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Gemie McLeod, N.M.D.  
*Naturopathic Physician*

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PHONE: (928) 776-1600  
FAX: (928) 778-5264

820 AINSWORTH DR, SUITE B,  
PRESCOTT, AZ 86301

## Ozone Therapy

### What is Ozone Therapy?

Ozone therapy is a unique form of therapy that both heals and detoxifies at the same time. It is used to treat a variety of chronic disease including cardiovascular disease, diabetes, Lyme disease, chronic hepatitis, herpes, chronic fatigue states, chemical sensitivity, macular degeneration, chronic bladder conditions, colitis, auto-immune diseases, and Crohn's disease.

### What is Ozone?

The oxygen you breathe is present in the air as a pair of oxygen atoms. This is the most stable form of oxygen, and it's colorless. Ozone is a blue colored form of oxygen (it's what makes the sky blue), and unlike regular oxygen, it is composed of three oxygen atoms instead of two. It is the addition of the third oxygen atom that makes ozone "supercharged" oxygen, and gives it all of its remarkable medical properties.

The use of ozone to treat various medical conditions was first developed in Germany in the early 1950's. Today, medical ozone therapy is common throughout Europe, and its use has gradually been spreading in America over the last 25 years.

### Ozone is Toxic, Isn't It?

Anything, including water and oxygen, is toxic if given in amounts that exceed the body's capacity to utilize it. Ozone is found naturally in the body. The white cells make it as part of the immune response. Pure medical grade ozone, when it is used according to the established medical guidelines, has a safety record that is unparalleled.

### Medical Properties Of Ozone

Ozone has five properties that account for why it works so well not only for macular degeneration, but also for most other chronic age related conditions as well:

1. Ozone is a potent regulator of the immune system. This means that when the immune system is overactive (as in auto-immune disease), ozone will calm it down. Conversely, when the immune system is under active as in cancer, AIDS, and chronic infections, ozone will stimulate it. This unique ability of ozone stems from its action on the membranes of white cells that causes them to produce immune related messenger molecules called cytokines. Examples of cytokines are gamma interferon, interleukin-2, colony stimulating factor, and TNF-alpha just to name a few.
2. Ozone stimulates increased uptake of oxygen by stimulating the enzyme diphosphoglycerate (DPG). DPG enables the release of oxygen from the hemoglobin molecule so that it can be taken up into the cell. In the absence of an adequate amount of DPG, our cells become starved for oxygen. This is a common problem in diabetics.
3. Ozone improves circulation. It does this by enhancing the flow characteristics of blood as a liquid. This effect enables more of the



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- oxygen carrying hemoglobin to reach the capillaries where ultimately the cells will receive more of the oxygen they require. Many patients with chronic inflammatory conditions have impaired circulation.
4. Ozone increases antioxidant protection more than any other therapy including vitamin C. Most people with chronic disease have deficient antioxidant defenses.
  5. Ozone is a powerful mitochondrial stimulant. The fundamental underlying cause behind all degenerative disease from diabetes to heart disease to cancer is decreased mitochondrial energy production. Ozone can often correct this problem.

### **How is Ozone Used Medically?**

Autotherapy is the most common and, in most cases, the most effective way ozone is administered. The patient sits in a chair and has from 6-12 ounces of blood removed into a sterilized bottle. Then ozone is injected into the bottle, and the bottle is gently shaken, allowing the red and white blood cells to take up the ozone. The ozonated blood is then returned to the body. The entire procedure takes about 30-40 minutes.

### **Is Ozone Therapy For Me?**

This is a decision for a doctor who is trained and experienced in the medical use of ozone. Some conditions simply will not clear up unless ozone is used, and of course many conditions will clear up without ozone. Because of its many therapeutic properties, ozone can be used as part of a therapeutic plan for almost every disease.

It is invaluable in the treatment of heart disease and circulatory disorders. Chronic infections such as hepatitis-C, herpes, Lyme, and AIDS respond very favorably to ozone. It is also very helpful in chronic fatigue syndrome, fibromyalgia, and autoimmune diseases.

It is important to realize that ozone therapy is not a panacea or some kind of magic bullet. Although it is often an indispensable modality, it is only rarely effective by itself. In the great majority of cases it must be combined with an individualized program of other alternative and natural therapies, such as nutrition and detoxification.

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## **Additional Ozone Therapy Information**

Over the past sixty years, over a dozen methods have been developed in the application of ozone in medical therapy. Some have undergone extensive testing under clinical conditions, and have been determined safe and effective by leading physicians and professional groups like the International Ozone Association and The Medical Society for Ozone Application in Prevention and Therapy [Ärztliche Gesellschaft für Ozonanwendung in Prävention und Therapie] in Germany, while others have not. New methods are being introduced on a regular basis, including some that are considered highly experimental.

In most cases, tiny amounts of ozone are added to pure oxygen (consisting of 0.05 parts of ozone to 99.95 parts of oxygen for internal use and 5 parts of ozone to 95 parts of oxygen for external applications). Doses are usually expressed in terms of micrograms of ozone per milliliter of oxygen ( $\mu\text{g}/\text{ml}$ ). For example, if a physician were to require 1200 micrograms of ozone, he or she would select a concentration of 12  $\mu\text{g}/\text{ml}$  and use a volume of 100 ml of oxygen. Because exact amounts of ozone are usually indicated for medical use, only ozone generators that allow measurements of precise concentrations should be used.

The exact amount of ozone to be used is determined on a case by case basis, after a careful medical diagnosis by a practitioner with extensive training in ozone therapy. That is the main reason why only representative ozone (and hydrogen peroxide) protocols are included in this document, whose goal is to educate the reader about these therapies rather than promote self-treatment. In addition, protocols can change over time, and the medical needs of each patient must be determined on an individual basis before an oxidative therapy is used.

Over the years, some physicians have found that too much ozone can be immunosuppressive, while not enough can be ineffective. In an effort to discover the lowest possible dose of ozone needed to enhance immune activity, many researchers see microdosing as an important guideline in future therapeutic ozone applications.

At the present time, there are eight simple methods and one highly complex method of ozone therapy that are used in medical practice today. Some are designed for very specific health problems, while others have more generalized applications. Some methods are considered extremely safe, while the safety of others is questionable.

According to *The Use of Ozone in Medicine*, the most common recommended applications include:

### *Systemic Applications*

- Major autohemotherapy
- Rectal insufflation
- Minor autohemotherapy



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### *Topical Applications*

- Ozone bagging
- The suction cup method
- Rectal/vaginal insufflation
- Intraarticular injection
- Ozonated water as sprays
- Ozonated ointments (1)

### **Systemic Applications**

#### *Direct Intra-arterial and Intravenous Application*

An oxygen/ozone mixture is slowly injected into an artery or vein with a hypodermic syringe. This method has been used primarily for arterial circulatory disorders. However, this method has been abandoned by most physicians in favor of safer modalities.

#### *Rectal Insufflation*

First pioneered by Payr and Au bourg in the 1930's, a mixture of ozone and oxygen is introduced through the rectum. In the past, it was believed that the ozone was absorbed into the body through the intestine. In fact, ozone reacts with the luminal content immediately and only some of the generated chemicals produced during the reaction are absorbed: this has been scientifically measured both in the portal and general circulation by Bocci and his colleagues.(2) Used for a wide variety of health problems -- including arterial circulatory disorders, general immunoactivation, adjuvant cancer therapy, and to treat hepatitis A, B and C (3) -- this method is considered one of the safest Typically, between 100-800 ml of oxygen and ozone (for an average adult of normal body weight) is insufflated into the rectum, a process that takes between ninety seconds and two minutes. Rectal insufflation is considered a safe and simple method of ozone delivery that is particularly suited to the elderly (whose access to veins is often difficult), to babies and young children, and to others who don't like getting stuck with hypodermic syringes. When administered under medical supervision in Germany, Russia, and Cuba, a growing number of private individuals in the United States have used this method for self-treatment for cancer, HIV-related problems, heart and circulatory disorders, diabetes and other degenerative diseases. It has also been found useful in treating localized health problems like proctitis and colitis. Whenever insufflation is used, the ozone/oxygen mixture must be humidified in order to prevent sensitive tissues from drying out.

#### *Vaginal Insufflation / Urethral Insufflation*

Vaginal insufflation is based on the wrong philosophy that ozone can be absorbed into the body through the vaginal wall, uterus, and fallopian tubes: in reality, oxygen and certain chemicals produced by the post-ozone reaction are absorbed. Considered safe and effective, physicians have found that it can not only be useful for the same kinds of systemic diseases ordinarily treated by rectal insufflation, but the vaginal route can be used specifically to treat gynecological problems like yeast infections (such as candida) and uterine



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infections. This method is not recommended during pregnancy.

Urethral insufflation is recommended primarily for treating bladder infections among men, but may be useful in localized problems like urethritis as well.

#### *Ear Insufflation*

Applying a mixture of oxygen and ozone through the ear is a recent but popular development in ozone therapy. This method is based on the idea that ozone is absorbed by the body through the tiny capillaries of the ear canal. Once again, this idea is wrong, and only some chemical compounds produced by a post-ozone reaction are absorbed into the ear canal.

Used only in a well-ventilated room (and preferably with a fan placed behind the patient to prevent inhalation of ozone), the generator is connected to a tube with a plastic catheter. The generator is turned on and the catheter is placed gently into the ear. Some use a modified stethoscope to split the ozone flow so that both ears are treated at the same time. The gas is run at a slow flow rate through a glass humidifier and then it interacts with the surface tissues of the eardrum. The chemical compounds produced by these interactions enter the middle ear, the inner ear, and down the Eustachian tube into the sinuses, brain, and bloodstream. A typical treatment takes one to two minutes.

Typically, sick patients undergo three treatments a week, while others use it once or twice weekly for health maintenance. Although this method has not yet been clinically studied, doctors report that ear insufflation is helpful in treating ear infections, mastoiditis, tinnitis, sinusitis, head colds, hearing problems caused by candida and more generalized disease symptoms like Parkinson's disease, influenza, bronchitis and asthma. However, some physicians question whether a prolonged and repeated course of treatment is safe considering the delicacy and low levels of antioxidants in these auricular structures.

#### *Intramuscular Injection*

A small amount of an ozone and oxygen mixture (up to 10 ml) are injected into the patient (usually in the buttocks) like a normal injection would be. This method is commonly used to treat allergies and inflammatory diseases, and is sometimes utilized as an adjunct to traditional cancer therapies in Europe. However, it has been reported that ozone concentrations over 20 µg/ml in volumes exceeding 10 ml can be very painful and may produce feelings of faintness in some patients.

#### *Minor Autohemotherapy*

Used since the 1960's, minor autohemotherapy involves removing a small amount (usually 10 ml) of the patient's blood from a vein with a hypodermic syringe. The blood is then treated with ozone and oxygen, and given back to the patient via intramuscular injection. Thus the blood and ozone becomes a type of auto-vaccine given to the patient that is derived from his or her own cells and can be very specific and effective in treating the patient's health



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problem. This method is primarily used to treat acne, allergies, furunculosis and as an adjunct to traditional cancer therapy.(4)

#### *Major Autohemotherapy (MAHT)*

Major autohemotherapy is perhaps the most popular form of generalized ozone therapy. A type of extracorporeal blood treatment (in which blood is taken from the body, treated, and reinfused), it has been analyzed and evaluated under a wide variety of clinical conditions. Major autohemotherapy typically calls for the removal of up to 250 ml of the patient's blood. Ozone and oxygen are added carefully (to avoid bubbling) into the blood for several minutes, and then the ozonated blood is reintroduced into the vein in the form of an IV drip. Bubbling causes foaming that damages blood cells and must be avoided.

Like rectal insufflation described above, MAHT has been found to activate red blood cell metabolism, increase ATP production and oxygen release, activate the immune system with the release of cytokins (such as interferon and interleukins), aid in immune system modulation, and increase the body's antioxidant capacity.(5) For these reasons, it has been used successfully to treat a wide variety of health problems, including herpes, arthritis, cancer, circulatory disorders and HIV-infection. It is probably the most commonly used type of ozone therapy today.

#### *Body Ozone Exposure (BOEX): The Sauna Bag*

Ozone pumped into a "sauna bag" (which leaves the head uncovered) is now being used to treat more generalized health problems, such as HIV-infection, circulatory problems and diabetes. Typically the patient would take a warm shower and get into the bag. Pure oxygen mixed with small amounts of ozone are then pumped into the bag for a period of twenty to thirty minutes, making contact with all skin surfaces. The skin interacts with the ozone, and only the oxygen and ozone reactive products are absorbed.

#### *Body Ozone Exposure: The Steam Cabinet Method*

Another BOEX delivery system calls for the patient to sit in a steam cabinet. In addition to steam, a mixture of oxygen and ozone is pumped into the cabinet through a tube from an ozone generator. Wet towels are placed around the patient's neck and a ventilating fan is placed behind the head so that ozone is not breathed into the lungs. A session will normally last from ten to twenty minutes, or until the patient feels uncomfortable from the heat. Like the sauna bag technique described above, the theory behind this method is that the ozone will react with the surface of the skin, and the oxygen and ozone reactive products will be absorbed and eventually find their way into the bloodstream.

BOEX with a steam cabinet can easily be done at home with a minimum of technical skill, and many enjoy it as a spa treatment or in health maintenance programs. A growing number of physicians and patients have expressed enthusiasm for the steam cabinet method for treating a wide variety of health complaints, although more scientific research needs to be done. In addition,





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standardized protocols need to be developed for this relatively new form of ozone application.

While the method itself is considered very safe, ozone must not be inhaled, even in small amounts. For this reason, the steam cabinet must be sealed to prevent ozone leakage and the room in which treatment takes place must be adequately ventilated.

One of the few researchers to document the effects of BOEX is Velio Bocci in his book *Oxygen-Ozone Therapy: A Critical Evaluation*. While acknowledging the problems mentioned above, Dr. Bocci cites several advantages of BOEX over other methods like MAHT: it is simple to perform, fairly inexpensive, non-invasive (no puncturing of veins), and it does not involve the handling of blood. He points out that BOEX can be potentially useful in treating a variety of health problems, such as viral diseases (including HIV and herpes), chronic fatigue syndrome, and certain circulatory diseases at low temperature levels (such as hind limb ischemia due to atherosclerosis, Buerger disease and diabetes), moderate burns, skin diseases, sclerodermia, certain types of muscular-tendinous lesions in athletes and advanced lipodystrophies, such as Madelung disease.

As with other ozone therapies, Dr. Bocci recommends the "start low, go slow" protocols, with low initial concentrations of ozone to help the body adapt to chronic oxidative stress. He recommends a course of therapy every other day for several weeks at temperatures from 70 to 90 degrees Celsius for periods often to twenty-five minutes each treatment.(6)

#### *Direct Intravenous Injection*

This controversial method involves injecting a mixture of oxygen and ozone directly into a vein. This method has long been promoted by Ed McCabe in his publications and lectures, and he includes a protocol for treatment in his popular book *Flood Your Body with Oxygen*. When determining how much ozone to use, McCabe writes:

"I have always used the analogy of filling up the gas tank in your car. You pump the gas in and when it's full, if you keep pumping it in the gas runs down the side of the car. The lungs are the oxygen overflow mechanism for the blood. When the bloodstream is full, the blood out-gasses into the lungs, and the oxygen-ozone sub species 'run down' the inside of the lungs, causing rapid lung pollution detoxification, heat, and possible slight temporary edema. All the patient knows is that he or she can't stop coughing if you do not quickly stop the procedure at the first sign of this."(7)

Although a number of health practitioners in the United States and Canada claim that this method to be safe and effective, many physicians (especially those trained in Europe and Cuba) consider it dangerous and without clinical advantages over other ozone delivery methods.

There are other stories of embolism, including one of a patient going comatose and another patient suffering respiratory arrest after direct IV



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treatment Dr. Robert Atkins' medical license was temporarily revoked after a patient went to the hospital complaining of adverse side effects to direct IV injection, which lead to him to abandon it permanently.

Dr. Frank Shallenberger, perhaps the most respected ozone practitioner in the United States today, has treated thousands of patients with therapeutic ozone since 1985. After several negative experiences with direct IV early in his practice, he stopped using the method completely in favor of autohemotherapy. In his training manual for physicians who attend his workshops, Dr. Shallenberger offered seven reasons why direct IV injection should not be used:

1. *Precise dosing is impossible, because the induction effects of ozone vary according to the volume amount of blood being treated. Since it is impossible to know with any precision what volume of blood is being treated in a direct IV application, it is impossible to maximize the treatment effect.*
2. *Autopsy studies of dogs treated with the direct IV method have consistently demonstrated that the technique causes pulmonary embolisms. These embolisms are caused by the oxygen in the gas mixture and not the ozone.*
3. *The embolisms associated with direct IV injection will induce bronchospasm, which in the case of patients with a history of either asthma or chronic lung disease may result in fatal acute respiratory failure.*
4. *The treatment of many clinical conditions requires fairly large doses of ozone. While these doses are readily achieved using MAH [major autohemotherapy], they are extremely time-consuming using the direct IV method.*
5. *The direct IV method is very uncomfortable to patients. The embolisms cause chest pain, coughing spasms, and tachycardia.*
6. *Phlebitis at the injection site is a common side effect of this modality.”(8)*

Dr. Bocci has also spoken out strongly against direct IV injection. In a 1995 speech on the future of ozone therapy presented at the Twelfth World Congress of the International Ozone Association in Lille, France, he cautioned:

*“[The] use of the intravenous administration route is extremely dangerous because even if the gaseous mixture of oxygen-ozone is administered very slowly with a pump, it frequently procures lung embolization and serious side effects, particularly when daily dosing is up to 120ml.”(9)*

Prof. Bocci has cited a number of fatalities in Italy resulting from subcutaneous (under the skin) ozone injections to treat lipodistrophy, commonly known as cellulite. Three deaths, from March 1998 to December 2002, caused the Italian Ministry of Health to not only prohibit the use of ozone therapy in all cosmetic and beauty centers, but in public hospitals as well.

*“I am always very emphatic in proscribing Direct IV injection of the gas [oxygen-ozone] mixture: Unfortunately charlatans and technicians without medical qualification do this because they either are stupid or because they cannot do major AHT. It has been well defined that a gas injection with a volume above 20ml can produce a deadly embolism. Thus why risk harming the patient? Moreover, it does not matter that it is not ozone, but actually oxygen kills the patients. Indeed the minute volume of ozone is immediately dissolved and disappears because of extreme reactive capacity.”(10)*





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He also points out that in the oft-cited 1983 German survey on the safety of ozone applications, the only adverse side effects were attributed to direct IV injection. Administering ozone through this method is considered medical malpractice in Europe, and has been outlawed there since 1984.(11)

#### *Ozone IV and Saline*

First developed by researchers affiliated with the Russian Association of Ozonotherapy in Nisni Novgorod, the intravenous IV method appears to be free of the dangers of embolism.(12)

Using an ozone generator, fill spout and ozone destructor unit, oxygen and ozone is bubbled into a prescribed amount of saline (the Russians use 200 or 400 ml of sterile physiological 0.9 percent sodium chloride solution), the kind usually used in IV drips. The ozonated saline is then infused slowly into the patient through a vein, as would a normal intravenous saline drip.

While Russian studies have found this method to be both safe and effective, (16) similar research has not been done in the West. However, physicians who have used this method have reported good results with minimal adverse reactions. Some possible clinical applications for this ozone delivery method could include treating disease-causing microorganisms in the blood, as well as rheumatic diseases, inflammatory conditions and degenerative diseases like arteriosclerosis, diabetes and cancer.

According to Natalia Bernikova of Medozons, Ltd. [a company formed by the Russian Association of Ozonotherapy and the Russian Federal Nuclear Centre ARZAMAS] (13):

*"Intravenous infusion of ozonated saline is still procedure No. 1 in Russia, being a priority of the Russian technology of ozone therapy and considered as a better systemic alternative to major autohaemotherapy and rectal insufflations. Nevertheless, the latter methods have been used in Russia as well, depending on the indication."*(14)

However, this method is not without its critics, especially Dr. Bocci. He writes, *"Unless very low levels of ozonation are adopted, some formation of hypochloric acid, with time, will cause venous damage, possibly phlebitis" and could "possibly induce intravascular coagulation."* He also dismissed this method more as a placebo than a real treatment.(15)

Dr. Renate Viebahn was asked for her views on this subject, and she replied:

*"As to the ozonization of saline I am of the same opinion as Prof. Bocci: we have measured the reaction products under different conditions and approaches. The results are not promising: we always got NaOCl {hypochloric acid} which is toxic to blood and blood vessels. So, there is no recommendation to treat saline or another solution containing physiological NaCl solution. I know there are Russian groups treating patients that way but with very, very low ozone concentrations."* (16)

#### *Extracorporeal Blood Circulation (EBOO)*

EBOO is an experimental procedure developed by Velio Bocci and others in Italy. Its goal is to ozonate large amounts of blood in a single session (five liters



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over a period of 30 to 45 minutes), using a method similar to kidney dialysis. However, Bocci is critical on the use of dialysis filters:

*“I condemn the use of dialysis filters because they are ineffective and toxic, and unfortunately Russians and other charlatans in Kenya, Malaysia etc. use them. We need only to exchange gas and therefore we can use only appropriate hydrophobic gas exchanger coated with biocompatible compounds to prevent platelet activation. The system operates quite differently from dialysis because blood run outside the ozone-resistant hollow-fiber tubings.”(17)*

By 2006, it was used on several dozen volunteers, mostly suffering from serious coronary disease. Most received fourteen treatments over a period of several weeks, with periodic follow-up treatments. Improvements were noted in all patients.

Dr. Bocci feels that EBOO can be potentially useful in patients with chronic, inoperable ischemic limbs (where amputation is the only alternative), severe coronary angiostenosis (narrowing of the blood vessels), chronic hepatitis C, acute cardiac ischemia, inoperative metastatic cancer and severe lipodystrophies, which are characterized by abnormalities in fatty tissue (that can be associated with total or partial loss of body fat), abnormalities of carbohydrate and lipid metabolism, severe resistance to insulin and immune system dysfunction.

However, disadvantages include the high costs of a disposable oxygenator and training a highly-qualified technician, possible deterioration of access to veins, and complications associated with the occasional need to insert a catheter into a central vein.(18)

#### *Intraperitoneal (IP) Ozone*

Another highly experimental yet promising method is administering oxygen and ozone into the peritoneum, a thin membrane that lines the abdominal and pelvic cavities that covers most abdominal viscera. Russian physicians have been washing out purulent material with ozonized water in treating peritonitis and pleural empyema for years with good results, and Dr. Bocci has explored the possibility of using this method to treat chronic viral hepatitis.(19)

Administering medication through the peritoneum is rare, but not unknown. A 2006 article in The New York Times highlighted how this method can help prolong the lives of ovarian cancer patients and reported that the National Cancer Institute took the unusual step to encourage doctors to adopt this previously little used abdominal treatment.(20)

A new technique to administer intraperitoneal ozone was developed by Dr. Siegfried Schulz and others from various institutes and departments (Veterinary Services and Laboratory Animal Medicine; the Department of Otorhinolaryngology, Head and Neck Surgery; the Department of Pathology; the Institute of Anatomy and Cell Biology and the Department of Pediatrics) at the Philipps-Universitat of Marburg, Germany. Dr. Schulz and his colleagues believe that intraperitoneal application can yield great benefits for



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patients suffering from cancer and severe bacterial diseases like sepsis and enterocolitis. (21)

### **Topical Applications**

#### *Ozonated Water*

This method calls for ozone gas to be bubbled through water, and the water is used externally to bathe wounds, burns and slow-healing skin infections. It is also used as a disinfectant by dentists who perform dental surgery. In Russia, physicians are using ozonated water to irrigate body cavities during surgery. In both Russia and Cuba, ozonated water is used to treat a wide variety of intestinal and gynecological problems, including ulcerative colitis, duodenal ulcers, gastritis, diarrhea and vulvovaginitis. Ozonated water can also be used for colonics or enemas.

### **Intra-articular Injection**

In this method, ozone gas is bubbled through water and the mixture is injected directly between the joints, primarily those of the knee and shoulder. Some feel that using water is not necessary, because synovial fluid (a transparent viscid lubricating fluid secreted by a membrane of an articulation, bursa, or tendon sheath) contains plenty of water. And unless the water and the delivery system are sterile, they may also contaminate the gas.

Intra-articular injection is used primarily by physicians in Europe and Cuba to treat rheumatoid arthritis, knee arthrosis, rheumatism, traumatic knee disorders and other joint diseases. A variation of this method, known as Prolozone™ Therapy, was developed by Dr. Shallenberger.

#### *Ozone Bagging*

This non-invasive method uses a special ozone-resistant plastic bag containing some water that is placed around the area to be treated. An ozone-oxygen mixture is pumped into the bag and the oxygen and reactive ozone products that result are absorbed into the body through the skin. Ozone bagging is primarily recommended for treating leg ulcers, gangrene, fungal infections, burns and slow-healing wounds. Without water in the bag, ozone is practically ineffective. A normal treatment takes ten to twenty minutes using approximately 80 to 100 microns of ozone.

#### *Ozone Glass Cupping Funnel*

Another form of trans dermal ozone application is ozone cupping, which utilizes a small glass cup with a funnel attached to administer ozone to specific areas of the skin. The cupping funnel has an ozone destruct and an ozone line to introduce ozone into the funnel. The physician first applies a small amount of water to the skin, and then the glass cup is applied firmly to the area being treated. A mixture of oxygen and ozone is pumped into the cup and the oxygen and ozone reactive products penetrate the skin. This method has been found to be especially effective in treating poorly-healing wounds, abrasions, skin infections, herpes, decubitus ulcers, fungal skin infections, burns and radiodermatitis. A typical treatment involves a low flow of ozone administered



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from ten to fifteen minutes.

#### *Ozonated Oils*

Ozonated oil has been used to treat skin problems for over a century. Although not yet widely available in pharmacies, it became quite popular in Europe during the 1950s and is marketed by mail through a number of ozone suppliers in the United States and Canada. Ozone gas is added to olive oil and applied as a balm or salve for long-term, low-dose exposure. Other bases (such as sunflower oil) for salves and creams have been developed in Cuba, where their effects have been extensively documented in hospitals and clinics.

Ozonated oil has been found to be useful in treating a wide variety of skin problems, including dermatitis, bacterial infections of the skin (including staphylococcal diseases such as cellulitis, impetigo, ecthyma, and scalded skin syndrome) fungal infections (including infections of the nail bed and athlete's foot), fistulae, leg ulcers, bedsores, gingivitis, herpes simplex, hemorrhoids, vulvovaginitis, bee stings and insect bites, acne, furuncles and carbuncles, infections of the sweat glands (hidradenitis suppurativa), and yeast infections of the skin including candidiasis [caused by *Candida albicans*]. It is also useful in the postsurgical treatment of wounds, and Cuban physicians are using capsules filled with ozonated oil to treat gastro-duodenal ulcers, gastritis, giardiasis, and peptic ulcers.

#### *Inhalation of Ozone?*

Physicians who use medical ozone warn that inhaling ozone into the lungs can bring about alterations in the density of the lung tissue, can damage delicate lung membranes, irritate the epithelium [the surface layer of mucus] in the trachea and bronchi, and can lead to emphysema. They caution users that no ozone should escape into the room in which it is being used; properly designed medical ozone generators are becoming available for use in avoiding the accidental escape of ozone gas. Dr. Stephen A. Levine, the co-author of *Antioxidant Adaptation*, cautions people against using commercial air purifiers that generate small amounts of ozone to clean the air, since ozone should not be inhaled.

Having said this, it is important to point out that in Russia, tiny amounts of ozone are being added to oxygen for therapeutic inhalation in certain cases. This has been done with patients suffering from carbon monoxide poisoning, and doctors have been impressed with the results. No adverse side effects were observed.(22)

Here in the United States, some physicians have begun to experiment with inhalation of ozone filtered through olive oil, because by bubbling ozone and oxygen into olive oil, a different gas is produced (C-10 H-18 O-3) that can be safely inhaled through the nostrils.

Pure oxygen is used as the feed gas through a medical ozone generator. A low concentration of ozone is used at a flow rate of .25 to .5 liter per minute. A humidifier or nebulizer is filled half full with extra-virgin cold-pressed olive oil,



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Naturopathic Physician

and the oxygen-ozone gas is bubbled through the olive oil. The patient either inhales the vapors directly from the olive oil or inhales it through an oxygen mask or nasal cannula. A typical treatment takes approximately twenty minutes. Practitioners in both Europe and the United States report that this delivery system is both safe and effective for treating allergies, asthma and other respiratory diseases. However, they warn that this method is never to be used without olive oil or at high ozone concentrations.

#### *Ozone: Exact Measure*

Different therapies require very specific concentrations of ozone, and the ozone must be given in exact amounts. According to Dr. Bocci, "The ozone therapist must be aware of the dilemma that either too low or too high ozone doses can be either ineffective or toxic, respectively."(23)

Some generators, like the German, Canadian and Cuban machines referred to earlier, are capable of generating ozone for all therapeutic applications, while others (especially inexpensive models designed primarily for treating tap water in the home) are not. This is why it's important to verify a generator's capacity before purchase, and to determine the exact ozone concentration produced by the generator for a specific therapeutic use.

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Notes

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PHONE: (928) 776-1600  
FAX: (928) 778-5264

820 AINSWORTH DR, SUITE B,  
PRESCOTT, AZ 86301





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Gemie McLeod, N.M.D.  
*Naturopathic Physician*

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FAX: (928) 778-5264

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