THE SCIENCE OF MAGNESIUM

Magnesium is critical for health, healing, and maintenance of energy. Everyday, it acts as a catalyst and cofactor of almost 400 enzymes and minerals in the body. **Magnesium's deficiency — perhaps the silent epidemic of our times — has been directly linked, via extensive research, to many diseases and health conditions.** It is estimated that perhaps 80% of people today are daily deficient of this precious life supporting "king of minerals." Life cannot exist, nor heal itself from injury or disease, without the energy Magnesium gives to cellular regeneration.

Transdermal Magnesium Therapy is the immediate topical application of MgCl to affected areas and the lymph system. This method, using concentrated topical sprays, lotions or gels, is the safest and most efficient way to use Magnesium for immediate benefits, when compared to the low bioavailability and laxative effect of oral ingestion.

It is important to know why Magnesium is such a big deal in your body, health, and life. This web page provides information about the scientific and practical value of Magnesium.

MAGNESIUM: The King of Minerals

Magnesium is a trace metal found throughout our bodies and is fourth most abundant of the trace metals. It is necessary in every cell for oxygen usage so is essential for life; in fact Magnesium is critical to over 300 enzymatic chemical reactions, most fundamental animal & human body functions and the integrity of the double helix of DNA. It may be the most important mineral for plant and animal life on Earth. It is certainly one of the essential minerals most deficient in our food. Consequently, we are all magnesium deficient.

Magnesium was the key element in the evolution of plant life on Earth as it is the heart, the central ion of chlorophyl, a plant’s photosynthesizing lifeblood. **Chlorophyll and hemoglobin have identical molecular structures,** only that chlorophyll has magnesium at its heart, while hemoglobin has iron. This does indeed seem amazing at first, but upon reflection, it seems quite natural, as we can be certain that this is not an evolutionary coincidence since simple cellular life came first, then plant life—obviously dependent on the simplest forms of life, and then animal life — which is completely dependent on plant life.

The human body is about 70% water by weight, with about 2/3 inside our cells and 1/3 outside; the dry weight of a 70 kg (154 lbs) person is about 20 kg (44 lbs). So we can say that the rest of our weight is various arrangements of naturally occurring elements.

But of the 92 naturally occurring elements, a mere 7 of them make up 99% of the body’s total mineral content.
# 7 ESSENTIAL MICRO-MINERALS
(In order of abundance in our body)

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>The most abundant mineral and must be in balance primarily with phosphorus and magnesium for proper physiological function. This mineral creates rigidity, stiffness and contraction, unlike Magnesium’s flexibility and relaxing effects.</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>Second most abundant mineral and present in every cell of the body. It plays a role in almost every chemical reaction.</td>
</tr>
<tr>
<td>Potassium</td>
<td>Potassium and sodium work together in their most notable function to transport nutrients into cells and metabolic waste out of them. Hence, potassium is the most abundant element inside the cell, in the intracellular fluid, while sodium is the most abundant element outside, in the extracellular fluid.</td>
</tr>
<tr>
<td>Sulfur</td>
<td>Necessary for the formation of hair, nails, cartilage and tissue. It is needed for metabolism and a healthy nervous system, plus it aids bile secretion in the liver.</td>
</tr>
<tr>
<td>Sodium</td>
<td>The primary element the kidneys rely upon for regulating the amount of water in the blood and bodily fluids in general.</td>
</tr>
<tr>
<td>Magnesium</td>
<td>See below</td>
</tr>
<tr>
<td>Chloride</td>
<td>Chloride is Chlorine gas dissolved in water. It works with its sibling’s potassium and sodium in their role as fluid and acid-base regulators. Chloride is also the essential element in hydrochloric acid secreted in the stomach to break down proteins into amino acids.</td>
</tr>
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**Magnesium is King**

Among these 7 macrominerals, however, Magnesium is ruler — it regulates, oversees, conducts, catalyzes and guards. Without it, most other minerals would not function.

Magnesium is the second most abundant element inside cells after potassium, and even though it totals only around 25 g in the average 70 kg human body, (more than half of it stored in bones and teeth, and the rest in muscle and soft tissues), it plays a role akin to that of a conductor in regulating the absorption and excretion of many of its sibling macrominerals, both in the intestines and in our cells.

Of the multitude of functions it plays, Magnesium is involved as a necessary co-factor on which more than almost 400 essential metabolic enzymatic reactions depend; it is crucially needed for structural function of proteins, nucleic acids and mitochondria; it regulates production, transport, storage and utilization of energy in cells; it regulates DNA and RNA synthesis, cell growth and cell reproduction; and it regulates nerve function throughout the body. But certainly most noteworthy, and indeed very important for the vast majority of us magnesium-deficient humans, is that **Magnesium is what allows muscles to relax**: every single muscle cell in our body depends on Magnesium to release a contraction instigated by calcium, Magnesium’s antagonist brother.

Going further, only Magnesium can inhibit calcium-induced cell death: only Magnesium regulates entry, and can thus prevent calcium from flooding a cell to trigger apoptosis (programmed cell death). It is for these two reasons that Magnesium is so much more important than calcium. Sadly, we are as over-calciﬁed as we are Magnesium deﬁcient. And that’s bad news because the more over-calciﬁed the body grows, the more Magnesium deﬁcient it becomes. In addition, as important as it is to optimize vitamin D status, it is now clear that this cannot be done without at the same time optimizing magnesium status.

**What Does Magnesium's Importance Mean to You?**

It means that most modern diseases and conditions are
either a direct consequence of or severally aggravated by magnesium deficiency. It means that of all the heart attacks and strokes that claim the lives of most people in industrialized countries, it’s estimated that more than half are caused by magnesium-deficiency. It means that hypertension; poor circulation, water retention, osteoporosis, kidney stones and kidney disease are all caused or severely aggravated by magnesium deficiency. It means that arterial plaque buildup (atherosclerosis), arterial wall thickening and stiffening (arteriosclerosis), cardiac arrhythmia and palpitations, headaches and migraines, anxiety, irritability, insomnia and depression are all caused or severely aggravated by magnesium deficiency.

It means that from the seemingly most benign, occasional involuntary twitching of the eye, or the cramp in your foot, calf or hamstring that just seems to you as a brief nuisance unworthy of attention, to the cardiac arrest or stroke caused by a prolonged spasm of a coronary or cerebral artery that can claim your life in a few instants or leave you paralyzed and debilitated for the rest of your life, to chronic anxiety, occasional panic attacks, recurring depression, bipolar or schizophrenic disorders, all of these health problems and hundreds more are caused or severely aggravated by magnesium deficiency.

Insulin resistance, metabolic syndrome, and diabetes are also intimately related to magnesium deficiency as it is this mineral that allows insulin to transfer its cargo of glucose from the bloodstream into the cell. Like many other realities of our world in the realm of medical sciences and treatment of disease, that this can be so — that we can be in such a dire situation of global magnesium deficiency — is truly mind-boggling given the ease with which it can be both prevented and remedied. But for this one as well as so many other such logic-defying realities in today’s medical and health sciences, ignorance is the major hurdle, but the power of the politics of profits cannot be underestimated, and should not be ignored or overlooked.

MAGNESIUM vs CALCIUM

The belief that calcium is the holy grail of what builds strong bones is absolutely ingrained in our society, but has no basis in reality. Calcium is but ONE of the many minerals your body needs for building strong bones. Dietary intake of magnesium, not necessarily calcium, may be the key to developing and maintaining healthy bones, especially during childhood or elder years.

The Appropriate Calcium to Magnesium Ratio

Most of human history has shown a calcium to magnesium ratio of 1:1, which is considered optimal. Today, however, that ratio is significantly skewed.

Modern Western diets have a much higher Ca:Mg ratio, estimated to range from 3.5:1 up to 10:1, or over 1000mg daily. Consequently, we also experience much higher incidences of osteoporosis and tooth decay.

Of course, the ideal ratio for any individual will vary depending on current health conditions, age, as well as risk factors for deficiency.

If you are taking Calcium supplements, you must be aware of the greater risk to your body.

Why Calcium Supplements Don’t Work

Research demonstrates that when Magnesium intake is low, Calcium supplementation may reduce Magnesium absorption and retention. Magnesium supplementation, however, improves the body’s use of Calcium.

Most supplements on the market today contain calcium carbonate which is an inferior form of calcium. Manufacturers, therefore, attach a simple chelating agent like citric acid to make it more absorbable. However, the end product is inferior to other calcium supplements such as calcium orotate, which is the only known form of calcium which can effectively penetrate the membranes of cells.

Another fact most people are unaware of is the myth promoted by the dairy industry that...
consuming pasteurized dairy products such as milk or cheese increases calcium levels. This is totally false. The pasteurization process only creates calcium carbonate, which has absolutely no way of entering the cells without a chelating agent. So what the body does is pull the calcium from the bones and other tissues in order to buffer the calcium carbonate in the blood. This process ACTUALLY CAUSES OSTEOPOROSIS. Milk definitively does not do a body good if it’s pasteurized.

The body tends to retain Calcium when in a Magnesium-deficient state. Extra Calcium intake at such a time could cause an abnormal rise of Calcium levels inside the cells, including the cells of the heart and blood vessels. Given the delicate balance necessary between Calcium and Magnesium in the cells, it is best to be sure Magnesium is adequate if you are taking Calcium Supplements.

Dr. Mildred Seelig — noted Magnesium researcher

**Mg CHLORIDE vs Mg SULFATE (Epsom salts)**

**THE NEED FOR MAGNESIUM SUPPLEMENTATION**

People are awakening to the many needs that the human body has for magnesium. It has been estimated that 70-80% of people worldwide are deficient in this vital mineral. Nature intended that we receive magnesium and other minerals from our food. This plan has been compromised by the decreasing mineral levels found in our food due to chemical fertilizers disrupting the natural regeneration of the soil by microbial action. What little we do ingest is further depleted by chemicals in both food and water, and also by medications that often directly reduce cellular magnesium levels. Supplementation, therefore, is essential for good health.

**ORAL OR TOPICAL SUPPLEMENTATION**

We have two avenues to supplement our weakened diet with minerals; oral or topically. There are many forms of oral magnesium supplements on the market, but this means of supplementation can take from 6 months to a year to really get cellular levels into the healthy range, depending on how absorbable a given form is and the degree of deficiency. Added to this is the issue of low bioavailability — typically only 5-15% of oral Magnesium supplementation is available to the body. One reason, in part, is that, when taken orally, Magnesium has a laxative effect. The body needs any Magnesium supplement to be in the GI tract for 12-14 hours for proper assimilation and enzyme-connection with the liver and kidneys. However, it is very likely that a person will have had a bowel movement well before any Magnesium has been assimilated.

Topical supplementation is the fastest means to increase total body magnesium levels to the needed levels for good health, sometimes taking only a month, depending on how low previous levels were and how much is assimilated. Topical supplementation can be done by soaking the body in a magnesium solution, or by simply rubbing, or spraying, a solution directly on the skin. More and more people are using “magnesium oil” as a very easy way to apply magnesium quickly to the skin.

**EPSOM SALT ISSUES**

The form most used in topical applications (especially in bathtub soaking) over the years, has been magnesium sulphate (MgSO4), commonly known as Epsom salts. This form of magnesium is in many ways inferior to magnesium chloride (MgCl2). Magnesium sulfate is rapidly excreted through the kidneys.
and therefore difficult to assimilate, thus the need for much more magnesium sulfate in a bath than magnesium chloride to get similar results. Magnesium chloride is very easily assimilated and metabolized by the body; therefore, lesser amounts produce greater results.

TOXICITY

There is also the issue of toxicity. While no serious negative effects have been observed at lower dosage levels of magnesium sulfate, very high dosages (50 grams or more) have been shown to be toxic. Dr. Jean Durlach et al, at the Université P. et M. Curie, Paris, wrote a paper about the relative toxicities between magnesium sulfate and magnesium chloride. The toxicity of MgSO4 has to do with its unique molecular structure on the sulphate side. Though sulphate is needed for essential cellular and other body functions, too much can be bad. Their conclusion was that magnesium chloride was better suited for addressing magnesium deficiency associated issues.

SULPHATE VS CHLORIDE

Therefore, the toxicity of MgSO4 is not related to the magnesium, but the sulphate part of the molecule. On the other hand, the chloride part of the MgCl2 is not only not toxic, but very beneficial to the body. Chloride is essential to the production of gastric acid needed each day for digestion and also to stimulate starch-digesting enzymes.

OTHER FORMS OF MAGNESIUM

Furthermore, if we supplement using magnesium as oxide or carbonate we then need to produce additional hydrochloric acid to absorb them. These forms of magnesium put a further drain on chloride reserves essential for good digestion of food. Many aging individuals, especially with chronic diseases who desperately need more magnesium cannot produce sufficient hydrochloric acid and then cannot absorb the oxide or carbonate.

CONCLUSION

Magnesium Chloride is therefore the clear choice for supplementation and the best delivery system for this is magnesium oil through the skin.

THE SCIENCE BEHIND MG CHLORIDE VS MG SULPHATE

According to Daniel Reid, author of The Tao of Detox, magnesium sulfate, commonly known as Epsom salts, is rapidly excreted through the kidneys and therefore difficult to assimilate. This would explain in part why the effects from Epsom salt baths do not last long and why you need more magnesium sulfate in a bath than magnesium chloride to get similar results. Magnesium chloride is easily assimilated and metabolized in the human body.[i] Epsom salts are used by parents of children with autism because of the sulfate, which they are sometimes deficient in; sulfate is also crucial to the body and is wasted in the urine of autistic children.

Dr. Jean Durlach et al, at the Université P. et M. Curie, Paris, wrote a paper about the relative toxicities between magnesium sulfate and magnesium chloride. They write, "The reason of the toxicity of pharmacological doses of magnesium using the sulfate anion rather than the chloride anion may perhaps arise from the respective chemical structures of both the two magnesium salts. Chemically, both MgSO4 and MgCl2 are hexa-aqueous complexes. However MgCl2 crystals consist of dianions with magnesium coordinated to the six water molecules as a complex, [Mg(H2O)6]2+ and two independent chloride anions, Cl-. In MgSO4, a seventh water molecule is associated with the sulphate anion, [Mg(H2O)6]2 +[SO4. H2O]. Consequently, the more hydrated MgSO4 molecule may have chemical interactions with paracellular components, rather than with cellular components, presumably potentiating toxic manifestations while reducing therapeutic effect."

MgSO4 is not always the appropriate salt in clinical therapeutics. MgCl2 seems the better anion-cation association to be used in many clinical and pharmacological indications.[ii] Dr. Jean Durlach et al These researches also studied ionic fluxes in the two directions between the mother and the fetus. They found that there was a greater positive effect when MgCl2 was used and that MgSO4 could not guarantee the fetal needs in sodium and potassium exchange like MgCl2 could. Dr. Durlach summarized saying, "MgCl2 interacts with all exchangers while the interaction of MgSO4 is limited to paracellular exchangers, and MgCl2 increases the flux ratio between mother to
fetus while MgSO4 decreases it." (Paracellular transport refers to the transfer of substances across an epithelium by passing through the intercellular space between the cells. It is in contrast to transcellular transport, where the substances travel through the cell, passing through both the apical membrane and basolateral membrane.)

So, unless you can titrate the Oxygen and Sulfur content and successfully create the covalent bond with molecular Chlorine.... The short answer is, NO — If you mix your Epsom salts with some unknown or miscellaneous oil, you'll end up with Magnesium Sulfate in oil.

Dropping levels of magnesium during pregnancy leads to premature contraction and this has been treated by allopathic medicine mostly with magnesium sulfate. But high-dosage, tocolytic magnesium sulfate administered to pregnant women during preterm labor can be toxic, and sometimes lethal, for their newborns.[iii] A Medline's search found MgSO4 had 53 reports of its use in prematures,[iv] whereas MgCl2 had only 4 papers of its use. The paper sited just above showed the results of sever overdose of the mothers, 50 grams or more of MgSO4. Clearly too much is toxic, but other studies show safety and efficacy at lower doses. Magnesium sulfate given to women immediately before very preterm birth may improve important pediatric outcomes. No serious harmful effects have been seen at lower dosage levels.

Chloride is required to produce a large quantity of gastric acid each day and is also needed to stimulate starch-digesting enzymes. We may use magnesium as oxide or carbonate but then we need to produce additional hydrochloric acid to absorb them. Many aging individuals, especially with chronic diseases who desperately need more magnesium cannot produce sufficient hydrochloric acid and then cannot absorb the oxide or carbonate.

Sulfate is also important and has an influence over almost every cellular function. Sulfate attaches to phenols and makes them less harmful, and sets them up for being excreted from your kidneys. A lot of these potentially toxic molecules are in food. Sulfate is also used to regulate the performance of many other molecules. Many systems in the body will not function well in a low-sulfate environment. Sulfur is so critical to life that the body will apparently borrow protein from the muscles to keep from running too low.

Though magnesium sulfate will save your life in emergency situations as quickly and easily as magnesium chloride, magnesium chloride fits the bill as a universal medicine, magnesium sulfate does not. Magnesium sulfate is a close cousin whose effect, form and toxicity demands it be used in special applications when the sulfur is needed.

..."both magnesium as well as chloride have other important functions in keeping us young and healthy. Chloride, of course, is required to produce a large quantity of gastric acid each day and is also needed to stimulate starch-digesting enzymes. Magnesium is the mineral of rejuvenation and prevents the calcification of our organs and tissues that is characteristic of the old-age related degeneration of our body.

Using other magnesium salts is less advantageous because these have to be converted into chlorides in the body anyway. We may use magnesium as oxide or carbonate but then we need to produce additional hydrochloric acid to absorb them. Many aging individuals, especially with chronic diseases who desperately need more magnesium cannot produce sufficient hydrochloric acid and then cannot absorb the oxide or carbonate. Epsom salt is magnesium sulphate. It is soluble but not well absorbed and acts mainly as a laxative. Chelated magnesium is well absorbed but much more expensive and lacks the beneficial contribution of the chloride ions. Orotates are good but very expensive for the amount of magnesium that they provide and both orotates and chelates seem to lack the infection-fighting potential of the magnesium chloride."....

Why Magnesium Chloride

Magnesium chloride is easily assimilated and metabolized in the human body. [1] Parents of children with autism frequently use Epsom salts baths or creams because of the sulfate, which they are usually deficient in due to metabolic issues. Sulfate is also crucial to the body and is wasted in the urine of autistic children.

For purposes of cellular detoxification and tissue purification, the most effective form of magnesium is magnesium chloride, which has a strong excretory effect on toxins and stagnant energies stuck in the tissues of the body, drawing them out through the pores of the skin. This is a powerful hydrotherapy that draws toxins from the tissues, replenishes the "vital fluid" of the cells, and restores cellular magnesium to optimum levels. Magnesium chloride is environmentally safe, and is used around vegetation and in agriculture. It is not irritating to the skin at lower concentrations, and is less toxic than common table salt. Magnesium chloride solution was not only harmless for tissues, but it had also a great effectover leucocytic activity and phagocytosis; so it was perfect for external wounds treatment.
Chloride

Chloride is an "essential" mineral for humans. [3] It is abundant in ionic trace mineral preparations. It is a major mineral nutrient that occurs primarily in body fluids. Chloride is a prominent negatively charged ion of the blood, where it represents 70% of the body's total negative ion content. On average, an adult human body contains approximately 115 grams of chloride, making up about 0.15% of total body weight. The suggested amount of chloride intake ranges from 750 to 900 milligrams per day, based on the fact that total obligatory loss of chloride in the average person is close to 530 milligrams per day.

As the principle negatively charged ion in the body, chloride serves as one of the main electrolytes of the body. Chloride, in addition to potassium and sodium, assists in the conduction of electrical impulses when dissolved in bodily water. Potassium and sodium become positive ions as they lose an electron when dissolved and chloride becomes a negative ion as it gains an electron when dissolved. A positive ion is always accompanied by a negative ion, hence the close relationship between sodium, potassium, and chloride. The electrolytes are distributed throughout all body fluids including the blood, lymph, and the fluid inside and outside cells. The negative charge of chloride balances against the positive charges of sodium and potassium ions in order to maintain serum osmolarity.

In addition to its functions as an electrolyte, chloride combines with hydrogen in the stomach to make hydrochloric acid, a powerful digestive enzyme that is responsible for the break down of proteins, absorption of other metallic minerals, and activation of intrinsic factor, which in turn absorbs vitamin B12. Chloride is specially transported into the gastric lumen, in exchange for another negatively charged electrolyte (bicarbonate), in order to maintain electrical neutrality across the stomach membrane. After utilization in hydrochloric acid, some chloride is reabsorbed by the intestine, back into the blood stream where it is required for maintenance of extracellular fluid volume. Chloride is both actively and passively absorbed by the body, depending on the current metabolic demands. [4] A constant exchange of chloride and bicarbonate, between red blood cells and the plasma helps to govern the pH balance and transport of carbon dioxide, a waste product of respiration, from the body. With sodium and potassium, chloride works in the nervous system to aid in the transport of electrical impulses throughout the body, as movement of negatively charged chloride into the cell propagates the nervous electrical potential.

Deficiency of chloride is rare. However, when it does occur, it results in a life threatening condition known as alkalosis, in which the blood becomes overly alkaline. A tedious balance between alkalinity and acidity is in constant flux, and must be vigilantly maintained throughout the entire body. Alkalosis may occur as a result of excessive loss of sodium, such as heavy sweating during endurance exercise, and in cases of prolonged vomiting and diarrhea. Symptoms include muscle weakness, loss of appetite, irritability, dehydration, and profound lethargy. Hypochloremia may result from water overload, wasting conditions, and extensive bodily burns with sequestration of extracellular fluids. In a situation in which infants were inadvertently fed chloride-deficient formula, many experienced failure to thrive, anorexia, and weakness in their first year of life.

Excessive intakes of dietary chloride only occur with the ingestion of large amounts of salt and potassium chloride. The toxic effects of such diets, such as fluid retention and high blood pressure, are attributed to the high sodium and potassium levels. Chloride toxicity has not been observed in humans except in the special case of impaired sodium chloride metabolism, e.g., in congestive heart failure. Healthy individuals can tolerate the intake of large quantities of chloride provided that there is a concomitant intake of fresh water. Other situations in which increased blood levels of chloride are seen include diseases of improper waste elimination that occur in kidney diseases. Excess chloride is normally excreted in the urine, sweat, and bowels. In fact, excess urinary excretion of chloride occurs in high salt diets. Excessive intakes of chloride can occur in a person with compromised health in addition to an unhealthy diet. However, those that follow a healthy diet and lead an active lifestyle may need to consider supplementing their diet with this important mineral.

The mineral supplement chloride is very different from the gas chlorine. While elemental chlorine is a dangerous gas that does not exist in the free elemental state in nature because of its reactivity, although it is widely distributed in combination with other elements. Chloride is related to chlorine however, as one of the most common chlorine compounds is common salt, NaCl. Chloride is a byproduct of the reaction between chlorine and an electrolyte, such as potassium, magnesium, or sodium, which are essential for human metabolism. [5] Chloride salts are essential for sustaining human metabolism and have none of the effects of isolated chlorine gas.

Chloride occurs naturally in foods at levels normally less than 0.36 milligrams per gram of food. The average intake
of chloride during a salt-free diet is approximately 100 milligrams per day. Unfortunately, chloride is found commonly combined with undesirable dietary sources. The most common of these negative sources is table salt. Table salt is made from a combination of sodium and chloride ions. Other unhealthful sources include yeast extracts, processed lunch meats, and cheeses. Healthier sources of chloride include kelp (seaweed), ionic trace minerals, olives, rye, tomatoes, lettuce, and celery, although not in large enough amounts to supply the needs of an active adult. In its original form, however, chloride is leached from various rocks into soil and water by years of weathering processes. The chloride ion is highly mobile and is transported to closed basins, such as the Great Salt Lake, or oceans.

In summary, chloride is a highly important, vital mineral required for both human and animal life. Without chloride, the human body would be unable to maintain fluids in blood vessels, conduct nerve transmissions, move muscles, or maintain proper kidney function.

As a major electrolyte mineral of the body, chloride performs many roles, and is rapidly excreted from the body. Active adults that eat a healthy diet devoid of salt and illnesses in which vomiting and/or diarrhea are profuse warrant the supplementation of additional chloride. Replacement of chloride is essential on a daily basis to maintain regular metabolic function. The body safely utilizes without negative health effects. Negative health effects associated with diets high in chloride are mainly attributable to sodium and potassium, the other two electrolyte minerals to which chloride is often attached. [6]

Researches also studied ionic fluxes in the two directions between the mother and the fetus. They found that there was a greater positive effect when MgCl₂ was used, and that MgSO₄ could not guarantee the fetal needs in sodium and potassium exchange like MgCl₂ could. They also found that MgCl₂ interacts with all the exchangers in the cell membrane, while the effect of MgSO₄ is limited to paracellular components without interaction with cellular components. Dr. Durlach summarized saying, "MgCl₂ interacts with all exchangers while the interaction of MgSO₄ is limited to paracellular exchangers, and MgCl₂ increases the flux ratio between mother to fetus while MgSO₄ decreases it."

High-dosage, tocolytic magnesium sulfate (MgSO(4)) administered to pregnant women during pre-term labor can be toxic, and sometimes lethal, for their newborns.[7]

Chloride is required to produce a large quantity of gastric acid each day and is also needed to stimulate starch-digesting enzymes. Using other magnesium salts is less advantageous because these have to be converted into chlorides in the body anyway. We may use magnesium as oxide or carbonate but then we need to produce additional hydrochloric acid to absorb them. Many aging individuals, especially with chronic diseases who desperately need more magnesium, cannot produce sufficient hydrochloric acid and then cannot absorb the oxide or carbonate.

SULFATE is also important and has an influence over almost every cellular function. Sulfate attaches to phenols and makes them less harmful, and sets them up for being excreted from your kidneys. A lot of these potentially toxic molecules are in food. Sulfate is also used to regulate the performance of many other molecules. Many systems in the body will not function well in a low-sulfate environment. Sulfur is so critical to life that the body will apparently borrow protein from the muscles to keep from running too low.

Though magnesium sulfate will save your life in emergency situations as quickly and easily as magnesium chloride, magnesium chloride fits the bill as a universal medical nutrient. Magnesium sulfate is a close cousin whose effect, form, and toxicity require that it be used in special applications when the sulfur is needed.

It is good to know that magnesium chloride will provide the chlorides (without the sodium) needed to eliminate bromides, which is also necessary to any successful detoxification program. "Chloride competes with bromide at the renal level and increases the renal clearance of bromide[8] thus magnesium chloride is ideal for magnesium supplementation. Some patients require up to 2 years of iodine therapy to bring post loading urine bromide levels below 10 mg/24 hr, if chloride loading is not included in the bromine detoxification program." [9]

Dr. David Brownstein promotes the use of magnesium as a supplement "synergistic" to treatment with iodine. "As with using any nutritional supplement, a comprehensive holistic treatment plan provides the best results. Magnesium is an important part of the iodine treatment plan. Magnesium deficiency is very common. Magnesium is nature's relaxing agent. Magnesium levels (via red blood cell magnesium levels) should be assessed and supplementation instituted. Magnesium supplementation will likely ensure optimal results with iodine." [10]

Magnesium Chloride Benefits

For purposes of cellular detoxification and tissue purification, the most effective form of magnesium is magnesium chloride, which has a strong excretory effect on toxins and stagnant energies stuck in the tissues of the body, drawing them out through the pores of the skin. Chloride is required to produce a large quantity of gastric acid each day and is also needed to stimulate starch-digesting enzymes.

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Magnesium Chloride, Bromide & Iodine

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For more detailed information feel free to consult my digital version of the book Transdermal Magnesium Therapy that's with a reasonable price, or for a more personal approach check my Consultations page.

[4] Iodine, the Rest of the Story; David Brownstein M.D.;

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