



Health & Wellness



The Good, The Bad and the Medical Uses of Ozone



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The Good Ozone, Stratospheric Ozone Protects the Planet

Ozone naturally occurs in the Earth's upper atmosphere, the stratosphere. This is the area from 6 – 30 miles above the Earth's surface. At this level, ozone provides a protective layer – absorbing some of the ultraviolet rays of the sun. Excessive ultraviolet (UVB) rays have been linked to skin cancers, cataracts, and have also been known to harm some crops and marine life. Stratospheric ozone is known as the "good ozone". Ozone concentrations in the stratosphere vary naturally with seasons, latitude and sunspots. In the 1970s, it was found that the ozone shield was being depleted beyond its ability to recover. The effects of pumping synthetic chemicals into the atmosphere was starting to take an irreversible toll. Emissions from industrial facilities and electrical utilities, chemical solvents, gasoline vapors, and motor vehicle exhaust are collectively called volatile organic compounds (VOCs). Once emitted, it may take as long as 2 – 5 years for some of the ozone depleting volatile organic compounds to get to the stratosphere. Once there, the chlorines and bromines from the VOCs react with UV light and destroy ozone molecules. One chlorine molecule can destroy over 100,000 ozone molecules!! The "ozone hole" over Antarctica is not really a hole but an area in the stratosphere with extremely low amounts of ozone. While this may be the best known, ozone depletion of the stratosphere is also known to exist over latitudes covering

much of the world. In 1987, 180 countries (including the US) adopted the Montreal Protocol to phase out the production and use of ozone depleting substances. The ozone layer has been "healing" and is expected to fully recover by 2065.

The Bad Ozones: Tropospheric Ozone and Ground Ozone are Impure Ozones Created by Pollution

Ozone can "trickle down" from the stratosphere to reach the troposphere – the lowest level of the atmosphere. Here ozone and other pollutant gases can act as potent greenhouse gases. These gases let the sunlight pass through the atmosphere but prevent the heat that the sunlight brings from leaving the atmosphere. Collectively these pollutant gases trap heat and warm the planet. This is ozone acting badly.

Ozone is also created at the ground level by pollution. It is also known as a "bad ozone". Pollutants emitted by cars, power plants, industrial boilers, refineries, chemical plants and other sources of synthetic hydrocarbon molecules react with sunlight creating ground level ozone. "Air pollution" is a combination of atmospheric water vapor (humidity), hydrocarbons, peroxidized hydrocarbons, nitrates and ozone. It can reach unhealthy levels on hot sunny days in urban environments but it can exist in colder months and, transported by winds, can reach rural areas. Air pollution has many harmful effects including health effects (affecting sensitive animals and vegetation). Smog is a type of air pollution that reduces visibility. Satellite data is used to measure five major air pollutants: ground level ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide and airborne particles, creating an Air Quality Index that we hear on our weather reports. Unfortunately ozone gets a bad reputation because it is a measure of this pollution. But this is impure, pollution-caused ozone mixed with many other chemicals – not medical grade ozone.

Medical Grade Ozone – Stimulates the Body to Heal Itself

A single atom of oxygen likes to share electrons with another atom of oxygen forming O₂ - the stable molecule we call Oxygen. The earth's atmosphere is 20% oxygen. Obviously we need it to live. Ozone is produced when an energetic force reacts with oxygen and splits O₂ into singlet oxygen. A small percentage of oxygen atoms will re-combine as a threesome, O₃ – ozone. As a relatively unstable molecule, ozone will convert back to oxygen in a short time, or react with other molecules (as in the case of pollutants above).

Ozone was discovered in 1785 by the Dutch physicist Martinus Van Marum. He was working with electrical charges and noticed an unusual smell as the charges were reacting with the air in the room. It was first deliberately produced in 1840 in Germany and called ozonized gas. "Ozein" in German means "smelling gas". The first ozone generating electrode was built in 1857 by Werner von Siemens, the founding father of electrical engineering. In 1870 a German doctor published a paper describing the use of ozone for sterilizing water and in 1873, ozone was found to be an anti-microbial agent. In 1885, the Florida Medical Association published the first textbook on the medical applications of ozone.

In 1896, Nikola Tesla (inventor of A/C current) patented the first ozone generator and founded the Tesla Ozone company, manufacturing ozone generators for medical use. In the early 20th century a program teaching the medical uses of ozone for infectious disease was taught at Loyola Chicago University and ozone therapy was being used by the German army for wound treatment. Ozone was being used by dentists by the 1930s and, in the 1950's the first modern ozone generator was made, thanks to the development of ozone resistant plastics. The 1980's brought us the classic text, "The Medical Use of Ozone" by Renate Viebahn-

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If you are going to use ozone therapy:

- You will need a properly trained and certified practitioner. Check www.aaot.us
- You can check YouTube for videos on ozone therapy
- Optimal equipment is paramount. Medical grade oxygen must be used and all the equipment must not be reactive with ozone gas. Equipment must have one of these safety approval stickers: ETL, CSA, UL, QAL.
- The equipment and practitioners must produce pure ozone/oxygen mixtures at the right concentrations and not impure, contaminated gases at unreliable concentrations.
- The information on Medical Ozone in this article is condensed from the great book, "The Ozone Miracle," by Frank Shallenberger MD



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Hansler and in 2010 the International Scientific Committee on Ozone was formed. The ISCO3 compiled the Madrid Declaration, the first standards for ozone therapy. Shortly after, the Academy of Ozonotherapy was created. There have been over 2,500 papers published on the medical use of ozone in the last 30 years. It is not new. Ozone has a long history of use in medicine.

So how does it work as a therapeutic agent in medicine? When ozone is put into the body it instantly reacts with the tissues to form peroxides. We call these peroxides - ozonides. These can last in the body for minutes up to weeks. The ozonides penetrate cell membranes and react with the Vitamin B3 associated cofactors (oxidizing NADH back to NAD) essential to the production of energy. The mitochondria in your cells use oxygen as part making energy (ATP). Ozone stimulates this energy production process inside the mitochondria ten times more than oxygen!! This is why many of the studies have shown ozone to be beneficial for cardiovascular disease and in many of the conditions of aging. Ozone increases anti-oxidant reactions in the body and because it is a dipolar molecule (has a north and south end like a magnet), the magnetic potential of ozone prevents it from becoming a

harmful free radical. Ozone activates the immune system in infectious disease (acute and chronic). It has been shown to reduce chronic pain. Ozone causes the release of growth factors that can help regenerate damaged joints. It is so useful for healing because it induces the body's natural healing response. Published papers have shown that ozone is a useful modality in treating many chronic conditions where conventional medicine has few solutions. These include: chronic fatigue, fibromyalgia, Lyme disease, chemical sensitivity, macular degeneration, autoimmune conditions and others. Many doctors, dentists and veterinarians have realized the potential of ozone for healing many of the conditions of our times. It is inexpensive and virtually free of side effects. And it is a very safe therapy. Hopefully it will gain more widespread use soon!!!!

Dr. Kate Thomsen's office for holistic health care is located in Pennington, NJ. She is trained in Family Medicine, is Board Certified in Integrative Medicine, and is an Institute for Functional Medicine Certified Practitioner. She has been practicing Functional Medicine for 20 years. For more information see www.drkatethomsen.com or call the office at 609-818-9700.