

NUTRITION: MEDICINE OF THE FUTURE

**The medicine of the future will no longer be remedial, it will be preventive; not based on drugs but on the best diet for health. This document explores the issue:
*What is Optimum Nutrition?***

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The subject of nutrition is massively wide and deep. There is so much to know and so many seemingly contradictory theories on the subject of nutrition and its relationship with human physiology and mental function. Most people, even (or perhaps especially) when partly informed by means of articles on the subject in magazines, etc., find they are confused. The purpose of this site is to provide a clear explanation of the basic principles of nutrition and its effect upon your health.

Tomorrow's Medicine

2500 years ago, Hippocrates, the "Father of Medicine", said to his students, "Let thy food be thy medicine and thy medicine be thy food". Moses Maimonides, the great 12th century physician, repeated the Hippocratic statement when he said, "No illness which can be treated by diet should be treated by any other means". In essence, Hippocrates and Maimonides were insisting that their students practice **nutrient therapy**.

This type of medical therapy is being used by doctors today, but only by a minority. It is more likely to be applied by nutritionists who have studied the specialist subject of nutrition in depth. There is little training in nutrition at medical schools and unless a doctor has pursued the study of nutrition out of choice, he or she is unlikely to be sufficiently informed to advise about optimum nutrition.

In 1968 one of the great minds of this century, twice Nobel prize winner Linus Pauling, coined the term *Orthomolecular Nutrition*. "Orthomolecular" is, literally, "pertaining to the right molecule". Pauling proposed that by giving the body the right molecules (optimum nutrition) most disease would be eradicated. This Web site is based on Pauling's premise that "**Optimum nutrition is the medicine of the future**".

Ortho vs. Toxic Medicine

Orthomolecular doctors and nutritionists believe that the treatment of infectious and degenerative diseases should be a matter of varying the concentration of "right molecules" (i.e. vitamins, minerals, trace elements, amino acids, enzymes, hormones, etc.) which are present in the body. The optimum nutritional micro-environment of every cell in the body is vital to achieve or restore optimal health; deficiencies in this environment cause the body to be more susceptible to disease and degeneration.

The list of necessary nutrients is the same for every human being, but the relative amounts needed by each individual are as distinctly different as the shape of people's bodies, and for this reason a "one for all" daily nutritional requirement is impossible to specify.

Why is this? Because the kind of food you eat, the physical, mental and emotional stress you experience, the environment in which you live and work, your inherited biochemical and physiological make-up, the constituents of soil in which your food is grown, the contents of water you drink, the amount of exercise you have, and many other factors, determine the fact that you are a unique individual with unique needs.

In other words, your *optimum daily need* is determined by your own biochemical uniqueness, which in turn relates to your mental and spiritual state. Optimum nutrition is not just about preventing or reversing disease states, to cross the line where deficiency is directly causing disease; more than that, it is about living optimally, where you have room to stretch your physical, mental and spiritual "muscles" to the full, without overstepping the threshold at which cellular health in any of the systems of the body becomes threatened.



By contrast, *Toximolecular medicine*, used by the majority of doctors (especially in the past 50 years) is the administration of drugs at sub-lethal levels. Drugs, of course, are alien chemicals which serve to cover-up the disease process - to mask the difficulty, not eliminate the real cause. They offer symptomatic relief but often at the cost of severe and dangerous side effects. They create dependence on the part of the patient and often complicate the doctor's job by erasing valuable clues as to the real source of the trouble.

Of course, drugs can save the life of an ill patient, as can surgery and the other techniques at which doctors are so expert. But the paradigm is changing. As a doctor in Dublin recently said, "The evidence for nutritional therapy is becoming so strong that if the doctors of today don't become nutritionists, the nutritionists will become the doctors of tomorrow."

Patrick Holford, Director of the Institute for Optimum Nutrition in London which is at the forefront of research and education in this field, makes this very clear:

“Tomorrow's medicine will not be about using nutrients *instead* of drugs. It will be about looking through a new pair of glasses which reveal the true causes of disease. In most cases these lie in faulty nutrition, pollution, stress, negativity, addiction and lack of exercise - the greatest cause of all being ignorance. The original meaning of the word 'doctor' is "teacher or learned man" and that is perhaps the most important role a health professional can perform.”

So what is a healthy diet?

What is a healthy diet? Most people don't know, not because they're ignorant or don't care - it's because they're confused. There is so much conflicting advice about diet and nutrition, who can blame us when we throw in the towel and eat pizza?

You may hear much conflicting advice and confusing information, but actually, hidden away among the self-serving propaganda of a lot of the food industry - and even the nutritional supplement industry - there are very clear guidelines for healthy eating. After years of research and campaigning, there are finally official and nutritionally sound guidelines for a good diet. The message is plain: a low saturated fat, moderate protein, high complex carbohydrate diet is the way to go. Stated simply, **the golden rules for a healthy diet are:**

Avoid stimulants such as sugar, coffee, tea and cigarettes, and limit alcohol.

Avoid saturated (animal) fats and hydrogenated (processed) fats.

Avoid simple (refined) carbohydrates, including white bread, biscuits, cakes and other processed foods.

Avoid unnatural additives, flavorings and preservatives.

Eat more beans, lentils, seeds, nuts and whole grains.

Eat more vegetables, raw or lightly cooked (steaming is best).

Eat oily fish several times a week.

Eat several servings of fresh fruit every day.

Wherever possible eat organically-grown, natural, unprocessed foods.

Drink plenty of filtered water.

Avoid these poisonous items in your diet and medications: aspartame, ritalin, Prozac, fluorinated water, vaccinations.

It works for weight loss but more importantly it's the cornerstone of optimum nutrition - an approach to diet and health that says food can be both pleasure and medicine, and that diet has a crucial role to play in disease prevention and longer, healthier living.

Many people would like to believe that as long as they take their vitamin supplements they can keep eating all the "bad" foods they desire. But you can't rely simply on supplements, a well-planned, varied diet is essential.

Of course it is good to eat foods rich in vitamins and minerals. But this is only one criterion. Good food should also be low in saturated fat, salt and fast-releasing sugars and high in fiber. Alkaline-forming foods (foods high in calcium, magnesium and potassium) are preferable - such as all fruit and vegetables, millet, seeds, almonds, brazils, herb teas, yoghurt, bean sprouts. These help to buffer the acids that result from the metabolism of proteins, refined foods and stimulants. Such a diet will also be low in calories. And to further help keep your weight in check, eat earlier in the day, rather than later when the metabolism slows down. And of course, equally important is to exercise every day.

The best sources for essential nutrients include:

Carbohydrates - *Beans, lentils, whole grains, vegetables, fruit*

Protein - *Nuts, seeds, beans, lentils, whole grains, vegetables, and small quantities of animal produce*

Fats - *Nuts, seeds, cold-pressed vegetable oils, whole grains, oily fish*

Water - *Filtered water, still bottled water, fruit and vegetables*

Vitamin A - *Carrots, watercress, spinach, cabbage, squash, sweet potatoes, melon, pumpkin, broccoli, apricots, beet root and tomatoes, eggs, fish liver oils, cheese*

Vitamin B Complex - *Whole grains, seeds, nuts, vegetables, beans, lentils, eggs, milk, yoghurt, liver, poultry, fish, meat, eggs*

Vitamin C - *Berries, tropical fruits, peppers, tomatoes, cabbage*

Vitamin D - *Fish, dairy products, egg yolk*

Vitamin E - *Wheat germ, unrefined vegetable oils, avocados, seeds, nuts, beans, peas, fish, egg yolk*

Vitamin K - *Kelp, alfalfa, cauliflower, leafy green vegetables, potato, tomatoes, polyunsaturated oils, dairy products*

Calcium - *Peanuts, sunflower seeds, dairy foods, bones in small fish, green leafy vegetables*

Chromium - *Brewer's yeast, egg yolk, mushrooms, whole-wheat bread, molasses*

Iron - *Green leafy vegetables, dried fruits, whole grains, beans, lentils, fish, meat*

Magnesium - *Green leafy vegetables, nuts, seeds, soya beans, whole grains*

Potassium - *Fruit - particularly bananas, vegetables*

Selenium - *Nuts, seeds, whole grains, fish, meat, eggs, dairy products*

Sodium - *Fruit, vegetables contain all you need*

Zinc - *Nuts, seeds, whole grains, wheat germ*

The Need for Nutrients

We are not all alike. The needs for your particular lifestyle must be adequately covered, preferably through eating more of the appropriate kinds of foods, but also in cases where nutritional deficiencies are causing health problems, the use of nutritional supplements may also be helpful. For example, if you smoke and drink alcohol frequently your nutritional needs will be higher. If you are pregnant, if you live in a polluted environment, if you have a high stress occupation or are suffering emotional stress, if you suffer from allergies, if you have any sort of disease, degenerative illness or inherited weakness - all of these factors may increase your needs.

The poor nutritional quality of many purchased foods is another factor. Depleted soils and lengthy storage, as well as toxicity from pesticides, antibiotics, additives, and so on can make an apparently healthy food of little value. Tests have shown that, for example, most people do not obtain adequate zinc, folic acid or the essential fatty acids in their diet, and health (physical and mental) suffers - the weakest link of the interacting bodily systems inevitably gives way.

Deficiency of any of the essential nutrients (below the RDA amount) will, over a period of time, result in illness. Recent research has shown that most of the population in Western countries is deficient in at least a few nutrients (the most common being zinc, selenium, B and C vitamins) and literally on the edge of illness.

Moreover, individual nutritional needs are frequently higher than the RDA amounts, and to reverse the effects of decades of poor diet and the resulting toxicity, yet alone to attain optimum health, larger amounts are required - preferably as part of an improved diet but if necessary, through supplements as well.

An Optimum Nutrition Formula

Vitamins and minerals are essential for almost every function of the body. They are vital for energy and they protect you from premature ageing and degenerative diseases. And because they work together they are best digested and absorbed as natural and wholesome foods, in the context of a balanced and varied diet, not just in isolation in the form of nutritional supplements.

Nevertheless, supplements can play a role to prevent the risk of deficiencies occurring and to remedy health symptoms caused by long-standing deficiencies

due to inadequacies in our diet - all too common with cultural bad eating habits and over-processed foods. If you are suffering from significant health problems caused by dietary deficiencies, it is best to obtain personal professional guidance for remedial therapy from a nutritional consultant, who will work in liaison with your doctor.

The question is, how much do you need of the various vitamins and minerals? There's a big difference between the amount required to prevent deficiencies that would lead to serious degeneration, and the amount of each vitamin and mineral you need for optimum health. A few years ago, scientists at the University of Alabama worked this out for every nutrient and called the amounts Suggested Optimal Nutrient Allowances or SONAs. The following formula is based on SONAs and gives the amount of each essential vitamin and mineral that you need contained in your diet (with supplementation if necessary) for optimal health.

The formula provides:

Vitamin A 7500 i.u. - Retinol, a fat-soluble vitamin and antioxidant, derived from animal sources such as dairy foods, fish liver oil, eggs and liver. Like other fat-soluble vitamins, this form of vitamin A can build up in the body tissues causing undesirable side effects if taken in excessive amounts (much more than 7500 i.u. per day). Excess should particularly be avoided by pregnant mothers or those expecting to become pregnant. A good supply of vitamin A is however essential for optimal functioning of the eyes, gums, skin, the mucous lining of the nasal sinuses, respiratory and digestive tracts. Also for bone development, production of sex hormones and normal immunity.

Deficiency symptoms: mouth ulcers, poor night vision, acne, frequent colds or infections, dry flaky skin, dandruff, thrush or cystitis, diarrhea.

Beta Carotene 2500 i.u. - Vegetable precursor to vitamin A, found in orange/red fruit and vegetables, that is not toxic in larger amounts (it is converted in the body to vitamin A only as and when required). As an antioxidant it helps prevent cancer and premature ageing and protects the heart and arteries.

Vitamin D 300 i.u. - Ergocalciferol, a fat-soluble vitamin derived from animal sources (fish, dairy, eggs). Needed for the absorption, utilisation and retention of calcium, normal sexual function, and calcification of bone to maintain strong bones and teeth. Helps prevent loss of calcium from urine. Made by the body when exposed to sunlight. Toxic in excess (more than 1500 i.u. daily) as this may cause calcification of the liver.

Deficiency symptoms: joint pain or stiffness, back ache, tooth decay, muscle cramps, hair loss (in extreme: rickets in children, osteoporosis in adults).

Vitamin E 150 i.u. - D-alpha tocopherol is a fat-soluble antioxidant found in nuts, seeds and vegetable oils which it helps to prevent becoming rancid, just as it protects fats within the body from oxidation. Its antioxidant properties help limit the damage to all body cells caused by naturally present free oxygen radicals, and therefore helps prevent cancer and ageing. Needed for maintenance of a healthy heart and circulation, normal sexual function, proper growth and repair of skin. Helps heal scar tissue, oxygenate muscles and maintain immunity.

Deficiency symptoms: lack of sex drive, exhaustion after light exercise, easy bruising, slow wound healing, varicose veins, loss of muscle tone, infertility.

Vitamin K (not included) - Phylloquinone, fat-soluble, required for blood clotting, is found in many vegetables, dairy products and wholegrain cereals. It is also produced by healthy intestinal bacteria, so it is rarely deficient except in young infants (nursing mothers should eat cauliflower and cabbage).

Vitamin C 300 mg - Ascorbic acid, a water-soluble antioxidant found in fruits and vegetables. Strengthens the immune system - fights infections. Makes collagen, the intercellular glue, keeping bones, skin and joints firm and strong and strengthening blood vessels. A powerful antioxidant, helping to detoxify pollutants and protect against cancer and heart disease. Helps make anti-stress hormones and needed for metabolism. Helps the absorption of iron from food. Most animals make the equivalent of several grams of vitamin C daily; however, by a quirk of evolution, humans cannot produce their own, so we really do need the benefit of further supplementation.

Deficiency symptoms: frequent colds, lack of energy, bleeding or tender gums, easy bruising, nose bleeds, slow wound healing, red pimples on skin (in extreme: scurvy).

NOTE: I've steered clear of the "mega-vitamin" approach to vitamin supplementation on this list because: (a) I would prefer to obtain as much as possible of my nutrients naturally in a well-balanced diet and supplement with just a good multi-vitamin/mineral to cover all basics, plus omega-3, plus any nutrients lacking as evidenced by health symptoms; (b) it can be an expense that many people cannot afford; (c) it's controversial as to the benefits, depending on whose views you respect. However the approach (pioneered by Sandy Shaw, Carl Pfeiffer and Linus Pauling among others) is interesting and worth investigation, particularly to help with prevention/treatment of cardiovascular or immune system diseases. I would recommend the advice of a professional nutritionist before

jumping in. Vitamin C is the number one candidate. This is what an enthusiast of this approach emailed me...

"Vitamin C 300 mg? No distinction between L and D ascorbic acid? No L-lysine? One name: Linus Pauling! To summarize, chronic scurvy, chronic dehydration and sugar overload is responsible for most illness in our country. The AMA doesn't have a clue. I take 25 gm of pure L-ascorbic a day and 5-10 gm of L-lysine, along with a very good multi that contains no copper or iron (I am an Atkins dieter, there's plenty of both in my steak). Over the last six months I have turned my health and appearance around. I'm going on 36 and I feel better than I did at twenty six which is the age of my younger brothers and I can run circles around them. I couldn't do that a year ago. Check out [The Vitamin C Foundation](#). Your vitamin picks seem good but you really need to look at L-ascorbic and L-lysine a lot closer. And emphasize that meat eaters shouldn't be taking in iron and copper though supplementation."

That site is indeed a gold mine of information. For example, this is what Patrick Holford (from whom I learned much of what is on this site) has to say...

Aren't you simply making expensive urine when you take large amounts of supplements? Dr. Michael Colgan investigated this often made rebuttal. He investigated how much vitamin C we use by giving increasing daily doses and measuring excretion. "Only a quarter of our subjects reached their vitamin C maximum at 1,500 mg a day. More than half required over 2,500 mg a day to reach a level where their bodies could use no more. Four subjects did not reach their maximum at 5,000 mg." Increasing vitamin C intake from 50 mg to 500 mg tends to double serum vitamin C levels. Increasing intake to 5,000 mg a day will double serum levels again. Expensive urine? Vitamin C protects the bowel, kidneys and bladder on the way out. As Dr. Michael Colgan points out the average victim of bowel or bladder cancer spends \$26,000 for treatment - mostly to no avail.

A quick review of some of vitamin C's hundreds of biochemical roles will help us here. Vitamin C is required for the synthesis of collagen. Our intercellular glue that keeps skin, lungs, arteries, the digestive tract and all organs intact. It is a potent anti-oxidant protecting against free radicals, pollution, carcinogens, heavy metals, and other toxins. It is strongly anti-viral and mildly anti-bacterial. Energy cannot be made in any cell, brain or muscle without adequate vitamin C. The adrenal glands have a high concentration of vitamin C which is essential for stress hormone synthesis. Vitamin C is so central in so many chemical reactions in the body that, without it, life is simply not possible.

The immune system depends on having healthy immune cells and associated molecules such as antibodies. Vitamin C is essential for both. Antibody production increases on supplementing 1 gram of vitamin C. It is also needed for interferon, complement, and prostaglandin production, and is essential for the proper function of immune cells such as lymphocytes and leukocytes. A recent study showed, in the test tube, that vitamin C can even inactivate the HIV virus.

Thanks to the work of Linus Pauling and coworkers we know that 10 grams of vitamin C doubles the life expectancy of cancer patients, and, in some cases effects a complete cure. Its role is even more pivotal in cardiovascular disease, which is now being postulated as the long-term consequence of vitamin C deficiency. Just about every marker of cardiovascular disease, arterial damage, high blood cholesterol levels, low HDL levels, high levels of oxidized cholesterol, thick blood are all improved by adequate vitamin C intake at levels up to 10 grams a day. Vitamin C increases resistance to stress, lessens allergic reactions, helps arthritic conditions, slows down the aging process and improves energy production. Beneficial effects of vitamin C in human trials tend to increase with the amount given up to, and above, 10 grams per day. On the basis of research into vitamin C's effect on disease states it would appear that an intake of somewhere between 1 and 10 grams may be optimal simply for maintaining optimal function of the immune, endocrine and cardiovascular system.

Vitamin B1 37.5 mg - Thiamin, a water-soluble vitamin, found in association with other B Complex vitamins in wholemeal products, brown rice, many vegetables, meat, nuts and dairy, is unstable and frequently destroyed by cooking or by preservatives. B1 is needed for carbohydrate metabolism and may be deficient in those on a high sugar diet. Helps maintain appetite, normal functioning of the nervous system, eyes, hair, heart and other muscles. Helps keep mucous membranes (digestive lining, lungs, etc.) healthy. It is needed for digestion, growth and maintenance of muscle tone.

Deficiency symptoms: tender muscles, eye pains, irritability, poor concentration, prickly legs, poor memory, fatigue, loss of appetite, nausea, stomach pains, constipation, tingling hands, rapid heart beat (in extreme: beriberi).

Vitamin B2 37.5 mg - Riboflavin, a water-soluble B Complex vitamin found in vegetables, fish and dairy, works particularly closely with vitamins B6 and B3 and selenium. It assists in the metabolism of proteins, carbohydrates and fats and therefore is needed for energy. It plays a role in cataract prevention and is needed for healthy mucous membranes, skin, nails, hair and the absorption of iron. It is also a necessary factor in healthy functioning of the nervous system and helps to

regulate body acidity. Requirement is increased with with alcohol or drug abuse, consumption of coffee, the contraceptive pill, antibiotics and pregnancy.

Unrequired B2 harmlessly colours the urine yellow.

Deficiency symptoms: burning or gritty eyes, sensitivity to bright lights, sore tongue, cataracts, dull or oily hair, eczema or dermatitis, split nails, cracked lips.

Vitamin B3 75 mg - Niacin or nicotinic acid, a water-soluble B Complex vitamin found in vegetables, fish, dairy and unrefined cereals, has a vasodilatory effect (felt as flushing of the skin) which helps take nutrients to cells and remove toxins and also reduce stickiness of the blood. (Niacinamide, another form of the vitamin, does not have this beneficial effect). B3 is essential for energy production, normal digestion, nerve function and the skin. Helps balance blood sugar and lower cholesterol and triglyceride levels. It is also needed for the production of vital hormones such as cortisone, estrogen, progesterone and thyroxin. Deficiency can occur with alcohol or drug abuse, or protein deficiency, and may, in extreme cases, result in pellagra (dermatitis, diarrhea and dementia).

Deficiency symptoms: lack of energy, diarrhea, insomnia, headaches or migraines, poor memory, anxiety or tension, depression and other psychological disorders, irritability, bleeding or tender gums, acne, eczema/dermatitis.

Vitamin B5 75 mg - Pantothenic acid, a water-soluble B Complex vitamin found in eggs, lentils, unrefined grains and vegetables. B5 is essential in energy production and the synthesis of hormones and blood cells. Known as the 'Anti-Stress Vitamin' it is needed to make the neurotransmitter acetylcholine and therefore for proper brain activity and nerve transmission. It is also needed by the adrenal glands to make glucocorticoids, the anti-stress hormones, and along with glucosamine has been found helpful in arthritis and relieving joint pains and stiffness. Helps healing and counteracts allergy effects. Maintains normal hair pigment.

Deficiency symptoms: muscle tremors or cramps, apathy, poor concentration, burning feet or tender heels, nausea or vomiting, lack of energy, exhaustion after light exercise, anxiety, teeth grinding.

Vitamin B6 75 mg - Pyridoxine, a water-soluble B Complex vitamin found in meat, fish, vegetables, bananas, whole grains, seeds and nuts, may be toxic in extreme doses (above 1000 mg). Works with other B Complex vitamins, zinc and magnesium. Required for the metabolism and synthesis of proteins. Needed for making energy, utilizing essential fatty acids, keeping levels of the female hormone estrogen stable (and therefore effective in preventing pre-menstrual tension). Essential for efficient nerve transmission, protein digestion and utilization, making healthy red blood cells and antibodies. Involved in the

maintenance of the circulation, the skin, the immune system and the production of chemicals in the brain which govern mood, sleep patterns, etc. Helps absorption of B12 and maintenance of fluid balance in the body.

Deficiency symptoms: infrequent dream recall, water retention, tingling hands, depression or nervousness, irritability, muscle tremors or cramps, lack of energy, flaky skin, anaemia, peripheral neuritis, convulsions, lesions of the skin or mucous membranes.

Vitamin B12 15 micrograms - Cyanocobalamin, a water-soluble B Complex vitamin found in fish, eggs, meat and dairy produce which often works together with folic acid in the body. Needed for making energy. Essential for the production of red blood cells and is also needed to make DNA. Helps make the myelin sheath that insulates nerve cells. Vegans and vegetarians are susceptible to deficiency and other causes are: alcohol, coffee, smoking, lack of calcium or iron, diabetes and liver disease. In extreme may cause pernicious anaemia.

Deficiency symptoms: poor hair condition, eczema or dermatitis, mouth over sensitive to hot or cold, irritability, anxiety or tension, lack of energy, constipation, tender or sore muscles, loss of muscle co-ordination, fatigue, sore tongue, drowsiness, pale skin, menstrual problems.

Folic Acid 150 micrograms - Folic acid is water-soluble, part of the B Complex group of vitamins, found in leafy green vegetables, citrus fruits, eggs, organ meats, whole grains, seeds and nuts but often destroyed by overcooking. Required for protein synthesis, works with B12 in the formation of red blood cells and is also vital for rapidly dividing cells and the developing fetus. It is needed to make RNA and DNA and therefore essential for the repair and manufacture of all cells. Needed for proper growth, brain activity, normal nervous function. Recent research indicates that folic acid may play a protective role against heart disease due to its ability to lower homocysteine levels; along with B6 and B12 it reduces the risk of heart attacks. It also helps to regulate histamine levels in the body. As with B12, anemia will result when folic acid is low. 400 micrograms is needed prior to and during pregnancy to prevent spina bifida or other neural tube defects. It is adversely affected in the body by alcohol, coffee, celiac disease, oral contraceptives, stress, the taking of drugs and smoking.

Deficiency symptoms: eczema, cracked lips, premature grey hair, anxiety or tension, poor memory, lack of energy, fatigue, breathlessness, anaemia, poor appetite, stomach pains, depression.

Biotin 75 micrograms - Biotin, a water-soluble co-enzyme which works with the B Complex vitamins, is found in many vegetables, nuts, seeds, fish, milk, eggs. Biotin is part of many enzyme systems and is involved in the conversion of amino

acids to protein. It is involved in the production of energy from carbohydrates, fatty acid metabolism and the conversion of folic acid to a biologically active form. It helps maintain healthy skin and hair, good muscular tone and a balanced hormonal system. Promotes healthy sweat glands, nerve tissue and bone marrow. Antibiotics, excessive intake of alcohol, coffee or raw eggs will inhibit dietary intake.

Deficiency symptoms: dry skin, greyish skin colour, poor hair condition or hair loss, premature grey hair, leg cramps, tender or sore muscles, poor appetite or nausea, eczema or dermatitis, depression.

Choline 30 mg - Choline is a constituent of the emulsifier lecithin, found in egg yolks, meat organs, green leafy vegetables, wheat germ, soy beans, and can be made in the body so strictly speaking it is not a vitamin. It helps make acetylcholine and is therefore essential for brain function. Necessary to help break down accumulating fats. Reduces lactic acid build-up in muscles.

Deficiency symptoms: Poor memory, high blood pressure, excess cholesterol, fatigue, degeneration of the liver.

Inositol 30 mg - Like choline, a constituent of lecithin, needed for hair growth, healthy arteries, normal fat and cholesterol metabolism.

Deficiency symptoms: eczema, high cholesterol, poor hair condition or loss of hair.

Minerals are originally extracted from the soil by plants. Like vitamins, they may be obtained directly from plants or indirectly via meat. However they are frequently refined out of foods and over-farmed soils may be deficient in trace minerals. For this reason it is essential to eat organically grown, unprocessed produce.

Calcium 500 mg (as citrate, phosphate and carbonate) - Calcium (found in dairy, fish, eggs, root vegetables, pulses, nuts, whole grains and water) is the most abundant mineral in the body, of which 99 per cent is found in the bones and teeth. The remaining 1 per cent circulates in the blood and has many functions. The 800 mg daily requirement is needed for growth and maintenance of bones and teeth, nerve transmission, regulation of the heartbeat, and muscle contraction. It is needed for blood clotting, for helping to maintain the right acidity in the bloodstream and for insulin production. Absorption is increased by exercise and adequate vitamin D status, and decreased with exposure to lead, consumption of alcohol, coffee and tea and a lack of hydrochloric acid in the stomach. Continued stress leads to calcium loss. With hormonal changes, post-menopausal women are particularly prone to osteoporosis (weak and porous bones) since the lack of oestrogen negatively affects calcium absorption. Pregnant and breast feeding women may also need extra calcium, accompanied by magnesium.

Deficiency symptoms: muscle cramps, tremors or spasms, insomnia or nervousness, joint pain, osteoarthritis, tooth decay, high blood pressure.

Magnesium 225 mg (as citrate, aspartate, or other organic form) - Magnesium is present in green leafy vegetables, peas, nuts, brown rice, wholemeal products, seeds and some fruits (and therefore is more commonly deficient than calcium). It is involved as a co-factor in most enzyme reactions in the body and is necessary for the production of energy. It works together and in balance with calcium in maintaining bone density and in nerves and muscles. For bone integrity, calcium needs to be balanced with magnesium, preferably 2:1. Calcification of soft tissues can occur if there is a calcium/magnesium imbalance. The two minerals also act together in the regulation of blood pressure. A lack of magnesium is strongly associated with cardiovascular disease. Shortage of magnesium can also lead to loss of control over the relaxing and constriction of muscles, as again, calcium and magnesium act in balance. Magnesium may be lost through food processing and refining, and its absorption reduced with a high-fat diet, so it is widely deficient among those with a fast-food diet, and indeed, is deficient in most Western people! Magnesium has been shown to be beneficial for women with pre-menstrual cramps or sugar cravings, especially when taken in conjunction with vitamin B6. Deficiency may also arise with prolonged treatment with diuretics. It is a primary cause of most ADD cases (along with Zinc deficiency) and other types of learning disability and psychological disturbance.

Deficiency symptoms: Muscle tremors or spasms, "restless leg syndrome", chronic weakness and exhaustion, insomnia or nervousness, high blood pressure, headaches, irregular or rapid heartbeat, constipation, excessive muscle tension, fits or convulsions, ADD and hyperactivity, difficulty with mental concentration and memory, nausea, apathy, depression, anorexia.

Potassium (not supplied) - Potassium (found in fruits, vegetables and whole grains) works in conjunction with sodium in maintaining water balance and proper nerve and muscle impulses. The more sodium is eaten the more potassium is required and so a relative deficiency of potassium is widespread, with the high amounts of salt in typical diets.

Deficiency symptoms: vomiting, abdominal bloating, muscular weakness, loss of appetite (more likely to occur in those taking diuretic drugs, laxatives or corticosteroids). This is not supplemented in this Formula because of the large amounts required which are best obtained from dietary sources. Magnesium-potassium-aspartate, however, is a particularly effective combination in its 'anti-fatigue' and cholesterol lowering effects.

Iron 15 mg (as citrate or other organic form) - Iron (found in meat, eggs, nuts, beans, oatmeal) is needed as part of the haemoglobin molecule to carry oxygen around the bloodstream, and for the production of hydrochloric acid for protein digestion in the stomach. A deficiency of iron can result in anaemia. Those particularly at risk include pregnant women, children, women with heavy menstruation and people with malabsorption problems.

Deficiency symptoms: pale skin, sore tongue, fatigue or listlessness, loss of appetite or nausea, heavy periods or blood loss.

Zinc 15 mg (as citrate or other organic form) - Zinc (found in meat, shellfish, herrings, wheat germ, eggs, cheese, nuts, pumpkin and sunflower seeds) is needed for normal functions of taste and smell, for insulin formation, reproductive and immune systems, tissue renewal, and for healthy bones, skin and teeth. It is essential (along with B6) for protein synthesis including hormones, enzymes and antibodies. It is needed for over 90 enzymatic processes in the body. High levels are found in semen and a deficiency is linked to male infertility; zinc is also necessary for a healthy prostate gland. Hydrochloric acid, necessary for digestion of proteins and assimilation of minerals, is dependent on zinc and B6 for its secretion by the stomach. Zinc is vital for the growth and maintenance of the nervous system; therefore it is important in brain function and deficiency is linked to depression and anxiety, and it is an important factor in schizophrenia. Stress increases the need for zinc. With zinc deficiency there is increased risk of having a baby with low birth weight or premature. Women suffering from postnatal problems frequently benefit from supplementing zinc and B6. It is especially important to supplement because most zinc is lost in food processing or never exists in substantial amount because of nutrient-poor soil. Vegetarians and others on a high fibre diet may need more zinc to offset the additional phytate present, which binds to zinc and other minerals, making them less easily absorbed by the body.

Deficiency symptoms: poor sense of taste or smell, white spots on the fingernails, frequent infections, slow wound healing, stretch marks, acne, poor skin condition, low fertility, pale skin, irritability, tendency to depression and anxiety, ADD, poor digestion, loss of appetite, impotence, prostate enlargement, growth problems.

Manganese 4.5 mg (as citrate or other organic form) - Manganese (found in tropical fruits nuts, seeds, whole grains, green leafy vegetables, eggs) is associated with iron metabolism and utilisation of vitamin E and B vitamins. It has a critical role in the activation of over 20 enzymes involved in growth, digestion and assimilation of nutrients, the nervous system, healthy cartilage and bones, cell protection against viruses, and making energy. Manganese is found in female hormones and is required in the production of nucleic acids that are part of the

genetic code. Forms part of the important antioxidant enzyme Superoxide Dismutase. Reduced fertility, birth defects and growth retardation may, in part, be a result of manganese deficiency.

Deficiency symptoms: muscle twitches, joint pain, childhood growing pains, dizziness or poor sense of balance, fits or convulsions, sore knees, fatigue, nervous irritability, and in some cases: schizophrenia, Parkinson's disease and epilepsy.

Iodine 45 micrograms (as iodide) - Iodine (found in kelp, vegetables grown in iodine-rich soil, onions and all seafood) is needed for thyroid hormones which control metabolism.

Deficiency symptoms: slow mental reaction, weight gain, lack of energy.

Copper 75 micrograms (as citrate or other organic form) - Copper (found in peas, beans, whole grains, liver, seafood) is essential for the utilization of Vitamin C and is required to convert the body's iron into haemoglobin.

Deficiency symptoms: anaemia, edema, rheumatoid arthritis. In excess, copper lowers zinc levels and produces hair loss, insomnia, irregular menstruation, depression and schizophrenia. The balance of zinc and copper in the diet should be 15:1.

Chromium 30 micrograms (as picolinate) - Chromium (found in liver and seafood, whole grains, mushrooms and asparagus) is part of the Glucose Tolerance Factor (with B3 and amino acids) necessary for the regulation of blood sugar levels. Chromium works with insulin for normal glucose metabolism and conversion of amino acids into protein. Continued stress or frequent sugar consumption depletes the body of chromium. A diet high in refined carbohydrates can also lead to deficiency as the food processing removes much of the natural chromium content. Other causes of depletion include infection, strenuous physical exercise and pregnancy. Deficiency is implicated in adult onset of diabetes. Impaired glucose utilisation can promote sugar conversion to fats and cholesterol leading to obesity and arteriosclerosis.

Deficiency symptoms: excessive or cold sweats, dizziness or irritability after 6 hours without food (hypoglaecemia), need for frequent meals, cold hands, need for excessive sleep or drowsiness during the day, excessive thirst, addiction to sweet foods.

Selenium 45 micrograms (as selenomethionine) - Selenium (found in sea foods, liver and kidney and in small amounts in other meats, grains and seeds) helps maintain a healthy heart, eyes, liver, skin and hair. Part of the important antioxidant enzyme Glutathione Peroxidase, giving the body protection against cancer, premature ageing and degenerative diseases. Needed for prostaglandin formation, involved in hormone balance. Potentiates the antioxidant function of

Vitamin E. Helps produce CoQ10, required in cells to make energy. Selenium is particularly vulnerable to loss during food processing and the low amounts found in fruit and vegetables make this especially important for vegetarians to supplement. Considerable loss of selenium occurs in the seminal fluid. There have been indications of a connection between inadequate selenium and Downs Syndrome.

Deficiency symptoms: family history of cancer, signs of premature ageing, cataracts, high blood pressure, frequent infections.

Degenerative diseases have three main causes: malnutrition, incomplete digestion and internal pollution. These are reversed by nutrient enrichment, improved digestion, and detoxification.

An excellent, varied diet will provide these nutrients, and will supply the many factors that enable proper digestion and help to detoxify the body. Eat fresh, organically-grown produce. Eat slowly and chew your food well. A healthy, nutritional diet includes the following:

- **Fruits: apple, banana, grapefruit, orange, kiwi, lemon, lime, mango, strawberry, blueberry, raspberry, cranberry, cherry, grape, fig, pear, plum, peach, melon, plantain, papaya, pineapple, coconut...**
- **Vegetables: potato, tomato, carrot, onion, eggplant, cauliflower, broccoli, Brussels sprouts, cabbage, avocado, asparagus, zucchini, scallion, parsley, spinach, kale, lettuce, chard, squash, radish, okra...**
- **Whole grains: kasha, basmati rice, wild rice, wheat, oats, barley, kamut, spelt, quinoa, rye, millet...**
- **Unsweetened whole grain bread and pasta.**
- **Whole milk, cheese, and butter.**
- **Unsalted roasted nuts: peanuts, cashews, walnuts, pecans, hazelnuts, almonds, macadamia...**
- **Unsalted seeds: sunflower, pumpkin, sesame, flax, psyllium...**
- **Nut and seed butters.**
- **Beans (cook well): kidney, pinto, navy, lentils, chickpeas, soybeans, black turtle beans, lima beans...**
- **Grain-fed eggs, cooked well.**
- **Fresh fish, especially salmon.**
- **Plain non-iodized sea salt in moderation.**
- **Extra-virgin olive oil in moderation.**

- **Herbs and spices in moderation (use hot spices sparingly): garlic, ginger, basil, dill, thyme, bay leaves, rosemary, oregano, sage, fennel, red pepper, black pepper, cumin, chili powder...**

A particular individual may need more of the nutrients in which he or she has been deficient or on the edge of deficiency for many years. A guide to this requirement is the deficiency symptoms listed above. Other important factors include essential fatty acids, enzymes and special complex carbohydrates that can aid the digestive system, beneficial bacteria and the many phytochemicals that are found in live plant foods (exemplified by the many valuable herbal remedies) that play an important role. These factors can be provided by an optimum diet, but as with vitamins and minerals, supplements may be helpful to remedy ailments or balance deficiencies in the diet.

Lack or imbalance of essential fatty acids in our diet can lead to premature ageing, cancer, arthritis and a host of other ills. The consequences of low levels of omega-3 fatty acids are widespread and serious. They include *at least* the following: hardening of the arteries, hypertension, increased blood clotting (risk of heart attacks), diabetes, cancer, obesity, arthritis and other degenerative diseases, premenstrual tension, infertility and more. Doesn't this begin to sound like this is a list of civilized society's diseases?

Alongside a top-quality multi-nutrient, I recommend also taking a daily supplement of Omega 3 - **Higher Nature** products are among the best on the market for daily supplementation to meet your health needs. Whilst ensuring that you obtain the nutrients that the body requires for health, you also need to avoid these killer substances in your diet and medications: aspartame, artificial preservatives, genetically modified foods, fluorinated water, ritalin, Prozac, and vaccinations. I'm afraid that the authorities that promote the use of all these are not to be trusted. Keep well away from electric pylons and limit your exposure to mobile phones.

I recommend to everybody who is genuinely interested in achieving optimum health, as well as those who are suffering from deficiency symptoms, that they obtain professional advice. There really is no substitute for this, even if you feel just fine - the expert's advice will help you to stay that way! Following a detailed personal analysis you will know which particular nutrients are needed, and in what precise amounts (and what foods or supplements are best to supply them), to correct deficiency symptoms or states of ill-health such as hypoglycemia, Candida, chronic fatigue, poor digestion, high toxicity, trace element pollution, etc. as well as possible allergic responses that need handling. If you are being prescribed medication by a doctor, it is essential that this also be taken into account.

Over-Weight?

If you're overweight, quite simply you need to reduce the calories in your diet and/or do more calorie-burning activities. Your diet needs to be realistic, providing you proper nutrition and satisfaction too. Crash diets are counter-productive as the body thinks it is fasting due to food shortage and reduces metabolism accordingly, and will use muscle mass rather than fat as an energy source. A useful factor to be aware of when planning your diet is 'glycemic index':

Glycemic Index

The glycemic response of a food is a measure of the food's ability to elevate blood sugar, which also contributes to mood and energy fluctuations. We're all familiar with the after-dinner snooze, where the blood sugar level bounces back down and we feel tired. The glycemic response is influenced by the amount of food you eat, its fiber content, fat content or amount of added fat, and the way the food is prepared.

Reactive hypoglycemia is an over-production of insulin in response to eating simple sugars. The pancreas responds by producing too much insulin which causes a rapid and sharp decrease in blood sugar, usually falling below fasting blood sugar levels - so we fall asleep or find it hard to concentrate on our work. Insulin is a storage hormone: one of its jobs is to escort the sugar from the blood into either muscle or fat cells. When insulin levels are high, the body doesn't burn fat; it also signals the body to make more cholesterol. The faster a food raises your blood sugar, the greater the insulin reaction. The most common deleterious effects of too much insulin are constant weight gain and low energy levels.

The glycemic index uses pure glucose as a standard, giving it a rating of 100. The closer to 100 a particular food is, the higher its glycemic index. Here are a few representative samples:

- Cherries: 25
- Bananas (ripe): 60
- Beans: 30-40
- Rice cakes: 80-133(!)
- Many processed breakfast cereals: 100
- Nuts: 15-30
- French bread: 95+

High-glycemic foods are useful if you're on a college team and training twice a day and need the fastest replenishment of muscle glycogen stores. Highly glycemic

carbohydrates are best consumed during and after exercise. They enter the bloodstream quickly and are readily available for fueling exercising muscles.

Low glycemic carbohydrates enter the bloodstream slowly and are best eaten before exercise. They provide sustained longer-term energy, and help maintain stable blood sugar levels during extended exercise periods (greater than one hour).

But if you're trying to manage your weight, stay away from high GI foods. Go with the lower-glycemic foods as snacks. Eat the higher ones, if you must, with a little fat or protein to slow the response. Or avoid them completely for the time being, and begin to be aware of the powerful effect high insulin levels are having on your attempts to lose weight.

As well as low-GI foods, ensure your diet includes an adequate supply of low fat protein at each meal and eat fiber-rich vegetables. The ideal ratio of carbohydrates to fat to protein is 40:30:30. By maintaining insulin levels within a therapeutic zone, one is more able to burn excess body fat (and keep it off permanently) and enjoy increased energy, as well as improved mental acuity and vitality.

A 'crash' low-carbohydrate diet produces quick weight loss through depleting the body stores of glycogen (stored glucose) which retain water. Basically the body becomes dehydrated on this type of diet. When you resume a normal food intake, your body will restore the glycogen reserves and water, which will result in weight regain. The most successful weight-loss diets over the long term (more than 2 years) include reduced calorie and fat intake, an emphasis on lower-GI foods, a balanced diet (40:30:30), and a regular exercise program.

Highly Glycemic		Moderately Glycemic		Low Glycemic	
Glucose	100	Orange Juice	57	Apple	36
Baked Potato	85	White Rice	56	Pear	36
Corn Flakes	84	Popcorn	55	Skim Milk	32
Cheerios	74	Corn	55	Green Beans	30
Graham Crackers	74	Brown Rice	55	Lentils	29
Honey	73	Sweet Potato	54	Kidney Beans	27
Watermelon	72	(Ripe) Banana	50	Grapefruit	25
White Bread/Bagel	72	Orange	43	Barley	25
Table Sugar	65	Apple Juice	41		
Raisins	64				

GI's of common foods

The Glycemic Index measures how fast the carbohydrate of a particular food is converted to glucose and enters the bloodstream. The lower the number, the slower the absorption. The numbers are percentages compared to a reference food, in this case glucose, at 100%.

For a regularly updated, comprehensive list of GI's, go to Rick Mendosa's [Glycemic Index Lists](#).

When all's said and done, the best piece of advice for obtaining and maintaining a healthy weight is to listen to your body: **eat when you're hungry and stop when you're not!** The body knows the right amount to eat and will tell you. Observe the mind rationalizing and justifying eating something else, and then take those thoughts, put them in a balloon and just let it float away. Try it, it works.

For many people, psychological pressures (such as unmet needs, frustration and invasion of personal barriers) drive them into over-eating or binging, sometimes followed by bulimia and anorexia. Help is really needed in which these psychological factors are understood and taken into account. The following site is the best resource I've found for practical and empathic help for individuals with eating disorders...

Triumphant Journey: A Guide To Stop Overeating & Recover from Eating Disorders

Excellent and extensive information provided freely by Joanna Poppink, M.F.T.

Acid/Alkaline Balance

When the body is too acidic as a result of acid forming foods, high fat, mucus forming foods, and toxic food residues, disease and infections proliferate. This is especially true in cases of arthritis and rheumatic situations. If your body is frequently in an acidic state, you will tend to suffer from fatigue, emotional stress, aches and pains, frequent infections, and have digestive problems and allergies.

An alkalizing diet is one in which 75% of our food intake should come from alkaline-based foods like fruits (except for plums and prunes), green-leafy vegetables and other vegetables, and tubers (root vegetables). These foods help to alkalinize the blood and other tissue fluids in our body. The other 25% of our food intake can come from acid-producing foods like cereals, dairy, eggs and meat, though very acid-forming foods such as refined sugars, soft drinks, caffeine and alcohol are best cut out altogether. And we do well to drink plenty of the neutral water.

The main goal of an alkalizing diet is balanced eating in order to avoid acidosis. When this occurs, our blood reduces its ability to deliver oxygen to the cells and eliminate carbon dioxide from the body. When we reduce the alkalinity of our blood, it creates symptoms like hunger, heartburn, indigestion, nausea, vomiting,

headache and drowsiness. Acidosis is the breeding ground for many disorders, and can interfere with the way our glands and organs function. When blood becomes too acidic, our bodies pull calcium from our bones and teeth to neutralize the acid and this contributes to bone loss or osteoporosis. Also, cancer cells love highly acidic environments and do not do well in healthy, alkaline environments.

The correct ratio of acid and alkaline forming foods is difficult to determine for every individual since the balance is altered by chewing, food preparation, individual lifestyle, genetics, exercise, and mental outlook. However, those prone to infections, viruses, excess mucus problems and other toxic acidic conditions need to increase their alkaline diet.

Many foods are alkaline-producing by nature, but manufactured processed foods are mostly acid-producing. It is important to balance each meal with 75% alkaline-producing to 25% acid-producing to maintain health. We need plenty of fresh fruits and particularly vegetables (alkaline-producing) to balance our necessary protein intake (acid-producing). And we need to avoid processed, sugary or simple-carbohydrate foods, not only because they are acid-producing but also because they raise blood sugar level too quickly (high [glycemic index](#) therefore fattening), are nutrient-lacking and may be toxic too. Perfect body pH is 7.4, above is more alkaline and below is more acidic. It is important that your daily dietary intake of food naturally acts to balance your body pH.

Here is a list of acid-producing and alkaline-producing foods, to help you plan a balanced and healthy diet...

Alkaline-Producing

Vegetables

Alfalfa sprouts
Artichokes
Asparagus
Bamboo shoots
Barley grass
Broccoli
Brussels sprouts
Cabbage
Cauliflower
Cayenne pepper
Celery
Chives
Comfrey
Cucumber
Dandelion
Endive
French beans
Garlic
Green beans
Green cabbage

Neutral Foods

Fruits

Pineapple
Banana, ripe (more acid)
Banana, unripe (more alkaline)
Blackcurrant
Blueberry
Cantaloupe
Cherry
Coconut
Cranberry
Currants
Dates
Figs
Gooseberry
Grapes
Grapefruit
Mandarin oranges
Mangos
Papaya
Raisins
Raspberry

Acid-Producing

Meat, Poultry and Fish

Beef
Chicken
Eggs
Liver (mildly)
Ocean fish
Organ meats (mildly)
Oysters (mildly)
Pork
Lamb
Veal

Milk and Milk Products

Butter
Cream (mildly)
Cheeses
Custard
Homogenized Milk (mildly)
Quark
Yoghurt

Grains

Biscuits

Kale
Lettuce
Leeks
Lettuce
Mushrooms
Onion
Parsley
Parsnips
Peas
Potatoe (mildly)
Pumpkin
Red cabbage
Rhubarb stalks
Sauerkraut
Soy sprouts
Spinach
Sweetcorn
Sweet potato
Watercress
Wheat Grass
Yams

**Non-Stored Organic Grains
and Legumes**

Buckwheat groats
Granulated soy (cooked, ground
soy beans)
Lentils
Lima beans
Millet
Soy flour
Soy lecithin
Soybeans
Tofu
White beans

Nuts

Almond
Brazil nuts
Chestnuts (roasted)
Coconutnut (fresh)
Hazelnut

Seeds

Caraway seeds
Cumin seeds
Fennel seeds
Flax seeds
Pumpkin seeds
Sesame seeds
Sunflower seeds

Root Vegetables

Carrot
Fresh red beet

Red currant
Rose hips
Strawberry
Tangerines
Watermelon

Non-Stored Grains

Brown rice
Oatmeal
Wheat

Nuts

Walnuts

Fats

Sunflower oil

Fish

Fresh water fish

Dairy

Milk (raw only - human, cow,
goat)

Water

Distilled water (neutral
reference)

Rye bread (mildly)

Pastry

Pasta

White bread

Whole-grain bread

Whole-meal bread

Nuts

Cashews

Peanuts

Pistachios

Fats

Corn oil

Margarine

Fruits

Plums (mildly)

Prunes

Canned or processed

Sweets

Artificial sweeteners (strongly)

Barley Malt Sweetener

Barley malt syrup

Brown rice syrup

Chocolate

Fructose

Honey

Sweets

Jam

Molasses (strongly)

White sugar (refined cane sugar)

Condiments

Ketchup

Mayonnaise

Mustard

Vinegar

Beverages

Cocoa

Coffee (strongly)

Fruit juice sweetened (strongly)

Fruit juice, natural

Liquor

Soft drinks (strongly) Tea (black)
(strongly)

Wine & Beer (strongly)

Miscellaneous

Canned Foods

Drugs

Food chemicals

Microwave Foods

Processed Foods

Horse radish

Kohlrabi

Red radish

Turnip

Fruits

Apples/cider

Apricots

Avocados

Lemons

Grapefruit

Limes

Tomatoes

Fats (Fresh, Cold-Pressed Oils)

Flax seed oil

Borage oil

Evening primrose oil

Marine lipids

Olive oil

Dairy

Acidophilus milk & buttermilk

Whey

Omega-3 Fish Oils

This is another important health factor. Scientific interest in marine oils increased greatly with the discovery that Eskimos who consumed large amounts of cold water fish experienced considerably lower mortality rates from cardiac and circulatory diseases. Overall health benefits of regular consumption of oily fish or supplementation include lower blood pressure, reduced asthma attacks, decreased joint inflammation, and prevention of excessive clotting of the blood.

Food Combining

According to this "school," proteins and carbohydrates have different mechanisms of digestion. Proteins have to be broken down in an acid environment, while concentrated carbohydrates are digested more easily in a high pH environment. The stomach is said to be able to sense the kind of food and adapt the pH of stomach (or intestinal) fluids accordingly. As a result of this theory, any meal combining carbohydrates and proteins is considered bad, giving you problems like indigestion, toxicity and weight gain.

The facts however are different. Carbohydrates take about 2 hours to digest and be absorbed into the blood. Protein or fat does not effect carbohydrate's absorption rate. The pH of stomach acid is about 1.2 and any food you put into your stomach will neutralize the acid. The body does not adjust the amount of acid based on the "kind of food". Acid starts the digestion of protein by denaturing it or unwinding

the strands of protein so enzymes can break it down for absorption. Fat digestion starts after the stomach with the action of bile, which is an emulsifier that pushes the fat molecules apart to allow specific enzymes to break them down so absorption can occur. Saliva starts to digest some simple carbohydrates like sugar, fruit and milk sugars so they can be absorbed into the blood within 15 minutes but more complex ones are mainly digested later on in the small intestine, again with special enzymes for the purpose.

Other than sugar and fat, foods are neither pure sources of one macronutrient (protein, fat and carbohydrate) nor a single source of any nutrient. Therefore it is not bad to eat a mixed meal of carbohydrate and protein. I recommend you look into the **Zone Diet** as an example of a well-informed and balanced dietary program, based on alkaline-producing foods and supplemented omega-3.

A healthy lifestyle combines a diet low in saturated and trans (hydrogenated) fat, enough calories to maintain your healthy body weight, sufficient fiber to maintain normal intestinal elimination, and at least enough vitamins and minerals to meet the RDA, alongside a regular aerobic and weight training exercise program. In addition the body may need additional amounts of specific nutrients depending on the state of health of the individual, stresses he or she is under, and genetic and environmental factors (such as nutrient depletion in common foods and pollutants, toxicity, etc).

Homocysteine

The Best Single Indicator of Whether You Are Likely to Live Long or Die Young

Staying healthy, happy, clearheaded and full of energy into old age - this is what we all want. But insuring that we do depends on how well we can "read" the state of our health. What if there was a single test that could do that, as well as point the way to a superhealthy future? Fortunately, there is. This test measures your level of homocysteine, an amino acid that is found naturally in the blood.

High levels of homocysteine, or a high "H" score, predicts your risk of more than 100 diseases and medical conditions, including Alzheimer's disease, cardiovascular disease, arthritis, cancer and depression. In fact, it is more accurate than a cholesterol reading for predicting the risk of heart attack or stroke.

In "**The H-Factor Solution**," Dr. James Braly and Patrick Holford clearly explain what factors contribute to a high H score and how you can go about dramatically lowering your level to a risk-free range with simple dietary changes and nutrient

supplementation. The following extract from the book explains how and why this is so...

Methyl Magic

Homocysteine is made in the body from another amino acid, methionine. As meat, cheese and some other proteins are especially rich in methionine, we tend to eat this amino acid every day.

Why does the body make homocysteine and what does a high level tell us? It's all to do with a fundamental process upon which your life depends, called methylation.

To understand methylation we need to know a bit about body chemistry. You eat 10 tons of food in your lifetime and, somehow, this turns into you. Your body is quite literally a sea of chemicals, from glucose to fats, and amino acids to hormones and neurotransmitters.

For example, when you are under stress, the body makes more adrenalin to keep you going. When you go to bed, the body releases melatonin to help you sleep. When you've got a cold or flu the body makes more glutathione, which turns your immune cells into cold-busting warriors. These are just three examples of literally hundreds of thousands of adjustments the body makes every second to keep you healthy and alive.

But how on earth does the body keep everything in balance? This is where methylation comes in. In the methylation process 'methyl groups' (made of one carbon and three hydrogen atoms) are added to, or taken away from, other molecules.

Methylation happens over a billion times a second. It is like one big dance, with bio-chemicals passing methyl groups from one partner to another.

Take noradrenalin. The brain produces this chemical to keep you happy and motivated. However, if you are under stress, it adds a methyl group to noradrenalin to make adrenalin, which gives you a burst of energy and aggression known as the 'fight or flight syndrome'. Then, when the apparent emergency is over, your brain takes the methyl group away.

This is how homocysteine is made in the body: when you eat a piece of fish containing methionine, this amino acid is incorporated into your bloodstream and a methyl group is taken away, leaving you with homocysteine. Ideally, the body adds a different methyl group back to homocysteine to convert it into an extraordinarily important chemical called SAME (pronounced 'Sammey'). SAME is a natural anti-depressant, anti-arthritic and liver-protecting agent in your body.

Homocysteine can also be converted to another extremely important body chemical, called glutathione. Glutathione is the body's best anti-ageing antioxidant and detoxifying agent. A low glutathione level is, like a high homocysteine level, linked to increased risk of death from all common causes. So methylation is also the key to slowing the ageing process and keeping your body free of toxic chemicals.

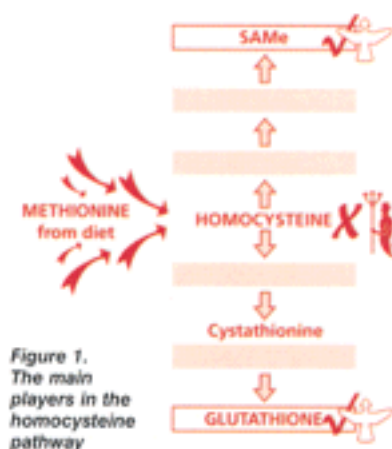
It is also thought that methylation plays a critical role in protecting us from certain serious diseases. Methyl groups are added to and taken away from the DNA in our cells. When not enough methylation is going on, our DNA cannot properly repair itself, which puts us at higher risk from cancer and autoimmune diseases such as rheumatoid arthritis or lupus.

What's Your Methyl IQ?

It can be helpful to think of people with high-functioning methylation as having a high methyl IQ. They stay in balance, while those with a low methyl IQ suffer from chemical imbalances that ricochet into almost every organ and tissue of the body.

The best, most sensitive methyl IQ test is your homocysteine level. When your H score is low (below 6 units), you are well-methylated, your SAME and glutathione levels are most likely high, and you are in good health. When your H score is too high, you suffer from a methyl deficiency, and not surprisingly a deficiency in SAME, glutathione and lots of other vital bio-chemicals.

This relationship between homocysteine, methylation and vital body chemicals is complex but vital (see Figure 1). Provided your body has a good methyl IQ, only small amounts of homocysteine accumulate, with the great majority immediately being methylated, en route for greater destinies.



We've had a taster on how the body deals with homocysteine. Now let's look closer. In Figure 1 you can see how homocysteine can convert to either SAME or glutathione.

If this conversion process isn't working well — for example, due to a lack of the vitamins and nutrients which the homocysteine-converting enzymes need to function — homocysteine begins to accumulate in the body, and that spells trouble. Increased levels of homocysteine and therefore decreased levels of methylation, SAME, glutathione and B vitamins are associated with the chronic symptoms that many of us experience every day.

What if you feel good, though? Don't make the fatal mistake of assuming that if you don't have the symptoms, you don't have a problem with homocysteine. High homocysteine, especially in the early stages, is often symptom-free, exactly like many of the serious medical conditions associated with it, such as heart attacks, high blood pressure and strokes.

In any case, lowering your H score should be a priority. And intelligent nutrients are one way of doing it.

Intelligent Nutrients

The reason homocysteine accumulates in the body is because the enzymes involved aren't working properly. Have a look at Figure 2. Here you can see the spotlight on the enzymes that keep your brain doing the right thing with sulphur and methyl groups.

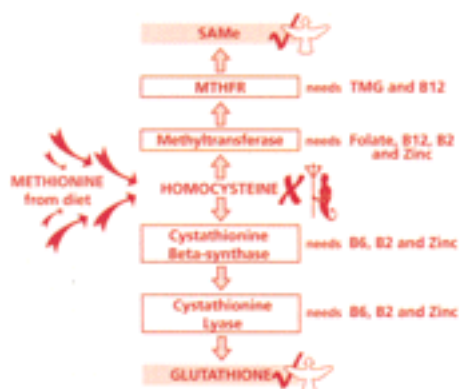


Figure 2.
The main enzymes in the homocysteine pathway

You'll see that these enzymes don't work alone. They have helpers, called co-factors: primarily the B vitamins, folic acid (folate), pyridoxine (B6), cobalamin (B12), riboflavin (B2) and the mineral zinc. There is also a very special nutrient called TMG (for trimethylglycine).

So as you can see, the dance of homocysteine is mainly choreographed by these co-factors. The B vitamins among these are ‘intelligent’ in that they help you stay chemically flexible, well-methylated, and in the best possible physical and mental health. Sadly, very few of us get enough of these nutrients from our diet, and certainly not enough to lower a high homocysteine level to an optimal level. The average intake of zinc, for example, is 7.5mg, which is only half the basic recommended daily allowance, or RDA.

Eat Right AND Take Your Vitamins – and More

In the US, where homocysteine is now seen as superseding cholesterol as the best predictor for heart disease, more and more health consumers are becoming B-vitamin crazy. The American Medical Association published a report in 2001 suggesting that if every cardiovascular patient were to supplement B12 and folic acid, no less than 310,000 lives in the US alone would be saved in the next 10 years. Meanwhile, the New England Journal of Medicine ran a lead editorial written by top cardiologists entitled ‘Eat Right and Take a Multivitamin’, again arguing that optimal intakes of these vital B vitamins can dramatically cut heart disease risk.

Some critics continue to disparage vitamin and nutrient supplements although this is rapidly becoming an old-fashioned view among the medical community. As you will see, however, the evidence shows clearly that eating a well-balanced diet is not enough in itself to lower high homocysteine to a safe level.

But simply adding multivitamins to the equation won’t do the trick, either. Why? Because the evidence shows, again and again, that if you have a high homocysteine level you’ll need more than basic amounts of B vitamins. You’ll also need ‘methyl donors’ – nutrients like TMG and SAME, which can donate an abundance of methyl groups to your body’s chemical dance. And, if you’re serious, you’ll need to test for your H levels.

The story of a 60-year-old man treated by the Life Extension Foundation in the US is a case in point. This man had had bypass surgery and was suffering from angina caused by a re-clogging of his coronary arteries, a very common occurrence in heart surgery patients with high homocysteine. He was well aware of the dangers of high homocysteine and was supplementing 100 mcg of folic acid a day (that’s almost 1,000 times the RDA!) plus other key B vitamins. He was smart enough to have his H score retested. When he did, he discovered that his homocysteine level, although lower, was still in the extremely high-risk range, above 15 units. So, in addition to the key B vitamins, he began to take 6g of TMG. His H score then dropped dramatically to 4, indicating zero risk.

This story shows why blindly supplementing with the big four B vitamins (B2, B6, B12 and folic acid) and failing to test (or retest) your homocysteine level or reassess your diet, can literally be a fatal mistake. If you want to live long and stay

healthy, you need to know whether your regime is working for you, and what to do if it isn't.

Are You Well Methylated?

So, in addition to the vital 'methyl movers' – that's folic acid, B2, B6, B12, plus zinc – we all need an abundance of the methyl groups themselves. These, as we've seen, are dispensed by methyl donors such as SAME and TMG.

SAME is not necessarily the best nutrient to supplement, although it is very important within cells. It is, among other things, both very unstable and very expensive to produce as a supplement. Instead, *TMG is the single best and most affordable methyl donor discovered so far*. In combination with the big four B vitamins, it's the best homocysteine buster. TMG, as well as being available as a supplement from **Higher Nature**, is formed naturally from choline, which is found in fish and eggs and so is easy to get from our diets.

These nutrients have amazing effects not only on your homocysteine levels but also your day-to-day health. When levels are optimised, you'll find you have:

- Optimum mood, memory and mental clarity
- Optimum liver function
- Optimum condition of hair, skin and nails
- Optimum energy
- Excellent sleep
- Flexible joints
- Raised glutathione levels (slowing the ageing process and aiding detoxification)
- Dramatic reduction in risk for degenerative disease.

You can check the level of homocysteine in your blood by an accurate, easy test that you can take at home. These test kits are available from **Higher Nature**.

Health Insurance

This routine will do a great deal to keep you healthy:

1. First thing, instead of a coffee, take a glass of hot filtered water and squeeze in half a fresh lemon - this will clean out your system of toxins. Do a brief but effective exercise program.
2. A good, healthy breakfast is the most important meal of the day. With a muesli breakfast, add ground flax seeds, providing the essential fatty acids. Also mix in some lecithin granules. The oats and lecithin will help control cholesterol and give the fiber you need. Add a banana for potassium and tryptophan.
3. Accompany this with a glass of diluted fruit juice, with a pinch of powdered vitamin C. This will repair your arteries, provide anti-oxidant protection and boost your immune system.
4. An extra organically-fed, free-range boiled egg gives you the protein and B vitamins you need for energy, especially B12.
5. For snacks eat fresh fruit. At lunch and dinner (preferably early and light) include plenty of well-washed, briefly-steamed vegetables. Choose organic produce if possible, to avoid food with toxic pollutants.
6. Several times a week have oily fish, to be sure of the essential Omega-3.

Vaccines - Cry of the Heart

On the physical, intellectual and moral strength of the children of today the future rests. Yet that future is in doubt, it's in big trouble. The last thing that we would expect to find working to diminish our children, even to the point of taking away their very lives, is a deliberate attack on their immune systems. A strong case can be made that using 'toxic' medications and vaccines only reduces the efficiency of the immune system and the general health of living organisms. There is a growing groundswell of people around the world who are accusing the medical profession and many major international companies and organizations of deliberately weakening the strength and health of the young through vaccination programs.

More and more clinicians and researchers are beginning to see mass vaccination programs as being utterly without worth. We have been assured of the safety and effectiveness of vaccines for over fifty years yet these seemingly rock-solid assumptions are directly contradicted by government statistics and reputable research by scientists from around the world.

Download the free book by Dr. Mark Sircus, [**Cry of the Heart**](#), which reports on the personal histories and scientific evidence about this issue.

Further Articles

Is Glucosamine Really The Arthritis Cure?

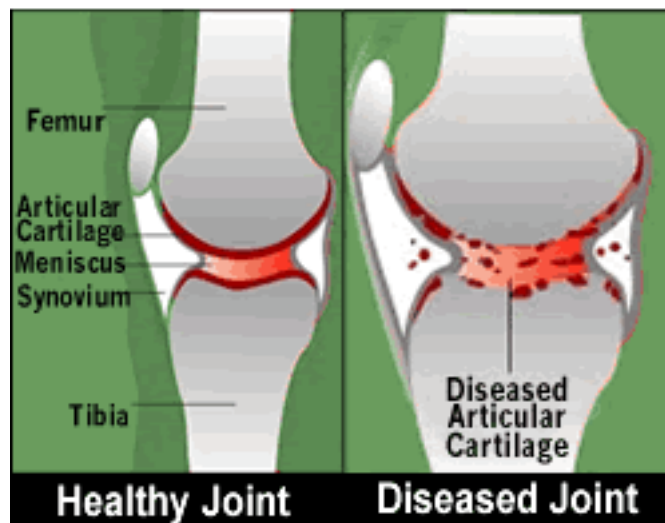
By J. R. Rogers, J.D.

If you are among the millions who suffer from osteoarthritis I do not have to tell you about pain. Nagging, persistent and at times unbearable, pain is a way of life for you. For most of you, the search for relief from this grinding pain is a chore in and of itself.

My name is J.R. Rogers and this is the story of how I beat one of the most dramatic pain problems imaginable. You see, in 1993 I sustained a very serious traumatic injury to my spine. So bad in fact, my upper spine was crushing the cord and I could not even walk in a straight line. The spinal fluid was not getting through the cord and my vertebrae were deteriorating rapidly. Now, using what I have learned I have been able to help thousands of people fully end or significantly reduce their pain problems.

While exact numbers differ widely, according to Newsweek, there are 22 million with Osteoarthritis in the US. Whether your pain is in your knees, neck, hands, shoulders or any other joint, there have been some important advances made in treating these conditions. I'm going to discuss these advances with you and explain in detail how this information can help you take control of your osteoarthritis.

The Effect of Osteoarthritis



What the medical community has to say

Osteoarthritis (OA) is the most common type of arthritis and its typical targets are your hands, hips, knees, feet and spine. Sometimes, it will attack your knuckles, wrists, elbows and shoulders. I should mention that these are not the only areas of your body subject to attack however. There are 143 joints in the human body and any of them may be subject to osteoarthritis. When OA attacks it causes a degeneration of the cartilage and fluids that protect against inflammation.

For those of you who live with this debilitating disease, you are all too familiar with what the doctors have to say. Some will tell you to take one of those "over-the-counter" remedies. You know...products like Aspirin, Ibuprofen or Acetaminophen. (Called NSAIDS) In fact, some \$8 Billion dollars a year is spent on these kinds of products in this country every year. Unfortunately, when it comes to using them to fight the pain of osteoarthritis, they can do you more harm than good.

Although you will obtain some temporary pain relief using them, there is also evidence that indicates that they will also cause a progression of osteoarthritis. Not only do they not stop joint degeneration, they are also associated with stomach ulcers and liver damage.

In the more serious cases of OA, doctors will take more extreme steps by ordering dangerous steroid injections or prescribing COX-2 inhibitors. While you might get some temporary pain relief, you are clearly more prone to dangerous side effects and they will do nothing to help you with the core of the problem. After all, what you are really seeking is two-fold. First and foremost, you want your pain to end.

Secondly, you want to address the medical problem itself and end (or reverse) the progression of your OA.

The big announcement that set America on its ear

There is a compound that has no side effects that has been known by many for years to effectively reduce pain and slow the progression of osteoarthritis. Only recently, however, has this information been scientifically verified. You may have already heard of this compound. It is called glucosamine.

On January 21, 2001 MSNBC reported on the findings published in The Lancet medical journal regarding the use of glucosamine in treating osteoarthritis. Countless television commentaries and newspaper stories were soon to follow with the expected result. Everyone began searching for the "perfect" glucosamine product and there was no shortage of choices. (Just because I was aware of the European research certainly didn't mean the rest of the country was.)

Glucosamine is an over-the-counter dietary supplement that has gained a lot of attention from this recent coverage. It is completely safe, as it is a natural, non-toxic compound, and mounting evidence suggests it may improve symptoms for those who suffer from osteoarthritis.

Suddenly, every company in America 'hit the market' with a glucosamine product that (they) claimed was the solution you had been looking for. After all, it's the American Way. If a product is in demand, everyone wants to get on the bandwagon. Unfortunately, most of you were quick to learn that there was no "magic bullet." For most, you experienced exactly what I had already been through. These glucosamine products didn't fully diminish your pain or in some cases did not work at all. (Does this sound at all familiar?)

Unfortunately, with store shelves and mail-order catalogs crammed with choices the task of finding a product that works has only become more difficult. Television commercials flood your living room every day with glucosamine ads. Direct mail pieces arrive in your mailbox bearing some celebrity's face and they are insisting the product they are endorsing is the one you are looking for.

The Science

That article in The Lancet medical journal came about as a result of studies conducted in Lourdes, Belgium. At last, the American public as well as the medical community was aware of objective evidence that glucosamine indeed worked as a treatment for osteoarthritis. Incredible news for the medical

community since after all, glucosamine is a nutritional supplement. But that's not all. This study had even more to say:

"Previous studies had indicated that glucosamine could dull the pain of Arthritis, but experts say the latest study shows for the first time that it could improve the structure of the joints."

THE ASSOCIATED PRESS-London

"Improve the structure of the joints." Now that is very important language. This study not only concluded that pain could be managed, but as well the damage from osteoarthritis could be reversed. Incredible claims. But are they real?

Let's go back to my story

In 1996, the doctors finally got around to operating on my spine. What they had to do is remove leg bone to rebuild my upper spine. (Think about a stiff rod or piece of wood inside your back.) I was left with constant pain; had limited mobility in my neck; and was left to rely on narcotic painkillers just to get by. If you are suffering from osteoarthritis pain, I can empathize as I have walked in your shoes. Fortunately, I'm not a "quitter." I was determined to learn everything I could about osteoarthritis, joint pain and any possible means to restore my body to its formerly healthy state. (Of course, I did not have a clue how I was going to do this.) One thing I did know. The doctors had made it clear to me that my condition would only get worse, even though they had operated in time to keep me out of a wheelchair. I knew then that if I were going to have any chance at all, it would be up to me to find the way.

A doctor with vision

Fortunately, the pain management specialist who was treating me was from Europe and unlike most doctors, was willing to listen. When I approached him with what I was learning about glucosamine, (it was now 1997) he didn't "shrug it off." Instead, he was impressed with the information I was finding and encouraged me to "give it a try."

What exactly does the compound do

Glucosamine is a "chondroprotective agent", which relieves the symptoms of OA without any side effects while at the same time slowing the progression of the disease. And what is a "chondroprotective agent?"

Glucosamine (and chondroitin) is produced naturally within your body. However, it is not produced in sufficient quantities once you have developed osteoarthritis. That is the reason that we must rely on "synthetic" products to replenish our systems.

What has happened to your body when you have osteoarthritis is that the cartilage (that acts as a "cushion" between bones) has deteriorated. Healthy (articular) cartilage is what we need to make movement and motion of our joints pain free. In other words, it allows bones to move across one another providing an ultra-smooth, slippery surface to do so.

The Choices

Most of the products I was able to buy back then were in either pill or capsule form. Believe me, I was trying just about every one I could afford. Unfortunately, I didn't seem to be making any real progress. My pain hadn't changed and of course, I had no way of knowing what changes if any were going on inside of my body. If the research was correct, glucosamine should have been taking care of my pain and reversing my osteoarthritis damage. You could not have proved it by using me as an example. It was now late in 1998 and I didn't seem to be getting anywhere. I had to ask myself some tough questions.

Was all that research a waste of time? Or, was my case just so bad that glucosamine was just not going to help? Somehow, I convinced myself that I was on the right track but there was something missing from the equation.

Why Your Previous Glucosamine Products May Not Have Been Fully Effective (or work at all)

New outside research, confirmed by what I have witnessed myself, has shown that glucosamine in a different form can double the benefits received and dramatically reduce the time it takes for results to be noticed. This new form is a liquid glucosamine. Liquid glucosamine offers quite a few benefits over powdered pills. Here's a comparison:

	Topical Analgesics	Pills/Capsules/ Powder	Liquid Glucosamine
Apply Topical Cream	X		
Swallow Pill		X	
Ingest Liquid			X
Quickest Absorption			X
Greatest Absorption			X

Fastest Pain Relief			X
Lasting Pain Relief		X	X
Longest Lasting Pain Relief			X

Based on my personal experience, I can verify that these differences are real. High impact, fast-acting pain relief, and solid, long-lasting effect. If you are currently taking glucosamine in any form other than liquid you are losing out on half of its effect. Later on, I recommend a liquid glucosamine product that gave me great results so keep reading!

How do you know what's best?

With all of the hype surrounding glucosamine, almost every major pharmaceutical company and vitamin manufacturer (among others) has come out with a product. This rush to market is not something that is in your best interests. There are far too many products out there that seem to have appeared only with profits in mind. In a perfect world, companies should be more interested in producing products that are formulated to help you end your suffering.

It is a fair bet to say that you have already been disappointed about glucosamine products you have tried. After all, if glucosamine is the answer then you were expecting your pain to end immediately.

I too had tried the pills and capsules and was disappointed. Too much "filler" and not enough real components to do any good. At one point, I also got around to trying some of those products you apply externally where you experience pain. Maybe a little pain relief but it was very short-lived.

Eventually, I even tried some of those products that you apply externally to your body. You know, those creams and 'roll-on' products. It was clear right away that they weren't the solution I was looking for either. And then I got lucky.

The phone call that changed my life

In late 1999 a friend of mine called to tell me about a liquid glucosamine that he was using to treat his thoroughbred horses. In fact, he had several other friends who were also horse owners and they were using the product as well. But here's where the story got really interesting.

He said that the owners were giving two ounces of the product to their horses every day and then "taking a swig" themselves. That really got my attention since we were talking about a glucosamine product in liquid form. "Do you mean to tell me that the owners are treating their arthritis with this product?" He laughed and

replied, "You bet they are and they all feel terrific. No joint pain at all." Of course, my heart skipped a beat. I asked him to send me a "jug" of the product.

To make a long story short, this stuff was incredible. Within ten days, I could move my neck just as if it had never been injured and equally important, I had no pain. I knew that I had found a glucosamine solution that belonged in the hands of everyone who suffered from osteoarthritis. All I had to do was consider some changes in the formula itself.

The makeup of articular cartilage

Most of the cartilage we are discussing contains between 65% and 80% water. The remainder is comprised of collagen and proteoglycans. The collagen portion of cartilage is what gives it elastic-like properties and provides the "shock absorber" qualities that you need for pain-free movement. Of equal importance, the collagen is what holds proteoglycans in place. Now, let's try to make some sense out of this.

Proteoglycans are nothing more than molecules composed of sugar and proteins. What they do inside your cartilage matrix is "wrap" themselves in and around the collagen fibers. So what happens then? The proteoglycans add stretching capability and they act to capture water. Remember, we already said that 65% to 80% of your cartilage is made up of water. It is this squeezing "in and out" activity as your joints are in motion that is facilitated by these proteoglycans. And there is just one final ingredient we need to add to the mix.

The principal producer of both collagen and proteoglycans are chondrocytes. So long as everything is working correctly, you are going to have healthy and vibrant articular cartilage. There is however one down side here. Chondrocytes also produce enzymes that act to "destroy" the older, worn out collagen and proteoglycans. Unfortunately, one negative effect can be the overproduction of enzymes that are destroying collagen and proteoglycans. Another way of putting it is that your body is "working against itself."

When things go wrong

Once this essential part of normal joint functioning goes bad, it's a straight downhill run. Of course, that's why you are reading this material right now. You're in pain and you are looking for answers. That pain that's driving you crazy is caused by cartilage that is developing ragged edges and bone that is overgrown. It is "pockmarked" and abrasive. As the problem increases, the lining of your joints is becoming inflamed. (The synovium)

The synovium is the area where nerves and nerve endings are bundled. The inescapable fact is that it's going to send out pain messages. As part of your body's

defense mechanism, the synovium is fighting to produce more synovial fluid. It is this fluid that provides your cartilage with its "slippery" qualities. Unfortunately, your synovium goes into "overdrive" and the result is that too much fluid is produced. In turn, this builds up in the joint space and when this happens, things are getting out of control.

But Did The Glucosamine Work For Me?

I began taking a daily regiment of glucosamine, hoping it would help my pain. Within about three weeks my pain had been reduced and limited mobility was restored to my neck. I was ecstatic and wanted to see if this could help others like it helped me.

I contacted a woman I had recently met who had been complaining about how badly osteoarthritis was interfering with her life. She was in pretty tough shape. I sent her a "sample" of this product to try. These are her words...directly quoted:

"Less than three days after taking this product the severe pain in my knees was gone. I'm now able to walk at the mall, go up and down ladders and after playing with my grandchildren, I am able to get up from the floor without any help. I no longer have to live in pain."

That's all I needed to hear. If she was getting relief this fast with her situation (which was bad) then this product was everything I believed it to be. All I needed to do was to experiment with a few more ingredients and have more people try it as I continued to make improvements. That's exactly what I did.

The Magic of Adding Complementing Ingredients

My "education" in the use of glucosamine had never stopped. In fact, to this day I still spend whatever time I have exploring new avenues. All I knew at this point was that I had a fantastic product that was working quickly to end pain. The remaining question was what more I might be able to do to improve on that success.

I may not have mentioned this before so this is an appropriate time to do so. The original formula for this product used only pharmaceutical-grade glucosamine. Not just one type of glucosamine but two. Glucosamine Sulfate and Glucosamine Hydrochloride. It also contained Chondroitin Sulfate. (Found in the Shark Cartilage) That Shark Cartilage acts to "drive" the glucosamine as well.

In addition to those ingredients, the newly formulated product now had some other changes to give it even greater strength. Bromelaine was added because of its

ability to clean away "debris" in the joints and because it aids in restoring proper fluid balance. It also helps to inhibit inflammatory compounds to reduce pain and swelling. Ascorbate (Manganese and ascorbic acid) was added to assist your body's ability to process the glucosamine. (A very important factor and one that is missing in nearly every glucosamine product on the market today.)

Yucca was added because of its long history in treating arthritis and rheumatism. (The root is rich in sponins that elevate your body's ability to produce cortisone naturally. The Omega 3 & 6 fatty acids (eicosapentaenoic acid) and DHA (docosahexaenoic acid) are constituents of fish oils that act as anti-inflammatory agents. (Usually, these products are sold separately in health food stores as salmon oil or under other names.)

Each of the vitamins here also plays an important role in regaining healthy joints. Vitamin A (Beta carotene) is essential for growth and repair of body tissues and it aids in bone formation. Vitamin C (ascorbic acid) produces a mobilization of your body's self-defense mechanisms, which assists your immune system to overcome pathological consequences. And finally, Vitamin E (Tocopherol) is an antioxidant, which acts to protect red blood cells and unsaturated fatty acids from oxidation damage. It also assists your body in maintaining healthy membrane tissue.

What A Relief!

As I discovered benefits of each of these ingredients, I created for myself a daily regimen of taking each one. While it cost me over \$65 a month to purchase these separate, it was worth it. Within a few weeks I full mobility had returned to my neck. Once again, I wanted to see if the same results we experienced by others.

You have a right to be skeptical because I certainly was for a very long time. But it was time to really put my new product to a broader test to see if everyone was getting the results that I had seen up to that point.

Did it work?

The second person I gave some to was my old friend Lou. After just a week he told me he was able to dance for the first time in years. In total, I had given samples to eight other people so I was anxious to hear what they had to say as well.

Lou, Howard, Joan, Ken, Tina, Julia, Joyce, Iris, and Kathy. Without exception they all told me that the product had either ended their pain completely or dramatically reduced it. They were astounded. You can imagine how great I felt.

So What Have I Learned?

Through the course of my journey to rid my body of my arthritic pain I have learned much. I have tried everything and very little has worked. Glucosamine did work however. But only to an extent. It took a couple more years of testing to really find something that would fully end my pain and stop the progression of osteoarthritis. In order to achieve full results with glucosamine here's a review of what you need to know.

- * Liquid glucosamine is more effective than powdered glucosamine
- * Supplements which use high quality, pharmaceutical grade liquid glucosamine are the most effective.
- * When glucosamine is combined with other beneficial ingredients these often work synergistically to provide fast-acting and complete pain relief and in many cases halt the progression of osteoarthritis

My Recommendations

To date, I am aware of only one product that combines all the latest knowledge into one product. The product is formulated using pharmaceutical grade liquid glucosamine sulfate and glucosamine hydrochloride and all of the complimenting ingredients I have mentioned before. Chondroitin sulfate, shark cartilage, boswellin, bromelaine, omega 3 and 6, vitamins A, C, and E, and yucca powder are included. I highly recommend this product and use it myself. The name of it is **Syn-Flex**: [Click here to learn more about Syn-Flex](#)

Supplements: Are They Necessary & Are They Safe?

The argument goes that eating a varied diet rich in fruit and vegetables delivers the right amount of vitamins and minerals to the body and that high doses of synthetic supplements are unsafe. So don't bother with supplements. But this is a misleading distortion of the truth

The following Questions & Answers are based on an article by Dr John Briffa, 'The Great Vitamins Debate: Lifesavers or a deadly menace?'

Should we always stick to Recommended Daily Allowances?

Not necessarily. The RDAs, established more than 50 years ago, represent the level of nutrients needed to prevent deficiency diseases. For instance, 60 mg of vitamin C (the RDA) is deemed to be the amount of this nutrient we need to consume each

day to keep us from getting scurvy. In practice, RDAs are of little relevance for many reasons.

To begin with, the RDAs take no account of individual circumstances. The fact is, nutritional needs vary enormously. Requirements for nutrients can vary according to genetic make-up, sex, age, levels of stress, activity levels, alcohol consumption, pollution, smoking, the use of prescription medications, pregnancy and menopause. The RDAs make no provision for the special requirements individuals may have for nutrients.

The other major failing of RDAs is that they are based only on the levels of nutrients necessary to prevent deficiency. However, we know that vitamins and minerals have a crucial role to play in the prevention of illness and maintenance of optimum health. Generally, the levels of nutrients required to achieve these important health-giving effects are way in excess of the pitifully low RDAs.

Isn't it true that the whole supplements industry is all about money?

The manufacturers of nutrient supplements are no doubt in the business of making money. However, I do not believe that the motivation for the industry as a whole is entirely financial. It is clear that the nutritional supplements industry provides products to the public which often have very significant health-giving properties.

Natural remedies are generally very safe and often help where conventional medicine has failed. I feel that the supplements industry is generally proud of the fact that through its efforts, more individuals have the opportunity to improve their health.

Wouldn't we be better off simply eating a healthy diet?

A healthy diet is the cornerstone of any nutritional approach to health. However, intensive farming methods and food processing have stripped our food of much of its vital nutritional content. Many of the foods we eat today are nutritionally lacking. Even if we eat a 'healthy diet' it is virtually impossible to get the amounts of nutrients across the board that we need for optimal health.

Another reason why supplements may be advised is when it is not practical to obtain a nutrient from the diet at the levels required to produce a particular effect. An example of this is vitamin E in the prevention of heart disease. Studies have shown that taking 100-200 IU of vitamin E each day reduces the risk of heart disease by about 40 percent. It is, however, virtually impossible to consume this amount of vitamin E through diet alone.

Another example is folic acid, which is recommended by doctors at a dose of 400 mcg per day for pregnant women. To get this quantity of folic acid via the diet is

impractical, which is why the medical profession recommends supplementation in this instance.

I am often asked whether people need to take supplements. The answer is that no one needs to take supplements. However, if an individual is interested in preventing illness and optimizing their health, supplements can have a useful role to play.

Is there any evidence that people live longer or are any healthier taking handfuls of supplements every day?

Yes. The evidence linking vitamin E to prevention of heart disease is a case in point. Vitamin E has been shown to dramatically reduce the risk of heart attack in people with existing heart disease. There is also good evidence that selenium can reduce the risk of cancer. And the list goes on.

Numerous scientific studies demonstrate that nutrients can be effective in treating a wide range of conditions. It is important to remember that while we know people do not get sick because of lack of a prescription medication, nutrient deficiencies are quite often an important factor in disease.

Don't most vitamins just pass through the body, in effect throwing money down the drain?

The body will generally dispense with what it doesn't need and nutrients are no different in this respect. Excess nutrients are removed from the body, often through the urine. Yet a significant proportion of nutrients that are consumed are retained by the body - according to individual needs - and go on to play a vital part in all bodily processes. Even the nutrients that are expelled will exert some influence as they pass through the body. It is possible to take too much of certain vitamins and minerals, especially those that are not water-soluble, but such toxic amounts are way in excess of normal supplementary recommendations.

Point by point, how do you answer charges that:

Too much vitamin A causes birth defects, dry skin, scaly skin, headaches, fatigue, painful bones and loss of appetite?

Vitamin A in excess may give rise to all the symptoms listed here, just as a deficiency of the vitamin also gives rise to unhealthy symptoms. However, the smallest daily supplement generally considered to generate any risk of birth defects is 25,000 IU per day. To be on the safe side, it is recommended that pregnant women should take no more than 10,000 IU per day. Packaging of products containing vitamin A now carry a warning to this effect.

With regard to the other problems associated with vitamin A usage, the scientific literature shows that vitamin A is safe in adult men and post-menopausal women at a dose of 30,000 IU per day. This is about several times the dose of vitamin A found in multivitamin supplements.

Too much vitamin D leads to high blood calcium, headaches and appetite loss?

Vitamin D plays an essential role in the absorption of calcium from the gut and may therefore help prevent osteoporosis and other conditions. Recent tests showed that the majority of elderly people are deficient in vitamin D. The toxic effects of vitamin D have been found only at doses which exceed 2,000 IU per day in adults. This is many times the dose found in multivitamin supplements. The danger occurs when an over-zealous person misguidedly takes prolonged mega doses of the individual vitamin, without having a severe deficiency proven by tests (mega doses of vitamins are sometimes appropriate to deal with deficiency symptoms but this is best administered with the guidance of a nutrition consultant or doctor).

Too much vitamin E can thin the blood and may be dangerous for those on certain medications?

Vitamin E is a natural blood thinner, which in part accounts for its beneficial effect in the prevention and treatment of heart disease. Certain medications, notably warfarin, also thin the blood and this effect may be enhanced too far by the additional taking of vitamin E. For this reason it is generally advised that individuals on warfarin or other anti-coagulant medication do not take vitamin E. If you are receiving medication for any health problem you should always check with your doctor before taking nutritional supplements (or any other dietary change) in case there is such a contra-indication.

Too much folic acid can disguise a deficiency in B12 with potentially serious neurological consequences?

It is true that folic acid supplements may mask the symptoms of vitamin B12 deficiency. Nerve damage can result, which may not be responsive to further B12 supplementation. For this reason, it is an established natural health practice that folic acid is given either with B12 or as part of a B Complex supplement containing B12. It is actually conventional doctors who tend to prescribe use of folic acid on its own.

The same is true for other nutrients: just as each can have a beneficial preventative or healing effect, if taken over-zealously, in isolation, in excess amounts over a long period, or if taken inappropriately, then harm can result. But don't be scared off from using supplementation by such stories of what can happen if they are used misguidedly. They are safe if used sensibly, and more than that, they can help you lead a healthier, longer life!

Feeling Exhausted?

Mental and physical exhaustion are very common symptoms, linked to the stressful lifestyle, poor diet and lack of exercise that so many people suffer. This article describes just what is going on and what you can do about it, describing the symptoms of stress and touching on the related topics of hypoglycemia, hypertension and Chronic Fatigue Syndrome.

Definition of fatigue: abnormal tiredness and lack of energy; mental and physical weakness; depression; lethargy

There are many possible causes of fatigue, including:

- Hypoglycemia (and resulting adrenal exhaustion)
- Stress (with nutritional and glandular reactions; made worse by stimulants such as sugar, cigarettes and coffee)
- Anaemia (possible shortages of iron, B12, folic acid, copper, vitamin C)
- Toxicity (from diet; pesticides; additives; drugs; pollution; cigarettes)
- Allergy (tends to be the things you feel you must have or can't do without)
- Glandular imbalance (thyroid etc.)
- Poor elimination or digestion
- Low or high blood pressure
- Improper diet (excess saturated fats; excess refined carbohydrates; junk foods; overeating; inadequate fruit and vegetables; skipped breakfast; too much alcohol; excess animal protein or on the other hand a protein deficiency)
- Lack of demanding exercise
- Birth control pill
- Overweight
- Overwork
- Lack of sleep
- Sedentary occupation
- Heavy metal poisoning, including from fillings

- Shallow breathing

Stress & Fatigue

What does stress have to do with fatigue? Plenty. Neuroscientists at the University of Virginia have studied the relationship between stress and glucose. During times of stress, glucose is released by the hormone epinephrine (adrenaline). Excess glucose stimulates the fat enzyme, lipoprotein lipase. This results in excess stored body fat. Also, during stress the body craves very high fat, high glycemic (high in quickly absorbed sugars) foods in order to balance out anti-stress chemicals.

In the West, consumption of high calorie, high glycemic, nutrient-deficient, high fat foods is the norm. High glucose levels in the blood are counteracted by insulin, resulting in a 'blood-sugar low', causing tiredness and hour or two after meals. And if stress is continuous, this condition can come on at any time, and may eventually lead to adult-onset hypo-glycemia. Moderating consumption of high glycemic foods not only reduces your chances of developing diabetes, it also reduces stored body fat and helps keep energy levels high.

A combination of factors account for the increase in incidence of hypoglycemia. They include:

1. Incorrect ratios of proteins/carbohydrates/fats in our diet
2. Deficit of adequate nutrients and minerals (due to over processed soil and foods)
3. Overabundance of high glycemic foods
4. Lack of exercise
5. Excess meat consumption
6. Excess dietary fat consumption
7. Over consumption of 'empty calorie' foods
8. Stress

High Blood Pressure

Stress increases blood pressure, as does too much saturated or hydrogenated fat in the diet. Coffee, sugar, tobacco and alcohol don't help either, neither does salt. Overweight is another important factor, and lack of exercise. An entirely vegetarian diet is the most straightforward way to reduce blood pressure. In terms of supplements, take plenty of B Complex, C, E, Niacin, Calcium and magnesium.

Hypotension is helped greatly by taking the amino acids L-tyrosine and L-phenylalanine. You also need enough iodine in the diet (such as from kelp). This is better than taking salt as salt has other negative side effects (affecting the

sodium/potassium balance and mineral losses). As well as increasing blood pressure, this combination boosts the thyroid giving you more energy and mental alertness. The amino acids are taken (1g each) between meals, away from other proteins. It also helps to take an Amino Complex (1g) after meals. Improved adrenal function (see below) will enable decrease of blood pressure through the production of adrenaline and aldosterone, and antidiuretic hormone from the pituitary.

Stress is the biggest drain on vitamin and mineral resources, so you also need to take a daily (generous) multi supplement. Plus added vitamin C (several grams); 1g calcium, 500mg magnesium; and also 250 mg extra B5 (pantothenic acid) which is particularly drained by stress. And some essential fatty acids to complete the nutritional picture. Vitamins, etc. take months to replenish, so you need to stick with it.

Emotional stress combined with stress on the immune system would leave you susceptible to the ME phenomena (see below), which is really immune system failure. Recovering from ME is a matter of rebuilding strength through both emotional repair and moving to a diet that supports the extra nutritional drain that such stress causes, to reverse the dwindling spiral.

The less 'on the edge' you are, the more tolerant your systems will be to such factors as toxic trace elements (see the Mercury Poisoning article) and electromagnetic pollution.

To help reduce emotional stress, I recommend the Release Technique, described in [Transforming the Mind](#) and moving on from that, the [New Life Course](#) for personal development would be a great life enhancer. The course teaches many ways to manage mental stress and increase happiness.

NOTE: Stress causes a type of hypoglycemia by depleting the adrenal glands which respond to any fear, anxiety, worry or similar emotion, as if they were emergency conditions. A wide range of physiological reactions are evoked to provide sufficient energy to meet this 'danger'. Eventually the adrenal glands become exhausted and, as vital energy reserves become taxed, fatigue results. Unlike true nutritional hypoglycemia, this does not necessarily occur just between meals, but may be more related to situations of stress or emotion. If this stress fatigue is coincident with a refined diet and especially if caffeine is regularly consumed, the hypoglycemic state may take on a totally unpredictable character.

Hypoglycemia is glucose intolerance, cause by the adrenals being worn out from constant stress and/or by too much sugar/stimulants/refined carbohydrates. To remedy this, the following is helpful:

Eat small, frequent meals, avoiding refined carbohydrates and eating complex carbohydrates and proteins which release energy slowly. Use a good multi- vitamin and mineral supplement like those of Higher Nature. Take additional calcium and magnesium in 3:2 ratio. Avoid fried food and hydrogenated fat, tea, coffee, alcohol, cigarettes, food additives. Drink filtered water and avoid aluminium utensils. Using digestive enzymes and acidopholus to improve digestion and colon health is also a good idea. Help yourself or get help with stress management.

Chronic Fatigue

Chronic Fatigue Syndrome (ME) is basically a weakened immune system causing chronic weakness. To remedy this, in addition to the above, also supplement vitamin C, starting at 1g per day and building up to 3 or more grams - you will get slight diarrhea at the point of maximum absorption, at which point reduce the dose slightly. (Note: you need to maintain a mega-dose of vitamin C as abruptly reducing the dose can cause symptoms of C deficiency). Aloe Vera, Echinacea and garlic also help. If you still have problems, allergic reactions may be making the symptoms worse, in which case try cutting out wheat, then if that doesn't work after five days, try eliminating dairy produce. Also watch out for foods you have a craving for - the body has a strange way of desiring more of the foods to which it is intolerant (due to poor digestion or faulty absorption).

Many vitamin and mineral deficiencies are also related to lack of energy. So the supplements approach described above should help, along with improved diet.

Glutamine, the amino acid, may also be a valuable supplement in cases of fatigue. This form of blood sugar supplies brain energy, reduces muscle fatigue, and it also helps the colon to heal, reducing the symptoms of colitis and thereby reducing blood toxicity.

The meditation, deep breathing and relaxation exercises in the New Life Course will help, as will the reduction of stress-inducing distorted thinking, again handled in the course. Getting good exercise and also regular massages also helps, and attention to any of the other factors listed above. So this is a broad based (and very common) problem that does require an holistic approach.

Taking Exercise

Taking frequent effective exercise is probably one of the best physical stress-reduction techniques available. Exercise not only improves your health and reduces stress caused by unfitness, it also relaxes tense muscles and helps you to sleep.

Exercise has a number of other positive benefits you may not be aware of:

- It improves blood flow to your brain, bringing additional energy and oxygen which may be needed when you are thinking intensely.
- When you think hard, the neurones of your brain function more intensely. As they do this they build up toxic waste products that cause foggy thinking in the short term, and can damage the brain in the long term. By exercising you speed the flow of blood through your brain, moving these waste products faster. You also improve this blood flow so that even when you are not exercising, waste is eliminated more efficiently.
- Exercise increases the release of chemicals called endorphins into your blood stream that give you a feeling of happiness and well-being, counter-acting the depression that fatigue may induce. Surprisingly, one feels much more energetic when taking regular exercise.

An over-strenuous approach to exercise may actually damage your body. Certainly one should enter gradually into an exercise regime and not cause strain on inflexible muscles and joints; so this is best done under the supervision of your doctor or a fitness professional, or at least a good book on the subject. The most important thing to remember is that exercise should be fun - if you don't enjoy it, then you will probably not keep doing it.

Nutrition in the Treatment of Depression

This article (extracted from "Alcoholism--The Biochemical Connection" by Joan Larson) was written especially to help alcoholics, who are particularly prone to suffer from depression, but the information it contains will be valuable for every person who frequently feels depressed or unable to sleep through anxiety. Until these nutritional factors are handled no amount of positive thinking or psychotherapy can make much headway. This is the reason that I, as a psychologist, initially became interested in the subject of nutrition.

If you have been unsuccessfully battling depression, you are not alone. At least 40 percent of all alcoholics in the United States are affected. I say 'at least' because our Health Recovery Center study found that almost two-thirds of our clients are depressed at entry. In fact, most alcoholics I have treated suffered from some degree of depression.

It is tempting to pin the blame for hopelessness and despair on the external events that can be triggered by alcoholism, such as the deterioration of a marriage or the loss of employment. To be sure, some of the depression alcoholics report is a result

of the negative course life can take when you drink too much. You will be relieved to learn that this type of situational depression is self-limiting and will pass when your life begins to improve. Counseling or group therapy can be of enormous value here. But depression among alcoholics usually runs much deeper than the situational variety I have just described.

Depression often has biochemical roots that stem from the destructive effect of alcohol on the normal chemistry of the brain. Research has verified the relationship between biochemistry and depression. Autopsies of people who have committed suicide have revealed biochemical disruptions that may be unique to suicidal depression. In this chapter you will learn to recognize the warning signs of this tragedy in the making.

No amount of counseling or psychotherapy can help people who suffer from biochemically induced depression. I learned this the hard way: watching my son fight the deep sadness and feelings of hopelessness that descended upon him as his depression worsened. The counseling he received was excellent, but words have no power to reverse the biochemical disruption caused by alcoholism and drugs. In fact, therapy's focus on the unhappy or unsatisfactory external events marring the lives of such seriously depressed people only creates more misery.

My search for an explanation for Rob's suicide led me to studies that confirmed the connections between brain biochemistry and depression and offered methods of repair that succeed far more reliably than any form of talk therapy. I learned that there is no single biochemical glitch that explains all depression. At my clinic, we treat seven different sources of depression affecting alcoholics. In this article, you will learn which of the seven may underlie your depression, (in some cases, two or more may be to blame). You will also learn how to overcome your particular chemical problem or problems. This may mean taking more nutrients. It may require further changes in your diet. Or you may need drug treatment to correct a medical condition that can precipitate depression. First, of course, you'll have to confirm that you are depressed. Then you can evaluate the severity of your case.

How Can You Tell if You are Depressed?

Although two-thirds of the clients at my clinic are severely depressed when they enter the program, many do not realize they are affected. Men in particular are inclined to attribute the feelings induced by depression to other causes. Some blame their inability to handle stress well. Others reject being labeled depressed because of the social stigma often unjustly attached to this condition. Some are

simply so overwhelmed by alcoholic symptoms that their depression is masked. Even so, depression is not difficult to spot if you know that certain behaviors are red flags to the condition:

- Withdrawal from activity; isolating yourself
- Continual fatigue, lethargy
- Indecisiveness
- Lack of motivation, boredom, loss of interest in life
- Feeling helpless, immobilized
- Sleeping too much; using sleep to escape reality
- Insomnia, particularly early morning insomnia (waking very early and being unable to get back to sleep)
- Lack of response to good news
- Loss of appetite or binge eating
- Ongoing anxiety
- Silent and unresponsive around people
- An "I don't care" attitude
- Easily upset or angered, lashing out at others
- Inability to concentrate
- Listening to mood music persistently
- Self-destructive behavior
- Suicidal thoughts or plans

How to Tell if Your Depression is Psychological or Biochemical

Biochemical depression has certain symptoms that distinguish it from the depression stemming from negative life events. You have reason to suspect that you are biochemically depressed if any of the markers listed below describes your depression:

You have been depressed for along time despite changes in your life

Talk therapy has little or no effect; in fact, psychological probing--questions like "Why do you hate your father?"--leave you as confused as Alice at the Mad Hatter's tea party

You don't react to good news

You awaken very early in the morning and can't get back to sleep

You cannot trace the onset of your depression to any event in your life

Your moods may swing between depression and elation over a period of months in a regular rhythm (this suggests bipolar, or manic-depressive, disorder)

Heavy drinking makes your depression worse

How Serious Is Your Depression?

As important as identifying the cause of your depression is determining the depth of your feelings. If you often have suicidal thoughts, please confide in your physician and a close friend or relative. You will recover, but in your present state you need the support of someone you trust. Share this information and together do the detective work needed to discover what is responsible for your continued depression.

The Seven Kinds of Alcoholic Depression

As I noted earlier, at my clinic we have identified seven sources of biochemical depression affecting alcoholics:

1. Neurotransmitter depletion
2. Unavailability of prostaglandin E1
3. Vitamin/mineral deficiency
4. Hypothyroidism
5. Hypoglycemia
6. Food and chemical allergies
7. Candida-related complex

[These may not only affect alcoholics but any of us who suffer from depression.]
Where do you fit in? Let's begin with the most likely biochemical scenario.

Neurotransmitter Depletion and Depression

Neurotransmitters are the natural chemicals that facilitate communication between brain cells. These substances govern our emotions, memory, moods, behavior, sleep, and learning abilities. Neurotransmitters are manufactured in the brain from the amino acids we extract from foods, and their supply is entirely dependent on the presence of these precursor amino acids. Alcohol destroys these essential precursor amino acids which is probably why alcoholics seem so emotionally muddled and depressed. Without adequate amino-acid conversion, neurotransmitters are no longer produced in sufficient amounts; this deficiency causes "emotional" symptoms, including depression.

The two major neurotransmitters involved in preventing depression are serotonin (converted from the amino acid L- tryptophan) and norepinephrine (converted from the amino acids L- phenylalanine and L-tyrosine). You can resupply the vital neurotransmitter precursors and reverse depression by taking daily amino-acid supplements. Your symptoms will determine which amino acid you will take for depression: L-tryptophan if your symptoms are sleeplessness, anxiety, or irritability; L-tyrosine or L-phenylalanine if your symptoms are lethargy, fatigue, sleeping too much, or feelings of immobility.

Tryptophan to Serotonin

The amino-acid tryptophan found in large amounts in milk and turkey is the nutrient needed to form serotonin, which controls moods, sleep, sex drive, appetite, and pain threshold. Eating disorders and violent behavior have also been traced to serotonin depletion. Replacing serotonin can lift depression and end insomnia. In one notable study, a medical researcher in Holland demonstrated that a combination of tryptophan (2 grams nightly) and vitamin B6 (125 milligrams three time a day) could restore patients with anxiety type depression to normal in four weeks. Depression accompanied by anxiety and sleep disturbances is most likely to respond to tryptophan.

How to Take Tryptophan

Until the U.S. Food and Drug Administration prohibited the manufacture and sale of tryptophan in the United States in the fall of 1980, we used it for ten years at the clinic without any ill effects. This amino acid has also been widely used in England and Canada. Last year, however, a number of deaths and illnesses in the United States were traced to batches of tryptophan manufactured in Japan. In response, the FDA removed tryptophan from the U.S. market. At the time of this writing, the ban remains in effect. I want to caution you against using any tryptophan purchased before the FDA barred its sale. I am confident that eventually tryptophan will again be freely available in this country. At that point, you can purchase a fresh supply. Here are guidelines for its use:

Tryptophan alone will not be converted to serotonin. To insure that it is properly used, you must also take vitamin C and vitamin B6 (see table below)

Tryptophan is converted to niacin before its final conversion into serotonin. If your body is deficient in niacin, the tryptophan you take will supply you with niacin, not serotonin. For this reason, it is a good idea to take a B-complex vitamin daily. This will give you both vitamin B6 and niacin and allow the tryptophan to be converted to serotonin.

Of all the amino acids, tryptophan is least able to cross the blood-brain barrier. It must pass this biological hurdle in order to be converted to serotonin. Always take your tryptophan on an empty stomach.

Safety and Side Effects

Orthomolecular physicians have safely used tryptophan in doses of one to six grams daily. Since it is not stored in the body, it cannot accumulate to toxic levels. However, taking high levels of tryptophan can produce some side effects:

- Drowsiness the next morning
- Bizarre or strange dreams (rare)
- Increased blood pressure in persons over age sixty who already have high blood pressure
- Aggressiveness (this rare side effect can occur in the absence of sufficient supplies of the nutrients needed for normal conversion of tryptophan to serotonin.)

Formula for Depression Due to Serotonin Depletion

Nutrient	Dose	Directions
L-Tryptophan	500 mg	2 to 8 capsules per day in divided doses (1 or 2 midmorning, 1 or 2 mid afternoon, 2 to 4 at bedtime, on an empty stomach)
Vitamin B6	50 mg	1 capsule 3 times per day
Vitamin C	1000 mg	1 capsule per day
Niacin	500 mg	1 capsule per day (non-time released)

*Use tryptophan only if the FDA lifts the current ban on its sale.

Who Should Not Take Tryptophan?

- Anyone who takes an MAO (monoamine oxidase) inhibitor for depression; do not take tryptophan until ten days after giving up MAO inhibitors
- Anyone with severe liver disease (a damaged liver cannot properly metabolize tryptophan or any other amino acid)
- Pregnant women (you may be able to take five hundred to a thousand milligrams of tryptophan, but only with the approval and supervision of your physician)

Tyrosine to Norepinephrine

The amino acid tyrosine, found in large amounts in cheeses, has an amazing effect on depression. A number of studies have found that it can succeed where antidepressant drugs fail. In the brain, tyrosine is converted into the neurotransmitter norepinephrine, which has been described as the brain's version of adrenaline. You can appreciate the power of norepinephrine when you realize that the effect produced by cocaine comes from the drug's ability to activate norepinephrine while inhibiting serotonin. This chemical reaction causes the brain to race until the supply of norepinephrine is depleted. The crash leaves addicts exhausted, depressed, extremely irritable, and craving more cocaine. Large doses of tyrosine can reduce withdrawal symptoms and prevent serious depression among cocaine addicts. We have used tyrosine at the Health Recovery Center for the past few years with no adverse effects. The usual dose is three to six grams per day, taken on an empty stomach. You must take vitamins B6 and C to facilitate conversion of tyrosine to norepinephrine (see table below).

L-Phenylalanine to Norepinephrine

As an alternative to tyrosine, you can take the amino acid L-phenylalanine, which also can be converted into norepinephrine. A number of studies have confirmed L-phenylalanine's amazing antidepressant effects. In one, this potent amino acid was found as effective an antidepressant as the drug imipramine (Tofranil). L-phenylalanine has one important advantage over tyrosine in treating depression. It can be converted to a substance called 2-phenylethylamine or 2-PEA. Low brain levels of 2-PEA are responsible for some depression (before it converts to tyrosine, which then converts to norepinephrine). If you are affected, L-phenylalanine will be better for you than tyrosine. The only way to find out is by trial and error. I recommend that you start by taking L-phenylalanine. If you find that it makes your thoughts rush (an effect that is often described as the brain "racing"), you don't need 2-PEA and should switch to tyrosine. The only other disadvantage to taking L-phenylalanine is its slight potential for raising blood pressure.

There is also some evidence that excess L-phenylalanine can cause headaches, insomnia, and irritability. For these reasons, it is important to start with a low dose. L-Phenylalanine doses can range from 500 milligrams to 1500 milligrams daily taken on an empty stomach. Overdose symptoms are headaches, insomnia, and irritability.

Formula for Depression Due to Norepinephrine Depletion

Nutrient	Dose	Directions
L-Tyrosine	500 mg	4 to 10 capsules per day in 2 or 3 equal doses on an empty stomach
OR --		
L-Phenylalanine	500 mg	1 to 3 capsules per day in equal doses on an empty stomach
Vitamin B6	50 mg	1 capsule 3 times per day
Vitamin C	1000 mg	1 capsule per day

Who Should Not Take Tyrosine or L-Phenylalanine?

- Anyone with high blood pressure should avoid phenylalanine or take very low doses (one hundred milligrams) at first and monitor blood pressure as dosage is increased.
- No one taking an MAO inhibitor for depression should take either tyrosine or L-phenylalanine
- No one with severe liver damage should take any amino acid.
- Do not take any amino acids during pregnancy except with the approval and supervision of your physician.
- No one with PKU (phenylketonuria) should use L-phenylalanine.
- No one with schizophrenia should take either amino acid (except with a physician's approval and under their supervision.)
- No one with an overactive thyroid or malignant melanoma should take either amino acid.
- If you are being treated for any serious illness, consult your doctor before taking these amino acids.

Unavailability of Prostaglandin E1 and Depression

Another biochemical cause of depression is a genetic inability to manufacture enough prostaglandin E1 (PGE1), an important brain metabolite derived from essential fatty acids (EFAs). The problem is the result of an inborn deficiency in omega-6 essential fatty acid. Alcohol stimulates temporary production of PGE1 and lifts the depression.

If you have been depressed since childhood, your introduction to alcohol was probably an extreme relief. But this relief is short-lived. When you stop drinking, PGE1 levels fall again and depression returns. To banish it, you turn again to alcohol. Thus a deadly spiral begins toward alcoholism.

During the last fifteen years, researchers have learned to restore normal PGE1 levels in alcoholics and eliminate both the depression and the need to drink for relief. A substance called gamma-linolenic acid (GLA) is easily converted to PGE1. I have seen some amazing recoveries from depression within three weeks of GLA treatment. Take the case of Colleen, a high school English teacher:

Colleen described her childhood and teenage years as withdrawn and lonely, "I can't remember not being depressed," she told me. In college, she drank alcohol for the first time and received the shock of her young life. Her world brightened in a way she had never before experienced. She felt different. Friendly. Happy. The effects lingered into the next day, and then gloom closed in again. After experiencing the dramatic lift in her spirits, she was convinced that she had discovered a magic elixir in alcohol. In a short time she was drinking a few beers every day. The alcohol never failed to banish her depression.

As her college years passed, Colleen's alcohol consumption escalated. She needed to drink more and more to get the lift she sought. She also began to experience deep depressions in the days following heavy drinking. After college, she began teaching high school English. Controlling her depression with alcohol became a real balancing act. Eventually, her drinking came to the attention of her peers and her students. Colleen was appalled at the idea that she was a problem drinker. She decided to prove she could live without alcohol. The next ten years were some of the most miserable of her life. She joined AA and sought psychiatric help for her severe depression. Sadly, no antidepressant drug relieved her misery. It was hard to keep teaching, hard to keep living.

Her depression had reached the suicidal stage when she reasoned that alcohol could put an end to her despair. Her decision to resume drinking didn't take much reflection. Predictably, her alcohol intake began to escalate rapidly. This time, no one sympathized. Her principal ordered her to treatment. Three weeks after completing an inpatient program, she was back at employment and drinking again to medicate her depression. A second round of treatment left her temporarily dry and depressed. Colleen was on a merry-go-round she couldn't get off. When she called the Health Recovery Center, she was crying, "I have alienated everyone because I won't stay sober, but being drunk feels better than being depressed."

I often think someone up there does watch over people, it seems more than coincidence that Colleen found her way to one of the few treatment centers in the

country that would run tests and restore her chemistry to normal. Within three weeks, her depression had vanished. She no longer needed nor craved alcohol.

Colleen's was a classic case of chronic depression caused by too little PGE1. Although alcohol blocks production of additional amounts of this metabolite, its active effect is to enhance what little is available in the brain. Eventually, a no-win situation develops and alcohol becomes the only way to prevent depression. The solution, of course, is to provide the brain with the PGE1 needed to reverse the depression. If your body can't do this normally, you can correct the problem by taking gamma linolenic acid (GLA) in the form of Efamol (a trade name for oil of evening primrose). The formula for EFA deficient depression (see table below) includes three supportive nutrients in addition to Efamol: zinc, needed for formation of gamma-linolenic acid (GLA); vitamin B6 for metabolism of cis-linolenic acid; and vitamin C, to increase production of PGE1. When you take GLA and its co-factors, depression magically lifts and won't return as long as you continue to take the formula. Colleen now uses this natural substance daily instead of alcohol, and her world has brightened up permanently.

Do You Have an EFA Deficiency?

In his book "Essential Fatty Acids and Immunity in Mental Health, Charles Bates, Ph.D., provides a list of factors that suggest an essential fatty acid deficiency:

- Ancestry that is one-quarter or more Celtic, Irish, Scandinavian, native American, Welsh, or Scottish.
- A tendency to abuse alcohol or feel that it affects you differently from others; trouble with alcohol in your teenage years.
- Anxiety or depression during hangovers
- Depression among close relatives
- A family history of alcoholism, depression, suicide, schizophrenia, or other mental illness.
- Depression that persists while you are abstinent from alcohol.
- A personal or family history of Crohn's disease, hepatic cirrhosis, cystic fibrosis, Sjogren-Larsson syndrome, atopic eczema.
- A personal or family history of ulcerative colitis, irritable bowel syndrome, premenstrual syndrome, scleroderma, diabetes, or benign breast disease.
- Experiencing an emotional lift from certain foods or vitamins.
- Winter depressions that lighten in the spring.

Formula for Depression due to EFA Deficiency

Nutrient	Dose	Directions
Efamol	500 mg	3 capsules, 3 times per day with meals (9 per day); can be reduced to 6 per day after 1 month
Zinc picolinate	20 mg	1 capsule with food
Vitamin B6	50 mg	1 capsule 3 times per day
Vitamin C	1000 mg	1 capsule per day
Niacin	100 mg	1 capsule with food daily

Vitamin and Mineral Deficiency and Depression

The effect of nutritional deficiencies on brain chemistry can cause depression, anger, listlessness, and paranoia. Unfortunately, the connection between depression and vitamin and mineral deficiencies is often missed. At Johns Hopkins University, sixty-nine cases of scurvy (total vitamin C depletion) were discovered at autopsy, and yet the disease had not been diagnosed before death in 91 percent of these patients.

One of the most dramatic cases of vitamin and mineral deficiencies I have seen involved a man I'll name Paul. He had been arrested four times for drunken driving but continued to drink daily. His probation officer brought him to the Health Recovery Center. The three of us had to decide if an outpatient program would be proper for someone as depressed as Paul. The court had just ordered him back to treatment; judging by the miserable look on his face, it was the last place he wanted to be. Paul was thirty, divorced and living alone. He rarely ate more than one meal a day, usually fast food or junk food. He lived on coffee, cigarettes, and beer. Paul confided that he was probably going to lose his sales job because he could no longer motivate himself. He blamed all of his troubles on depression. There were so many aspects of his life-style that suggested a real depletion of the natural chemicals he needed to recover from alcoholism and depression that I urged Paul to let us work with him. Two days later, after receiving his B-complex shots, Paul remarked that we must have injected him with an amphetamine. The effect of restoring these life-giving substances was dramatic. He also made many life-style changes that contributed to his recovery, but one of the most important was the replacement of certain key natural substances that helped relieve his depression.

The B-Complex Vitamins

The B-complex vitamins are essential to mental and emotional well-being. They cannot be stored in our bodies, so we depend entirely on our daily diet to supply

them. B vitamins are destroyed by alcohol, refined sugars, nicotine, and caffeine--the very substances that most alcoholics consume almost to the exclusion of everything else. Small wonder that deficiencies develop.

Here's a rundown of recent findings about the relationship of B-complex vitamins to depression:

- Vitamin B1 (thiamine): Deficiencies trigger depression and irritability and can cause neurological and cardiac disorders among alcoholics.
- Vitamin B2 (riboflavin): In 1982 an article published in the British Journal of Psychiatry reported that every one of 172 successive patients admitted to a British psychiatric hospital for treatment of depression was deficient in B2.
- Vitamin B3 (niacin): Depletion causes anxiety, depression, apprehension, and fatigue.
- Vitamin B5 (pantothenic acid): Symptoms of deficiency are fatigue, chronic stress, and depression. Vitamin B5 is needed for hormone formation and the uptake of amino acids and the brain chemical acetylcholine, which combine to prevent certain types of depression.
- Vitamin B6 (pyridoxine): Deficiency can disrupt formation of neurotransmitters. Vitamin B6 is a co-enzyme needed for conversion of tryptophan to serotonin and phenylalanine and tyrosine to norepinephrine. I have discussed the relationships of these neurotransmitters to depression.
- Vitamin B12: Deficiency will cause depression.
- Folic acid: Deficiency is a common cause of depression.

Vitamin C

Continued vitamin C deficiency causes chronic depression, fatigue, and vague ill health.

Minerals

Deficiencies in a number of minerals can also cause depression. I would like you to familiarize yourself with the minerals that can underlie depression so you can better understand the rationale for taking supplementary doses:

- Magnesium: Symptoms of deficiency include confusion, apathy, loss of appetite, weakness, and insomnia.
- Calcium: Depletion affects the central nervous system. Low levels of calcium cause nervousness, apprehension, irritability, and numbness.

- **Zinc:** Inadequacies result in apathy, lack of appetite, and lethargy. When zinc is low, copper in the body can increase to toxic levels, resulting in paranoia and fearfulness.
- **Iron:** Depression is often a symptom of chronic iron deficiency. Other symptoms include general weakness, listlessness, exhaustion, lack of appetite, and headaches.
- **Manganese:** This metal is needed for proper use of the B-complex vitamins and vitamin C. Since it also plays a role in amino-acid formation, a deficiency may contribute to depression stemming from low levels of the neurotransmitters serotonin and norepinephrine. Manganese also helps stabilize blood sugar and prevent hypoglycemic mood swings.
- **Potassium:** Depletion is frequently associated with depression, tearfulness, weakness, and fatigue. A 1981 study found that depressed patients were more likely than controls to have decreased intracellular potassium. Decreased brain levels of potassium have also been found on autopsy of suicides. You can boost your potassium intake by using one teaspoon of Morton's Lite-Salt every day.

The Safety of Supplements

Vitamin C and the B-complex vitamins discussed above are all water soluble. This means that they can't accumulate in your body or be stored for future use. Amounts above and beyond your current nutritional needs are dumped into your urine. As a result, there is no danger of overdose. Unlike water soluble vitamins, minerals can be stored in your tissues. [Refer to the Optimum Nutrition Formula for the RDAs and suggested optimum levels.] For therapeutic doses you will need the advice of a qualified nutrition consultant. Do not exceed the recommended therapeutic doses, since accumulation of minerals in the body can be dangerous.

Hypothyroidism and Depression

The stress showed on Mary's face as she described how weary and depressed she felt. Her husband and children demanded too much of her and she drank to escape the pressures and responsibilities. Mary had been in our program for two weeks. She was now alcohol free and making life-style changes. Still, she had very little energy and didn't seem to be recovering very fast. As we talked, she inadvertently offered several clues to the source of her problem. She complained that even on her restricted diet she simply couldn't lose weight. Exercise was out of the question. She was just too tired, even though she slept up to ten hours a night. She was wearing a heavy sweater even though it was a warm spring day. She said she had a hard time keeping warm and was very susceptible to catching colds. By the end of

our session, I had heard enough to refer her to our physician for a thyroid test. Symptoms of hypothyroidism (low thyroid function) include:

- Depression
- Mental sluggishness
- Confusion
- Poor memory
- Fatigue
- Low sex drive
- Brittle hair
- Dry skin
- Puffiness around the eyes
- Cold hands and feet
- Sleeping more than eight hours a night
- Susceptibility to colds and infections

Researchers speculate that hypothyroidism causes depression because there is an insufficient supply of oxygen to the brain, since people with low thyroid function do not use oxygen efficiently. Linus Pauling contends that all depression could be eliminated if brain cells received sufficient oxygen.

Testing

If you have any of the symptoms listed above, you can test yourself for hypothyroidism with a procedure first described in the Journal of the American Medical Association by thyroid expert Broda Barnes, M.D. The test could not be simpler. People with low thyroid function have lower than normal temperature because they are not burning up as much food as they should. All you have to do for this test is determine whether your body temperature is lower than normal. Use a digital or basal thermometer, not a fever thermometer. The basal type is commonly used by women trying to get pregnant--or trying to avoid pregnancy--to determine when ovulation occurs on the basis of an increase in body temperature. Basal thermometers are available in most drugstores. Place the thermometer snugly under your armpit for ten minutes. If it registers below 97.8 degrees and if you have symptoms of hypothyroidism, you probably need thyroid hormone. This home test can give you a fix on your thyroid status. If you haven't yet been tested, you can ask your doctor to check further. The usual laboratory tests for thyroid (T3, T4, and TSH) do not always tell the whole story. But a new test, the fluorescence activated microsphere assay (available from ImmunoDiagnostic Laboratories in San Leandro, California) will often reveal abnormalities less sophisticated tests miss.

In Mary's case, standard lab tests indicated low-normal thyroid function, but her morning temperature never rose above 96.9 degrees. We treated her with Armour Thyroid, a prescription drug. It relieved her depression and eliminated her mental sluggishness and fatigue. She also lost weight. If your home thyroid test shows that your temperature is consistently below 97.8 degrees, see your physician to discuss treatment. If the doctor wants more information on your testing method, refer him or her to Dr. Barnes's book "Hypothyroidism: The Unsuspected Illness". Another useful book is "Solving the Puzzle of Illness" by Steven Langer, M.D. Dr. Barnes has published more than a hundred papers and several books on the role of the thyroid gland in human health. He treats thyroid disorders with natural desiccated thyroid rather than synthetic thyroid preparations. The advantage of natural thyroid over synthetic is that all thyroid hormones are replaced with the natural product, whereas synthetics have not yet been able to duplicate nature completely and do not affect two troublesome symptoms of hypothyroidism, dry skin and water retention.

Hypoglycemia and Depression

In his studies of twelve hundred hypoglycemic patients, Stephen Gyland, M.D., found that 86 percent were depressed. More recently, positron emission tomography (PET) scans have verified that glucose metabolism is often reduced in the brains of patients suffering from depression. The table below, which is based on Dr. Gyland's studies, compares the symptoms of hypoglycemia and depression. It is no accident that both conditions are so common among alcoholics. If hypoglycemia underlies your depression, you should begin to notice an improvement soon after you adopt a better diet that no longer supports the hypoglycemia.

Symptoms of Hypoglycemia and Depression

Hypoglycemia	Depression
Nervousness	Nervousness
Irritability	Irritability
Exhaustion	Exhaustion
Faintness, cold sweats	---
Depression	Depression
Drowsiness	Drowsiness
Insomnia	Insomnia
Constant worrying	Constant worrying

Mental confusion
 Rapid pulse
 Internal trembling
 Forgetfulness
 Headache
 Unprovoked anxieties
 Digestive disturbances

Mental confusion
 Rapid pulse
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Food and Chemical Allergies and Depression

The connection between food allergies and depression was a revelation to me. I was treating a young woman who was both alcoholic and depressed. I expected to find some food or chemical sensitivities because she had a terrible withdrawal hangover when she stopped drinking, indicating an allergic/addicted response to alcohol. But I was not prepared for the Jekyll and Hyde changes that I witnessed.

By the end of the week-long modified fast, Carol was feeling much better. Her depression was gone and her energy had returned. Then she tested wheat. Within two hours she crashed. Crying over the telephone, she told me she was too depressed to continue the program. The next day she apologized. We were both grateful to find a major trigger to her depression. After her severe reaction, I expected Carol to avoid wheat religiously. At the time, I didn't understand the addiction aspect of the allergic/addicted response. Carol had enormous cravings for breads and pasta, so her resolve lasted only a few days. Then she succumbed to temptation and ate pizza for lunch. An hour later, she arrived at her treatment group sobbing inconsolably while the others groped for emotional explanations for her behavior. After her wheat reaction wore off, her depression again lifted.

Wheat is not the only substance capable of triggering a maladaptive reaction within the brains and nervous systems of sensitive people. Alcohol, certain foods (particularly the grains from which alcohol is made), and many chemicals (particularly hydrocarbon-based products like gasoline and paints) can also cause reactions. Food addiction keeps us coming back for more of certain foods. We love the initial mild energy they provide as they bring us out of our withdrawal state. We don't understand that the downside of this addiction is depression, anxiety, and mental confusion, the result of the inevitable withdrawal in the nervous system and the brain. So be suspect of foods that you feel you cannot do without.

Candida-Related Complex and Depression

During the last five years, we have seen a steady parade of clients who are fighting an internal war with an overgrowth of a common intestinal yeast called *Candida albicans*. I can usually tell on the basis of a first interview who is a probable candidate for treatment of candida-related complex (CRC). People suffering from this problem appear depressed, tired, anxious, and so spacey that they can't follow what I'm saying. They tell me they continually crave sugar as well as alcohol, and they have telltale signs of yeast invasion throughout their bodies. Their immune systems are so depressed that most foods cause bloating and produce allergic/addictive responses. If you suffer from CRC, your depression won't lift until these yeast colonizers are brought under control.[Visit your nutrition consultant for a full program to handle this all-too-common condition.]

Suicide and Depression

Before we leave the subject of depression, I want to discuss a painful subject: suicide, the final solution to depression. If your life, like mine, has been seared by the suicide of a family member, you may find the answers you have been seeking. And if you have been trying to cope with overwhelming depression and are plagued with thoughts of suicide, you will find a welcome warning that can help you avert tragedy. Over the years, I've learned that alcoholics often conceal the fact that family members have taken their own lives. But if I tell them about my son's suicide, the truth comes rushing out: "My father shot himself" or "Several times, my mother took a deliberate overdose of pills" or "My son hung himself." The pain of these tragic deaths is often compounded by a family code of silence.

Often, those touched by the tragedy are tormented by guilt. They can't stop wondering whether they could have done something to prevent the suicide, whether they missed warning signs that tragedy was approaching. Recent scientific findings provide some of the answers to these agonizing questions and offer comfort and insight.

Most people experience some major disappointment or stress in the course of life, but suicide is rarely the outcome. And, there is no good evidence suggesting that most depression predates alcoholism or that any personality traits underlie alcoholism. Indeed, researchers have so far failed to find genetically transmitted depression among most alcoholics. Instead, studies suggest that the prolonged use of alcohol causes biochemical changes in the brain associated with depression and suicide. The most striking of these findings (from the National Institute of Mental Health) shows that the neurotransmitter serotonin is almost depleted in all the

brains of suicides examined during autopsies. Since alcoholism causes the destruction of tryptophan and other precursor amino acids needed for production of the antidepressant neurotransmitters, it's not surprising that many alcoholics are prone to depression and even suicide. As I have explained earlier in this chapter, alcohol can also precipitate depression by destroying a number of other natural chemicals, including

- The neurotransmitter norepinephrine, formed from the amino acids phenylalanine and tyrosine
- Endorphins
- Essential fatty acids needed to form brain metabolites, including prostaglandin E1 (PGE1)
- B vitamins, which supply the brain's energy and maintain mental and emotional balance
- Trace elements and enzymes that govern the body's hormonal balance

A cerebral allergic reaction to alcohol or other substances can cause suicidal depression. High levels of toxins from *Candida albicans* overgrowth can also affect the brain and central nervous system and induce suicidal depression. Alcoholism promotes both proliferation of candida and escalation of cerebral allergies. Since alcohol can inflict so much biochemical damage on the brain and nervous system, it should not be surprising that many alcoholics attempt suicide. One recent study found that up to 40 percent of all alcoholics try to take their own lives at least once; another study found that 26 percent of the deaths of treated alcoholics were suicides. If you feel that you or someone close to you is a suicide risk, please re-read this chapter carefully and encourage the changes recommended to restore normal balance and banish depression once and for all.

Where Do You Fit In?

Now that you are familiar with the various problems that can underlie depression, it's time to determine what to do about the one(s) that may be responsible for your own state of mind. Here are the options:

1. Restoring the neurotransmitters serotonin and/or norepinephrine
2. Replacing essential fatty acids to create PGE1
3. Restoring key vitamins and minerals
4. Treating hypothyroidism
5. Correcting hypoglycemia
6. Avoiding foods/chemicals responsible for cerebral allergy/addiction
7. Treating candida related complex

Don't be surprised if you fit several of these seven categories. Heavy alcohol use wreaks havoc on your biochemical balance. But with a repair program you can restore your health. In some cases you'll need a physician's help or the help of a nutrition consultant. I can't overemphasize the importance of expert medical advice when you are dealing with depression, especially if it is severe. It is equally important to choose a professional attuned to your special needs. Orthomolecular MDs are experts in both allopathic and nutritional science who treat disorders at the cellular level with biological weapons--nutrients that nature has provided in its own system of defense for millions of years. An orthomolecular psychiatrist or physician can help you address the following problems:

- Restoration of neurotransmitter levels via amino-acid therapy
- Vitamin, mineral, and essential fatty acid testing and restoration
- Thyroid testing and treatment
- Hypoglycemia testing and treatment
- Allergy testing and treatment
- Candida testing and treatment

Nutrition and Cancer

Inadequate nutrition is one of the root causes of cancer, and although under-used by medical doctors, nutritional therapy can play an important part in recovery from cancer.

The subject of preventing and fighting cancer is of course a vitally important one. Treatment of cancer should be under the direction of your doctor and preferably also a Nutrition Consultant liaising with the doctor. A proper nutritional strategy is required and therefore an individual consultation on the matter is recommended.

The aim of this article is to describe the basic physiology of cancer and provide information about the role of nutrition in cancer prevention and treatment.

What is a carcinogen?

A carcinogen is a chemical or other environmental agent that produces cancers. Such a substance induces cell damage, affecting either the behaviour of a cell (DNA damage) or the permeability of the cell membrane - frequently because of the affect of free radicals on double bonds in phospholipids and DNA. This results in a cell which is incapable of utilising oxygen or nutrients and so it reverts to glycogen metabolism and becomes a lactate fermenting cell, growing and proliferating rapidly in an undifferentiated manner, to form a tumour mass of cancer cells. Metastasis (migration of cancer cells) may be controlled by a strong immune system.

Four major groups of carcinogen are:

1. Smoke - benzoprenes from cigarettes and exhaust gases or smoked foods, which damage cells in the lungs. Food heated to high temperatures until burnt (e.g. fried, grilled or barbecued) contains carcinogens.
2. Common food dyes, preservatives and additives. Nitrosamines are formed in the gut from nitrates in fertiliser and meat colouring.
3. Metabolic by-products - including peroxides, the by-product of respiratory metabolism.
4. Environmental sources - such as pesticides (e.g. DDT), plastics, detergent, radioactivity (e.g. X-rays), inhaled free oxygen radicals (FORs) from polluted air, and UV radiation from the sun. Also occupational pollutants (e.g. asbestos), and water pollutants and added halogens (chlorine, fluoride).

What allopathic treatment is available for the cancer sufferer? Allopathic treatment is the use of a method which is "incompatible with or antagonistic to the condition being treated" (Greek allo = different, as opposed to homeopathy from Greek

homeo = same). For the cancer sufferer this includes surgery to remove cancer growth (though this does not prevent a recurrence), radiation therapy to kill off cancer cells (though this also destroys healthy cells and damages the immune system) and chemotherapy using cytotoxic drugs to kill cancer cells (this is also poison to the rest of the body but more discriminate cytotoxins are being developed).

Hormone therapy (not strictly allopathic since it uses natural products of the body, e.g. steroids) is also used for anti-inflammatory effect, and can be helpful in cancers of organs under hormonal control including breast and prostate. Medical immunotherapy involves reintroducing cultivated killer T-cells to boost natural defenses.

What are the main types of cancer?

The forms of cancer represent different kinds of tumour and respond differently to treatment:

- Carcinoma (90% of adult cancer) - malignant tumours of the epithelial cells lining body cavities and glandular organs, e.g. lung, colon, breast, uterus, prostate, etc. Melanomas are cancerous growths of melanocytes, skin cells that produce the pigment melanin.
- Sarcoma - very malignant tumours of the connective tissues, muscle, bone and cartilage.
- Leukaemia - a cancer of blood-forming organs affecting growth and development of leukocytes (white blood cells). Lymphoma is a malignant disease of lymphatic tissue, causing excess lymphoid cells. Multiple myeloma occurs in bone marrow causing excess plasma cells.

What are the characteristics of a cancer cell?

The primary characteristic of a cancer cell is that it is starved of oxygen and nutrients, and so it reverts to a non-oxygen requiring (anaerobic) form of metabolism utilising glycogen, resulting in a build up of lactic acid. This occurs because of an increased or decreased permeability of cell walls or altered behaviour due to genetic (DNA) mutation, the effect of free radical damage.

The cells lose the ability to differentiate from one another and form clumps and invade surrounding tissues. As the cancer develops, the tumour obtains its own blood supply for nourishment and elimination, competing with normal tissues for space and nutrients. Cancer cells have the ability to migrate into the blood or lymph system where a weak immune system may fail to prevent their spread.

They are also able to move directly through surrounding tissues with the aid of pseudopodia. Some cancer cells secrete enzymes that break down collagen, the substance which binds cells and tissues together, allowing easier migration - vitamin C directly counters this process. Cancer cells also do not produce the enzyme which breaks down essential fatty acids (delta-6-desaturase) and thrive on arachidonic acid (found plentifully in meat and milk). Essential fatty acids such as GLA from Evening Primrose oil counter this imbalance.

What are metastases?

One property of malignant cells is their ability to undergo metastasis - the spread of cancerous cells from the initial (primary) tumour to a body cavity or fluid (blood or lymph) or by migration through tissues, which may result in the development of metastases - secondary tumours.

Why is the disarming of free radicals so important in cancer prevention?

It is important to disarm free radicals because they can damage double bonds in phospholipids of cell walls and of DNA, altering cell permeability and causing genetic mutation affecting cell behaviour (including abnormal growth patterns such as proliferation of undifferentiated cells). Damaged mitochondrial membranes (the energy power-houses inside every cell) reduce the ability of cells to utilise oxygen.

The vitamins C, E and A (beta carotene) have an anti-oxidant effect, disarming free radicals. They work closely with the important anti-oxidant enzymes Superoxide Dismutase (SOD) containing zinc, manganese and copper, and Glutathione Peroxidase (GP) containing the mineral selenium.

What nutrients have been shown to be effective in the prevention and/or treatment of different types of cancer?

Nutritional therapy is not a cure for cancer, but certain vitamins and minerals may prevent deterioration and spread of the cancer, and boost the immune system.

The primary anti-oxidants are: vitamins C, A (beta carotene) and E, and the minerals zinc and selenium. Many other natural substances also have powerful anti-oxidant effects, such as Pycnogenol, Lycopene, CoEnzyme-Q10, N-Acetyl Cysteine.

Minerals that support the anti-oxidant enzyme SOD are: manganese, and copper and zinc in 1:15 ratio; and to support the anti-oxidant enzyme GP: selenium.

Immune enhancing vitamins are: B2, B5, B6 and B12; folic acid*; vitamins A, C and E and zinc*. (*Growth enhancing so if malignancy present, use to normalise levels only).

Nutrients to detoxify carcinogens: vitamins C and A, and selenium.

To help restore normal cell membrane development and cell oxidation: Essential Fatty Acids (such as Evening Primrose oil, seed oils and fish oils).

Potassium keeps cells alkaline and is toxic to cancer cells, so keep the diet high in potassium (fruits) and low in sodium (salt).

What diet will help?

By improving the diet towards optimum nutrition, all the family will benefit.

Daily eat one salad, 3 pieces of fruit, 5 lightly cooked or raw vegetables (one green leafy for B vitamins and magnesium). Nibble a handful of nuts and seeds daily for zinc and good quality oils. Twice a week eat oily/white fish. Experiment with vegetarian dishes using peas, beans and lentils. Drink plenty of water between meals.

Avoid foods with added salt. Avoid sugar and other foods with concentrated sweetness. Avoid meat and dairy foods - try to have more vegetarian sources of protein. Avoid processed and fast foods with long lists of preservatives and additives. Avoid frying foods and avoid regular consumption of tea or coffee - for alternatives try diluted fruit juices and herb teas. Avoid alcohol and certainly don't smoke.

What supplements should I take?

If cancer has been diagnosed, you should always seek approval from your doctor for a nutritional strategy. Nutrients simply enhance health and only your doctor will know if an allopathic treatment is necessary as an urgent life-saving measure, and some drug prescriptions conflict with normally required nutrients.

However, prevention of cancer is something every responsible adult can take in their own hands, and the principles are clear. First and foremost, optimum nutrition is required, and this will help to protect you from environmental carcinogens, and to strengthen all the body systems in case you have an inherited weakness. Secondly, supplementing the diet with nutrients proven to help prevent cancer is a wise step to take.

Vitamin C, taken in generous doses (such as 3g or more over the day), is the primary nutrient to help prevent cancer and, indeed, to promote good health. High levels of vitamin C may cause slight diarrhoea - if this occurs, reduce the amount slightly, then gradually increase back to the original amount, or even more if your gut will tolerate this vital anti-cancer substance. Do not suddenly cease this

supplementation, however; to do so may result in deficiency symptoms as the body has got used to high amounts in circulation.

In addition, Proanthanol is a very powerful antioxidant which works synergistically with Vitamin C and this combination is the best anti-cancer measure you can take. The product has also been shown to inhibit tumour production in the skin and to protect against the carcinogenic effect of tobacco smoke.

Selenium is a vital element to both prevent and treat cancer. A synergistic mix with other antioxidants such as vitamins A, C and E and glutathione, etc. (they need each other to work best) is desirable.

A clean and rapid colon is required to prevent colon cancer and supplementation of Acidophilus along with adequate fibre in the diet is of assistance here.

Mercury Toxicity

If you have a good diet, avoid obesity and do not smoke, then your chances of good health are greatly increased, as these are very much the senior factors. It is wise to take account of other factors though. We are all exposed to environmental toxins, such as harmful chemicals in the water, on and in our food, and in the air. As well as testing for biochemical imbalances in the system, including deficiencies of important nutrients, a nutrition consultant will also check for excess amounts of toxins such as lead, aluminium, cadmium, etc. Even our fillings can cause problems. We would like to draw your attention to an individual case of Chronic Fatigue Syndrome (CFS, also known as ME) which was not resolvable by nutritional means alone. This was because the real cause was Mercury poisoning, a form of toxicity which has very similar symptoms to CFS. If you have had a lot of dental fillings with silver/mercury amalgam, and you suffer from chronic fatigue, you may have the answer right there in your mouth! The following article relates the moving experiences of a CFS sufferer who resolved his illness only when he eventually discovered that dental mercury poisoning was the cause!

Chronic Fatigue Syndrome or Low Level Mercury Poisoning?

By Jeff Clark 7/3/96

Dear CFS Sufferer,

Your situation is of great interest to me. I too have suffered similarly for a long time. In my case I have found a root cause and solutions! Now that I am back to

good health, I want to share my story with you. I want you to know what I have found, to see if my experiences can help you in reversing your health problems.

My Chronic Fatigue Story

I moved to Portland, Oregon in 1983 after graduating from college in Montana. Financially, I had to struggle through school: food, books and tuition were my priorities, with very little left for anything else.

At graduation I was 23, and strapping healthy. There was only one exception to my excellent health, bad teeth. During childhood I had developed a large number of serious cavities resulting in 13 teeth with major fillings. By the end of college many of these fillings were in disrepair. The university health clinic dentist repeatedly did patch work, admonishing me that I needed to go get things fixed properly.

I started work at Tektronix, Inc. in Beaverton, OR, May 1983. Six months later my dental plan vesting was completed, and I began having my teeth fixed. In a 3 month period, each and every filling was replaced. When it was over I was proud of my teeth. My dentist did excellent work. My mouth was restored to great condition.

Three months later I started having a sore throat, sniffles, and some fatigue, not unlike a flu. My new job produced stress because of the demands of meeting a product development schedule, and because of my own demands to prove myself in my new career. For the longest time the sore throat persisted, and slowly, almost imperceptibly, my strength began slipping away.

By 1986 my symptoms were an exact match for CFS. I was having night sweats, swollen lymph glands, loss of memory, constant headaches, inability to concentrate, numerous vague aches and pains, extreme fatigue, a high level of anxiety and emotional instability.

My life consisted of fighting my way through work each day, and collapsing on the sofa in the evening. Sleep, that refreshing friend, could not revive my energies, no matter how long I rested. Work was all I could muster. Off hours and weekends were spent attempting to rest and recover. My girlfriend, now my wife, Carmen, wondered how we would ever have a life together. We wanted children, and many other happy things. If all I had energy for was work, how could I help raise children? have a home? have a happy life together?

I went to several doctors. Yes, there were Epstein-Barr titers, but no sign of active virus. Endocrinology checked out. Blood chemistry revealed a perfectly normal 26 year old. At some point I was tested for AIDS, even though my risk level was in

the extremely low category. With no great surprise, AIDS wasn't the cause either. My doctor decided it must be stress, it must be psychosomatic, it must be in my head. He gave me the name of a psychologist on "pill hill", maybe he could help. I never went. Of course I was stressed out. There was something drastically wrong with me, and no one could figure out what it was. I was a young man, I had so much life to live. I began to resign myself to a life of chronic fatigue.

In 1983 I weighed in at a muscular 190 pounds. At the end of 1986 my weight was down to 150 pounds. Food didn't work for me any more. I ate vigorously, enormous amounts to retain weight, it just barely kept me alive.

Carmen and I started to notice a pattern in my symptoms. Whenever I would eat something sweet, or drink a soda pop, all of my symptoms would go off together like a 3 alarm fire. This reminded Carmen of a girlfriend who had developed chronic yeast infections. We picked up the "Yeast Connection" book, and the name of a Natural Path who had helped the friend recover. This began my odyssey into the fringes of conventional medicine.

There were some strong clues with the yeast theory. Eliminating all forms of sugar, and testing myself for food allergies helped to stabilize my situation. Some stool tests and we were convinced that somehow yeast had taken over my body chemistry. My illness gained a focus, it became a pitched battle with chronic yeast infection. The center of my yeast problem was my lower intestine. I became an expert on how to kill those little buggers in my gut, and it helped. My energies increased a little, and my symptoms eased somewhat.

In 1988 Carmen and I decided to marry. We had a life characterized by less than normal energy, and burdened with an onerous picky diet, but we had a life. My Natural Path kicked me out because she couldn't see any way to progress me further. I was now in maintenance mode. Never giving up the desire for a cure, I tried a few more doctors. We found some MD's who would prescribe Nizoral and other prescription yeast killing drugs. A couple rounds of this stuff brought me up another level of health, but still didn't cure me. The only proof I needed of not being cured was to stray from my diet. If I were to have something sweet, I'd be sick again. The drugs are not a long term solution, because they will destroy your liver if you keep taking them. When I went off the drugs my symptoms would slowly ratchet up again.

In 1992 we had our first daughter. By 1994 I had 4 of my largest dental fillings replaced with crowns, and my physical life was stable, the best it had been since 1983. I was not cured, but I was not as desperate as before.

A friend heard a nutritionist speaking on the radio. This expert was talking about chronic yeast infections. She contended there is an underlying cause for people who are unable to shake chronic yeast. I hadn't been able to shake yeast by any method, conventional or unconventional, after 8 years of trying. My attention was riveted. The nutritionist believes that heavy metal poisoning is the culprit. Astonishingly, almost the entire baby boom generation, including me, has been systematically exposed to low levels of one particular heavy metal, mercury.

Mercury is 50% of the material found in silver / mercury amalgam dental fillings.

My mind went back to 1983. My word!, it was my dental fillings that had made me sick!

How I Was Cured of Chronic Fatigue

Today it is July 1996. There are no longer any silver / mercury amalgam dental fillings in my mouth. I have been through 6 chelation treatments. Chelation is a method of extracting mercury from human chemistry.

The measurable mercury in my system is now within normal acceptable limits. At the beginning of 1995 my body mercury levels measured at 4 times the acceptable limit. Who knows what the levels were in 1986, when I was deathly ill?

My vitamin chemistry is in balance, the chronic yeast is gone. I no longer have to treat for yeast. I can eat sweets. Ice cream doesn't ruin me for 3 days anymore. There is no food to which I am sensitive. My weight is back up to 180 pounds.

I feel great!

Sleep is my friend, returning me to the land of the refreshed every morning.

My mind is sharp, and my emotions are stable. I'm finally cured.

I lost 11 of my best years to sickness, but I am not bitter. I am thankful that the next years of my life can be that normal happy life Carmen and I have always desired. We have 2 daughters now, the second one came in 1995. Together, Carmen and I have enough energy to make it all work.

Ironically, the doctor in 1986 was right, it was all in my head, just not the way he was thinking. While my dentist and his colleague were willing to replace all of my fillings, they are skeptical. They and the ADA (American Dental Association) are in strong denial that the mercury in dental fillings has any ill effects on peoples health. Everyone agrees it is well established that high level mercury poisoning exists, and is a serious health problem when it occurs. Somehow, the majority of

the dental industry believes you just can't get any poisoning at all from silver / mercury amalgam dental fillings.

I'm no medical or mercury expert. Based on my experiences, I feel qualified to hypothesize that there is truth on all sides. When the number of amalgam dental fillings is small, and the size of those is not so big, and the fillings are replaced sparsely over a long period of time, a healthy person probably can't accumulate enough mercury to have any symptoms of mercury poisoning.

When there are a number of amalgam dental fillings, they are large, they are drilled out and repacked with fresh amalgam in the shortest amount of time, I know first hand that a person can become quite sick.

My current doctors have speculated that the health of some people is more sensitive to low levels of mercury, this is probably true.

In my case, there is now a very clear before and after story. I have wished for myself to be well for a long time, and have done many things over 8 years to become better, without complete success.

By directing my efforts at removing the silver / mercury amalgam fillings in my teeth, and by going through chelation to remove the accumulation of mercury in my body, I finally have a cure.

What Should You Do?

If you've made it this far, then it's time to talk about you, which is the main reason for me writing.

My story represents what science calls anecdotal evidence. Anecdotal evidence is proof of nothing more than a series of events occurred. There may or may not be any cause and effect relationships between any of the events, it could all be coincidence. At best, anecdotal evidence is a clue, the basis for a hypothesis. A hypothesis requires rigorous, repeatable experimentation to produce true scientific proof. I personally don't have another 11 years to give for producing this kind of proof.

Therefore, my experiences are uniquely mine. I provide them here for you to use as a clue, for you to use as a single reference point in forming a hypothesis about your own health problems.

My experiences may apply to other people who are suffering CFS. My experiences do not necessarily apply to everyone who suffers CFS.

Here are the indicators I suggest looking for in forming your own hypothesis about how low level mercury poisoning may be affecting your health.

- Do you have numerous large, silver / mercury amalgam fillings in your teeth?
- Does your CFS include a sequence of events where dental work involving silver/amalgam fillings precedes the development of symptoms?
- Have you ever worked in a dentist office or dental lab?
- Can you think of any other ways you may have been exposed to mercury?, for example: a broken thermometer? or skin lotion from Mexico? or eating fish from a volcanic or mining area?

If you can answer a definitive no to all of these questions, then my experiences probably don't apply to your health problems.

If the answer to any of these questions is yes or maybe, then it's worth your time and effort to have your mercury levels tested. You may have elevated mercury levels, and may be suffering from low level mercury poisoning.

My wife, family and friends regularly tell me they cannot believe how well I am now, having witnessed how ill I had once been.

May you too find a root cause to your illness and become well soon !