

MAGNESIUM

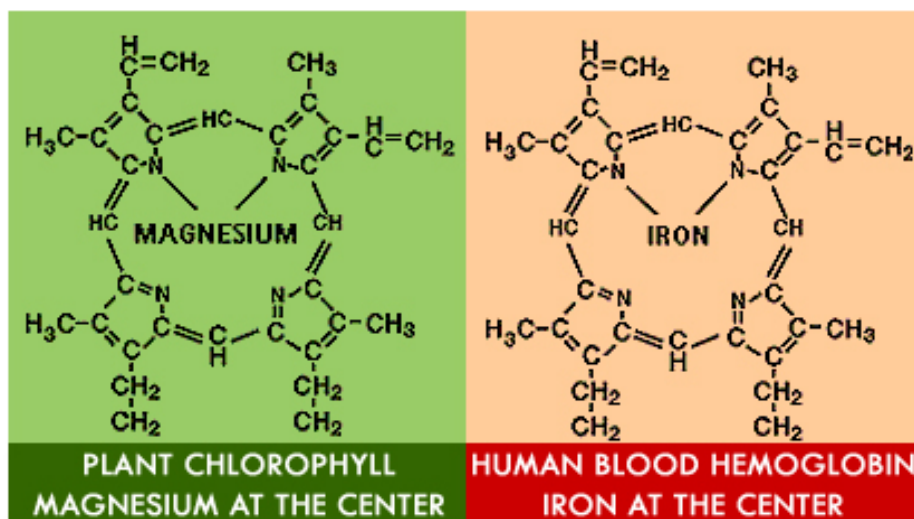


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See also:

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Sodium Bicarbonate
Chlorella
Spirulina
Green Smoothies

Books:

***Sodium Bicarbonate: Rich Man's Poor Man's Cancer Treatment* by Dr. Mark Sircus**
***Magnesium Medicine: Magnesium The Lamp of Life* by Dr. Mark Sircus**

Articles:

Websites:

www.MagnesiumForLife.com

Audio/Video:

Publications:

Organizations: LL's Magentic Clay (suppliers of Magnesium Flakes and Oil)
<http://www.MagneticClay.com>

People: Dr. Mark Sircus
Dr. Gabriel Cousens, M.D.

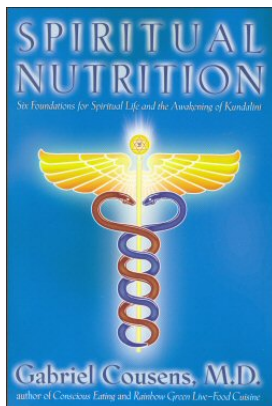
Integral Nutrition: Magnesium Oil
Angstrom Magnesium
Green Superfoods (Chlorella, Spirulina)

Conventional:

Terms:

MAGNESIUM: THE RELAXER MINERAL

Source: Cousens, Gabriel. "Minerals: Frequencies of Light" in *Spiritual Nutrition*



Magnesium, the relaxer mineral, is one of the most important minerals. Magnesium is important for all muscles, heart function, and the digestive system. Magnesium deficiency is associated with a chronic stress state and decreased adrenaline function. More than 80 percent of the population is deficient in magnesium. Magnesium is very important in the treatment of all people with chronic exhaustion, adrenal exhaustion, and depression. It is very important for the optimization of neurotransmitter function.

Almost all the clients seen at the Tree of Life are deficient in magnesium. This is particularly true with people who are experiencing tension, anxiety, adrenal exhaustion, chronic fatigue, constipation, and muscle spasm. Magnesium is very good for muscle cramps and spasm, particularly when people are fasting. Magnesium activates many enzyme systems and is involved in neurotransmitter production. It helps regulate temperature control in the body. It is needed for synthesis in protein. Magnesium is used by the pituitary gland as part of its regulation of parathyroid, adrenal, and thyroid function. It is a key enzymatic mineral used in almost 100 different enzyme systems in the Krebs cycle of making energy in the mitochondria of our cells. Many people who are depressed have a magnesium deficiency; therefore, it is used quite often in the treatment of depression. We don't need a lot of magnesium to get proper functioning; we have about 2 ounces of organic magnesium in our bodies.

Magnesium is very alkalizing to the body; and works as a natural laxative. At the Tree of Life we use it regularly for these two purposes with clients. It also helps calm nerves and improves flexibility, particularly in the muscles, nerves, ligaments, and joints. It has a positive effect on the mucous

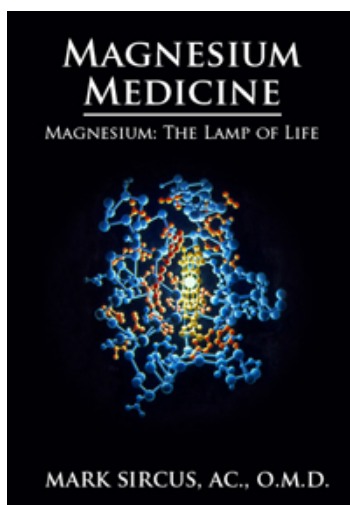
membranes, nerves in general, and excretory and secretory nerves. It is good for insomnia, as well as to cool the body Magnesium neutralizes acids in the system. It helps to alkalize the body (or raise the pH level), and soothes and cools the brain and nervous system in general.

An excess of magnesium often shows up as diarrhea. Magnesium excess is like amplifying the common sedative qualities of magnesium, so we start to see symptoms of poor memory, central nervous system apathy, slow reasoning power, and a dull brain function. With a magnesium deficiency we see a hyperactive nervous system, cramps, muscle spasms, anxiety, apprehension, excessive concern about work, tremors in the head, quivering in the voice, and a sense of doom psychologically, as well as depression. We also see shoulder and neck muscle stiffness in the evening. In time, a chronic magnesium deficiency creates an overactive inflammation of the nerves, disrupts mental functioning, undermines ambition, and causes the personality to become scattered and erratic. Women who are magnesium deficient may have difficulty with their menses. One of the main treatments for menstrual difficulties is magnesium and vitamin B6 One interesting symptom is that tobacco smoke is extremely irritating and debilitating to a magnesium-deficient person. Hatred, jealousy, resentment, bitterness, hostility, and greed tend to create a magnesium deficiency. These qualities are often ameliorated by giving magnesium to the person. Magnesium is synergistic with calcium. It is the combination of calcium and magnesium that helps maintain healthy bones, teeth, and tissues. It activates cell growth, improves tissue elasticity, and relaxes the nervous system. The magnesium helps us feel younger, lose weight, and is associated with an increase in libido. Magnesium in combination with calcium is anti-aging and even helps protect the skin.

Magnesium is highest in nuts, whole grains, unpolished rice, and wheat germ. Generally high-magnesium foods include apples, apricots, avocados, beet tops, berries, black walnuts, Brazil nuts, cabbage, coconuts, comfrey leaves, figs, dulse, endive, greens, spinach, rye, walnuts, watercress, and yellow corn.

MAGNESIUM MEDICINE BY DR. MARK SIRCUS, AC, O.M.D.

Source: <http://publications.imva.info/index.php/e-books/magnesium-medicine-e-book.html>



This book will take you on a sweeping journey across the universe of magnesium medicine. Magnesium was known by the Chinese thousands of years ago and was called the beautiful metal. Magnesium chloride offers the ultimate medicine for heart patients as well as the foundational treatment for cancer. It is a prime medicinal substance for pain management as well as offering a tonification of enzyme and mitochondrial systems. It helps with detoxification and chelation of chemicals and heavy metals while calming the nervous system. Magnesium is literally the lamp of life – without it life simply would not exist on planet earth.

Athletes can improve their performance and avoid injury. For those interested in staying young and strong as well as preserving the beauty of

their skin magnesium is the element of first choice for these types of things. This is my third book on magnesium and offers a quantum jump from my first book Transdermal Magnesium Medicine. Its information is cutting edge and is current with dosages and administration methods where as my first book is not.

This book is serious about using magnesium chloride as the lead item in protocols for every major disease category. The information is vital for all healthcare practitioners and their patients. Some of the main areas covered in this book are:

Magnesium and Cancer

One would not normally think that Magnesium (Mg) deficiency can paradoxically increase the risk of, or protect against cancer yet we will find that just as severe dehydration or asphyxiation can cause death magnesium deficiency can directly lead to cancer. When you consider that over 300 enzymes and ion transport require magnesium and that its role in fatty acid and phospholipids acid metabolism affects permeability and stability of membranes, we can see that magnesium deficiency would lead to physiological decline in cells setting the stage for cancer. Cellular degeneration is unavoidable when magnesium levels drop. From the DNA to the mitochondria, all levels of cell physiology suffer when there is not enough magnesium. Magnesium is a preventive medicine in terms of cancer and is also essential for its treatment. Even if one undergoes conventional treatment it makes more than good sense to use both magnesium chloride and sodium bicarbonate in one's treatment. (See chapter on magnesium bicarbonate)

Magnesium and the Heart

Magnesium is nutritional oil to the heart; it lubricates and facilitates its function. Administration of magnesium, in the correct way, can eliminate angina pain, muscle spasms, keep blood flowing smoothly and prevent platelet stickiness. Magnesium also produces vasodilation by a direct action as well indirectly by sympathetic blockade and inhibition of catecholamine release. Magnesium dilates both the epicardial and resistance coronary arteries. Magnesium also balances cholesterol and is essential for endocrine stability and function. Most importantly - magnesium prevents calcification of the heart tissues. For a full review for cardiologists and heart patients see Magnesium – The Ultimate Heart Medicine.

Magnesium and Emotions

The Department of Family Medicine, Pomeranian Medical Academy, states that dietetic factors can play a significant role in the origin of ADHD and that magnesium deficiency can result in disruptive behaviors. Even a mild deficiency of magnesium can cause increased sensitivity to noise, nervousness, irritability, mental depression, confusion, twitching, trembling, apprehension, and insomnia. All of these signs and symptoms lead to heart ache and heart break. Magnesium holds a huge potential as a first line medicine for psychologists and psychiatrists though it would damage the pharmaceutical companies mightily because of the vast decrease in need for their extremely dangerous and toxic psychotropic drugs.

The Ultimate Mitochondrial Cocktail

Magnesium and bicarbonate would at the same time increase energy in several ways. First, magnesium bicarbonate protects the natural organic and inorganic phosphate buffers in the cytoplasm of cells. Second, magnesium bicarbonate neutralizes the acid produced as a result of metabolic processes and ATP hydrolysis. This allows more ATP to be hydrolyzed; that is, more energy can be utilized. Magnesium bicarbonate buffers the mitochondria in body cells from excess acid concentrations which improves mitochondrial function and allows more ATP to be produced.

Magnesium and Inflammation

Ignorance has prevailed over the interrelationship between muscular lipid accumulation, chronic inflammation and insulin resistance because the central mediating factor is magnesium. It is magnesium that modulates cellular events involved in inflammation. The chronic and continuous low-level stress that silent inflammation places on the body's defense systems often results in an immune-system breakdown. Magnesium deficiency is a parallel silent insult happening at the core of our physiology. Magnesium deficiencies feed the fires of inflammation and pain.

Calcification and Magnesium

If calcium is not taken with magnesium or if it is not highly absorbable, it will cause much more harm than good. Unabsorbed calcium can lodge anywhere in our body. For instances, if it lodges in your bones and joints, it mimics arthritis; if it lodges in your heart, it mimics arterial lesions. Calcification or calcium poisoning can manifest as heart disease, cancer, wrinkled skin, kidney stones, osteoporosis, dental problems, bone spurs, cataracts and many other health problems. Calcium deposits in the joints are called arthritis; in the blood vessels it is hardening of the arteries; in the heart it is heart disease, and in the brain it is senility. A healthy cell has high magnesium and low calcium levels.

Transdermal Medicine

Transdermal medicine is ideal for pain management as well as sports and pediatric medicine. In fact it is one of the best ways of administering medicines quickly and effectively. Transdermal methods of delivery are widely used because they allow the absorption of medicine directly through the skin. Gels, emulsion creams, sprays and lip balm stick applicators are easy to use and are effective in getting medicine into the blood stream quickly. Traditional methods of administering medicine such as tablets or capsules get watered down and become much less effective due to stomach acids and digestive enzymes, before they eventually get into the bloodstream. Bypassing the stomach and liver means a much greater percentage of the active ingredient goes straight into the bloodstream where it's needed.

Magnesium and Surgery

When magnesium levels are corrected by the administration of magnesium before, during and after surgery medical complications are significantly reduced to the point where it becomes simply imprudent to perform surgery without it. Dr. Minato at the Department of Thoracic and Cardiovascular Surgery, in Japan, strongly recommends the correction of hypomagnesemia during and after off-pump coronary artery bypass grafting (OPCAB) for the prevention of perioperative coronary artery spasm and his team has actually said that they won't perform this surgery without its use any longer.

Magnesium Massage

One of the most luxurious medical treatments on earth is to have magnesium oil massaged right onto one's body or to bathe or take foot baths with it. Magnesium chloride is truly astounding in terms of safety, low cost and proven effectiveness. From the pain of sports injuries to low back pain and sciatica, headaches, relief from kidney stones, the pain of restless legs, arthritic pain, and just about every painful condition imaginable will find often instant relief when magnesium oil is used transdermally.

Product Information

For the very purest magnesium oil we now have to turn to Europe. Deep underground is a 250 million old inactive sea of magnesium chloride oil that has never been touched by modern day pollution. It is so pure that I dilute it and use it in my eyes and I use it for oral supplementation. It has been tested down to parts per billion and at that level shows no mercury at all. It is the purest substance I have found since discovering the joy of pure bentonite clay. This magnesium oil is called Ancient Minerals and carries my endorsement. Download the book and read this chapter without purchase.

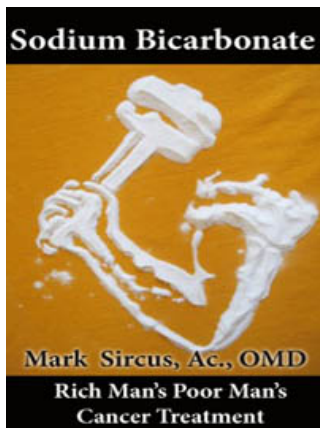
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MAGNESIUM AND CANCER

Source: *Sodium Bicarbonate: Rich Man's Poor Man's Cancer Treatment* by Dr. Mark Sircus



It is known that carcinogenesis induces magnesium distribution disturbances, which cause magnesium mobilization through blood cells and magnesium depletion in non-neoplastic tissues. Magnesium deficiency seems to be carcinogenic, and in case of solid tumors, a high level of supplemented magnesium inhibits carcinogenesis.[3] Both carcinogenesis and magnesium deficiency increase the plasma membrane permeability and fluidity.

With the disease predicted to surge in the next 15 years it certainly is time to get serious about cancer prevention. Researchers from the School of Public Health at the University of Minnesota have just concluded that diets rich in magnesium reduced the occurrence of colon cancer. A previous study from

Sweden[5] reported that women with the highest magnesium intake had a 40 per cent lower risk of developing the cancer than those with the lowest intake of the mineral.

The School of Public Health at the Kaohsiung Medical College in Taiwan found that magnesium also exerts a protective effect against gastric cancer. But only for the group with the highest levels.[6]

Magnesium protects cells from aluminum, mercury, lead, cadmium, beryllium and nickel, which explains why re-mineralization is so essential for heavy metal detoxification and chelation. Magnesium protects the cell against oxyradical damage and assists in the absorption and metabolism of B vitamins, vitamin C and E, which are anti-oxidants important in cell protection. Recent evidence suggests that vitamin E enhances glutathione levels and may play a protective role in magnesium deficiency-induced cardiac lesions.[7]

Without sufficient magnesium, the body accumulates toxins and acid residues, degenerates rapidly, and ages prematurely. Recent research has pointed to low glutathione levels being responsible for children's vulnerability to mercury poisoning from vaccines.[8] It seems more than reasonable to assume that low levels of magnesium would also render a child vulnerable. And in fact we find out that glutathione requires magnesium for its synthesis.[9] Glutathione synthetase requires γ -glutamyl cysteine, glycine, ATP, and magnesium ions to form glutathione.[10] In magnesium deficiency, the enzyme γ -glutamyl transpeptidase is lowered.[11] Data demonstrates a direct action of glutathione both in vivo and in vitro to enhance intracellular magnesium and a clinical linkage between cellular magnesium, GSH/GSSG ratios, and tissue glucose metabolism.[12] Magnesium deficiency causes

glutathione loss, which is not affordable because glutathione helps to defend the body against damage from cigarette smoking, exposure to radiation, cancer chemotherapy, and toxins such as alcohol and just about everything else.

According to Dr. Russell Blaylock, low magnesium is associated with dramatic increases in free radical generation as well as glutathione depletion. This is vital since glutathione is one of the few antioxidant molecules known to neutralize mercury.[13]

Resources for “Magnesium and Cancer”

[3] Durlach J, Bara M, Guiet-Bara A, Collery P. Relationship between magnesium, cancer and carcinogenic or anticancer metals. *Anticancer Res.* 1986 Nov-Dec;6(6):1353-61.

[4] *American Journal of Epidemiology* (Vol. 163, pp. 232-235)

[5] *Journal of the American Medical Association*, Vol. 293, pp. 86-89

[6] Yang CY et al. *Jpn J Cancer Res.* 1998 Feb;89 (2):124-30. Calcium, magnesium, and nitrate in drinking water and gastric cancer mortality.

[7] Barbagallo, Mario et al. Effects of Vitamin E and Glutathione on Glucose Metabolism: Role of Magnesium; (*Hypertension.* 1999;34:1002-1006.)

[8] Environmental Working Group. www.ewg.org/reports/autism/part1.php

[9] Linus Pauling Institute, ipi.oregonstate.edu/infocenter/minerals/magnesium/index.html#function

[10] Virginia Minnich, M. B. Smith, M. J. Brauner, and Philip W. Majerus. Glutathione biosynthesis in human erythrocytes. *Department of Internal Medicine, Washington University School of Medicine, J Clin Invest.* 1971 March; 50(3): 507–513. Abstract: The two enzymes required for de novo glutathione synthesis, glutamyl cysteine synthetase and glutathione synthetase, have been demonstrated in hemolysates of human erythrocytes. Glutamyl cysteine synthetase requires glutamic acid, cysteine, adenosine triphosphate (ATP), and magnesium ions to form γ -glutamyl cysteine. The activity of this enzyme in hemolysates from 25 normal subjects was 0.43 ± 0.04 μ mole glutamyl cysteine formed per g hemoglobin per min. Glutathione synthetase requires γ -glutamyl cysteine, glycine, ATP, and magnesium ions to form glutathione. The activity of this enzyme in hemolysates from 25 normal subjects was 0.19 ± 0.03 μ mole glutathione formed per g hemoglobin per min. Glutathione synthetase also catalyzes an exchange reaction between glycine and glutathione, but this reaction is not significant under the conditions used for assay of hemolysates. The capacity for erythrocytes to synthesize glutathione exceeds the rate of glutathione turnover by 150-fold, indicating that there is considerable reserve capacity for glutathione synthesis. A patient with erythrocyte glutathione synthetase deficiency has been described. The inability of patients' extracts to synthesize glutathione is corrected by the addition of pure glutathione synthetase, indicating that there is no inhibitor in the patients' erythrocytes.

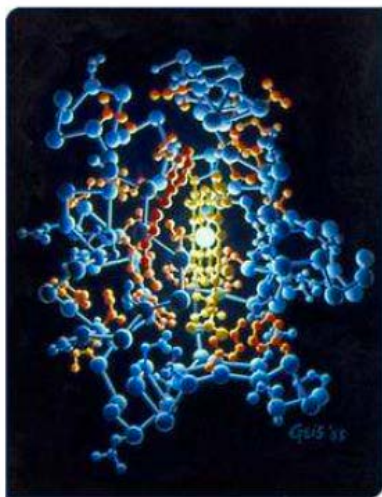
[11] Braverman, E.R. (with Pfeiffer, C.C.)(1987). *The healing nutrients within: Facts, findings and new research on amino acids.* New Canaan: Keats Publishing

[12] Barbagallo, M. et al. Effects of glutathione on red blood cell intracellular magnesium: relation to glucose metabolism. Hypertension. 1999 Jul;34(1):76-82. Institute of Internal Medicine and Geriatrics, University of Palermo, Italy. mabar@unipa.it

[13] www.dorway.org/blayoutism.txt

MAGNESIUM: THE LAMP OF LIFE

Source: *Sodium Bicarbonate: Rich Man's Poor Man's Cancer Treatment* by Dr. Mark Sircus



Inside chlorophyll is the lamp of life and that lamp is magnesium

The capture of light energy from the sun is magnesium dependent. Magnesium is bound as the central atom of the porphyrin ring of the green plant pigment chlorophyll. **Magnesium is the element that causes plants to be able to convert light into energy** and chlorophyll is identical to hemoglobin except the magnesium atom at the center has been taken out and iron put in. The whole basis of life and the food chain is seen in the sunlight-chlorophyll-magnesium chain. Since animals and humans obtain their food supply by eating plants magnesium can be said to be the source of life for it is at the heart of chlorophyll and the process of photosynthesis.

A huge step forward for early life was the development of chlorophyll, a molecule that captures light energy from the sun in a process called photosynthesis. Chlorophyll systems convert energy from visible light into small energy-rich molecules easy for cells to use. The harnessing of the energy of visible light led to a vast expansion of early life-forms. Fossilized layers, three and half billion years old, have been found with evidence of blue-green algae that lived on top of tidal rocks.

Magnesium is needed by plants to form chlorophyll which is the substance that makes plants green. Without magnesium sitting inside the heart of chlorophyll, plants would not be able to take nutrition from the sun because the process of photosynthesis would not go on. **When magnesium is deficient things begin to die.** In reality one cannot take a breath, move a muscle, or think a thought without enough magnesium in our cells. Because magnesium is contained in chlorophyll it is considered an essential plant mineral salt.

*Without chlorophyll, plants are unable
to convert sunlight and carbon dioxide.
There is no life without magnesium.*

Magnesium is a necessary element for all living organisms both animal and plant. Chlorophyll is structured around a magnesium atom, while in animals, magnesium is a key component of cells, bones, tissues and just about every physiological process you can think of. Magnesium is primarily an

intracellular cation; roughly 1% of whole-body magnesium is found extracellularly, and the free intracellular fraction is the portion regulating enzyme pathways inside the cells. **Life packs the magnesium jealously into the cells, every drop of it is precious.**

Insulin and Magnesium

Magnesium is necessary for both the action of insulin and the manufacture of insulin.

Magnesium is a basic building block to life and is present in ionic form throughout the full landscape of human physiology. **Without insulin though, magnesium doesn't get transported from our blood into our cells where it is most needed.** When Dr. Jerry Nadler of the Gonda Diabetes Center at the City of Hope Medical Center in Duarte, California, and his colleagues placed 16 healthy people on magnesium-deficient diets, their insulin became less effective at getting sugar from their blood into their cells, where it's burned or stored as fuel. In other words, they became less insulin sensitive or what is called insulin resistant. And that's the first step on the road to both diabetes and heart disease.

Insulin is a common denominator, a central figure in life as is magnesium. The task of insulin is to store excess nutritional resources. This system is an evolutionary development used to save energy and other nutritional necessities in times (or hours) of abundance in order to survive in times of hunger. Little do we appreciate that insulin is not just responsible for regulating sugar entry into the cells but also magnesium, one of the most important substances for life. It is interesting to note here that the kidneys are working at the opposite end physiologically dumping from the blood excess nutrients that the body does not need or cannot process in the moment.

Controlling the level of blood sugars is only one of the many functions of insulin. Insulin plays a central role in storing magnesium but if our cells become resistant to insulin, or if we do not produce enough insulin, then we have a difficult time storing magnesium in the cells where it belongs. **When insulin processing becomes problematic magnesium gets excreted through our urine instead and this is the basis of what is called magnesium wasting disease.**

There is a strong relationship between magnesium and insulin action. Magnesium is important for the effectiveness of insulin. A reduction of magnesium in the cells strengthens insulin resistance. [1],[2]

Low serum and intracellular magnesium concentrations are associated with insulin resistance, impaired glucose tolerance, and decreased insulin secretion.[3],[4],[5] Magnesium improves insulin sensitivity thus lowering insulin resistance. Magnesium and insulin need each other. Without magnesium, our pancreas won't secrete enough insulin--or the insulin it secretes won't be efficient enough--to control our blood sugar.

Magnesium in our cells helps the muscles to relax but if we can't store magnesium because the cells are resistant then we lose magnesium which makes the blood vessels constrict, affects our energy levels, and causes an increase in blood pressure. We begin to understand the intimate connection between diabetes and heart disease when we look at the closed loop between declining magnesium levels and declining insulin efficiency.

Though it would be a long stretch of the longest giraffe's neck to compare insulin with chlorophyll we are walking a trail at the very nuclear core of life. It's the magnesium trail and we find to our surprise that it takes us into intimate contact with the very structure and foundation of life. The dedication of this chapter is to the beauty of magnesium, to its meaning in life, in health and in medicine.

We were talking about chlorophyll and now insulin and putting magnesium in-between. Walking further along is the DHEA magnesium story and the DNA magnesium story. And then there is the cholesterol magnesium story. Every part of life is in love with magnesium except allopathic medicine which just cannot accept it in all its light, flame and beauty. Thousands of years ago the Chinese named it the beautiful metal and they were seeing something pharmaceutical medicine does not want to see for there is little money to be made from something so common.

Magnesium and DNA

Magnesium ions play critical roles in many aspects of cellular metabolism. Magnesium stabilizes structures of proteins, nucleic acids, and cell membranes by binding to the macromolecule's surface and promote specific structural or catalytic activities of proteins, enzymes, or ribozymes. **Magnesium has a critical role in cell division.** It has been suggested that magnesium is necessary for the maintenance of an adequate supply of nucleotides for the synthesis of RNA and DNA.

*Magnesium plays a critical role in vital DNA repair proteins.
Magnesium ions synergetic effects on the active site
geometry may affect the polymerase closing/opening trends.
Single-stranded RNA are stabilized by magnesium ions.*

Distinct structural features of DNA, such as the curvature of dA tracts, are important in the recognition, packaging, and regulation of DNA are magnesium dependent. Physiologically relevant concentrations of **magnesium have been found to enhance the curvature of dA tract DNAs.** The chemistry of water activated by a magnesium ion is central to the function of the DNA repair proteins, apurinic/apyrimidic endonuclease 1 (Ape1) and polymerase A (Pol A). These proteins are key constituents of the base excision repair (BER) pathway, a process that plays a critical role in preventing the cytotoxic and mutagenic effects of most spontaneous, alkylations, and oxidative DNA damage.[6]

*Magnesium ions help guide polymerase selection for the
correct nucleotide extends descriptions of polymerase pathways.[7]*

Dr. Paul Ellis informs us that, "Magnesium ions are central to the function of the DNA repair proteins, apurinic/apyrimidic endonuclease 1 (Ape1) and polymerase A (Pol A). These proteins are key constituents of the base excision repair (BER) pathway, a process that plays a critical role in preventing the cytotoxic and mutagenic effects of most spontaneous, alkylations, and oxidative DNA damage." [8] DNA polymerase is considered to be a holoenzyme since it **requires a magnesium ion as a co-factor to function properly.** DNA-Polymerase initiates DNA replication by binding to a piece of single-stranded DNA. This process corrects mistakes in newly-synthesized DNA.

DHEA – Magnesium - Cholesterol

Low levels of DHEA are associated with loss of "pathology preventing" signaling between immune system cells.[9]

Dr. James Michael Howard says, "Cancer and infections are both increasing and one of the basic reasons is reduced availability of DHEA, **which stems from magnesium deficiency.**" Also known as "mother of all steroid hormones" DHEA is converted in the body into several different hormones, including estrogen and testosterone. DHEA appears to restore immune balance and stimulate monocyte production (the cells that attack tumors), B-cell activity (the cells that fight disease-causing organisms), T-cell mobilization (infection fighting T-cells have DHEA binding sites), and protection of the thymus gland (which produces T-cells).[10]The data suggest that DHEA has a role in the neuro-endocrine regulation of the antibacterial immune resistance.[11]

All steroid hormones are created from cholesterol in a hormonal cascade. Cholesterol, that most maligned compound, is actually crucial for health and is the mother of hormones from the adrenal cortex, including cortisone, hydrocortisone, aldosterone, and DHEA. **Cholesterol cannot be synthesized without magnesium and cholesterol is a vital component of many hormones.** These hormones are interrelated, each performing a unique biological function with them all depending on magnesium for their function. Aldosterone interestingly needs magnesium to be produced and it also regulates magnesium's balance.[12]

Dr. Mildred S. Seelig wrote, "Mg²⁺-ATP is the controlling factor for the rate-limiting enzyme in the cholesterol biosynthesis sequence that is targeted by the statin pharmaceutical drugs, comparison of the effects of Mg²⁺ on lipoproteins with those of the statin drugs is warranted. Formation of cholesterol in blood, as well as of cholesterol required in hormone synthesis, and membrane maintenance, is achieved in a series of enzymatic reactions that convert HMG-CoA to cholesterol. The rate-limiting reaction of this pathway is the enzymatic conversion of HMG CoA to mevalonate via HMG CoA. The statins and Mg inhibit that enzyme. Mg has effects that parallel those of statins. For example, the enzyme that deactivates HMG-CoA Reductase requires Mg, making Mg a Reductase controller rather than inhibitor. Mg is also necessary for the activity of lecithin cholesterol acyl transferase (LCAT), which lowers LDL-C and triglyceride levels and raises HDL-C levels." [13]

Desaturase is another Mg-dependent enzyme involved in lipid metabolism which statins do not directly affect.

DHEA is a steroid hormone produced by the adrenal gland and ovaries and converted to testosterone and estrogen. After being secreted by the adrenal glands, it circulates in the bloodstream as DHEA-sulfate (DHEAS) and is converted as needed into other hormones. **Magnesium chloride, when applied transdermally, is reported by Dr. Norman Shealy to increase DHEA.**[14]Dr. Shealy has determined that when the body is presented with adequate levels of magnesium at the cellular level, the body will begin to naturally produce DHEA and also DHEA-S.

Transdermal is the ultimate way to replenish cellular magnesium levels. Every cell in the body bathes and feeds in it and even DHEA levels are increased naturally, according to Dr. Norman Shealy

This effect is not seen in oral or intravenous magnesium administration and Dr. Shealy has a patent

pending in this area. It is thought that transdermal application interacts in some way with the fatty tissues of the skin to create the affect. Studies link low levels of DHEA to chronic inflammation, immune dysfunction, depression, rheumatoid arthritis, Type-II diabetic complications, greater risk for certain cancers, heart disease and osteoporosis.

Magnesium and Glutathione

Without sufficient magnesium, the body accumulates toxins and acid residues, degenerates rapidly, and ages prematurely.

According to Dr. Russell Blaylock, low magnesium is associated with dramatic increases in free radical generation as well as glutathione depletion and this is vital since glutathione is one of the few antioxidant molecules known to neutralize mercury.[15] **Glutathione requires magnesium for its synthesis.**[16] Glutathione synthetase requires γ -glutamyl cysteine, glycine, ATP, and magnesium ions to form glutathione.[17]

In magnesium deficiency, the enzyme γ -glutamyl transpeptidase is lowered.[18] Data demonstrates a direct action of glutathione both in vivo and in vitro to enhance intracellular magnesium and a clinical linkage between cellular magnesium, GSH/GSSG ratios, and tissue glucose metabolism.[19] Magnesium deficiency causes glutathione loss, which is not affordable because glutathione helps to defend the body against damage from cigarette smoking, exposure to radiation, cancer chemotherapy, and toxins such as alcohol and just about everything else.

Scientific Miracles in Medicine

The 21st century is seeing the plagues of diabetes, heart disease, cancer and neurological diseases explode with the entire western medical establishment confused about even the most basic health issues. The three trillion dollar medical machine in the United States is impotent against chronic diseases and is responsible itself for much of the horror that is happening.

Medical basics, we have to get back to them returning to the understanding of the simplest things like water. What do you give a person coming out of a week long walk in the desert without water? A coke? Do we have to do a thousand double blind studies to realize there is only one answer? Are we that dumb that medicine cannot see the forest from the trees?

When someone is in cardiac arrest or are having a stroke, having panic attacks with heart palpitations what is the first thing, the very first thing we would reach for like one would reach for a six shooter? Our biological engine is seizing up what do we do? **For the next million years there is going to be only one answer and that answer is magnesium preferably in the chloride form.** It will never change either for that person coming out of the desert; water will always be the answer to the need. We are talking so close to the source of life when talking about water or magnesium. But unfortunately there will always be those who think giving a coke to a very thirsty person is just fine and doctors who think they can forget about nature and try to substitute something to stand in magnesium's place.

The bedrock of medical truth sits upon the metal magnesium for it is at the exact center of biological

life like air and water is. All of life collapses around its loss, but with only the smallest amount of caring and intelligence we can replete what has been lost inside of a person's cells. The realization that magnesium is at the center of life in chlorophyll should help us place magnesium in the temple it deserves. It is the ultimate love drug when used as a medicine. It's the first thing you give a person if you want to give something necessary and helpful.

It will take this entire book to present all the reasons that magnesium qualifies as a love drug; there are reasons that take us out of the physical body and into emotional, mental and spiritual bodies. Psychologists and psychiatrists also have to discover magnesium for it offers them a tool they have not found anywhere else. **Magnesium is the Lamp of Life; it operates at the core of physiology offering us what can only be called scientific miracles in medicine.** Though other substances like Vitamin C or even iodine are powerful competitors they cannot compare in sheer healing horsepower to magnesium.

Magnesium Medicine

*It is no exaggeration for me to say that magnesium saved my life.
But is ironic that I am the one saying it, because during my
diverse medical career in general medicine, my greatest expertise
has always been prescription drugs, not natural supplements.
Dr. Jay S. Cohen, The Magnesium Solution for High Blood Pressure*

Magnesium serves hundreds of important functions in the body and for that reason it has virtually no side effects. Researchers all over the world have confirmed its vital role yet, despite the intensive scientific brainpower that has been directed toward magnesium most doctors know hardly anything about it and never consider magnesium for treating patients. Magnesium comes to us with scientific evidence that dwarfs the evidence presented by pharmaceutical companies for any of their prescription drugs but its use is still contained. (See chapter on why doctors do not use more magnesium)

Magnesium chloride treatments address systemic nutritional deficiencies, act to improve the function of our cells and immune system, and help protect cells from oxidative damage. It's a systemic medicine as well as a local one bringing new life and energy to the cells wherever it is applied topically. When used with oral administration, transdermal magnesium therapy offers us the opportunity to get dosages up to the powerful therapeutic range without compromising intestinal comfort through oral use alone.

What we have found is that magnesium chloride, applied transdermally, is the ideal magnesium delivery system - with health benefits unequalled in the entire world of medicine.

Magnesium chloride solutions offer a medical miracle to humanity, one that many have sought but have not found. In fact Dr. Carolyn Dean, titled her book **The Magnesium Miracle** and she could not have been more correct. Nothing short of a miracle is to be expected with increases in the cellular levels of magnesium if those levels have been depleted.

There is no wonder drug that can claim, in the clear, what magnesium chloride can do. Most people

will show dramatic improvements in the state of their health when they replete their magnesium levels and the very best way to do that is with magnesium chloride applied transdermally (baths and body spraying), orally, vaporized into the lungs, diluted for use with ones eyes, intravenously, and even in douches and enemas.

Constant magnesium massages are what kings and queens should be dreaming of.

With such “brine solutions” the concentrate can simply be applied to the skin or poured into bath water, and in an instant we have a medical treatment **without equal** in the world of medicine. Intensive transdermal and oral magnesium therapy can be safely applied day in and day out for constantly strengthened health.

Hidden in each cubic mile of ocean water is enough healing power to put the pharmaceutical companies out of business.

And there are medical reasons why we love the beach and ocean. Intensive magnesium baths, aerosolized iodine, vitamin D natural style and grounding to the earth through the sand. Medical science and the pharmaceutical companies will eventually have to deal with the fact that the most powerful and universal medicine on earth is a basic nutrient from the sea and can be purchased by anyone at low cost.

Magnesium is nothing short of a miracle to a person deficient in this mineral. So clear and observable are the effects that there is no mistake, no mysticism, no false claim made.

Emergency room personnel know of this and use either magnesium sulphate or chloride to save peoples lives during heart attacks or to diminish the damage from strokes. And new research suggests that MgSO₄ infusions may have a role in cerebral vasospasm prophylaxis if therapy is initiated within 48 hours of aneurysm rupture.[20]

Medicine today is more and more frequently described in terms of science. With the origin and development of drugs and surgical techniques, modern medicine has thought itself to be evermore exact and evermore resembling the hard sciences of chemistry and physics. In the case of magnesium, medicine has fallen from the grace of the pure sciences, which insists that they are ignoring the best medicine available anywhere. Magnesium is clearly evidence-based medicine but the quality of the evidence used pharmaceutical medicine is highly suspect. There is no such cloud of doubt hanging over the scientific evidence that makes it clear why magnesium would be both potent and safe.

When it comes to cardiac disease we create our primary protocol around magnesium, selenium and iodine. These three core minerals, when backed up with a strong naturopathic protocol, which includes natural mercury detoxification of the heart tissues, will transform cardiology into a field of medicine that does not have its patients dying like flies.

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[11] *J. Med. Microbiol.* 1999; 48: 425)

[12] A deficiency in magnesium causes hyperplasia of the adrenal cortex, elevated aldosterone levels, and increased extracellular fluid volume. Aldosterone increases the urinary excretion of magnesium; hence, a positive feedback mechanism results, which is aggravated since there is no renal mechanism for conserving magnesium.

[13] *Journal of the American College of Nutrition*, Vol. 23, No. 5, 501S-505S (2004) Comparison of Mechanism and Functional Effects of Magnesium and Statin Pharmaceuticals Andrea Rosanoff, PhD and Mildred S. Seelig, MD Department of Physiology and Pharmacology, State University of New York, Downstate Medical Center, Brooklyn (M.S.)

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[17] Virginia Minnich, M. B. Smith, M. J. Brauner, and Philip W. Majerus. Glutathione biosynthesis in human erythrocytes. Department of Internal Medicine, Washington University School of Medicine, J Clin Invest. 1971 March; 50(3): 507–513. Abstract: The two enzymes required for de novo glutathione synthesis, glutamyl cysteine synthetase and glutathione synthetase, have been demonstrated in hemolysates of human erythrocytes. Glutamyl cysteine synthetase requires glutamic acid, cysteine, adenosine triphosphate (ATP), and magnesium ions to form γ -glutamyl cysteine. The activity of this enzyme in hemolysates from 25 normal subjects was 0.43 ± 0.04 μ mole glutamyl cysteine formed per g hemoglobin per min. Glutathione synthetase requires γ -glutamyl cysteine, glycine, ATP, and magnesium ions to form glutathione. The activity of this enzyme in hemolysates from 25 normal subjects was 0.19 ± 0.03 μ mole glutathione formed per g hemoglobin per min. Glutathione synthetase also catalyzes an exchange reaction between glycine and glutathione, but this reaction is not significant under the conditions used for assay of hemolysates. The capacity for erythrocytes to synthesize glutathione exceeds the rate of glutathione turnover by 150-fold, indicating that there is considerable reserve capacity for glutathione synthesis. A patient with erythrocyte glutathione synthetase deficiency has been described. The inability of patients' extracts to synthesize glutathione is corrected by the addition of pure glutathione synthetase, indicating that there is no inhibitor in the patients' erythrocytes.

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[20] Magnesium infusion for vasospasm prophylaxis after subarachnoid hemorrhage. J Neurosurg. 2006 Nov;105(5):723-9. PMID: 17121134 OBJECT: Despite the application of current standard therapies, vasospasm continues to result in death or major disability in patients treated for ruptured aneurysms. The authors investigated the effectiveness of continuous MgSO₄ infusion for vasospasm prophylaxis. METHODS: Seventy-six adults (mean age 54.6 years; 71% women; 92% Caucasian) were included in this comparative matched-cohort study of patients with aneurysmal subarachnoid hemorrhage on the basis of computed tomography (CT) findings. Thirty-eight patients who received continuous MgSO₄ infusion were matched for age, race, sex, treatment option, Fisher grade, and Hunt and Hess grade to 38 historical control individuals who did not receive MgSO₄ infusion. Twelve grams of MgSO₄ in 500 ml normal saline was given intravenously daily for 12 days if the patient presented within 48 hours of aneurysm rupture. Vasospasm was diagnosed on the basis of digital subtraction angiography, CT angiography, and transcranial Doppler ultrasonography, and evidence of neurological deterioration. Symptomatic vasospasm was present at a significantly lower frequency in patients who received MgSO₄ infusion (18%) compared with patients who did not receive MgSO₄ (42%) ($p = 0.025$). There was no significant difference in mortality rate at discharge ($p = 0.328$). A trend toward improved outcome as measured by the modified Rankin Scale ($p = 0.084$), but not the Glasgow Outcome Scale ($p = 1.0$), was seen in the MgSO₄ treated group..

MAGNESIUM: COMBINING ORAL WITH TRANSDERMAL

Source: *Sodium Bicarbonate: Rich Man's Poor Man's Cancer Treatment* by Dr. Mark Sircus

Dose Sensitivity and Therapeutic Effect

One of the most luxurious medical treatments on earth is to receive magnesium massages on a consistent basis. Having at least an ounce of what is called magnesium oil rubbed all over ones body by either a trained or even untrained massage therapist is simply heavenly. One can also do this oneself meaning cover ones body all over with the magnesium oil like one would sunscreen and go out in the sun and have some fun.

Another method of administration is pouring magnesium chloride into ones bath at high concentrations and soak in a hot tub, perhaps with a cup of sodium bicarbonate in it. On page 201 of my Transdermal Magnesium Therapy book I recommend 2-8 oz (56,6 -226,4 g) of Magnesium Oil for a full body bath (ca 100liter) These initial recommendations for baths were very low. My excuse is the inexperience of the early days of transdermal magnesium therapy and also that here in Brazil we don't have a bathtub so my experience has been with body spraying and magnesium massage. I am now recommending much higher dosages for baths ranging anywhere from 2 to 4 pounds to even six pounds for professional use in clinics and spas.

In the early days when a gallon of oil was over 100 dollars even eight ounces sounded expensive to many people. Now you can buy flakes of high quality (low heavy metal profile) in quantity and use three pounds (which is equivalent to a gallon of oil) in a adult bath for approximately 15 dollars. Small baths for autistic and other children with serious problems would probably be about half that for a full strength bath.

I am not talking about a nice hot magnesium bath for simple relaxation but professional baths intended for strong therapeutic effect. The % of magnesium in the bath under my old recommendations came only to 45-180 mg/l magnesium. When you discover that open seawater has a content of 1300 mg/l magnesium we see that our early recommendations were way to low. The driving force behind transdermal intake is the concentration gradient.

The concentration of magnesium in the pure magnesium oil is about 80,000 mg/l and when you apply that directly on the skin, intake rate is high. But in the case of a bath application my new recommendation needs to be brought up to somewhere between 1500 and 5000 mg/l magnesium (1 to 4 times the sea concentration). Dead Sea therapy[1]has a concentration of up to 40,000 mg/l magnesium and people bathe every day in these waters. Fick's Law of Membrane Permeability says that the amount of any solute (magnesium) that will be absorbed is directly dependent upon the area of contact, the concentration of the solution and the time that the solute is in contact with the membrane.[2]

So we are talking about setting the therapeutic level of magnesium chloride concentrations in baths much higher and **recommend between 2 and 4 pounds in an average bath.** Physical therapists and dermatologists, sport therapists, spas and other clinics will want to be using cost affective bath flakes as compared to ready made magnesium oil to achieve higher concentrations. Shipping costs are less also because the water has been taken out of the oil to make the flakes. The quality of the flakes are an

important factor for excess heavy metal ions will also flow in with the magnesium thus my recommendation for Ancient Mineral products that come from 250 million year old deposits.

A third avenue of administration is to simply drink magnesium chloride in ones water or juice. **The best way is to combine one of the transdermal routes with oral [3] for concentrated doses that achieve maximum therapeutic effect.** Magnesium is important and desperately needed because it is so terribly deficient in people that even at low concentrations people have felt results. But when we are practicing medicine of whatever kind we are looking for dramatic shifts in peoples' conditions. Below we will have a penetrating discussion about doses and therapeutic effect but the basic idea, when using concentrated nutritional medicines like magnesium chloride, iodine and sodium bicarbonate is to take doses up to maximum levels possible.

Each spray of Magnesium Oil contains approximately 18 milligrams of elemental magnesium.[4]An ounce would contain just over 3,300 mg. Five sprays in a glass of water would thus be almost 100 milligrams.[5]

Three to five to even ten sprays of magnesium chloride in a glass of pure water or juice is an excellent way to take magnesium internally. It assists digestion, counteracts excess acidity in the stomach, and delivers magnesium swiftly into the bloodstream for distribution to all the cells of the body. Minerals like magnesium in ionic liquid form are vastly superior to pill forms. Much more magnesium will get absorbed and absorption will not depend on hydrochloric acid levels.

Several years ago I told the story of a retired pediatrician Dr. Herbert Mansmann Jr., director of the Magnesium Research Lab who was a diabetic with severe peripheral neuropathy. He was able to reverse the neuropathy and nerve degeneration with a year of using oral magnesium preparations at very high doses. "For example it took me 6 tabs of each of the following every 4 hours, Maginex, MgOxide, Mag-Tab SR and Magonate to get in positive Mg balance. I tell people this not to scare them, but to illustrate how much I needed to saturate myself. Most will only need 10% of this amount (still about three grams). I was doing an experiment on myself to see if it helped my diabetic neuropathy. It worked so I did it for one year, and I have had significant nerve regeneration." [6]

He was taking 20 grams a day but that was because he also had what is called magnesium wasting disease. He thought that about three grams would be sufficient for people without that disorder. When we are going for therapeutic effect with serious disorders like cancer or even autism we want to emulate Dr. Mansmann's dosage levels.

There are over 200 published clinical studies documenting the need for magnesium and many examples of miraculous "cures" from the use of this common mineral. Yet DAN (Defeat Autism Now) doctors underestimate autistic children's needs recommending only 50 mgs twice a day in oral form even though children with gut problems can absorb only small percentages through their intestines. The entire autism community needs to be acutely aware that its present dependency on oral magnesium supplementation is responsible for a sizable cause of less than excellent results from chelation. A complete changeover to transdermal/topical approaches to magnesium supplementation is called for with these children because their guts are seriously compromised meaning they cannot absorb magnesium well through oral consumption. Fifty milligrams twice a day is way too low. There is a huge difference between supplementing magnesium and using magnesium chloride as a medicine to effect real and direct changes in overall cell physiology.

Magnesium Torment (Deficiency)

All those years when doctors used to tell their patients its all in your heads were years the medical profession was showing its ignorance. It is a torment to be magnesium deficient on one level or another. Even if it's for the enthusiastic sport person whose athletic performance is down,[7]magnesium deficiency will disturb sleep and background stress levels and a host of other things that reflect on the quality of life. Depression and other neurological disorders are also extremely correlated with magnesium deficiency.

Doctors have not been using the appropriate test for magnesium – their serum blood tests just distort their perceptions. Magnesium has been off their radar screens through the decades that magnesium deficiencies have snowballed.

Turning Paracelsus on his Head

So what do we do in the middle of this mess? We turn medicine's most basic principles upside down. Below is the very beginning of a chapter I published about two years ago called Beyond Paracelsus.[8]It describes the very heart of pharmaceutical pharmacology. As you read this remember that we are going to create a philosophy and practice of medicine exactly 180 degrees to the opposite. This is no small subject and it would be helpful to understand prerequisite information like the Science of Low Doses meaning that in reality we find that poisons poison people even at ultra low doses. That is what poisons in general do – they poison people, even in minuscule amounts.

While there is no such thing as a safe chemical, it must be realized there is no chemical that cannot be used safely by limiting the dose or exposure. Poisons can be safely used and be of benefit to society when used appropriately.
Royal Society of Chemistry

This statement by the Royal Society of Chemistry is one of the most basic assumptions of the chemical and pharmaceutical companies and the governments that supposedly regulate them. They use it as their guiding light no matter how wrong the assumption is, no matter how much death and disease is created from it. What we are seeing in the world today are massive spreads of chronic diseases like diabetes, neurological disorders, asthma, cancer and a host of other problems stemming from the inappropriate use of poisons. The assumption that poisons can be used safely is modern mans Pandora's box; once opened the most greedy power hungry industrialists felt free to use poison in everything from house hold products like soap and shampoo to putting it directly in our foods, medicines and even drinking water.

The problem all started with Paracelsus, sometimes called the "father" of toxicology, who wrote: "The dose makes the poison." The original quote actually is: "All things are poison and nothing (is) without poison; only the dose makes that a thing is no poison." In other words, the amount of a substance a person is exposed to is as important as the nature of the substance. For example, small doses of aspirin can be beneficial to a person, but at very high doses aspirin can be deadly. In some individuals, even at very low doses, aspirin may be deadly. We all know that everyone can drown in water and even too much oxygen will do you in. Thus it was Paracelsus' belief that it was not the substance which was toxic (since everything is toxic) but the amount. But is this really helpful to us today and does it reflect present realities? The big problem with people who fanatically follow Paracelsus comes down to this: hardcore believers in the dose makes the poison medical philosophy tend to forget one important

thing and that is – poison poisons people, even at ultra low doses.

*It is absurd to label pure water as poisonous
simply because one can drown in it.*

Though there is some perfect logic to Paracelsus statements there is a tragedy in the making defining everything along a poisonous scale as the world of medical science has done. Because we have defined everything as potentially poisonous, there are people (Codex) who are saying non poisonous helpful substances like vitamin C or any vitamin and mineral are dangerous like poisons if you take too much. Therefore they are already, in certain countries, limiting the amount that is available to consumers. This is a crime because the reality is that we are needing increasing amounts of antioxidants like Vitamin C, A, E, and minerals like magnesium, selenium and zinc to deal with the toxic overloads.

The basic principle of Natural Allopathic Medicine is just the opposite of orthodox allopathic medicine. Instead of using poisons at low doses we use concentrated nutritional substances at exceptionally high dosages. I am not suggesting we drown anyone or dump a ton of vitamin C on a baby to see if he or she can breathe under all that weight. **Natural Allopathic Medicine** is the name not only of a new book of mine in progress but is the name of the medical approach I am introducing this fall.

*If someone is having a stroke or heart attack you certainly do not
want to throw them into a bath with four ounces of magnesium inside.*

My suggestion for cancer patients and anyone else with serious illness is to bring levels of substances like magnesium chloride, iodine and sodium bicarbonate up to very high levels. **The dose makes the effect in Natural Allopathic Medicine were the dose makes the poison in modern medicine.** When we are confronting serious chronic or even acute situations we do want to maximize the strength of our treatments.

A sane rule of thumb for magnesium supplementation (not for therapeutic effect) is approximately 6-8 mg/kg (3-4 mg per pound) of body weight per day. That translates into a total dietary magnesium intake of 600 to 900 mg per day for a 200-lb man which is already way above the RDA, about double. With children some researchers indicate that 10 mg/kg/day are appropriate because of their low body weight and increased requirements for growth. Athletes also need more depending on their stress and training levels and we can always adjust upwards when under great emotional stress or when seriously ill.

*Our cells are best served when they
are brimming with magnesium reserves.*

In general, for a large adult, spraying one ounce of Magnesium Oil a day all over the body is recommended for six months to recover cellular levels with that adjusted downward for children depending on their age and size. This coupled with oral intake, especially for adults, is necessary to get the maximum kick out of magnesium. When magnesium levels are at extremely low levels intravenous application is an option and is often necessary in emergency situations. See my upcoming book **Magnesium – The Ultimate Heart Medicine** for more information on this. Very strong therapeutic magnesium baths yield another level of effect which competes quite handedly with intravenous applications but they are no a substitute for them in emergency situations obviously.

Magnesium chloride and Vitamin C have similar toxicity profiles with overdose from both resulting at worst usually in diarrhea unless the kidneys are seriously compromised.

Strong therapeutic foot soaks are another option and are especially important for diabetics who suffer from diabetic neuropathy. Soak the whole body or just the feet in bath water for 20-30 minutes, at a temperature of about 108 degrees. The most effective protocol for this therapy is to begin with a daily body or foot bath every day for the first 7 days, (starting at lighter concentrations and building up) then continue with a maintenance program of 2-3 times a week for 6-8 weeks or longer. Sensitive care must be taken especially with children as to dose levels, water temperature and magnesium concentrations. Muscle spasms might occur on rare occasions if one forgets to get out of the tub so it is necessary to supervise children and the length of time they remain soaking in magnesium chloride. All strong reactions like redness in local areas to diarrhea or even muscle spasms are indications to reduce concentration.

References for Magnesium: Combining Oral with Transdermal

[1] German research have shown Dead Sea salts have ultimately been the reason for reduced amounts of LangerhansA cells in the epidermis, and conversely salts of sodium chloride were void of any effect at all. (al G. S., 1990 December). Magnesium chloride is also discussed when the topic of dermatitis comes into play as an excellent treatment protocol. The anti-inflammatory result of utilizing hypertonic Dead Sea solution on atopic dermatitis by means of magnesium ions is well known. (al., 2002) Further studies also revealed that the magnesium solution greatly reduced inflammation in allergic contact dermatitis. The study involved five patients with an identified nickel allergy, where magnesium chloride (not sodium chloride) stifled nickel-sulfate induced contact dermatitis. (Greiner J, 1990 November)

[2] Diffusion is the mechanism by which components of a mixture are transported around the mixture by means of random molecular (Brownian) motion (cf. permeation: the ability of a diffusant to pass through a body - dependent on both the diffusion coefficient, D , and the solubility coefficient, S , ie, permeability coefficient, $P = D.S$). Flynn et al. cite Bertholot as postulating, at the beginning of the nineteenth century, that the flow of mass by diffusion (ie, the flux), across a plane, was proportional to the concentration gradient of the diffusant across that plane. www.initium.demon.co.uk/fick.htm

[3] Dr. Raul Vergin offered the following guidelines for oral intake of a 2.5% Magnesium Chloride hexahydrate ($MgCl_2 \cdot 6H_2O$) solution (i.e.: 25 grams or approximately one ounce of pure food grade powder in a liter of water). The quantity of elemental magnesium contained in a 125 cc dose of the 2.5% solution is around 500 mg.

Dosages are as follows:

Adults and children over 5 years old 125 cc

4 year old children 100 cc

3 year old children 80 cc

1-2 year old children 60 cc

Over 6 months old children 30 cc

Under 6 months old children 15 cc

125 milliliter = 4.2267528 ounce [US, liquid]

cc and ml are equivalent

Dr. Vergin indicates that "In acute diseases the dose is administered every 6 hours (every 3 hours the first two doses if the case is serious); then space every 8 hours and then 12 hours as improvement goes on. After recovery it's better going on with a dose every 12 hours for some days. As a preventive measure, and as a magnesium supplement, one or two doses a day can be taken indefinitely. Magnesium Chloride, even if it's an inorganic salt, is very well absorbed and it's a very good supplemental magnesium source."

[4]Magnesium chloride is an ionic compound because it has a metal, magnesium, and a nonmetal, chlorine. Magnesium will lose two electrons and form a +2 charge. Chlorine will gain one electron to form a chloride ion with a -1 charge. The formula for the compound is $MgCl_2$. To get the formula weight, find the atomic weights and add them together taking the subscripts into account. Magnesium is 24.3; chlorine is 35.5; so two would be 71.0. The total gives 95.3 as the formula weight.

[5]Magnesium Oil from the sea weighs 12 pounds per gallon. Distilled water weighs only 8 pounds. Thus we can calculate in a straight away manner how much elemental magnesium is in each gallon.

[6]"I was saturated at about 3 grams of elemental Mg per day, but went to 20 grams for over a year. I now take 5 grams, and stools are semi-formed, and the surrounding water is clear, 3-4 per day." "Mg is very safe, since the gut absorption is regulated by serum Mg levels, and then the Mg stays in the gut and results in varying degrees of diarrhea. Then the dose is too high. Want soft semi-formed stools. Mine, while on high dosages of magnesium were liquid every 2-4 hours for 2 years, the electrolytes every month were normal, but for low potassium, part of my urinary Mg wasting, both," wrote Mansmann. Dr. Mansmann concludes, "I have had diabetic neuropathy for over 10 years. The most significant symptom is my neuropathic pain of burning feet, called erythromelalgia. With the aid of Mg I can completely suppress the symptom, but if my blood glucose level is acutely elevated, because of a dietary indiscretion, the pain flares in spite of an apparent adequate dose of Mg. It goes away with extra Mg gluconate (Magonate) in an hour or so in either case. Without the Mg it will last for six plus hours, even though the blood glucose level is normal in about two hours." "It is my belief that every one with diabetes should be taking Mg supplementation to the point of one's Maximum Tolerated Dose, which is until one has softsemi, formed stools. In addition, anyone with neuropathy, without a known cause, must be adequately evaluated for diabetes and especially those with poorly, slowly, healing foot sores of any kind. Since the use of Mg is safe I see no reason that this should not be "the standard of care".

[7]Seelig, MS. Athletic stress, performance and magnesium in consequences of magnesium deficiency on the enhancement of stress reactions; preventive and therapeutic implications:a review. J Am Coll Nutr, vol.13, no. 5, pp. 429-446, 1994

[8]Auroleus Phillipus Theostratus Bombastus von Hohenheim, immortalized as "Paracelsus," was born in 1493. Paracelsus, a Swiss doctor, pioneered the use of chemicals and minerals in medicine. His name appears as a significant figure among voluminous numbers of works on homeopathy, natural medicine, alternative medicine, and botanical studies. Many see him as the predecessor of chemical pharmacology and therapeutics and the most original medical thinker of the sixteenth century.

A GUIDE TO MAGNESIUM OIL: APPLICATION, USAGE, AND COMMONLY ASKED QUESTIONS

Source: LL's Magnetic Clay, inc. 2007 <http://www.magneticclay.com/store/magnesium-oil-ancient-minerals-8.aspx>

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METHODS OF APPLICATION

1. Sprayed Directly on the Skin. Spraying magnesium oil full strength directly on the skin is the most efficient and economical application, and also happens to offer the most benefits to the user.

Now, this "body spraying" can be approached in a couple of different ways. The first way is what we might call the "Spray n' go" method, and is done by spraying the magnesium oil on isolated parts of the body such as the thighs, abdomen, arms, etc, with several carefully aimed applications throughout the day, or to areas that are in need (i.e. achy joints, muscle spasms, sore muscles). Rub it into the skin as much as you feel is necessary, although the more you rub, the more your skin will absorb. At this point, many people choose to leave the magnesium oil on indefinitely, while many more wipe it off with a moist washcloth after 30 or so minutes because they find the residue it leaves on the skin a little

uncomfortable. Only you can be the judge of that, as everyone has their own preference.

The second approach to body spraying is more of a “Let’s just be done with it already” method, and if possible, should be your core method. Simply take off all your clothes and give yourself a very liberal coating of the magnesium oil from the neckline down to your ankles, taking time to rub it in thoroughly. Depending on your body size and agility of course, it should take you no less than about 10 minutes and 100 or so sprays to give yourself a good rub-down. A quicker way to apply is just to pour a little out in your hand a slather it on the body such as one would do with sunscreen. Don’t be afraid to spend some time here.

Try to avoid application of the magnesium oil to sensitive parts of the body such as the nipples and genital area. It’s not going to hurt you—it just stings more than most would care for in these sensitive areas. You could apply it to the facial area and scalp, but again, it is a matter of comfort. The Ancient Minerals magnesium oil product is certainly more appropriate for these sensitive areas.

Now that you are naked and thoroughly doused with magnesium oil, find something to do for the next 30 minutes (or longer). Lay some old towels down on your bed, couch, etc, and just relax. Give your skin some time to drink up the magnesium that you have applied. At this point, get into the shower and give your body a quick rinse with just water (no soap), and towel dry yourself off.

2. Tub Soak. Adding magnesium oil to a warm bath makes for a very relaxing magnesium soak. How much should you add? That all depends on your needs, but 6 to 8 ounces is a good start, depending on one’s needs and requirements. Because of the obvious dilution that occurs when adding magnesium oil to a tub bath, adding up to 32 ounces is not unheard of.

3. Foot Soak. Adding magnesium oil to a warm foot soak is another method to consider, and also very convenient. A very popular way to use it is to add it to one of those nifty little heated foot spas. Bubbles, massage... all great, but be sure it keeps the water heated. Of course the obvious method is to throw some very warm water in a basin of some type that can accommodate the feet. Heated water is going to bring more circulation to the feet and keep your pores open, hence more absorption. How much should you add? Again, it all depends on your needs, but about 4 to 6 ounces is a good start. For any issues one might have with the lower extremities such as the feet, ankles, and legs, this is the preferred method of application.

BUT IT STINGS!!

The “sting factor” only applies to direct body spraying, and yes, we know it can be a tad uncomfortable the first few times you use it. But just think of the good you are doing for yourself? And, like all things, it is something you will become accustomed to. Of course, it really depends on how sensitive your skin is. Some say that it doesn’t sting at all, while others say that it does sting a bit. Again, you would need to be the judge of that. But regardless of which category you may fall into, any stinging or itchiness goes away after you rinse it off. Some users of the magnesium oil choose to dilute it 50/50 with spring water, which helps to considerably reduce the “sting factor,” but you also receive half the amount of magnesium per spray than you normally would. Other users of the magnesium oil prefer to focus on tub soaks and foot soaks, which is fine if that is what suits you.

THE BOTTOM LINE

So what is the bottom line? Do what is right for you. If you would rather eat nails than deal with the slight “sting factor,” use it in a tub soak. If you don’t feel like taking a tub bath, lose the shoes and plop

your feet in a foot soak. If you are immobile, spray it on isolated areas of the body. The point is, be consistent, and realize that the cells need large amounts of magnesium each day to function properly. Always remember the golden rule, "Anything worth doing, requires some effort."

MAXIMIZING THE BENEFITS

There are certain things you can do to increase the absorption of the magnesium oil by the skin

1. **Dry Skin Brushing.** Without delving into too much detail, dry skin brushing is a skin care technique whereby one utilizes a natural vegetable bristle brush to stimulate and cleanse the skin. Dry skin brushing removes old skin cells, stimulates blood flow to the skin, and stimulates the lymphatic system, among many other things. But for the purposes of this guide, these are the effects that we are most concerned about. Just like the name says, the technique is performed when the skin is dry, and also before showering. Ideally, this technique should be performed every single day for the rest of your life, but at the bare minimum should be done before you use the magnesium oil. This is not a requirement, just a strong suggestion.
2. **Massage.** Whether it be administered by a professional, your significant other or yourself, massage offers a huge bonus to the application of magnesium oil. Massage stimulates the blood flow to not only the skin, but to the underlying tissues, and of course—enhances the absorption and distribution of the magnesium oil.
3. **Taking a Warm Shower.** For obvious reasons, taking a warm shower to cleanse the skin of oils, acids, and other elements is a good idea prior to applying the magnesium oil. Everything absorbs better into freshly washed skin. Again, not a requirement, just a suggestion.

What not to do?

1. **Don't apply lotion before using the magnesium oil.** Lotions and other oils will saturate the skin and hinder the uptake of the magnesium by the skin. Instead what you will have is a whole bunch of magnesium oil sitting on top of your skin.
2. **Avoid your eyes, freshly shaved underarms, or freshly shaved face.** Avoid getting the concentrated magnesium oil in these areas. It won't hurt you, but it might sting a bit.

FREQUENCY OF USAGE

Ideally, for the first 3-4 months you should be using it every day with intensity. A good rule of thumb is use up to 1-2oz per day directly applied to the body. It is advisable to start the first several days with a small amount, and gradually work up to larger amounts. During this time you will be restoring your cells that are magnesium deficient. After this initial period, some users feel that they need to use the magnesium oil just as much as they were during the first 3-4 months, while others back off to using the magnesium oil a few times per week. It all depends on the person, as everyone responds differently and with different needs. Stress, diet, etc, all affect cellular magnesium levels, so one would need to take these factors into account and determine their own requirements. If you are engaging in *any* type of detox protocol, aggressive use of the magnesium oil is certainly recommended.

COMMONLY ASKED QUESTIONS

Can I use it more than once per day? Certainly. For example, you can take a few body sprays in the A.M., and when you get home in the P.M. you can take a magnesium bath or foot soak. And, if you are

not feeling “up to par,” using it more than 1x per day is encouraged.

Is magnesium “oil” actually an oil? Actually no, although this is a common misconception. Magnesium “oil” is a coined term for a highly saturated solution of magnesium chloride in water along with other trace elements, which happens to present itself in an oil-like texture due to its hygroscopic nature (attracts water molecules). No need to worry about oily skin, oil stains, or anything else having to do with oil.

Can I use magnesium oil as a massage oil? Absolutely! In fact, the use of magnesium oil in massages melts away those knots and spasms much more efficiently than massage alone, not to mention increasing the absorption of the magnesium as discussed before. If you see a professional for your massage, take a few ounces to them and let them work their magic.