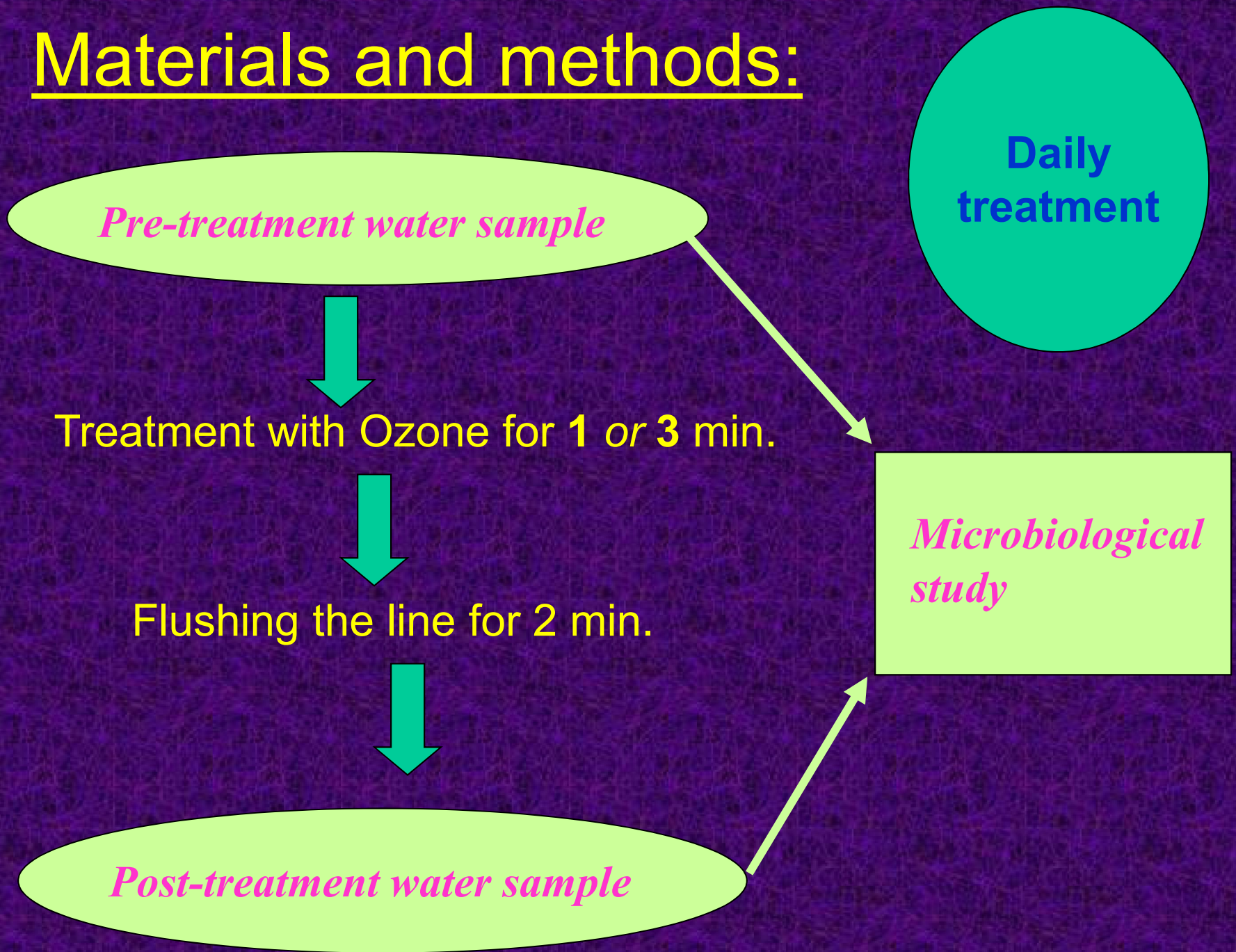
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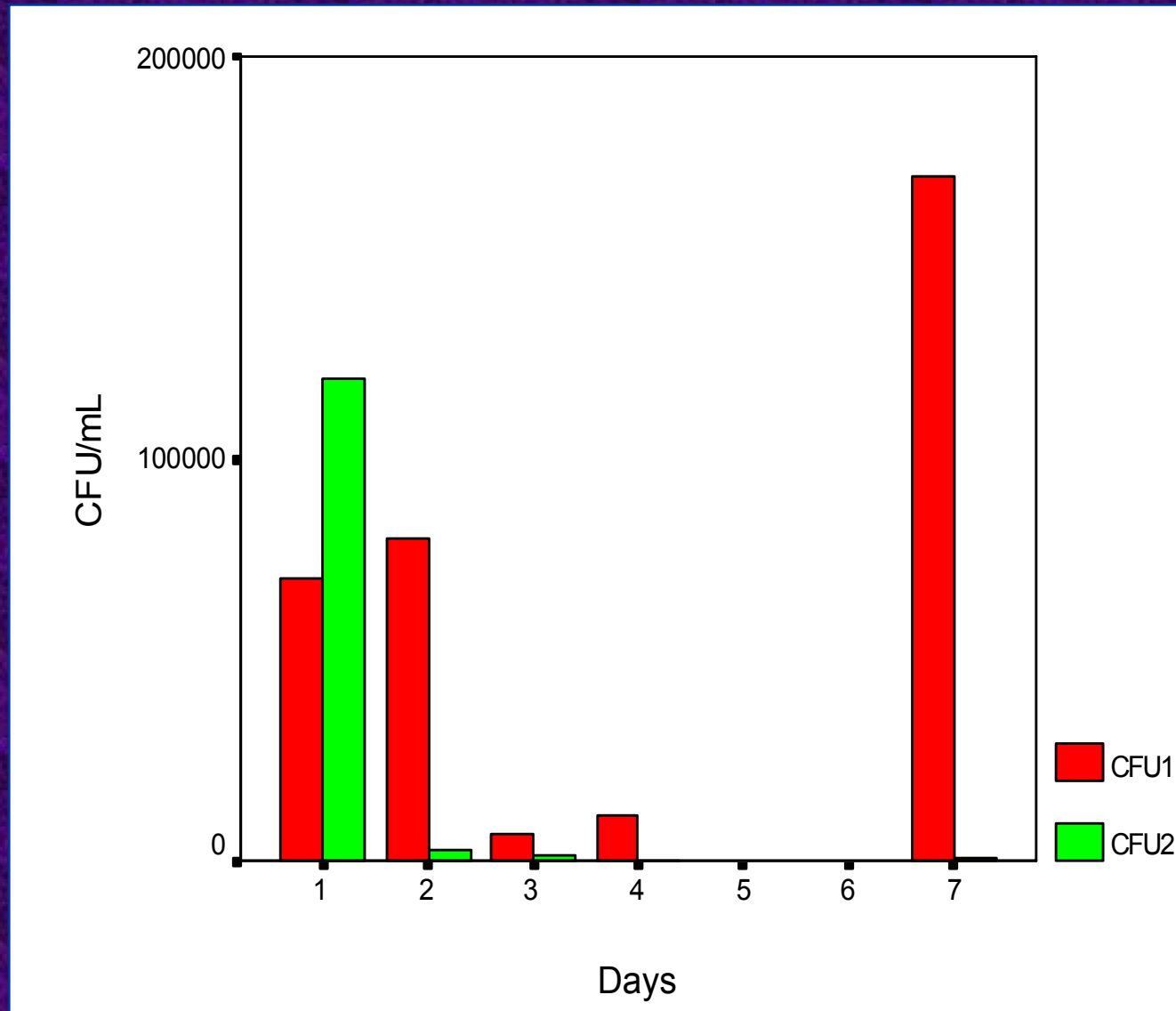
Aim:

The aim of this study was to evaluate the efficacy of Ozone (O_3) in the treatment of dental unit water lines in two proposed regimens.

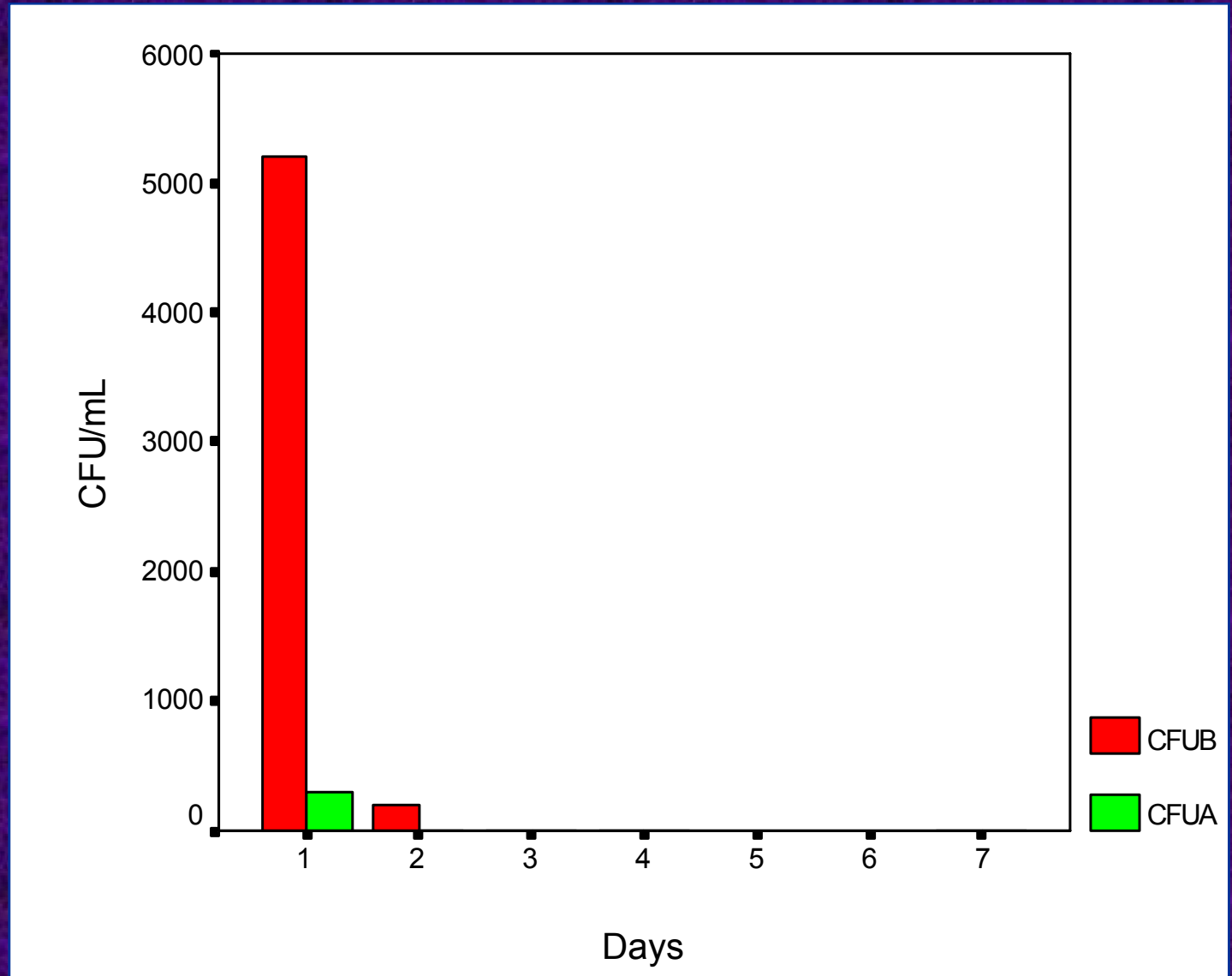
Materials and methods:



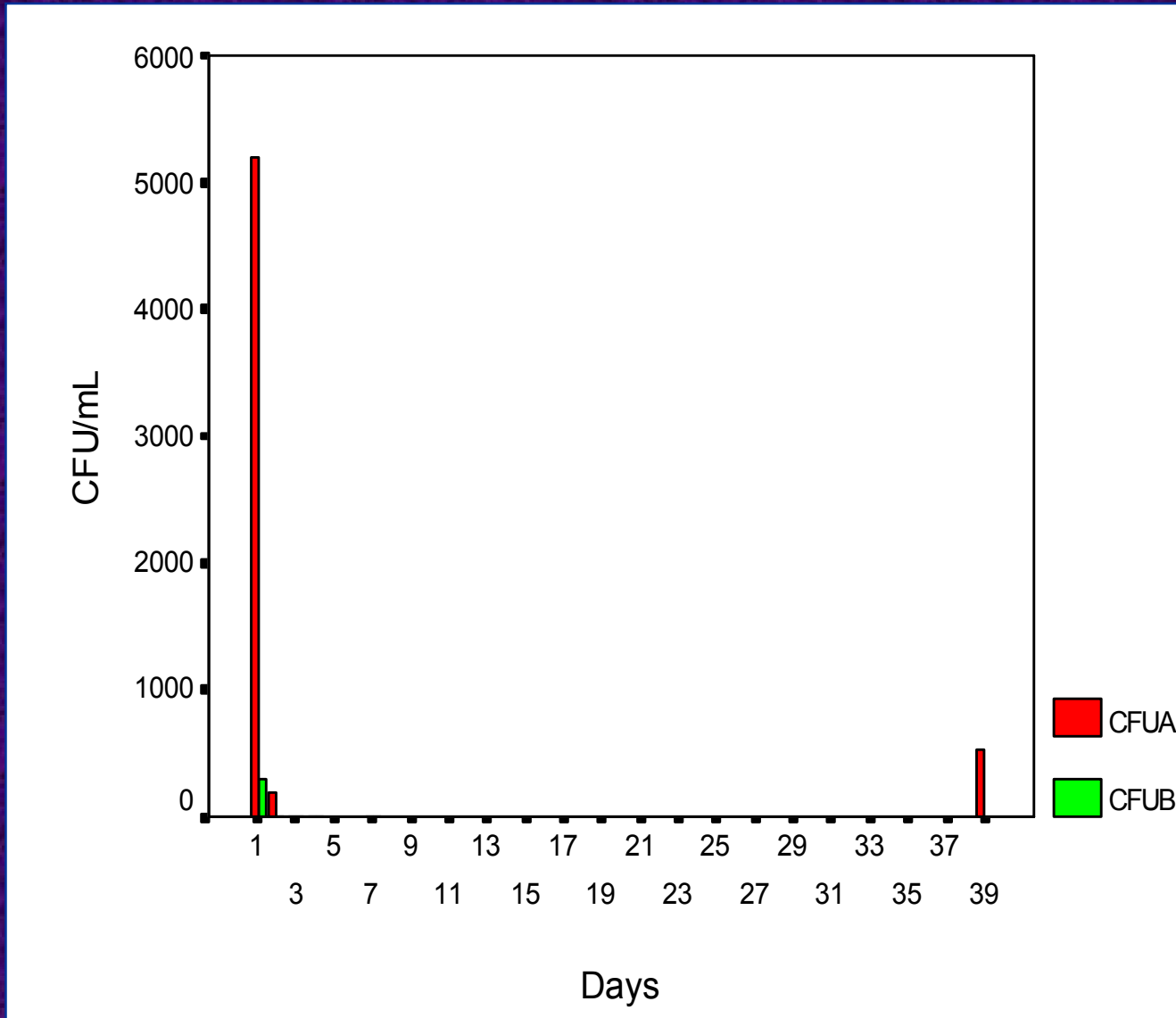
Results (1 min.)



Results (3 min.)



Results (3 min.)



Conclusions:

The results suggest that O₃ delivered in this way can play an important role in controlling the problem of contamination of DUWL.

Effect of Ozone on **biofilms in dental unit waterlines**

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Aim:

To evaluate the efficacy of O₃ to
remove the biofilms from inside
DUWLs.

Methods:

- Ozonation of the water bottle for 15 minutes
- Flushing the line for 15 minutes
- Water and line samples were collected at 0, 5, 10, and 15 minutes.
- Immunofluorescence & culture.

Results:

Microbiological culture :

- 0 sample: $> 2 \times 10^5$ CFU/mL
- 5, 10, 15 min samples: 0 CFU/mL

Results:



*Before O₃
treatment*

Results:



5 minutes flushing

10 minutes flushing

10 minutes flushing

10 minutes flushing

Results:

15 minutes flushing

15 minutes flushing

Conclusion:

Single treatment with higher levels of ozone was able to reduce and then remove the biofilm from inside the DUWLs.

Medical Applications of Ozone:

1. Autohaemotherapy:

How: Blood-Ozonation-Re-infusion

Where: Viral infections (AIDS, HBV, ...)

Cancer, GI diseases,...

Effect:

Viruses are small, denuded of complex defences and vulnerable to the oxidative challenge of ozone.

Cells, in contrast, are large and incorporate a multiplicity of homeostatic mechanisms.

These pathogenic micro-organisms are completely anaerobic or have an anaerobic portion of their life cycle, meaning that they cannot survive in an oxygen rich environment in the body. Healthy cells, by contrast, require a high oxygen environment.

2. Rectal Insufflation: GI diseases and ulcers

3. Dermatological “bagging”

4. Injections (IV, IA)

5. Others-ozonated water, ozonated oils,..

Other health-related uses:

- Water disinfection hospitals...
swimming pools...
- Air purification, Removal of smells
- Food industry

In September 1896, the electrical genius Nikola Tesla patented his first ozone generator and in 1900 he formed the Tesla Ozone Co. Tesla sold ozone machines and ozonated olive oil to doctors for medical use.

During World War 1 the Germans used ozone to treat wounds and infections.

In 1926, Dr. Otto Warburg of the Kaiser Institute in Berlin announced that the cause of cancer is lack of oxygen at the cellular level. He received the Nobel Prize for Medicine in 1931 and again in 1944, the only person to ever receive two Nobel Prizes for Medicine. He was also nominated for a third.

In the 1930s German scientists and doctors carried out considerable research into its effects, using it to successfully treat Crohn's disease, ulcerative colitis, inflammatory bowel disease and chronic bacterial diarrhea.

A German dentist, Dr EA Fisch, first used ozonated water as a disinfectant; one of his patients, surgeon Dr Erwin Payr, in 1945 pioneered the method of injecting ozone intravenously to treat circulatory problems.

Dr W Zable in the late 1950's became the first to treat cancer with ozone.

Dr Horst Kief, near Frankfurt, is believed to have been the first doctor to use it to treat HIV.

In a 1980 study done by the German Medical Society for Ozone Therapy, 644 therapists were polled regarding their 384,775 patients, comprising a total of 5,579,238 ozone treatments administered. There were only 40 cases of side effects noted out of this number which represents the incredibly low rate of 0.000007%. Ozone has thus proven to be the safest medical therapy ever devised.

Today, an estimated 9,000 licensed health practitioners in Germany use ozone, compared to a handful in the UK!!! Another 8,000 practitioners across Europe are using it.

HOW DOES OZONE WORK? (Bocci, V.)

1. Inactivation of bacteria, viruses, fungi, yeast and protozoa.
2. Enhancement of circulation:
Ozone reduces or eliminates blood cells clumping. Ozone also oxidizes the plaque in arteries, allowing the removal of the breakdown products, unclogging the blood vessels

3. Stimulation of oxygen metabolism:

Ozone causes an increase in the red blood cell glycolysis rate. There is a stimulation of the production of the enzymes which act as free radical scavengers and cell wall protectors.

4. Formation of peroxides:

Ozone reacts with the unsaturated fatty acids of the lipid layer in cellular membranes, forming hydro peroxides.

5. Enhancement of the immune system through release of many factors

Possible areas for future investigation in Dental Surgery:

- wound healing
- mouth ulcers
- Infections: viral, bacterial, fungal, ..
- periodontal therapy
- oral surgical procedures
- others...