

## **OZONE THERAPY - HISTORY, PHYSIOLOGY, INDICATIONS, RESULTS**

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Ozone therapy has been utilized and heavily studied for more than a century. Its effects are proven, consistent, safe and without side effects. Why is it not more universal in its use? Many of you have come with some trepidation about infusing a gas into a vessel because you are concerned about emboli, or have some dreadful fear about ozone's toxicity since we frequently hear about the unhealthy ozone levels in the atmosphere. These fears do not apply to properly administered medical ozone, and the potential benefits of ozone therapy are profound and without associated detrimental effects.

Oxygen, in its several forms, cycles through the atmosphere and life processes just as water does. Ozone is produced in the upper atmosphere when UV light strikes the oxygen rising from plants, plankton, and algae in our forests and seas. It then falls back through the atmosphere, as it is heavier than air, combining with pollutants and water, cleaning the air and forming peroxides that benefit plants. Ultraviolet light breaking down pollutants and nitrous oxides also can produce ozone at the ground level, which is the eye and lung irritant in smog.

Medical ozone, used to disinfect and treat disease, has been around for over 150 years. Used to treat infections, wounds, and multiple diseases, ozone's effectiveness has been well documented. Ozone has been used to disinfect drinking water since before the turn of the last century. A text on medical ozone therapy was published by Dr. Charles J. Kenworth in 1885! The best technology for producing ozone gas was designed and built by Nikola Tesla in the 1920's. Heads of leading medical institutions in the U.S. contributed to a 1929 book "Ozone and Its Therapeutic Actions" describing the treatment of 114 diseases using ozone.

In 1933, the AMA began its systematic suppression of all modalities of treatment that did not complement its liaison with the emerging pharmacologic and diagnostic industries. Ozone therapy, along with many other useful therapies, were methodically eliminated from the educational process and exposure to the public in the U.S.

Less suppression has occurred in Europe and other countries, especially in Russia. Today in Germany, and other countries, ozone therapy is commonplace. Over 7000 doctors in Germany use it daily. In fact, in Germany, ozone generators are in ambulances for treatment of stroke victims. The incidence of permanent paralysis in these patients is much less than that in similar patients where ozone is not used.

Ozone generators are relatively simple and inexpensive. The equipment used to handle ozone is readily available but needs to be relatively non-reactive. Glass, Teflon, Kynar, silicon, and gold are completely non-reactive. Equipment made of other substances can contaminate the ozone or just deteriorate rapidly using up the ozone and becoming nonfunctional.

Generators use several technologies to produce ozone:

- UV lamp – makes small amounts of ozone and is unreliable in making accurate concentrations. They burn out easily.
- Corona discharge – dual dielectric sealed systems produce ozone but also lots of heat which is both destructive to ozone and to the machine.
- Cold plasma generators – which produce ozone using low level current passed in 2 tubes of a noble gas between which an electrostatic plasma field forms that ionizes the oxygen.

Ozone concentration is measured in u/ml or gms/L of oxygen, 5% or 70 u/ml is usually the maximum concentration used in clinical medical applications. High concentrations will damage red cells and inhibit growth of healthy cells.

Dosage and frequency protocols vary widely. Initial high dose treatments may “jumpstart” the immune system followed by lower doses. Those who are fearful have been “starting slow and going low” with dosage and still have good results. Concentration must be carefully controlled with accurate flow rates, requiring pediatric regulators for the needed slow flow rates to produce high concentrations. Therefore, home made machines and lesser quality nonmedical devices are not appropriate.

Ozone potentiates free radical scavenging substances and systems in the body, inducing the production of superoxide dismutase, catalase, and glutathione peroxidase. If ozone administration causes any respiratory irritation from out-gassing through the lungs, a bolus dose of 1 to 5 grams of vitamin C can be given and will eliminate any coughing instantly.

Oxygen/ozone mixtures cannot cause emboli when injected at reasonable rates as they dissolve and diffuse very quickly in body fluids, unlike air (predominantly nitrogen) which is what forms emboli and causes the bends or decompression disease.

The physiologic actions of ozone are many, the simplest of which is to provide sufficient oxygen to allow complete oxidation of sugars and other fuels to produce sufficient and efficient energy and to “burn clean” to CO<sub>2</sub>, water, and inert end products. If not enough oxygen is available, then incomplete oxidation occurs, producing carbon monoxide, lactic acid, and partially oxidized toxins that inhibit further oxygen metabolism and “clog the system”, tying up hemoglobin, water, and the mechanisms for function and elimination.

Administration can be through any route with modifications:

- Direct IV infusion – Ozone slowly administered into a major vessel.
- Major auto-hemotherapy – Anticoagulated blood is mixed with ozone and is infused into a vessel.
- Rectal/vaginal insufflation – Humidified ozone is administered by catheter.
- Minor autohemotherapy – Blood mixed with ozone is injected intramuscularly.
- Limb or body bagging – Body or parts are bathed in humidified ozone.
- Ozonated water – Dissolves easily in water to be used topically or consumed.
- Ozone in Saline or LRS – Can be used topically or given IV or SQ.
- Intra-articular administration – For joint healing and prolotherapy.
- Prolo/Sclerotherapy – Very good, less painful than other agents.

- Acupuncture – With ozone, more effective than B12.
- Ozonated olive oil – Ozone is bubbled through oil until the oil is thickened. This will produce ozonides that are not irritating and thus is applied topically even to eyes.
- Inhalation – Ozone that has been bubbled through olive oil and humidified will not irritate respiratory epithelium.
- Subconjunctival injection – For ulcers and keratitis sicca.
- Gingival and tooth apex injection – Can eliminate infection.
- Urinary bladder insufflation – For chronic inflammation.
- Disc protrusions – Prolotherapy, which can be injected at interspinous space and around facets, stabilize joints and accelerate healing.
- Auricular – Can be direct, humidified, or bagged with a homemade device made from IV bags and tubing (á la Margo Roman).

As an anticancer, antiviral, antibacterial, and ant fungal agent, ozone is unsurpassed, especially since there are no appreciable side effects.

Oxygen deficit is key to the development and progression of all disease processes. Dr. Otto Warburg's work, confirmed by others, shows that this deficit and subsequent toxin buildup is the fundamental cause of all degenerative disease, especially cancers.

Antioxidants help the body to protect itself from excessive oxidative damage caused by multiple free radicals, many of which are inactivated by ozone. The support of free radical scavenging systems is important but only oxygen can improve the deficit that makes cells vulnerable to oxidative damage in the first place. Long-term ozone therapy can be augmented by supplementation with antioxidants, but normally they should not be administered within 4 to 12 hours of ozone therapies.

Ozone produces the same effects as exercise, which produces significantly more free radical oxygen than can be administered in any ozone treatment. Ozone equals "exercise in a syringe" without doing joint damage.

Ozone potentiates more complete oxidation, helps to maintain more normal body temperature and increases the effects of most hormones, vitamins, herbs, homeopathics, and drugs. Concurrent ozone administration reduces the amount of chemotherapeutic drugs needed to achieve effect by  $\frac{1}{4}$  to  $\frac{3}{4}$ . It complements chelation therapies and frequently improves the affect and sense of well being in patients.

Continued therapy will allow Herring's Law to manifest "Healing from inside to outside, top to bottom, front to rear, and in reverse chronological order of the insults to the body." Healing crises, however, may occur. Ozone therapy facilitates the rapid resolution of these crises.