

Vitamin Research News

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Infection Protection: An In-Depth Discussion About Strengthening Immune Health

by Chris D. Meletis, ND

The more information we obtain about our health the better we are able to take a proactive stance in feeling our best. That's why I was glad that Ronald Klatz, MD, DO, President of the American Academy of Anti-Aging Medicine (A4M), and Robert Goldman, MD, PhD, DO, FAASP, Chairman of A4M, recently wrote a handbook about one of the most important aspects of our health—immunity. *Infection Protection: Pandemic* features more than 70 natural, non-toxic ways to improve immune health as well as checklists to determine the reader's preparedness for a pandemic. I recently discussed this book with Dr. Klatz.

Dr. Meletis: *Infection Protection: Pandemic* is a wonderful resource for anyone who wants to boost the health of his or

her immune system. What was your primary motivation behind writing the book?

Dr. Klatz: When it became apparent that the bird flu was becoming such a critical threat to worldwide health, we wanted to give people a resource for learning how to nourish their immune systems, both during a worldwide bird flu pandemic and during a traditional cold and flu season. We wanted them to have a roadmap for building an immune system so strong that they and their loved ones would be able to thwart an attack from any virus or bacteria that they are exposed to, whether it's the H5N1 strain of the bird flu, the West Nile virus, the common cold, an influenza virus or a bacteriological terrorist attack.

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Fish Oil: The Best Source and Optimal Dosing of this Anti-inflammatory Nutrient

by Douglas MacKay, ND

When recommending fish oil to my geriatric and baby boomer patients the most common response I get is, "My grandmother used to make me take cod liver oil from a spoon." As it turns out, grandma was right.

Because of their health-promoting abilities, omega-3 fatty acids have received recognition from some of the top medical organizations in the world including, the American Heart Association, American Diabetes Association, World Health Organization, United Kingdom Scientific Advisory Committee on Nutrition, European Society for Cardiology, and The British Nutrition Foundation.

Fish Oil and Health

The health benefits of fish oil boil down to a few simple concepts.

First and foremost, EPA and DHA are absolutely essential for proper cellular health. EPA and DHA are required constituents of ALL cell membranes from our head to our toes and inside out. As constituents of cell membranes EPA and DHA are determinants of cell receptor action, hormone binding, cell fluidity, signal transduction, ion channel function, and membrane-bound enzyme activity.¹

Let's pause for a second to ponder the significance of these actions.

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Infection Protection

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Dr. Meletis: Your book is an intriguing glimpse into the immune system and some of the biggest threats to our immune systems' health. Since we are fast approaching the cold and flu season, perhaps you can paint *Vitamin Research News'* readers a clinical picture of influenza virus and how its symptoms differ from that of a common cold.

Dr. Klatz: Certainly. Influenza is, as everyone knows, highly contagious. A single sneeze can project up to 4,500 viral droplets, moving at speeds up to 100 miles per hour. This exposes anyone within three to four feet of the infected person to the flu virus. There are three types of influenza viruses, types A, B, and C. Influenza virus A is a genus of a family of viruses called Orthomyxoviridae. Influenza virus A has only one species of virus in it, but variants of this virus can occur in different animal species such as horses, dogs and humans. Human influenza virus refers to those subtypes that spread widely among humans. There are 144 different potential subtypes of Human influenza Virus A, but as of this writing there are only three known Influenza A virus subtypes circulating among humans.

The symptoms of influenza are similar to those of the common cold. Both of these conditions cause upper respiratory symptoms and begin similarly, with body

Table 1: Characteristics of Influenza Compared to the Common Cold.

Characteristic	Seasonal Flu	Common Cold
Pathogen	Orthomyxoviridae	Rhinovirus
Chest Congestion	Common and can become severe. Pneumonia is also a common complication	Common, but mild to moderate
Cough	Common and can be severe	Hacking
Fever	Usually high (102-104°). May last 3-4 days.	Rare (except in young children)
Chills	Common and can be severe	Mild or none
General aches and pains	Usual and can be severe	Mild
Headache	Common	Rare
Red, watery, itchy eyes	Common	Rare
Sneezing	Occasional	Usual
Sore throat	Occasional	Usual
Stuffy nose	Occasional	Usual
Tiredness	Severe	Mild
Nausea and vomiting	Occasional	Rare
Lingering fatigue	Common, can last 1-3 weeks	Mild, if any
Primary season	Winter months	Late August through April
Duration	Up to a month	7-10 days

aches, cough, fatigue, headache, and hot and cold sweats. However, with a flu, it is common for a fever to develop, along with a dry throat and cough. Nausea and vomiting are also characteristic of flues. The seasonal flu also lasts longer than colds—up to a month, including a week or more of residual coughing and fatigue. By contrast, the common cold usually lasts seven to 10 days (See table 1).

Dr. Meletis: Despite the fact that bird flu has been dominating the news, seasonal influenza also can have a devastating effect on our nation's and the world's health.

Dr. Klatz: That is correct. The annual flu in the U.S. results in approximately 36,000 deaths and more than 200,000 hospitalizations each year. In addition, influenza is annually responsible for a total cost of more than \$10 billion to the U.S. economy. One of the other costs of the flu is that it leaves people more susceptible to pneumonia, ear infections and sinus difficulties.

Dr. Meletis: In *Infection Protection: Pandemic*, you specify ten strategies people can take to optimize their immune systems. I thought we could discuss some of those strategies included in the book, starting with hygiene habits.

Dr. Klatz: People tend to neglect the importance of hygiene when it comes to defending themselves against pathogens.

Yet, this is an extremely important way to lessen the burden on our immune systems. The fact of the matter is that germs constantly surround us. The average desk, for example, harbors 400 more times bacteria than the average toilet seat, according to microbiologist Charles Gerba of the University of Arizona. Gerba describes keyboards as a "lunch counter for germs." (Table 2)

I recommend that people wash their hands ten times per day—double that amount if you're in an environment where infectious germs abound (such as in the same home or office with an ill person.) For example, hands should be washed after coughing or sneezing, before, during and after food preparation, before inserting or removing contact lenses, after you use the bathroom, after changing a diaper or handling garbage.

In order to minimize exposure to germs, I also suggest taping open latches

Table 2: The Most Contaminated Spaces in the Workplace.

Item	Germs/sq. in.
Phone receiver	25,127
Desktop	20,961
Computer mouse	1,676
Fax machine	301
Photocopy machine	69
Toilet seat	49

Source: *Infection Protection: Pandemic* by Ronald Klatz, MD, DO and Robert Goldman, MD, PhD, DO, FAASP.

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Deadly Mistakes

I was shocked when I read the results of a new government report, *Preventing Medication Errors*. The report, issued by the Institute of Medicine of the National Academies, documented that medication errors injure at least 1.5 million Americans annually, costing the nation more than \$3.5 billion a year. In hospitals alone, this translates into an average of one medication error per patient per day. This estimate does not take into account lost wages and productivity or additional health care costs, the report says.

Existing studies also suggest that 400,000 preventable drug-related injuries occur each year in hospitals, another 800,000 in long-term care settings, and about 530,000 among Medicare recipients in outpatient clinics.

Although the authors of the current report included herbals, vitamins and minerals in their definition of medications, I think it's noteworthy they could find no study in the medical literature on error rates associated with complementary and alternative medicine. They went on to state that there is, however, emerging evidence that certain herbals have the potential for adverse reactions with prescription drugs. Given the number of errors involving prescription medications documented in the report, the few places in the report that touched on herbals seemed more theoretical than fact based.

The majority of mistakes included in the report were the result of pharmaceutical errors that often produced devastating consequences. One case study presented speaks volumes about the most typical scenario behind drug errors. After misreading the handwritten prescription for an infant treated for congenital syphilis, a pharmacist filled the prescription for an adult dose. Even though the syringe label warned the medicine should never be administered by IV, the nurses administered it by that route anyway, further amplifying the overdose. Sadly, the infant died.

The heartbreaking story above is just one example of how our flawed healthcare system is a danger to our health. By contrast, nutritional supplements have an enviable safety record. Adverse events revolving around vitamins, minerals and herbals are rare. Nutritional supplements nourish our health, providing us with a safe and effective alternative.



Robert Watson
President/CEO

on doors to reduce the need to touch door-knobs, which are known to harbor many viruses and bacteria. You can also pull your sleeves over your hands when touching doorknobs and other surfaces on which germs are found to thrive. Most importantly, keep a supply of disposable antiseptic towelettes near all phones, computers, fax machines, copiers, etc. Use a towelette each time prior to, and after, touching these items, and discard it promptly.

Dr. Meletis: Daily nutrition is another immune enhancing strategy you mention in the book.

Dr. Klatz: Our lifestyle plays an integral role in whether our immune systems are strong enough to fight off pathogens. In my book, I interviewed Dr. John B. Symes, a veterinarian who recovered from numerous ailments after he was diagnosed with celiac disease and subsequently became an Internet medical researcher and consultant. Dr. Symes points out that we are "sitting ducks" in this country for diseases such as the bird flu because we do so much wrong with our diet and lifestyle and our lack of sleep and our abuses of alcohol, drugs and cigarettes.

Eating right is a part of maintaining a healthy, immunosupportive lifestyle. Meals should emphasize vegetables, fruits, whole grains, lean and low-fat sources of protein, and a limited amount of dairy products. Sugars are the food on which viruses feast, so limiting or avoiding sugar intake will do wonders for helping the immune system thrive. Bananas, oranges and citrus juices, peanuts, and dairy products should all be avoided during a flu since these food increase mucous formation, creating an internal environment conducive to harboring viruses.

Dr. Meletis: We are surrounded by germs. And it's not always feasible to avoid direct human contact with others. At business meetings, for example, we often shake hands immediately prior to eating. That's why I found one of the most interesting parts of your book to be the section on natural immune enhancement.

Dr. Klatz: Yes, given the sheer quantity of viruses and bacteria we encounter daily, building our immune systems is critical for optimal health. Although many of the strategies I list in *Infection Protection*

can help accomplish this, it is extremely important that we nourish our bodies with immune supporting supplements as well.

Dr. Meletis: In my own clinical practice I've noted that my patients have had positive responses to the nutritional supplement EpiCor™. In your book, you list EpiCor as one of the top ten natural immune enhancers according to A4M's Immunity Desk Reference. You were obviously as impressed with the research supporting EpiCor as I was, since you included it on the list.

Dr. Klatz: Yes, EpiCor is emerging as a new and potentially powerful way to nourish the immune system. The research is impressive. As you know, EpiCor isn't an herb or an isolated nutrient, but rather the product of a sophisticated fermentation process that creates a whole food concentrate with high levels of nutritional metabolites and exceptionally powerful antioxidant and immune modulating activity. First, I was impressed with the cell culture research documenting EpiCor's antimicrobial activity. Even at concentrations as low as 1 part per trillion, EpiCor significantly inhibited the growth of *E. Coli* and *Candida tropicalis*. EpiCor also is thought to encourage the growth of favorable bacteria in the gut, whose secondary metabolites are essential to human health.

Other impressive research showed that EpiCor produces a significant reduction in the levels of CD8 cells and produces a more favorable CD4/CD8 ratio. CD4 (helper) cells facilitate and coordinate immune response, while CD8 (suppressor) cells, in part, down regulate this response. Therefore, a higher ratio of CD4 to CD8 cells is desirable for mounting an effective immune response. Blood samples taken from persons ingesting EpiCor daily found the subjects had significantly better helper to suppressor (CD4:CD8) cell ratios than their age- and gender-matched counterparts who did not consume EpiCor.

Dr. Meletis: I also was impressed by the fact that EpiCor activates natural killer (NK) cells and increases levels of salivary Secretory IgA (sIgA).

Dr. Klatz: Yes, we were impressed by

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this, too. NK cells' sole mission is to destroy abnormal cells and those infected with viruses such as SARS, West Nile and Avian Flu as well as the common cold and influenza viruses. EpiCor's ability to enhance NK function makes it one of the most intriguing immunity supportive substances available.

Furthermore, subjects consuming EpiCor had very high levels of Secretory IgA (sIgA)—more than 300 mg per ml. In mounting a first line of defense against viruses and bacteria, sIgA is very important since sIgA is found on mucosal surfaces such as the nasal passages and eyes, which are common routes of entry for pathogens.

Dr. Meletis: Yes, I was very impressed by EpiCor's effect on sIgA. We should also mention that it has been shown to reduce interferon-gamma levels.

Dr. Klatz: Indeed this is also a very important point in a discussion revolving around immunity because interferon-gamma is a marker of inflammation, which contributes to the severity of respiratory diseases including influenza A and bird flu.

Dr. Meletis: In closing, I want to thank you for writing a book that people can read in order to get a firm grasp on what we can do to strengthen our immune systems. *Infection Protection: Pandemic* is available through VRP and I hope that many *Vitamin Research News* readers will take advantage of this valuable resource.

Dr. Klatz: Thank you for devoting the time to covering such an important and timely topic.

Ronald Klatz, MD, DO, is a long-time scientific pioneer and innovator. Dr. Klatz originated the term "anti-aging" and is regarded as the movement's first physician and chief champion. He is a best-selling author of 32 books with over 2 million copies in print. Dr. Klatz serves as President of the American Academy of Anti-Aging Medicine (A4M), the world's largest and fastest growing new clinical medical society. A4M has trained more than 50,000 medical professionals via its premier scientific conferences on topics relating to medical interventions to prevent and treat the diseases and disabilities associated with the biological process of aging.

Magnesium: The Key to Health and Life

By James South, M.A.

[Editor's Note: This is the fourth in a series of articles paying tribute to our departed colleague James South. We are re-printing some of his most memorable articles in order to pay tribute to his vast knowledge about nutritional supplements. By continuing to share his knowledge, we are hoping to carry on his legacy.]

Aside from the fact that the following conditions are epidemic in modern America, what do these all have in common: Cardiovascular disease (including heart attacks, cardiac arrhythmias, angina and congestive heart failure),¹⁻³ osteoporosis,⁴⁻⁶ hypertension,⁷⁻⁹ insulin resistance and type 2 diabetes,¹⁰⁻¹² inflammation,¹³⁻¹⁵ asthma,¹⁶⁻¹⁸ chronic stress,¹⁹⁻²¹ noise-induced hearing loss,²²⁻²⁴ colorectal cancer,²⁵ alcoholic brain damage,²⁶ depression,²⁷ tension and migraine headaches,²⁸⁻²⁹ attention deficit hyperactivity disorder,³⁰⁻³² preeclampsia (a pregnancy disorder),¹ kidney stones,³³ hyperlipidemia,^{34,35} muscle cramps and weakness,²⁷ and poor memory?²⁷

The answer: Every one of these conditions can be caused by or is strongly associated with cellular magnesium deficiency, and many of these conditions have been successfully treated with magnesium supplementation.

Mainstream nutritionists generally assume that magnesium deficiency is rare in America. The phrase "magnesium-deficiency" is somewhat equivocal. It may refer to a dietary deficiency of magnesium, or to significant depletions of total body magnesium stores. Is there any reason to believe either form of magnesium deficiency is common in America? It turns out that a host of factors have conspired to promote a widespread prevalence of at least mild magnesium deficiency in America, and that this magnesium deficiency may be responsible, at least in part, for much of the chronic ill-health of the American population.

Magnesium: Mineral Superstar

Magnesium has not attracted the degree of public attention that has been lavished on its complement/antagonist, calcium. Yet this public relations failure is

certainly not due to any biochemical unimportance of magnesium. Magnesium is essential to activate over 300 different enzyme systems critical to life, more than any other mineral.²⁷

Magnesium is essential in the glycolytic cycle that converts sugar to ATP (adenosine triphosphate) bioenergy.³⁶ Magnesium helps stabilize ATP; indeed 80 percent of the magnesium inside the cell is complexed with ATP.³⁶ Magnesium is intimately involved in nucleic acid metabolism and the synthesis of DNA and RNA.³⁶ Magnesium plays key roles in the second messenger systems that mediate hormonal effects on cells.³⁶ Magnesium is a major controller of cellular ion channels, governing the flow of sodium, potassium and calcium in and out of cells.³⁶

While physicians frequently use calcium channel-blocker drugs to treat various ailments, magnesium has been called "nature's physiological calcium channel blocker."³⁶ Magnesium plays critical roles in nerve function and in the contraction and relaxation of muscles, including the smooth muscle cells that constrict or relax arteries.³⁶ In a very real sense, magnesium is the "mineral of life." Magnesium is the center of the chlorophyll molecule, without which plant life would not exist, and so neither would the oxygen of our atmosphere, and so neither would we. It is hard to overestimate the importance of magnesium.

Magnesium Homeostasis

Because magnesium is so critical to human life, the body works hard to maintain a proper balance of magnesium. Approximately 60 percent of the body's magnesium is in the skeleton; 39 percent is inside cells (20 percent in skeletal muscle), and less than 1 percent outside the cells (mainly in the bloodstream).²⁷ The maintenance of the body's stores of magnesium is a function of three variables: dietary magnesium levels, intestinal magnesium absorption, and magnesium excretion—which is primarily controlled by the kidneys.²⁷ And, unfortunately for modern

Americans, there are numerous and common problems with these three mechanisms by which the body tries to regulate its magnesium status.

Dietary Magnesium: Not What It Used to Be

As one study noted, “The dietary intake of magnesium declined in the United States from 475 [to] 500 milligrams per day in 1900 to 215 [to] 283 milligrams per day in 1990, possibly owing to an increase in the consumption of processed foods.... [I]t [is] difficult to reach the recommended daily allowance of 400 milligrams through diet alone.1 “Evidence suggests that the occidental ‘American diet’ is relatively deficient in magnesium, whereas the ‘Oriental diet,’ which is characterized by a greater intake of fruits and vegetables, is rich in magnesium.”37

Wester points out that refining and cooking may diminish the magnesium content of foods substantially, with boiling of vegetables causing a loss of 50 percent of the magnesium, with brown rice losing 80 percent of its original magnesium content when refined into white rice.27 Magnesium is rarely added back to the soil in modern synthetic fertilizers, thus lowering magnesium levels in food.27

Absorption Barriers

There are many factors that inhibit magnesium absorption in the small intestine. A high calcium intake can cause magnesium deficiency. One study’s authors noted, “In subjects on low magnesium intake, calcium supplementation seems to reduce dietary magnesium retention.”27

Millions of Americans swallow thousands of milligrams of calcium daily attempting to ward off osteoporosis. Ironically, research shows, “Increasing the magnesium intake improves rather than interferes with calcium utilization.”27 A high-fat diet (the typical American diet is 40 to 45 percent fat calories) may decrease magnesium retention by 50 percent, even in those consuming adequate magnesium.38 Magnesium easily combines with phosphoric acid to make magnesium phosphate,27 which is totally insoluble and precipitates out of the intestinal juices, becoming part of the feces. Americans drink tons of phosphoric acid-containing

soft drinks. Oxalates in foods such as spinach, rhubarb and chocolate form insoluble magnesium compounds that cannot be absorbed. Laxatives also promote intestinal magnesium loss.

Magnesium Recycling Barriers

The main way the body conserves its magnesium supply is through the kidneys. Healthy kidneys typically reabsorb as much as 95 percent of the magnesium before it is excreted in the urine.27 Unfortunately, there are many common factors that promote the kidney’s excretion of magnesium. These include diuretics and digitalis;1,27 alcohol;27 high intake of sodium and calcium;27 high sugar intake;27 coffee; high blood levels of the stress hormones adrenalin, noradrenalin and cortisol;1,19,27 aminoglycosides, cisplatin and cyclosporine;1 and noise stress.22

Detecting Magnesium Deficiency

Magnesium is not routinely measured by physicians when they order bloodwork, and usually it wouldn’t matter anyway. “Total body stores and serum levels [of magnesium] are poorly correlated; serum levels can be normal in the presence of low intracellular stores,”1 research shows. In addition “...alkalotic patients may have low serum magnesium levels without total-body magnesium deficiency, while those with acidosis may have normal serum levels despite deficient intracellular stores.”1

Wester points out that “During prolonged fasting a deficit of 20 percent of total-body magnesium may occur but serum magnesium remains unchanged.”27 How then can one detect a magnesium deficiency problem? The Society for Magnesium Research emphasizes the importance of patient history as well as clinical symptoms in addition to serum ionized magnesium levels.39

Anyone eating the typical high-meat, high-fat, high-sugar-and-white-flour American diet is likely to have a low dietary magnesium intake. Anyone whose life contains the various magnesium absorption-inhibitors mentioned previously is likely to be poorly absorbing the magnesium in their diet. Anyone whose life contains the anti-kidney magnesium recycling factors mentioned above is likely to be urinating away much of their magnesium.

Another way to gauge possible magnesium deficiency is to check for magnesium-deficiency symptoms.

Magnesium Deficiency Symptoms

Some of the common symptoms of magnesium deficiency include:27,40,41

- Chronic fatigue, weakness and exhaustion
- Excessive noise and pain sensitivity
- High blood pressure
- Headaches
- Irritability, nervousness, anxiety
- Depression and apathy
- Muscle spasms, tics, cramps, tremors (especially of hands, feet, or facial muscles)

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Extend Plus	3226
Fiber-Rite	5612
Folic Acid & Vitamin B12	1141
Inositol Hexanicotinate (IHN)	1045
Iodoral®	9139
Larch AG	8101
Malate Complex	6681
Melatonin	9401
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Magnesium

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- Difficulty with memory and concentration
- Insomnia
- Chronic constipation
- Chronic excessive muscle tension
- Confusion and disorientation
- Anorexia (poor appetite)
- Emotional instability/overreaction
- Ataxia (an impaired ability to coordinate movement)
- Irregular or rapid heartbeat

Wester remarks, however, that in mild magnesium deficiency the "...symptoms are often vague and uncharacteristic."²⁷

Magnesium and the Calcium Controversy

Insofar as the American medical/nutritional establishment promotes intake of any supplements, it is calcium that is favored for megadose supplementation these days. Yet as noted earlier, high calcium intake both retards magnesium absorption and promotes magnesium excretion in the urine.

There are further reasons why America's high calcium craze combined with the typical low magnesium diet may be less than a good idea. In a classic 1982 article ("The Calcium Controversy"), Guy Abraham, M.D., pointed out that humans have evolved in a potassium-and-magnesium-rich but calcium-and-sodium-poor environment. As a consequence, the body has evolved mechanisms to absorb and conserve calcium and sodium, but not magnesium and potassium. Vitamin D, generated in the skin from sunlight and cholesterol, is a powerful calcium-conserving agent after it is converted to 1,25 dihydroxy D3.⁴²

Normally the body works to maintain calcium inside the cell at a level only 1/10,000 as high as extracellular levels. Excessive intracellular calcium will be taken up by mitochondria, gradually destroying them and leading to cell death.⁴² Magnesium stimulates release of the hormone calcitonin, which drives calcium into the bones where it belongs, and out of the soft tissues where it doesn't.⁴² A high-

calcium, low-magnesium diet and cellular environment will thus tend to favor calcification of soft tissues as osteoporosis gradually develops.⁴² Abraham points out that Asian and African diets are low in calcium (300 to 500 milligrams daily), yet high in magnesium, and osteoporosis is not more common in Asia and Africa than in Europe and America, where daily calcium intakes from high-dairy diets are often 800 to 1,000 milligrams daily, combined with low magnesium.⁴²

Abraham notes, "When patients with severe osteoporosis were given massive doses of calcium they went into positive calcium balance, but radiographic studies revealed no change in the osteoporotic process. Where did that calcium go? Obviously into the soft tissues where it does not belong."⁴² Abraham adds, "Magnesium has a calcium-sparing effect and decreases the need for calcium."⁴²

The country of Finland may serve as an object-lesson on the perils of a high-calcium, low-magnesium lifestyle. Marier observes that in Finland the per capita dietary intake of calcium is among the highest in the world at 1,300 milligrams per day, yet Finland has an exceptionally high death rate from cardiovascular diseases.⁴³ Wester reports that "In Finland the regional death rates from ischemic heart disease are found to be inversely correlated with the hardness and magnesium content of the drinking water and to the content of exchangeable [absorbable by plants] magnesium in the soil."²⁷

A 1978 study found a strong correlation between the dietary calcium/magnesium ratio and the death rate from ischemic heart disease. At that time, the USA, Finland and Holland had some of the highest heart disease death rates, combined with some of the highest calcium/magnesium dietary ratios (Fig. 1).⁵⁰ Note that Japan, with the lowest heart disease rate, had a roughly 1-to-1 calcium/magnesium dietary ratio.

Magnesium Supplementation

In an extensive 1964 article reviewing magnesium balance studies, magnesium expert Mildred Seelig discovered that for most people, at least 6 milligrams magnesium per kilogram of body weight is necessary to ensure a positive magnesium balance.⁴⁴ This is roughly 2.7 milligrams magnesium per pound of body weight. For those under severe chronic stress, or who are engaged in strenuous work/athletic training that promotes intense sweating even higher levels might be required, up to 10 milligrams per kilogram of body weight, or 4.5 milligrams per pound. Those whose lives contain many of the anti-magnesium absorption factors or anti-kidney recycling factors discussed previously might also require higher than the basic 2.7 milligrams per pound to maintain magnesium balance.

Magnesium is generally a safe nutrient. As Carolyn Dean, M.D., N.D., notes, "For the average person, oral magnesium, even in high dosages, has no side effects except loose stools..."⁴⁵ What is not

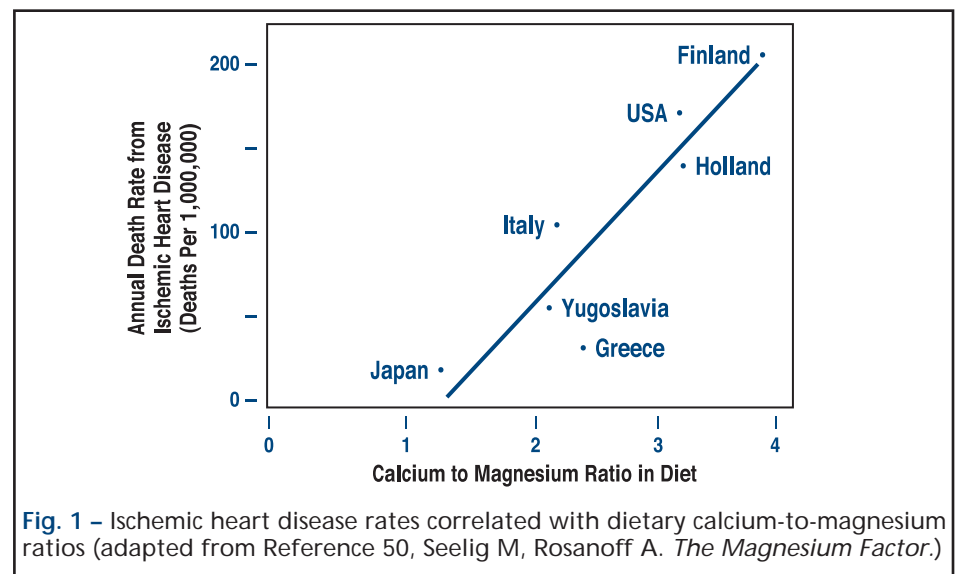


Fig. 1 - Ischemic heart disease rates correlated with dietary calcium-to-magnesium ratios (adapted from Reference 50, Seelig M, Rosanoff A. *The Magnesium Factor*.)

absorbed is excreted in the feces. Those with any degree of impaired kidney function should use magnesium supplements only with physician supervision, as the combination of renal dysfunction and magnesium supplementation may lead to potentially dangerous hypermagnesemia (excessive blood levels of magnesium).³⁶ Dean also lists myasthenia gravis, excessively slow heart rate and bowel obstruction as contraindications to magnesium supplementation.⁴⁵

It is best to spread magnesium supplement intake into at least three daily doses. This will increase absorption and lessen the risk of osmotic diarrhea, a sign that you're either taking too much total magnesium, or too much at one time, and aren't absorbing much of it.

Ideally magnesium should be taken separately from calcium, and not with a high-fat meal. If magnesium is taken with calcium, it should definitely not be one of the two parts calcium to one part magnesium as commonly sold in health food stores and drugstores. A ratio of 1-to-1 calcium to magnesium will be less likely to suppress magnesium absorption.

Vitamin B6 has been shown to increase intracellular uptake of magnesium, so it may be useful in getting magnesium where it belongs: inside the cell.⁴⁶ Washing a magnesium supplement down with a soft drink is not advised, as the phosphoric acid and sugar in the drink will definitely inhibit magnesium absorption and retention. For those consuming any significant quantity of alcohol, taking at least a modest dose of magnesium at such times may reduce the micro-brain damage alcohol can cause.²⁶

Which Form of Magnesium is Best?

Studies have shown that magnesium oxide is the least bioavailable form of magnesium,^{47,48} yet it has been successfully used in a human clinical trial.⁴⁹ In general, organic forms of magnesium such as magnesium citrate, magnesium succinate, magnesium aspartate, magnesium lactate and magnesium taurinate are well-absorbed forms.^{47,48} Magnesium chloride is a well-absorbed inorganic form.

When taking magnesium supplements, it is important to realize that it may take six weeks to six months to replenish

body magnesium stores through oral supplementation.¹ Thus, if you suffer from many of the listed magnesium deficiency symptoms and they don't immediately disappear, don't be discouraged and assume they aren't magnesium-related after all. Just be patient and watch for gradual changes.

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CUSTOMERS' CORNER

by **Ward Dean, MD**
VRP Medical Director

Lupus and Blood Disorder

Dear Dr. Dean,

I would like to know if you could help me with my situation. I have had 2 miscarriages and the blood work that came back said that I have lupus, an anticoagulant blood clotting disorder, and that I am lacking folic acid. My doctor prescribed me Folic Acid, but has recommended that I take a heparin shot every day. I don't want to take heparin because my doctor went over the risks and I am scared. Can you please help me? I am 23 and would like to be a mother one day. Thanks so much. Your response would be greatly appreciated.

Ms. H.

Dear Ms. H.,

First, I suggest *DHEA* 25 mg to start. *DHEA* is now recognized as the treatment of choice for lupus. Many lupus patients are able to take up to 75-100 mg per day (which is considered a pretty high dose for most women WITHOUT lupus). Also, I suggest 2-3 grams of *Turmeric Extract* each day, as a means of keeping your fibrinogen levels down (fibrinogen is a major cause of abnormal clotting).

Believe it or not, heparin is a natural substance, and has a number of beneficial uses. I recommend following your physician's guidance, while asking him or her to maintain you on the lowest effective dose.

Ward Dean, M.D.

Arterial Calcification

Dear Dr. Dean,

I have been diagnosed with severe calcification of the arteries. What, if any, recommendations do you have for repairing the situation?

Regards,
Mr. C.

Dear Mr. C.,

I suggest a combination of *Oral ChelatoRx*, *UniZyme™*, *Inositol Hexanicotinate* (IHN), and *Turmeric Extract* (3 grams per day). Also, make sure your basic supplement needs

are met by a high potency multivitamin formula such as *Extend Plus*.

If you haven't been on a supplement program before, don't start by taking all of these supplements at full dose, as they may upset your stomach. Start with a low dose of each formula, and gradually increase the dose based on your gastrointestinal tolerance.

Ward Dean, M.D.

Melatonin and Growth Hormone

Dear Dr. Dean,

Will Melatonin (3 mg) interfere with MGHR Night Formula? Thank you.

Mr. T.

Dear Mr. T.,

Growth hormone release is enhanced by sleep. *Melatonin*, of course, promotes natural sleep and helps to increase growth hormone production. *Melatonin* and *MGHR Night Formula* will actually ENHANCE each other's effectiveness.

Ward Dean, M.D.

Anxiety, Fibromyalgia

Dear Dr. Dean,

I had gastric bypass surgery, have fibromyalgia, and had a full hysterectomy. I'm 56 years old and for the first time I'm using progesterone cream. I have stopped taking Paxil® for anxiety, but I take amitriptyline 20 mg to help with pain and sleep. I also would like to stop the amitriptyline. Doing some research I found Positrol™. Do I have to take it in combination with Syncholamine™? I try not to take too many pills, since my stomach is very small, and I can taste it all day if I do.

Thank you.
Ms. W.

Dear Ms. W.,

No, you don't have to take *Syncholamine* if you only need *Positrol*. The combination is to be used for those suffering from bipolar disorder, as a means of balancing the neuro-

transmitters—*Syncholamine* for daytime use to enhance alertness while countering depression, and *Positrol* for nighttime use to promote restful sleep and improve mood. But either formula can be used alone.

Two products that are specific for fibromyalgia are *MPA Caps* (Magnesium-Potassium Aspartate), and *Malate Complex*. Most folks with fibromyalgia are also hypothyroid. Consequently, I would recommend VRP's *Iodora®*.

One of the most effective treatments for fibromyalgia is GHB, now available as a prescription drug. Your physician can learn about prescribing Xyrem by going to the manufacturer's website (www.orphan.com).

Ward Dean, M.D.

Blood Clot

Dear Dr. Dean,

A friend of mine recently had a blood clot in an artery leaving the brain causing bleeding on the brain. My friend now has memory loss, difficulty recognizing words and loss of peripheral vision in the right eye. Are you familiar with this condition and the recovery prospects? What can be taken to help the brain recover?

Mr. O.

Dear Mr. O.,

What you are describing is the residual problems from a stroke. However, your description of what happened is a little confusing. There are two kinds of strokes—those caused by blood clots, causing a loss of blood flow to the brain (arteries don't go FROM the brain), and those caused by a ruptured blood vessel, resulting in hemorrhage (bleeding) in the brain. The second type is the most serious, but it is also the least common (in the U.S.).

Assuming that your friend did NOT have a hemorrhagic stroke, I recommend VRP's *Oral ChelatoRx*, *Turmeric Extract*, *Methyl Caps*, and *UniZyme™*. *Phosphatidylcholine* (1.5 grams per day) may also help with recovery of the brain function.

Ward Dean, M.D.

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Heart Disease

Dear Dr. Dean,

I am interested in developing a supplement regimen for my father. He is 63 and taking Tenormen® and Allopurinol®. He had a heart attack at age 46 but has had regular checkups with no problems since. A CT for sinusitis revealed mild vascular disease.

I was thinking he should probably begin taking fish oil, vitamins E and C, and folic acid with B vitamins for prevention of dementia, which his mother had at 67. He does take low dose aspirin therapy and my concern was that with the aspirin, vitamin E and fish oil it may have too much of a blood thinning effect. What is your opinion and do you have any other recommendations?

Ms. T.

Dear Ms. T.,

I would first ask your father if he's interested in a nutritional regimen as you suggest. Often, family members and friends spend a great deal of time, effort and money preparing a nutritional regimen for someone who is not the least bit interested in following the recommendations ("You expect me to take all THAT?"). Nevertheless, since you asked, I would start him out on an easy-to-follow program of *Extend Core* (which includes vitamins E and C and the B vitamins), and then have him work up to *Optimum Six*. Then, I'd add *Oral ChelatoRx* (6 caps per day).

Ward Dean, M.D.

Muscle Tightening

Dear Dr. Dean,

My mother, who is 56, is having tightening of her leg muscles, as well as other muscles in her body. Her legs are now rock hard, and becoming more painful by the day. It is starting to move to her arms, etc. The doctor has suggested it is from pinched nerves in her back from a 30-year-old injury. The doctor says it is causing involuntary isometric contractions over and over. Could you recommend any natural alternatives? So far the only recommendation is surgery.

Thanks,
Ms. W.

Dear Ms. W.,

Without knowing more information it is difficult to make recommendations. It may be

that surgery is her best option—to correct an anatomical nerve impingement (if that is what is causing her problem). A combination of *Nutri-Joint* (to promote healthy cartilage in her intervertebral disks) and *UniZyme™* (as an anti-inflammatory) may help in the long run.

Ward Dean, M.D.

Cholesterol and High Calcium

Dear Dr. Dean,

My recent blood test results show I have a 151 LDL and a 122.5 HDL. I take one *Red Yeast Rice Extract* and 3 *Fiber-Rites* daily. Do I need to take more products, and do I need to be concerned about the 151 LDL?

Also, my calcium level was off the chart at 11.3. I do take *Calcium/Magnesium* and *Vitamin D3*. Do I need to take less calcium daily?

My sincere thanks for your response.

Sincerely,
Ms. O.

Dear Ms. O.,

With an HDL of 122.5, I wouldn't be concerned about the LDL. I would be interested in your total cholesterol, and triglycerides, however.

With regard to your calcium, I recommend having your parathyroid hormone and intracellular magnesium levels checked. I recommend a roughly 1:1 ratio of *Calcium/Magnesium* supplementation. If your calcium levels stay inexplicably elevated, I recommend trying *Oral ChelatoRx*. EDTA, an ingredient in *Oral ChelatoRx*, seems to have a "mind of its own" in normalizing tissue mineral levels.

Ward Dean, M.D.

Melanoma

Dear Dr. Dean,

I just found out today that my Dad has a malignant melanoma on top of his head, which will be removed in a week. Coincidentally, I lost my Mom to this disease 32 years ago.

What's the latest prognosis for a cure, and is there hope for fighting this thing?

Many thanks.
Mr. P.

Dear Mr. P.,

Sorry to hear about your father. The outlook for melanomas is, unfortunately, not good. I would contact the Cancer Control

Society in Los Angeles for their list of alternative doctors who specialize in cancer therapy. Burton Goldberg's book is also another good source of information.

In the meantime, I'd get him started on as many anti-cancer nutrients as he can comfortably afford. I'd recommend *C-Mend*, *Resveratrol* (which has shown benefit in cellular studies with melanoma), *Thymic Protein A*, *Beta-Glucan*, *Larch AG*, and, of course, high-dose *Vitamin C*. You may also want to try VRP's new immune modulating supplement, *EpiCor™*. *Turmeric* and *Vitamin D3* also have been shown to inhibit melanoma cancer cells—see the article "Skin Health: Nutritional Support for Ultraviolet Protection, Aging Skin, Rosacea, and Other Dermatological Concerns" available at www.vrp.com.

Ward Dean, M.D.

Organic Acid Testing

Dear VRP,

You really have one of the best newsletters around. I read it "religiously." You're always ahead and informed—it's just great. Thank you.

I just received an email of the latest articles. One was on Organic Acid Testing. Did I miss something? Do you have names of labs that you would recommend? I'd love to have mine done.

Thank you again for your time, help and consideration. I eagerly look forward to hearing from you.

Sincerely,
Ms. E.

Dear Ms. E.,

Thank you for the positive comments on *Vitamin Research News*.

VRP is currently working with one of the top labs in the nation so that our customers can easily obtain an *Organic Acids Testing* kit, which you can order directly from VRP. As you know, *Organic Acids Testing* is designed to help customize your supplement program so that you know exactly which supplements will be of the most benefit to you. I routinely encourage my patients serious about their health to perform an *Organic Acid Test* to identify potentially missing links in their supplementation regime.

Thanks again for your enthusiasm regarding *Vitamin Research News*.

Warmest regards,
Chris Meletis, ND

Fish Oil

Continued from front page

There are literally thousands of prescription drugs designed to modify one or more of the cellular functions mentioned above. In regards to fish oil, we are talking about one single non-toxic health promoting substance that can influence ALL of these actions.

The second major benefit of EPA and DHA is related to their function as precursors to eicosanoids. In my years of providing technical support for nutritional supplement companies and talking with doctors about eicosanoid production I have come to the conclusion that few doctors really appreciate the power and complexity of the eicosanoid cascade.

Eicosanoids are short lived, potent, hormone-like molecules that act as messengers and mediators of the immune/inflammatory response. There is a wide variety of eicosanoids produced during an immune response each with a different action and intensity.

Every cell in the body is surrounded by a cell membrane, which consists of a lipid bilayer and embedded proteins and glycoproteins. The lipid bilayer is made-up of individual fatty acids arranged in such a manner to create a semi-permeable barrier that protects a cell from its surroundings. Fatty acids within the cell membrane not only provide a protective envelope, but also serve as a reservoir of individual fatty acids for making eicosanoids.

When the immune system is triggered into action, phospholipase A2 releases individual fatty acids from the cell membrane. While in the extra-cellular space these fatty acids are taken up by enzymes such as cyclooxygenase (COX) and lipoxygenase (LOX) and converted into eicosanoids.

The predominant fatty acids consumed via the Standard American Diet are the omega-6 linoleic acid and arachidonic acid. Americans consume excess linoleic acid by eating a variety of vegetable oils including corn, soy, safflower, and sunflower that are ubiquitous in our food supply. Arachidonic acid comes mainly from animal products such as meat and eggs.

All dietary fatty acids, including omega-3 and omega-6 fatty acids, are incorporated into cell membranes. When the immune system is stimulated by allergens, injury, or infection fatty acids are released from cell membranes. Omega-6 fatty acids are converted into eicosanoids by the same enzymes (COX and LOX) that act on omega-3 fatty acids. Omega-6 and omega-3 fatty acids are actually in competition for binding sites on the COX and LOX enzymes. The critical difference is that the corresponding eicosanoids synthesized from omega-6 fatty acids drive a very aggressive and potent inflammatory response.

On the flip side when omega-3 fatty acids are converted into corresponding eicosanoids, these eicosanoids direct an anti-inflammatory response. Studies have shown that EPA blocks the release of arachidonic acid from cell membranes and reduces the production of prostaglandin E2, a very potent inflammatory and platelet aggregatory eicosanoid.²

The relative amount of omega-6 to omega-3 fatty acids found within cell membranes will determine the body's inflammatory status. Excess omega-6 consumption results in a high omega-6:omega-3 ratio in cell membranes. When the immune system is challenged by allergy or infection, predominantly omega-6 eicosanoids are formed. This results in an aggressive and sustained inflammatory response. When optimal omega-6:omega-3 ratio (2:1) is maintained, a balanced immune/inflammatory response occurs.

In my years of following fish oil research I have often wondered why only EPA gets recognition for having anti-inflammatory activity. What about DHA? EPA and DHA are molecularly similar. They both reside in the cell membrane, and both are released from the cell membrane by phospholipase A2. I have always been suspicious that DHA may play a role in the inflammatory/immune response as well.

Conventional wisdom up to this point has told us that DHA functions only as a structural component of cell membranes. It helps with cell membrane fluidity and signal transduction. DHA has a clinical reputation for treating conditions involving the eyes, brain, and nervous system where

DHA is found in higher concentrations within those cell membranes.

My intuition was correct. Recently researchers have discovered that DHA is also a substrate for COX-2. A newer class of compounds, known as resolvins, docosatrienes, and neuroprotectins has been identified in healing inflammatory tissue. It has been determined that these compounds are generated from EPA and DHA and possess anti-inflammatory, protective, and immunoregulatory properties.³ As more data becomes available we may discover that DHA is a partner to EPA in dampening inflammation and neutrophil mediated injury.⁴

Proper Dosage

When speaking to doctors about the benefits of omega-3 fatty acids the most common question I receive is, "What is the dose?" In my earlier days I would comb through Medline and investigate published studies, looking for information on the particular condition in question, and try to figure out the correct dose.

Anyone who has tried these same steps knows the number of published articles pertaining to fish oil is currently in the thousands with a wide range of doses being investigated. To add to the confusion institutions such as the American Heart Association heed caution with doses higher than three grams per day while influential physicians such as Barry Sears recommend mega-doses in the 10 gram and higher range.

A further complication to the dosing question is that not all fish oil provides the same amount of EPA and DHA. There is cod liver oil, fish body oil, and fish oil concentrates with a broad range of EPA and DHA. Some doctors recommend fish oil in grams and forget to specify if they are referring to grams of total oil or grams of elemental EPA + DHA (total milligrams of EPA and DHA combined). As you can see the dosing question is as murky as the ocean waters.

Recently I was lucky enough to hear a presentation by Dr. Alex Richardson who shed some light into these murky waters. In her presentation Dr. Richardson made a profound, yet simple, correlation between the optimal dose of omega-3 and its direct correlation to the background intake of

omega-6. It finally all made sense to me—clinical benefits, cell membrane function, and the inflammation/immune connection are all based on getting the correct balance of omega-6:omega-3 within the cell membrane.

We need omega-6 fatty acids. In and of themselves, they are not villains. The key is in the relative amounts of omega-6:omega-3. We have all heard how the Paleolithic diet was closer to a 2:1 omega-6:omega-3 ratio while our modern diet is closer to a 20:1. The high omega-6 ratio drives excess inflammation, which is possibly the single biggest underlying cause of chronic diseases such as heart disease, diabetes, metabolic syndrome, autoimmune diseases, and cancer.

As physicians we discuss the notion of “balancing our fatty acid intake” but Dr. Richardson took it one step further. She did a thorough analysis of the amount of omega-6 fatty acids consumed by different cultures throughout the world and estimates the amount of omega-3 fatty acids necessary to achieve a target ratio of omega-6:omega-3 (approximately 2.5:1 omega-6:omega-3). Amongst the cultures she analyzed she found the intake of omega-3 fatty acids necessary to achieve a protective tissue level varied more than 10-fold. (Figure 1)

This information has helped to shape my dosing recommendations tremendously. In patients that I would like to mega-dose for any significant period of time I prefer to start with a blood spot fatty acid analysis to objectively determine the amount of omega-3 necessary to achieve tissue balance.

In patients that I do not blood spot test, I use Dr. Richardson’s estimates. Based on the average consumption of omega-6 oils in the American diet, she has shown that it takes approximately 2 grams of elemental EPA + DHA daily to achieve a protective balance.

Remember, a 2-gram per day recommendation does not simply mean take two 1,000 mg capsules. We are talking about 2 grams of elemental EPA + DHA, which can range from around 3 to 9 capsules depending on the concentration of EPA and DHA in the capsule. (Figure 2)

In my practice the most common fish oil recommendation I make is Nordic

Naturals EPA Capsules, 4 per day, with a simultaneous reduction of dietary soy, corn, safflower, and sunflower oils.

Rancid Fish Oil: More Harm Than Good?

Recently I was taking the history of a new patient who is a pharmacist. When reviewing his supplements, I learned that he was taking a commodity grade fish oil purchased at a discount grocery store. I encouraged him to do a taste test and chew a Nordic Naturals EPA capsule, then chew one of his commodity grade capsules.

To no great surprise the EPA Capsules tasted great and the commodity oil had the characteristic rank taste and smell of a bad fish oil product. The surprise was that the pharmacist’s response was, “This fish oil is very inexpensive and fish oil is fish oil—right?” My response: “WRONG!”

Any oil exposed to light, heat, or oxygen is subject to free radical attack and oxidative damage. Fish oil is made up of many long chain polyunsaturated fatty

acids (PUFAs), which have many double bonds in the chain. Everywhere there is a double bond there is good opportunity for free radical attack.

Recently researchers have discovered that free radical catalyzed peroxidation of omega-3 fatty acids leads to the formation of a family of compounds that may be harmful to the body. For instance, free radical damage to DHA leads to the formation of neuroprostanes. Neuroprostanes are currently being investigated as markers for oxidative stress in the brain that may contribute to neurodegenerative diseases such as Alzheimer’s and Parkinson’s.⁵ Rancid oil will simply add to the body’s oxidative stress load and expose it to molecules such as neuroprostanes.

The best fish oil manufacturers test their oil for freshness by analyzing it for peroxide value, anisidine value, and totox value. These measurements give a good indication of how much free radical dam-

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	LA (en%: percentage of daily food energy)	AA (en%: percentage of daily food energy)	omega-3 to achieve 1:1 omega-6:omega-3
Philippines	0.80	0.06	133 mg/d
Iceland	2.48	0.10	689 mg/d
UK	3.91	0.07	867 mg/d
Australia	4.71	0.07	1,133 mg/d
Italy	5.40	0.06	1,244 mg/d
Germany	5.57	0.06	1,267 mg/d
USA	8.91	0.08	2,178 mg/d

Fig. 1 – Omega-3 requirements vary based on background omega-6 intake.

1 cap: total oil = 1,000 mg	EPA	DHA	EPA + DHA per capsule	# of caps needed
cod liver	90 mg	140 mg	230 mg	2,070 mg <u>9 caps</u>
fish body	180 mg	120 mg	300 mg	2,100 mg <u>7 caps</u>
concentrate	350 mg	250 mg	600 mg	2,400 mg <u>4 caps</u>

Fig. 2 – To prescribe 2 gm/day elemental EPA + DHA.

Fish Oil

Continued from page 11

age has occurred in the oil. In addition, if fish oil smells or tastes rank, it should be thrown out.

Omega-3 Fatty Acids: The Best Sources

Fish oil is unequivocally the best source for omega-3 fatty acids. Some purists still recommend eating fish to achieve optimal omega-3 levels. Unfortunately contamination of our oceans has made reaching optimal omega-3 levels via eating fish a potential health hazard. Both the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) have sounded the alarm regarding the potential dangers of consuming too-much fish because of the associated toxins.⁶ In addition, studies have compared levels of mercury and organochlorines in fish versus fish oil supplements and concluded fish oil provide the benefits of omega-3 fatty acids without the risk of toxicity.^{7,8}

Because there are no fish oil quality standards in the United States, individuals must determine what standards a manufacturer is voluntarily following—if any—to ensure the fish oil is without contamination. The highest standards in the industry today are the Norwegian Medicinal Standard (NMS) and the European Pharmacopoeia Standard (EPS). By following these standards a manufacturer can guarantee quality products by setting maximum allowances on peroxides, heavy metals, dioxins, furans, and PCBs.

During new patient visits I am dismayed to find patients still take flax oil as a source of essential omega-3 fatty acids. Flax and flax oil can be a part of a healthy diet, but it is not an adequate source of the omega-3 fatty acids EPA and DHA.

Flax oil is an excellent source of the long chain omega-3 fatty acid known as alpha-linolenic acid (ALA). This 18-carbon fatty acid is a precursor to EPA (a 20 carbon omega-3 fatty acid) and DHA (a 22-carbon omega-3 fatty acid). ALA is not associated with the many health benefits attributed to EPA and DHA. To get EPA and DHA from consuming ALA requires

several metabolic steps (elongation and desaturation) that are governed by two important enzymes known as delta-6 desaturase (D6D) and delta-5 desaturase (D5D).

Metabolic studies have shown that the enzymatic activity of D6D and D5D are impaired by intake of saturated and trans fatty acids, alcohol, stress-hormones, smoking, viral infections, ionizing radiation, and aging. It is hard to find a patient without these obstacles to converting ALA to EPA and/or DHA.

In general, the exact rate of conversion of ALA to EPA and DHA is a matter of debate. A thorough review of the literature reveals a range of estimated conversions of ALA to EPA with a maximum being around 15 percent and a minimum of 2-3 percent. The estimates are even less promising for conversion to DHA.

Therefore, in conditions that have been shown to be supported by EPA and/or DHA, pre-formed EPA and DHA from fish oil is the most effective means to nourish the body with these essential fatty acids.

Why I Use Nordic Naturals Fish Oils

In my practice I use Nordic Naturals exclusively for several reasons. All of Nordic Naturals products taste great. Taste is directly correlated to freshness and lack of oxidative damage to the oil. Using great tasting fish oil that does not repeat on my patients results in good patient compliance leading to clinical results.

Nordic Naturals takes several steps during the manufacturing process to eliminate free radical damage. The owners of Nordic Naturals are Norwegian and have developed relationships with independent fishermen that use smaller boats rather than larger trawling vessels that spend a longer time at sea. This means there is less time between the catch and the initiation of the oil extraction, which is done in a low heat, nitrogen-rich environment. Third party analysis of Nordic Naturals oils has resulted in anisidine values between 1 and 2, five to 10 times below the industry average.

Nordic Naturals also adheres to Norwegian Medicinal Standard (NMS) and the European Pharmacopoeia Standard (EPS) and consistently are well below allowable amounts of peroxides, heavy metals, dioxins, furans, and PCBs.

Another reassuring fact is that leading research institutions around the world choose Nordic Naturals oils for their clinical trials.

Douglas MacKay, ND is a licensed Naturopathic Doctor who is committed to the advancement of natural and preventive medicine. A national lecturer, Dr. MacKay divides his time between practice, research and advocacy, and has had several articles published in peer review medical journals. Dr. MacKay has served as medical consultant and technical advisor to the nutritional industry for the past seven years. He also has a thriving family practice in the New Hampshire Seacoast area. The Makai Naturopathic Center, located in Dover, N.H., combines Naturopathic, Chiropractic and Chinese Medicine under one roof for a new standard in family medicine.

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New Book Explores Pandemic Threat

Infection Protection: Pandemic, a Personal Survival Handbook, is a must-read for anyone interested in surviving both the cold and flu season and a potential bird flu outbreak. Authors Dr. Ronald Klatz and Dr. Robert Goldman have distilled thousands of pages of information from unbiased expert sources to offer readers pertinent facts about the bird flu and strategies to bolster the immune system. *Infection Protection* also is a complete source for understanding which nutritional supplements are most important for immune health. The book offers a comprehensive compilation of practical strategies to not only protect against an imminent pandemic, but also to promote longevity.

Fruits, Vegetables and Healthy Aging: A Recap of the Role Phytonutrients Play in Maintaining Health

By Kimberly Pryor

Fruits, vegetables and botanicals have wide reaching implications for maintaining health. There is a clear pattern between plentiful intake of fruits and vegetables and reduced rates of a multitude of common illnesses, including heart attacks, cancer, strokes, diabetes, and hypertension. Furthermore, the polyphenols found in various fruits, vegetables and botanicals protect against the ulcer-causing bacterium *H. Pylori*, act as anti-inflammatories to reduce pain and support cognitive health.

Some scientists have suggested that we possess the ability to fend off a number of degenerative diseases based on our diets alone. For example, researchers have called cancer “a largely preventable disease” because it is highly susceptible to modulation by dietary factors. One group of researchers point out that phenolic compounds abundant in vegetables and fruits have been “described to play an important role as chemopreventive agents” but that “The current diet phenolic intake is often insufficient to protect from mutagens (either exogenous or endogenous), which leads to the need for dietary supplementation as an alternative approach.”¹

This article is a recap of research that depicts the number of ways fruits, vegetables and phytonutrients contribute to healthy aging.

Cardiovascular Support

Fruits, vegetables and their associated phytonutrients have been shown to play an important heart-protective role. Artichoke extracts, for example, have been shown to reduce total and LDL cholesterol and LDL oxidation, and improve endothelial function in humans with high cholesterol.² These effects are important because when LDL is oxidized it becomes even more harmful and endothelial dysfunction represents the first stage of cardiovascular disease

Another example of a botanical that supports cardiovascular health is pomegranate juice. In a randomized, placebo-controlled, double-blind study of 45 patients who had ischemic coronary heart

disease (CHD), daily consumption of pomegranate juice for 3 months resulted in a decrease of stress-induced ischemia. The control group, by contrast, experienced an increase.³

Other studies have shown that in addition to and independently from their antioxidant effects, plant polyphenols (1) enhance the production of factors that dilate blood vessels and inhibit the synthesis of factors that constrict blood vessels and (2) inhibit the expression in smooth muscle cells of two major factors (vascular endothelial growth factor and matrix metalloproteinase-2) that promote sticky platelets.⁴

High-Fat Meals

Ingestion of a high-fat meal impairs dilation of the brachial artery for at least 4 hours. Researchers randomized 38 healthy volunteers to receive one of three treatments for four weeks in conjunction with a high-fat meal. The first group received daily supplementation with both a powdered fruit/vegetable juice concentrate and a supplement providing antioxidants and herbal extracts. The second group received the juice concentrate alone. A third group received a matching placebo. When the fruit and vegetable juice concentrate was consumed combined with the antioxidant supplement and when the fruit/vegetable drink was administered alone, it blunted the detrimental effect of the high-fat meal. The placebo had no substantial effect. The fruit and vegetable drink also improved arterial dilation and increased nitric oxide concentrations, which takes on an anti-clotting and anti-atherosclerotic role in the vascular system.⁵

Digestion

Phytonutrients are essential for our digestive tracts to function effectively. Parsley and cinnamon help to clean the digestive tract of *H. pylori* by stopping the ulcer-causing bacterium from adhering to stomach walls.⁶

Furthermore, in a number of studies, patients with indigestion who consumed

artichoke extract experienced an improvement in their symptoms and an improved quality of life.⁷ Artichoke extract also resulted in a significant fall in irritable bowel syndrome incidence, a significant shift in self-reported usual bowel pattern away from “alternating constipation/diarrhea” toward “normal”, and a 41 percent reduction in symptoms.⁸

Cancer

Oxidative stress imposed by reactive oxygen species (ROS) plays a crucial role in the development of cancer, atherosclerosis, and neurodegenerative diseases. The ROS-induced development of cancer involves malignant transformation due to altered gene expression as well as DNA mutations. Considerable attention has been focused on identifying naturally occurring antioxidative phenolic phytochemicals able to decrease ROS levels.

Fruits and vegetables are widely researched for their ability to act as antimutagenic agents through their antioxidant actions. Various botanicals have acted as antimutagenics in a variety of cancers including colon, oral, lung, breast, esophageal, ovarian, gastric and prostate. Many phytonutrients induce apoptosis (cell death) and inhibit cancer cell proliferation.⁹

Epidemiologic studies suggest that high fruit and vegetable intake is associated with decreased risk of cancers of the upper digestive tract. One study of 345,904 subjects found that the more total fruits and vegetables consumed, the lower the cancer risk.¹⁰

Many phytonutrients are anti-carcinogenic due to their antioxidant and anti-inflammatory effects. Lutein extracted from marigold flowers, for example, is a strong free radical fighter shown to have an anti-mutagenic effect on cells in vitro. High dietary intake of lutein also has been associated with a reduced cancer risk.¹¹

Acerola cherry extract is another example of a plant compound with anti-cancer properties. In mice, acerola cherry

regulated abnormal cell growth at the promotion stage of lung cancer.¹²

Phytonutrients also can protect the gastrointestinal tract from mutagens. When we cook food, especially meats, a carcinogenic compound known as N-nitrosamine is formed. Epicatechin, a flavanol found in green tea, can protect against N-nitrosamine formation and trigger the production of other compounds that inhibit cancer cell growth¹³ while apple juice can prevent oxidative damage to human colon cancer cells.¹⁴

Other botanicals, such as cruciferous vegetables, can favorably affect the way our body processes hormones, reducing the risk of breast and prostate cancer.¹⁵

Pain Reduction

While fruits and vegetables are known best for their heart-protective and anti-mutagenic actions, they also have been studied for other abilities. In one study, researchers tested orally administered anthocyanins extracted from tart cherries on the behavior of rats with induced inflammation. Tart cherry extracts reduced both edema and some of the negative effects associated with inflammation.¹⁶

Diabetes

Phytonutrients are also known for their antidiabetic actions. Green tea polyphenols and cinnamon both have a blood sugar stabilizing effect. In addition, administration of green tea polyphenols to normal rats increased glucose tolerance significantly, reduced lipid peroxidation, and increased liver glycogen content.¹⁷

Cognition

Studies have shown that various plant compounds play a role in cognitive health. Blueberries have reversed age-related deficits in neuronal signaling following eight weeks of feeding in animals. Polyphenolic compounds in blueberries cross the blood brain barrier and localize in various brain regions important for learning and memory.¹⁸

Conclusion

Fruit and vegetable intake is essential to support every aspect of our health. The need to nourish our bodies with a variety of phytonutrients indicates that everyone can benefit by supplementing his or her diet with an organic green drink.

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Veterinarian Joins VRP Pet Team

Vitamin Research Products is pleased to announce the addition of Gary L. Ailes DVM, owner of Sierra Veterinary Hospital, to the VRP Pet team. Dr. Ailes will regularly share his immense knowledge with readers of *Vitamin Research News* and the www.vrppet.com website.

Since joining the Veterinary Orthopedic Society in 1975, Dr. Ailes has become known for his extensive veterinary orthopedics skills. He was involved with the formation of the Association of Veterinary Orthopedics for Research and Education (AVORE), serving as president in 1989, and has been involved with research on various approaches to joint and fracture repair. His year of work at All Care Animal Referral Center performing radiation therapy, orthopedic and neurosurgery, gave him invaluable experience. This background enabled him to perform more extensive procedures such as TPLO repair of ruptured ligaments in the knee, triple pelvic osteotomy for early hip dysplasia, DARTHroplasty for more advanced hip dysplasia and total hip replacement for the most severe hip degeneration.

Dr. Ailes is the 2003 President of the Nevada State Board of Veterinary Medical Examiners. He is a TPLO Certified Veterinarian, a member of the American Veterinary Medical Association, American Animal Hospital Association, Association of Veterinary Orthopedics for Research and Education, Veterinary Orthopedic Society and the Veterinary Surgical Laser Society. He performs such procedures as Total Hip Replacement, Tibial Plateau Leveling Osteotomy, Triple Pelvic Osteotomy, and other surgical procedures in his practice.

Dr. Ailes has worked in the field since graduating in 1972 from veterinary school at Colorado State University. Born and raised on a farm in southwest Nebraska, he has been involved with animals from a young age. He began his veterinary career at Central Veterinary Hospital in Fremont, California and spent a year there before joining Woodrow Allen DVM in Carson City, Nevada in 1974, where he soon became partners with the owner. In the 30 years they've been together, they have built their veterinary hospital into one of the premier practices in northern Nevada.

Children's Health: Nourishing Developing Immune

Kids are more vulnerable to a number of pathogens, due to their underdeveloped immune systems and their frequent exposure to a large number of other children. Not only is it heartbreaking to watch the littlest members of our families become sick, it also means that inevitably, one or more parent will miss work because of a child's illness, indicating that childhood illness results in a cost to our economy.

Day care centers and schools are breeding grounds for a variety of harmful microorganisms. Children attending day-care centers are at an increased risk for becoming colonized by *Haemophilus influenzae*, a common cause of otitis media.¹ Furthermore, children in day care were reported to have more symptoms than children in home care such as wheezing, coughing at night apart from colds that lasted 12 months, doctor-diagnosed asthma, doctor-diagnosed hay fever, eczema, allergic reactions to foods, greater

than 6 colds in a year, and ear infections.²

When children experience infections it can lead to life-long consequences. *Helicobacter Pylori* infection is very common in young children, who acquire the organism that later leads to a chronic infection, causing a lifelong susceptibility to peptic ulcers.³ Another example is the link between day-care attendance during the first six months of life, "physician-diagnosed infections" between 5 and 10 years of age, and an increased risk for Crohn's disease.⁴

Antibiotics, while they can save lives and are sometimes necessary, aren't always the solution. In fact, children colonized with *H. influenzae* were more likely to carry resistant strains of the bacterium if they were taking an antibiotic.¹

Clearly, children are in need of a convenient, dependable way to boost their immune systems. EpiCor™ Junior, a new supplement shown to improve the ratio of

CD4 to CD8 immune cells and to increase the killing efficiency of natural killer cells, helps kids boost their immune systems. As children go back to school and the flu season approaches, EpiCor Junior's ability to enhance levels of secretory IgA provides kids with an immunological envelope around their mucous membranes where viruses and bacteria enter the body, an effect that further supports immune health.

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Vesteva™ Strengthens Bladder, Supports the Health of Individuals with UI

The National Institute of Health estimates 17 million Americans can medically be diagnosed with urinary incontinence (UI). An estimated 33 million Americans suffer with overactive bladder (OAB). In addition to urinary urgency, frequency and nocturesis, one in three cases of OAB also experience urge incontinence. The problem is widespread and affects people of all ages including children and young adults.

Vesteva™ is a proprietary herbal and mineral formula clinically researched to show its effectiveness in supporting the bladder and surrounding tissues and in helping to maintain proper bladder tone. It contains Opteva™, a proprietary extract of *Crateva*, an Indian herb that is specifically sourced, extracted and tested to ensure quality.

Vesteva also contains the better-known herb Horsetail (*Equisetum arvense*), which is standardized for two active components, and the minerals, calcium phosphate, magnesium phosphate

and silica. The Horsetail used in Vesteva is extracted using a method that destroys thiaminase-like effect (which would break down thiamine—vitamin B1) in the body; therefore Vesteva will not produce any long-term problems with vitamin B1 deficiency.

Recent research has suggested that hormone replacement therapy contributes to incidence and worsening of UI as it may weaken the collagen support of the bladder and surrounding area. The mechanism of action of Vesteva is considered to be via improving collagen and connective tissue support in the bladder and surrounding area not via anticholinergic effects, which are associated with side effects such as dry mouth, dry eyes, blurred vision and memory loss. As such, the therapeutic effects of Vesteva increase over a one to two month period, with 50 percent of trial participants experiencing effects at one month of use and 80-85 percent of trial participants experiencing best effects after two months of use.

A randomized, double-blind, placebo-controlled, clinical trial presented at the April 2006 Experimental Biology Conference in San Francisco assessed the effectiveness of the Vesteva formula in reducing the symptoms of overactive bladder (OAB) and urinary incontinence (UI) in 98 participants. Results showed that participants on the treatment demonstrated greater response in reduction of frequency and leakage compared to placebo by month two. Subjects taking the Vesteva formula experienced improvements in frequency of daily urination, frequency of nocturia (nighttime urination), frequency of daytime incontinence episodes, and frequency of nighttime incontinence episodes.

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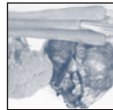
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Vesteva™ Strengthens Bladder,
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