The Patient's Guide
to
Intravenous Nutrition (IV)
A shortcut to faster results and more complete healing

If you suffer from serious illness, chronic symptoms or malabsorption then IV nutrition may be just what the doctor ordered.

What is IV nutrition?

The many benefits of IV nutrition & Its Scientific Basis

How is IV nutrition provided?

Misconceptions regarding intravenous administration of nutrition

Are the effects of IV nutrition permanent?

How does one determine if they would benefit from IV nutrition?

Conditions that may benefit from IV nutrition

Integrated Medicine & Nutrition, P.C.
495 Main Street
Mt. Kisco, New York 10549
Website: www.intmedny.com
Email: drwald@intmedny.com

What is IV (intravenous) nutrition?

Intravenous administration of nutrition and medications is nothing new in standard medicine. Doctors know that the fastest and most reliable way to deliver a desired substance to cells, tissues and organs is to put it directly into a small vein. Sugar, electrolytes, antibiotics and other drugs, vitamins and minerals can reach desired levels in the blood much faster when delivered intravenously as compared to orally. The benefit of nutritional substances depends solely upon the degree to which they reach the cells and tissues in need. The use of intravenous administration is known in medicine to be the most reliable delivery system and for this reason should be combined with intelligently applied and safe nutritional approaches. At present, nutritionally oriented physicians in private medical practice offer the most comprehensive admixture therapies. Hospitals of course deliver admixture therapies but they are most commonly drugs.

Intravenous nutrition provides nutrients directly into the blood stream. People who have difficult symptoms and degenerative diseases should be concerned with optimal delivery of nutrients to their cells – where it counts! If nutrients do not reach the cells, the consequence is that organs, tissues and organ systems will be prevented from healing to their capacity. Although not all symptoms and diseases are caused by nutritional imbalances, most health problems may result in nutritional imbalances by increasing one's nutrient needs or reducing the absorption and/or utilization of nutrients.

"People who have persistent symptoms and degenerative diseases should be concerned with optimal delivery of nutrients to their cells – where it counts! If nutrients do not reach the cells, the consequence is that organs, tissues and organ systems will be prevented from healing to their capacity."

Misconceptions regarding intravenous administration of nutrition

Some physicians are under the mistaken impression that if a multi-million dollar, 5-year, double-blind, placebo controlled FDA study did not prove that a particular nutrient works for a given condition it should not be used or it is unsafe. These same uninformed physician's might even advise their patients not to choose intravenous nutrition because it is unproven by *scientific methods*. Nothing could be farther from the truth.

For example, we know that vitamin C is an important antioxidant, and we know that cancer and heart disease involves accelerated oxidation (degeneration and abnormal cellular formation). Why then should it not be given to virtually every person suffering from these maladies? Also, vitamin C is without serious side effects (the worst of which is diarrhea) with dozens of proven benefits including lowering cancer and heart disease risk and helping to cure these conditions as well.

Hundreds of scientific studies prove that intravenous and intra-muscular injections of nutrients can both prevent and treat a variety of symptoms and degenerative conditions. Those of us who favor alternative medicine and nutrition strongly believe that the great safety of natural medicine behooves health care providers to make these options available to our patients. Moreover, pharmaceutical drugs albeit necessary when all else fails, carry potentially toxic and even deadly effects. Intravenous (IV) or intra-muscular (IM) administration of nutrition is capable of raising the concentration of nutrition available to cells by approximately ten times that which could occur orally. Chronic disease always compromises the digestive capacities of those affected. IV and IM nutrition bypass absorption and utilization blocks at the stomach or intestinal level allowing for large doses to gain access to the circulation. Compared to intravenous or intra-muscular use of medications this route of administration for nutrition is far safer. Few deaths have been reported in the past several decades from the use of IV and IM nutritional products.

Natural substances are time-tested and extensively scientifically proven to enhance the quality of life and reduce disease risk. The use of nutrients and herbs should be the first defense in the prevention and treatment of disease, not the last resort. It is simply no longer acceptable for health care providers to simply dismiss the use of nutritional medicine whether given orally or intravenously.

"The use of nutrients and herbs should be the first defense in the prevention and treatment of disease, not the last resort."

The Benefits of Intravenous Nutrition & Its Scientific Basis

The old adage, "you are what you eat" is wrong. More accurately, "you are what you absorb and the consequences of what you do not". If you have been taking a laundry list of vitamins, minerals, herbs, homeopathic remedies, enzymes and eating a particular diet for a while, and still have persistent symptoms, then it may have occurred to you that you may not be absorbing all of those wonderful nutrients. Intravenous nutrition bypasses the digestive tract and delivers the nutrients directly into the blood stream for more direct access to the organs and tissues in need.

Supplements taken orally may not raise blood levels high enough to affect more serious illness and symptoms for a number of important and well proven reasons:

1. There is a physiologic limit of all oral nutrients. For example, only 35% of oral calcium is absorbed by mouth – regardless of the form of calcium consumed. Beta-carotene has approximately a 25% oral limit; the more one takes orally the less is absorbed. Only 25% of oral vitamin C is absorbed – *regardless of how much you eat or take by vitamin supplement*.

2. Deficiencies of stomach acid (hydrochloric acid and pepsin) and pancreatic enzymes (amylases, lipases, proteases) may inhibit the absorption of a variety of nutrients. For example, most minerals (i.e. iron, zinc and calcium) depend upon adequate levels of stomach acid. Deficiency of pancreatic enzymes can inhibit the proper assimilation and absorption of proteins (by not breaking them down into their constituent amino acids and peptides), fats and carbohydrates. As we age, stomach acid levels decline progressively. The average 50-year-old person has little or no stomach acid left due to the destruction of the stomach's parietal cells that produce hydrochloric acid.

3. Auto-immune conditions such as multiple sclerosis, lupus and rheumatoid arthritis and digestive conditions such as ulcerative colitis, irritable bowel syndrome, Crohn's disease, food allergies, yeast overgrowth and leaky gut syndrome may either reduce one's absorption of nutrients or increase one's needs beyond what diet and oral supplements alone provide. Since hepatitis C is often accompanied by an autoimmune component and/or digestive disturbances, it is fair to assume that many people with HCV are not maximally absorbing nutrients orally.

4. You may have intolerance taking nutritional supplements by mouth. Upon taking them they get "stuck" in your throat; they are regurgitated later; they give you heart burn; you get diarrhea, gas, bloating. Vitamin pills may appear in your stool proving their occasional non-absorbability.

5. The quality and absorbability of oral supplements vary widely based on the manufacturing process, raw materials used, and formulations. Many tablets (not all) are compressed so hard during manufacturing that they cannot be broken down by our digestive tract. Some manufacturers apply extremely high pressure to tablets to extend shelf life. Capsules and liquid supplements tend to be better absorbed, however, just because a nutrient is chelated (a certain form of nutrient complexing) or in a liquid form, does not guarantee superior absorption.

"The old adage, 'you are what you eat' is wrong. More accurately, 'you are what you absorb and the consequences of what you do not.' "

How intravenous nutrition works

Nutritional substances exert their beneficial function in a number of ways, ranging from chemically simple to complex. Fundamentally, nutrients exert some of their physiological effects at the cellular or tissue level. Nutrients are needed for a countless number of important functions relating to the health and maintenance of body tissues. Nutrients must reach the cells and tissues in need to exert their essential benefits. Intravenous nutrition bypasses absorption (or malapsorption) difficulties in the gastrointestinal tract by virtue of direct access to the venous blood supply. Quickly after the intravenous nutrients enter the vein, they are diluted in the blood and rapidly distributed to the target cells; target cells are the tissues in need. Increasingly higher amounts of intravenously administered nutrients can push nutrients into damaged cells raising their concentrations and allowing for healing to take place. The administration of progressively higher and higher levels of nutrients into the blood, and the resultant beneficial effect, is known as mass-action. Ultimately, the higher the concentration of nutrients in the blood, the greater the probability that beneficial results can occur. Most nutrients gain access into cells by latching onto a carrier protein in the blood that literally carries it into the cell. However, when very

high levels of nutrients are achieved in the blood, as is capable through intravenous administration, nutrients may gain direct access into tissues and cells via mass action.

"Ultimately, the higher the concentration of nutrients in the blood, the greater the probability that beneficial results can occur."

How does one determine if they would benefit from IV nutrition?

IV-delivered nutrition is not for everyone. Your alternative medicine physician can determine if you are a good candidate for receiving IV-nutrition based on the following assessment methods:

a. Biochemical tests to determine (as individually as possible) what you really need.
b. A review of your health history and present symptoms.
c. A nutritionally oriented physical examination.
d. A detailed review of your health goals to determine what nutrients you will receive in the context of a dietary and lifestyle program. *For IV-nutrients to be most effective, they are best delivered in addition to improvements in diet and lifestyle modification.*

How is IV nutrition provided?

Once it is determined that someone would benefit from IV nutrition, the doctor creates a formula to be given intravenously. The doctor or nurse mixes each nutrient into an IV-bag. We have all seen hospital T.V show's where a patient has a pole next to the bed with a bag hanging from it and something (generally a drug) is being delivered directly into a vein. The IV-bag contains fluid such as Ringer's Lactate or Sterile Water. The nurse or doctor uses a butterfly needle to enter the vein (the most common small needle used to draw blood from children because it causes no pain), and attaches the needle to a tube that delivers nutrients from the IV-bag. The person receiving the IV-nutrition sits comfortably in a reclining chair either reading a book, watching a video or sleeping while the nutrients do their job. The typical nutrient IV "drip" takes between 45 minutes to 1½ hours to complete. Depending upon one's needs, a series of several IV's is generally recommended to achieve the best results.

Are the effects of IV-nutrition permanent?

The immediate and ultimate effects of IV-nutrition vary from individual

to individual. It is not uncommon for one receiving IV-nutrition to experience greater energy, reduce pain and alleviation or elimination of symptoms. Others experience no improvements in overall symptoms until many IV treatments are received. The effects of IV-nutrition can be compared to those of exercise; the overall benefits of exercise are not always realized during the performance of the exercise. Benefits of anaerobic or aerobic exercise occur during rest and sleep. Likewise, the benefits of IV-nutrition occur because the cells of the body are exposed to 100% of the nutrition in the IV. Some of the nutrients stay in the body only hours while others for years. Like cumulative exercise, the effects of IV-nutrition are cumulative over time. Like each individual workout, each IV-infusion produces benefits on top of the previous infusion – enhancing health benefits exponentially.

"The effects of IV-nutrition are cumulative over time."

Not all IV-nutrition is the same

In a hospital setting, it is not likely for an IV to be administered to a patient with much more than the medication alone added to the IV-bag. Some exceptions to this are the use of IV magnesium for treating acute episodes of hypertension, and the administration of IV potassium to pregnant women suffering from severe vomiting and dehydration. Although magnesium has years of proven safety and reliability, it's use has taken a back seat to prescription medications. These common examples demonstrate that standard medicine's IV-nutrition approach is not only limited, but also incomplete. Magnesium, for example, works better when taken along with vitamin B6; B6 in turn works best when given with vitamins B1, B2, B3 and B5 – all together as nature intended. The complementary medicine approach when administering IV nutrition is to provide a full complement of all or most nutritional factors that the person needs for the correction of their immediate symptoms, but also for the person's overall health.

A basic nutritional IV includes a minimum of the vitamins and minerals listed in Table 1 below. This provides a broad-spectrum foundation of nutritional support for general health.

Table 1: Common nutritional (Myers) cocktail

Ascorbic acid (vitamin C)
Magnesium
Calcium
Vitamin B5
Vitamin B6
Multivitamin complex with all B-vitamins
Multimineral complex with all major minerals
Note: One's health care provider may determine that certain nutrients are not appropriate for your health needs. In fact, IV nutritional mixtures and dosages may vary greatly from patient to patient.

The exact amounts of each of the above nutrients are carefully based on the factors found in table 2.

Table 2: Assessments utilized for determining Intravenous Nutrition Dosages

Immediate health complaints and symptoms
Personal history of health complaints and symptoms
Family history of health complaints (genetic tendencies)
The immediate and long-term health goals of the patient
Health conditions which may eliminate or add certain nutrients to an IV
Education and experience of the individual health care provider
Seriousness of the disease of the patient
Levels of physical activity (exercise) of the patient
The overall state of the diet (generally healthy or not)

Additional vitamins, minerals, herbs, and/or amino acids may be added to the basic IV cocktail to address and treat the person's individual health concern. For instance, ginkgo biloba, an herb used for centuries in many cultures, is effective for alleviating acute exaccerbations of multiple sclerosis. Glycerrhetic acid (derived from licorice) enhances the effects of chemotherapy and is a potent antiviral for hepatitis C and HIV-infected patients. Table 3 summarizes the uses of certain nutrients and nutritional factors for a variety of symptoms and health conditions. Keep in mind that dosages are adjusted for each individual based on his/her unique needs.

Table 3: Examples of nutrients used for selected health conditions

Glycyrrhizin (from licorice) for certain types of HIV infection in treatment and delay of onset of symptoms
Glycerretic acid (from Licorice) for all forms of hepatitis especially hepatitis C
Ginkgo biloba for cerebral ishemia (lack of blood flow to the brain)
Ginkgo biloba for improving atopic skin problems (anti-inflammatory)
Ginkgo biloba for reducing idiopathic cyclic edema (swelling of extremities)
Thymostimulin (from thymus) for improving immunity in gastrointestinal cancer
Copper for rheumatoid arthritis
Colloidal sulphur for arthritis
Echinacea for improving immunity in gastrointestinal cancer
Echinacea for stimulating the immune response with hepatocellular (liver) carcinomas
Echinacea for increasing the aggressiveness of cellular immunity and natural killer cells
Selenium for candida albicans infections (yeast)
Vitamin B12 and folic acid (a B-vitamin) for viral hepatitis
Vitamin B12 for aphthous stomatitis
Vitamin B12 for pain and neuropathy
Vitamin B12 for trigeminal neuralgia (facial nerve pain)
Vitamin B12 for neuropsychiatric disorders
Vitamin B12 for psoriasis
Vitamin B12 and seborrheic dermatitis
Vitamin B12 for fibromyalgia
Calcium therapy for the treatment of alcoholism
Calcium for allergic rhinitis
B-complex vitamins for immunodeficiency
Vitamin B3 (nicotinic acid) for allergies
Vitamin B1 (thiamin) and vitamin C for open-angle glaucoma
Vitamin B1 for inflammatory and degenerative diseases of the central nervous system
Vitamin B3 and vitamin B1 for multiple sclerosis
Vitamin B6 for paralysis agitans
Ascorbic acid (vitamin C) for viral hepatitis
Ascorbic acid and its curative action upon neurologic toxicity of MSG (monosodium glutamate)
Ascorbic acid for hepatitis
Ascorbic acid for certain cellular and humoral immune functions in normal people
Ascorbic acid and duodenal ulcers
Glycerin-sodium ascorbate for lowering intraocular pressure
Vitamin B5 (pantothenic acid) for certain anemia's
Vitamin B6 (the active form called pyridoxyl-5-phosphate) for inhibiting blood coagulation (sticking) and platelet function (involved in blood clotting)
Vitamin B6 and Parkinson's Disease
Vitamin B6 and vitamin B1 in disorders of the nervous system
Vitamin E for neuromuscular disease
Vitamin E for diseases of the skin
Glucosamine sulfate for arthritis

Magnesium for ischemic heart disease and acute myocardial infarction
Magnesium for hypertension
Magnesium for relieving migraine
Magnesium for angina (chest pain)
Magnesium for asthmatic paroxysm and acute asthma
Thymostimulin (from thymus) for stimulating the immune response with hepatocellular carcinomas
Thiophosphoric acid to stimulate lymphocyes (a type of white blood cell)
Thiophosphoric acid as an immunostimulant in patients with various carcinomas (cancers)
Ukrain (thiophosphoric acid) for terminal cancer and enhancing immunity
Lentinan as an anti-tumor and anti-metatasis (cancer spread) factor

Conditions that may benefit from IV nutrition

Not all of one's symptoms and disease states are caused by nutritional imbalances (either deficiencies, excesses or improper ratios). However, it is true to say that disease may increase one's nutritional requirements. Nutritional problems, whether a *result* of or a *cause* of disease, impact one's health. Intravenous nutrition is a reasonable step towards correcting nutritional problems that have taken years to develop. Think about it – how can one expect to repair years of long-standing nutritional imbalances when oral absorption of nutrients is limited to 50%-60%? This limited level of nutrition may meet minimum daily requirements (RDA's), but is certainly not optimal for disease prevention and treatment. Intravenously administered nutrition allows for much more rapid nutritional delivery and correction. Below is a small list of conditions that may benefit from intravenous nutrition:

"Nutritional problems, whether the a result of or cause of disease, impact one's health."

Table 4: Conditions Potentially Benefiting From Intravenous Nutrition (this list is not complete)

Allergies	Depression	Infertility (male)	Psoriasis
AIDS/HIV	Diabetes	Insomni	Rheum. Art.
Anxiety	Eczema	IBS	Scleroderma
Asthma	Fibroids	Lupus	Others.
Attention Deficit Disorder	Food allergies	Lyme Disease	
Cancer	Hepatitis	Migraine headaches	
Candida	High blood pressure	Multiple Sclerosis	
Cerebrovascular Disease	Hypoglycemia	Osteoarthritis	
Cholesterol, elevated	Infections	Parkinson's Disease	
Constipation	Infertility (female)	Prostate Disease	

Table 5: Comparison Between Oral Supplementation and IV/IM-Nutrition

Oral Supplementation	Intravenous Administration
Limited by normal absorption rates (avg. 30%) and ability	Absorption is rapid and 100%
Often dozens of different nutrients must be taken by mouth	Most nutrients may be added into the IV
May cause heart burn (gastric reflux)	Does not cause reflux
May cause esophagus/gastric burning	Does not cause esophagus/gastric burning
May cause diarrhea	Does not cause diarrhea
May require large amounts of water to flush down	Fluid is given intravenously
Absorption limited by stomach acid deficiencies	Absorption not dependent on stomach acid
Absorption limited by pancreatic enzyme deficiencies	Absorption not dependent on pancreatic enz
Absorption limited by large intestine inflammation	Absorption not limited by large intestinal infla
Therapeutic (high) doses for serious disease often not reached	Therapeutic doses can be reached
May never reach the cells/tissues in greatest need	Better chance of reaching the cells/tissues
Absorption may be limited by other foods consumed	Not limited by dietary intake
Absorption may be limited by certain medications	Not limited by the intake of medications
High blood levels may not be reached in certain conditions (see table I above)	High blood levels are easily reached and maintained
Certain diseases are not amenable to oral supplements (i.e. cancer of the esophagus, stomach, pancreas etc.)	Useful in all disease conditions
Inferior quality manufacturing	Only pure quality is utilized for IV
Inferior raw materials used to make the supplements	Only high quality materials are used
May be pre-formulated prior to use (i.e. multivitamin)	Formulated by the physician specifically for each person's unique needs.

Note: The purpose of Table 5 above is not to minimize the essentiality of foods and oral supplementation. On the contrary, oral intake of foods and supplements is by far the most ideal and practical way to maintain and replete nutrition. However, for those with conditions which are not amenable to consuming very large quantities of foods and oral supplements, the benefits of intravenous administrtion are unique and warranted.

Medical and Nutrition References

The medical and nutritional references below represent only a small sample of the extensive body of literature supporting the use of vitamins, minerals, enzymes, herbs, amino acids and other nutritional and food supplements for a variety of conditions. The layperson or health care provider can search in a medical library or contact the author of the article if so desired.

References

1. Mori K et al. Effects of glycyrrhizin (SNMC: Stronger Neo-Minophagen C) in hemophilia patients with HIV-1 infection. *Tohoku J Exp Med* 162(2):183-93, 1990).
2. Martinez G et al. Effect of the alkaloid derivative Ukrain in AIDS patients with Kaposi's sarcoma. *Int Cogress AIDS* 9(1): 401 (abstract no.I PO-B12-1596), 1993).
3. Kochi M et al. Antitumor activity of a benzaldehyde derivative. *Cancer Treat Rep* 69(5):533-7,1985
4. Lersch C et al. (Simulation of immunocompetent cells in patients with gastrointestinal tumors during an experimental therapy with low dose cyclophosphamide, thymostimulin, and Echinacea purpurea extract (Echinacin). *Tumordiagen Ther* 13:115-20, 1992)(German).
5. Ikegami N et al. Prophylactic effect of long-term oral administration of glycyrrhizin on AIDS development of asymptomatic patients. Int Conf AIDS 9(1):234(abstract no. PO-A25-0596), 1993).
6. Reaction of local myocardial blood flow in non-anesthetized dogs and anesthetized cats to oral and parenteral application of a Crataegus cats to oral and parenteral application of a Crataegus fraction (Oligomere procyanidines). *Arzneim Forsch* 27(7):1407-9,1977) (in German).
7. Tatsumura T et al. Antitumor effect of 4,6-benzylidene-D-glucose in clinical studies. Meeting abstract. *Proc Annu Meet Am Soc Clin Oncol* 6:A559, 1987).
8. Kochi M et al. Antitumor activity of a benzaldehyde derivative. *Cancer Treat Rep* 69(5):533-7, 1985).
9. Lersch C et al. (Simulation of immunocompetent cells in patients with gastrointestinal tumors during an experimental therapy with low dose cyclophosphamide, thymostimulin, and Echinacea purpurea extract (Echinacin). *Tumordiagen Ther* 13:115-20, 1992)(in German)
10. Lersch E et al. Stimulation of immune response in outpatients with hepatocellular carcinomas by low doses of cyclophosphamide (LDCY), Echinacea purpurea extracts (Echinacin) and thymostimulin. *Arch Geschwulstforsch* 60(5):379-83, 1990)(in German) – IV and IM study
11. Lohninger A Hamler F. Chelidonium Majus L.(Ukrain) in the treatment of cancer patients. *Drugs Exp Clin Res* 18 Suppl:73-7, 1992).
12. Staniszewski A et al. Lymphocyte subsets in patients with lung cancer treated with thiophosphoric acid alkaloid derivatives from Chelidonium Majus L. (Ukrain). *Drugs Exp Clin Res* 18 Suppl:63-7, 1992).
13. Nowicky JW et al. Evaluation of thiophosphoric acid alkaloid derivatives from Chelidonium Majus L. ("Ukrain") as an immunostimulant in patients with various carcinomas. *Drugs Exp Clin Res* 17(2):139-43, 1991).
14. Musianowycz J et al. Clinical studies of Ukrain in terminal cancer patients (phase II). *Drugs Exp Clin Res* 18 Suppl:45-50, 1992.
15. Nowicky JW et al. Ukrain both as an anti cancer and immunoregulatory agent. *Drugs Exp Clin Res 18 Suppl*:51-4, 1992
16. Danilos J et al. Preliminary studies on the effect of Ukrain (Tris(2-(5bS-5ba,6b,12ba)-5b,6,7,12b,13,14 hexahydro-13methyl(1,3) benzodioxolo(5,5-v)-1-3- dioxolo(4,5-l)phenala thridinium-6-ol-Ethaneaminyl)Phosphinesulfide.6HCL) on the immunological response in patients with malignant tumors. *Drugs Exp Clin Res* 18 Suppl:55-62, 1992
17. Pengsaa P et al. The effects of thiophosphoric acid (Ukrain) on cervical cancer, stage IB bulky. *Drugs Exp Clin Res* 18 Suppl: 69-72, 1992
18. Nowicky J et al. Biological activity of ukrain in vitro and in vivo. *Chemioterapia* 6(2Suppl):683 5, 1987

19. Spinnewyn B et al. (Effects of ginko biloba extract on a cerebral ishemia model in gerbils.) *Presse Med* 15 (31):1511-15, 1986)(in French)
20. Markey AC et al. Platelet activating factor-induced clinical and histopathologic responses in atopic skin and their modification by the platelet activating factor antagonist BN52063. *J Am Acad Dermatol* 23(2):263-8, 1990).
21. Chilhara G et al. Antitumor and metastasis-inhibitory activities of lentinan as an immunomodulator: An overview. *Cancer Detect Prev* suppl 1:423-43, 1987).
22. Brochet B et al. (Pilot study of ginkgolide B, a PAF-acether specific inhibitor in the treatment of acute outbreaks of multiple sclerosis.) Rev Neurol (Paris) 148(4):299-301, 1992)(in French).
23. Mose J. Effect of echinacin on phagocytosis and natural killer cells. *Med Welt* 34:1463-7,1983).
24. Vogel VG. Phase I pharmacology and toxicity study of glcyrrhetinic acid as a chemopreventative drug. *Proc Annu Meet Am Assoc Cancer Res* 33:A1245, 1992).
25. Sasaki S et al. Studies on the mechanism of action of asiaticoside (Madecasol) on experimental granulation tissue and cultured fibroblasts and its clinical application granulation tissue and cultured fibroblasts and its clinical application in systemic fibroblasts and its clinical applic tion in systemic scleroderma. *Acta Diabetol Lat* 52:141-50, 1972; (Medecassol) on fibroblasts, granulomas, and Sasaki S et al. Experimental and clinical effects of asiaticoside scler derma. *Jap J Clin Dermatol* 25:585-93, 1971).
26. Lagrue G et al. Idiopathic cyclic edema. The role of capillary hyperpermeability and its correction by Ginkgo biloba extract. *Presse Med* 15 (31):1550-3, 1986).
27. Boyne R, Arthur JR. The response of selenium-deficient mice to candida albicans infection. *J Nutr* 116(5):816-22, 1986).
28. Jain ASC, Mukerji DP. Observations on the therapeutic value of intravenous B12 in infective hepatitis. *J Indian Med Assoc* 35:502-5, 1960).
29. Campbell RE, Pruitt FW. Vitamin B12 in the treatment of viral hepatitis. *Am J Med Sci* 224:252, 1952).
30. Campbell RE, Pruitt FW. The effect of vitamin B12 and folic acid in the treatment of viral hepatitis. *Am J Med Sci* 229:8-15, 1955).
31. Cathcart, RF III. The method of determining proper doses of vitamin C for the treatment of disease by titrating to bowel tolerance. *J Orthomol Psychiatry* 10:125-32, 1981).
32. Baur H, Staub H. Treatment of hepatitis with infusions of ascorbic acid: comparison with other therapies. Abstract. *JAMA* 156(5):565, 1954).
33. Ahmad K, jahan K. Studies on the preventive and curative action of ascorbic acid on the neurological toxicity of monosodium glutamate. *Food Nutr Bul* 7(1):51-3, 1985).
34. McCurdy PR. Is there an anemia responsive to pantothenic acid? *J Am Geriatr Soc* 21(2):88-91, 1973).
35. Hoffman HN et al. Zinc-induced copper deficiency. *Gastroenterology* 94:508-12, 1988).
36. Palopoli J, Waxman J. recurrent aphthous stomatitis and vitamin B12 deficiency. *South med j* 83:475-77, 1990).
37. Wray D et al. Nutritional deficiencies in recurrent aphthae. *J Oral Panthol* 7(6):418-23, 1978).
38. O'Brien CC. Experimental evidence in the treatment of alchoholism by intensive calcium therapy. *J Am osteopath Assoc* 51(8):393-94, 428, 1952.
39. Dainow I. Recherches cliniques sur certaines proprietes anti-allergiques de la nicotinamide. Z Vitaminforsch 15:245-50, 1944).
40. Kamimura M. Antiinflammatory activity of vitamin E. *J Vitaminol* 18(4)204-9, 1972).
41. Bachert C et al. (Decreased reactivity in allergic rhinitis after intravenous application of calcium. A study on the alteration of local airway resistance after nasal allergen provocation.) *Arzneimmittelforsch* 40:984-7, 1990).
42. Wright J. Littleton K. Defects in sulphur metabolism. *Int Clin Nutr Rev* 9(3):118-19, 1989).
43. Hoffman HN et al. Zinc-Induced copper deficiency. *Gastroenterology* 94:508-12, 1988).
44. Palopoli J, Waxman J. Recurrent aphthous stomatitis and vitamin B12 deficiency. *Sout Med J* (83:475-77, 1990).
45. Wray D et al. Nutritional deficiencies in recurrent aphthae. *J Oral Pathol* 7(6):418-23, 1978).
46. Subbarao K et al. Pyridoxal 5-phosphate a new physiological inhibitor of blood coagulation and platelet function. *Biochem Pharmacol* 28:531-34, 1979).
47. Rasmussen HS et al. Magnesium deficiency in patients with ischemic heart disease with and without acute myocardial infarction uncovered by intravenous loading test. *Arch Intern Med* 148:329-32, 1988).
48. Prielipp RC et al. Magnesium inhibits the hypertensive but not the cardiotonic actions of low dose epinephrine. *Anesthesiology* 74:973-9, 1991).
49. Teo K et al. Effect of intravenous magnesium on mortality in myocardial infarction. *Circulation* 82:III-393, 1990).
50. Cohen L, Kitzes R. Magnesium sulfate in the treatment of variant angina. *Magnesium* 3:46-49, 1984).
51. Maisel FE, somkin E. Treatment of asthmatic paroxysm with nicotinic acid. *J Allergy* 13:397-403, 1942).
52. Green SM, rothrock SG. Intravenous magnesium for acute asthma: failure to decrease emergency treatment duration or need for hospitalization. *Ann Emerg Med* 21(3):260-5, 1992).
53. Shapiro S, Spitzer JM. The use of Cepevit (ascorbic acid plus "p" factors) in drug-induced hypoprothrombinemia. Angiology 5:64-71, 1954).
54. Asregadoo ER. Blood levels of thiamine and ascorbic acid in chronic open-angle glaucoma. *An Opthalmol* 11(7):1095-1100, 1979).
55. Bietti GB. Further contributions on the value of osmotic substances as means to reduce intraocular pressure. Trans *Opthalmol Soc* Aust 26:61-71, 1967:1502-8, 1967).
56. Shen T-M, Yu M-C. Clinical evaluation of glycerin-sodium ascorbate solution in lowering intraocular pressure. *Chin Med J* 1:64-68, 1975).
57. Wright JV. Magnesium can relieve migraine (and other magnesium-related matters). *AAEM Newsletter*, Winter, 1989, p.14).
58. Jain ASC, Mukerji DP. Observations on the therapeutic value of intravenous B12 in infective hepatitis. *Alchol Alcholism* 22(1):15, 1987).
59. Campbell RE, Pruitt FW. Vitamin B12 in the treatment of viral hepatitis. *Am J Med Sci* 224:252, 1952).
60. Cathcart, RF III. The method of determining proper doses of vitamin C for the treatment of disease by titrating to bowel tolerance. *J Orthomol Psychiatry* 10:125-32, 1981).
61. Baur H, Staub H. Treatment of hepatitis with infusions of ascorbic acid: Comparison with other therapies. Abstract. *JAMA* 156(5):565, 1954).
62. S. harvey Sklar, M.D. – reported in CFS Forum 2(3), April 15, 1989).
63. Kurashige S et al. Effect of vitamin B complex on the immunodeficiency produced by surgery of gastric cancer patients. *Jpn J Exp Med* 58(4):197-202, 1988).
64. Anderson R et al. The effects of increasing weekly doses of ascorbate on certain cellular and humoral immune functions in normal volunteers. *Am J clin Nutr* 33(1):71-76, 1980).
65. Hanck A, Weiser H. Analgesic and anti-inflammatory properties of vitamins. *Int J Vitam Nutr Res* (suppl) 27:189-206, 1985).
66. Dainow I. Recherches cliniques sur certaines proprietes anti-allergiques de la nicotinamide. *Z Vitaminforsh* 15:245-50, 1944).
67. Stern EL. The intraspinal injection of vitamin B1 for the relief of intractable pain, and for inflammatory and degenerative diseases of the central nervous system. *Am J Surg* 34:495, 1938).
68. Moore MT. Treatment of multiple sclerosis with nicotinic acid and vitamin B1. *Arch Intern Med* 65:18, 1940).
69. Spies TD et al.. some recent advances in vitamin therapy. *JAMA* 115(4):292-97, 1940).
70. Bean BB et al. An effect of vitamin B12 on pain in nutritional neuropathy. *Am J Med Sci* 220:431-4, 1950).

71. Dettori AG, Ponari O. Effetto antalgico della cobamamide in corso di neuropatie periferiche di diversa etiopatogenesi. *Minerva Med* 64:1077-82, 1973).
72. Surtees SJ, Hughes RR. Treatment of trigeminal neuralgia with vitamin B12. *Lancet* 1:439-41, 1954). 73. Alexander E. Davis CH Jr. Trigeminal neuralgia: Conservative management with massive vitamin B12 therapy. *N Carolina Med J* 14:206-07, 1953).
74. Fields WS, Hoff HE. Relief of pain in trigeminal neuralgia by crystalline vitamin B12. *Neurology* 2:131-39, 1952).
75. Baker AB. Treatment of paralysis agitans with vitamin B6 (pyridoxine hydrochloride). *JAMA* 116:2484-7, 1941).
76. Spies TD et al. Some recent advances in vitamin therapy. *JAMA* 115(4):292-97, 1940).
77. Lindenbaum J et al. Neuropsychiatric disorders caused by cobalamin deficiency in the absence of anemia or macrocytosis. *N Engl J Med* 318:1720-28, 1988).
78. Sokol RJ Et al. Improved neurologic function after long-term correction of vitamin E deficiency in children with chronic cholestasis. *N Engl J Med* 313(25):1580-86, 1985).
79. Guggenheim MA et al. Progressive neuromuscular disease in children with chronic cholestosis and vitamin E Deficiency: Diagnosis and treatment with alpha tocopherol. *J Pediatr* 100(1):51-58, 1982).
80. D'Ambrosio E et al. Glucosamine sulphate: A controlled clinical investigation in arthrosis. Pharmatherapeutica 2(8):504-08, 1981; Crolle G, D'Este E. Glucosamine sulfate for the management of arthrosis: A controlled clinical investigation. *Curr Med Res Opin* 7(2):104-09, 1980).
81. Berg PA et al. Bovine cartilage and marrow extract. Letter. *Lancet* 1:1275, 1989).
82. Rejholec V. Long-term studies of antiosteroarthritic drugs: An assessment. *Semin Arth Rheum* 17:2:Suppl 1:35-53, 1987).
83. Lopes Vas A. estudo aberto, controlado, com um complexo glicosaminoglicano peptido naartrose da articulacao do joelho. *Reumatol Med Int* 20:24, 1986).
84. Dorn R, Kluge F. Effects of Arumalon in the treatment of cox- and gonarthrosis – an ambulatory 2-year trial. EULAR Symposium, Vienna, 1985, abstr. 163).
85. Siegmeth W, Radi I. Vergleich von Glykosaminoglykanpolysulfat (Arteparon) und physiologischer Kochsalzlosung bei Arthrosen grosser Gelenke. Ergebnisse einer multizentrichen Dopelblindstudie. *Zscr Rheumatol* 42:223-28, 1983).
86. Ishikawa K et al. Clinical evaluation of the intrarticular injection of glycosaminoglycan polysulfate for osteoarthrosis of the knee joint. A multi-centric double-blind controlled study. *Zschr Orthop* 120:708-16, 1982).
87. Anderson IF. Intramuskulare Behandlung der Arthrose des Kniegelenks mit Arteparon (Doppelblind Versuch). *Akt Rheumatol* 7:164-66, 1982).Wagenhauser FJ. Die medikamentose Basisbehandlung der Arthrosen. Forbidungkurse Rheumatol 5:75-80, 1978).
88. Hanck A, Weiser H. Analgesic and anti-inflamatory properties of vitamins. *Int J vitam Nutr Res* (suppl)27:189-206, 1985).
89. Birkmayer W et al. Nicotinamidadenindinucleotide (NADH: the new approach in the therapy of Parkinson's disease. *An Clin lab Sci* 19:38-43, 1989).
90. Vainshtok AB. (Treatment of parkinsonism with large doses of vitamin B6) *Soy Med* (7):14-9)(in Russian).
91. Baker AB. Treatment of paralysis agitans with vitamin B6 (pyridoxine hydrochloride). *JAMA* 116:2484-7, 1941).
92. Zeligs MA. Use of pyridoxine hydrochloride (vitamin B6) in parkinsonism. *JAMA* 116:2148, 1941).
93. Stone S. Pyridoxine and thiamine therapy in disorders of the nervous system. *Dis Nerv Sys* 11(5):131-8, 1950).
94. Ochsner A. Preventing and treating venous thrombosis. *Postgrad Med* 44(1):91-95, 1968).
95. Jelnes R et al. Improvement of subcutaneous nutritional blood flow in the forefoot of hydroxyethylrutosides in patients with arterial insufficiency: Case studies. Angiology 37(3 Pt 1):198-202, 1986).
96. Carslaw RW, Neil J. vitamin B12 in psoriasis. Letter. *Br Med J.* 1:611, 1963).
97. Cohen EL. Vitamin B12 in psoriasis. Letter. *Br Med J* 1:125, 1963).
98. Eisinger j et al. Donnees actulles sur les fibromyalgies: traitement des fibromyalgies primitives par la cocarboxylase. *Lyon Mediterannee Med* 24:11585-86, 1988; Eisinger J. cocarboxylase et fibromyalgies, un rendezvous manque. *Lyon Mediterranee Med* 23:11526, 1987).
99. Sorenson JR, Hangarter W. Treatment of rheumatoid and degenerative diseases with copper complexes: A review with emphasis on copper-salicylate. *Inflammation* 2(3):217-38, 1977).
100. Fifty years of gold in rheumatoid arthritis. *Br Med J* 1:289-90, 1979).
101. Woldenberg SC. The treatment of arthritis with colloidal sulphur. J South med Assoc 28:875 81, 1935; See Also: Neligan AR, Salt HB. Sulphur in rheumatoid arthritis. *Lancet* 2:209, 1934).
102. Andrews GC et al. Seborrheic dermatitis: Supplemental treatment with vitamin B12. *NY State Med J* 50:1921-25, 1950).
103. Block MT. Vitamin E in the treatment of diseases of the skin. *Clin Med* January 1953, pp. 31-34).
104. Debray C et al. (Treatment of gastro-duodenal ulcers with large doses of ascorbic acid.) *Semaine Therapeutique* (Paris) 44:393-8, 1968).
105. Aprahamian M et al. *Am J clin Nutr* 578-89, 1985).