



130 Palmetto Street, Ste. 320
 Brooklyn, NY 11221
 Tel. 718 573-8123
www.newyorkbuyersclub.org

Using this Guide

Welcome to the New York Buyers' Club Catalog and Treatment Guide. This Catalog is designed to act as a guide to and database of nutritional supplements and alternative therapies available through our community-based co-op. And e-version is also available where we have utilized many interactive features to make information about our entire stock as accessible as possible (check out the .pdf version online at www.newyorkbuyersclub.org).

With this guide and your input to future guides, we all can begin to put the pieces together and build bridges toward greater wellbeing.

Table of Contents

I. Multivitamins & Minerals	
Added Protection <i>no iron</i> (AMNI)	7
Added Protection (AMNI)	8
Custom Multivitamin <i>no iron</i> (NYBC)	8
Custom Multivitamin (NYBC)	8
Multi 1-3 <i>no iron</i> (Jarrow)	9
INDIVIDUAL VITAMINS:	
Vitamin A	
Carotenoid Complex UltraAntioxidant (NYBC)	9
Vitamin B Complex/Choline Inositol	
Super B Complex (Allergy Research Group)	10
Vitamin B1	
Allithiamine (Ecological Formulas)	10
Vitamin B5	
B5 - Pantethine (Jarrow)	10
Vitamin B12 and Folic Acid	
B12 Methylcobalamin 1,000 mcg (Jarrow)	11
Vitamin C	
C, mineral ascorbates Ultra Antioxidant (NYBC)	12
Esterol (ARG)	12
Vitamin E	
E-400 (Jarrow)	12
Famil-E (Jarrow)	12

MINERALS:	
Mineral combinations	
Mineral Balance, no iron (Jarrow)	13
Lithium	
Lithium orotate (Advanced Research)	13
Magnesium	
Magnesium malate (Source Naturals)	14
Selenium	
Optisel (AMNI)	14
Sulfur	
MSM powder (NYBC)	14
Zinc	
OptiZinc (AMNI)	15
II. Amino Acids and Protein Powders	
Arginine	
Arginine (Jarrow)	16
Carnitine	
Acetylcarnitine, capsules (NYBC)	16
Carnitine, elemental (Jarrow)	17
Glutamine	
Glutamine, capsules (NYBC)	17

Glutamine, bulk powder (NYBC)	17
Glutathione (GSH)	
Glutathione, caps (Jarrow).	18
Lysine	
Lysine 500 (Jarrow)	18
NAC (N-acetylcysteine)	
ACC akut 600 effervescent NAC (Hexal)	19
NAC 500 mg (NYBC)	19
THIOLNAC (see Other Micronutrients, Alpha Lipoic Acid)	
Protein Powders	
Designer Protein (Next Nutrition)	20
Nutrivir (BioNexus)	20
Ultimate Balance Whey (Ultimate Balance)	21
Whey (Jarrow)	21
III. Other Antioxidants/Micronutrients, Fatty Acids	
Alpha Lipoic Acid	
Lipoic Acid (NYBC)	23
THIOLNAC (NYBC)	23
Bioflavonoids	
Phytoflavonoid Complex (NYBC)	23
CoEnzyme Q10 (CoQ10)	
CoEnzyme Q10, 30 mg (NYBC)	24
CoQ10 QSorb (Jarrow)	24
Essential Fatty Acids/"Good" Fats	
Borage Oil (Jarrow)	
Essential Balance (Jarrow)	
Evening Primrose Oil (Jarrow)	25
Evening Primrose Oil, Super (Jarrow)	25
Flaxseed Oil (Jarrow)	25
Max DHA (Jarrow)	25
IV. Botanicals and Blends	
Algae	
Yaeyama Chlorella (Jarrow)	26
Astragalus	
Astragalus (Murdock Madaus)	26
Bacopa	
<i>Bacopa monniera</i> (NYBC)	26
Bitter Melon	
Bitter Melon, capsules (Tai He)	26
Botanical Blends	
Glucose Optimizer (Jarrow)	27
Green Magma (Green Foods)	27
Kidney UT (MMS Pro)	27
ProGreens (Nutricology/ARG)	27
Triphala (NYBC)	28

Butcher's Broom	
Butcher's Broom (NYBC)	28
Chinese Herb Blends (see also Zhang)	
Clear Heat (Health Concerns)	28
Coptis Purge Fire (Health Concerns)	28
Digest Ease (Pacific BioLogic)	28
Ecliptex (Health Concerns)	29
Enhance (Health Concerns)	29
Marrow Plus (Health Concerns)	29
Quiet Digestion (Health Concerns)	29
Resist (Pacific BioLogic)	29
Coleus forskohlii	
Coleus forskohlii (NYBC)	29
Curcumin (Turmeric; <i>Curcuma longa</i>)	
Curcumin (Jarrow).	30
Elderberry	
Elderberry, liquid (Cardiovascular Research)	30
Eleuthero (formerly "Siberian ginseng")	
CM4 (Omega)	31
Flu Guard (see SPV-30)	-
Garlic (<i>Allium sativum</i>)	
Allicin (Tai He)	32
Glycyrrhizin (licorice extract, <i>Glycyrrhiza glabra</i>)	
Glycyrrhizinate Forte (Jarrow)	32
Liver Support	
Hepato-C (Pacific BioLogic)	32
Hepato-Detox (Pacific BioLogic).	33
Stimuliv (Ayurved Formulas/Jarrow)	33
Milk Thistle (Silymarin)	
Silymarin 80% (Jarrow)	33
Olive (<i>Olea europaea</i>)	
Whole Bulk Olive Leaf (San Francisco Herb Co.)	33
Policosanols	
Policosanols (Source Naturals)	34
Rhodiola rosea	
Rosavin (Ameriden)	34
Saw Palmetto (see also Prostate Support)	
Saw Palmetto (Jarrow)	35
Ultra Saw Palmetto (Jarrow)	35
Siberian Ginseng (see Eleuthero)	-
Silymarin (see Milk Thistle)	-

SPV-30	
Flu Guard/SPV-30, boxwood (Health from Sun)	35
<i>Terminalia arjuna</i>	
<i>Terminalia arjuna</i> (NYBC)	35
V. Zoological Substances	
Adrenal Cortex	
Adrenal Cortex (ARG)	35
Colostrum	
Colostrum Specific (Jarrow)	35
DHEA (Dehydroepiandrosterone)	
7-Keto DHEA (Source Naturals)	36
Thymus	
Thymus (ARG)	36
VI. Other Special Substances	
Acidophilus/Bifidus	
Bifidus Balance (Jarrow)	37
JarroDophilus+FOS caps (Jarrow)	37
JarroDophilus+FOS EPS (Jarrow)	37
Beta 1,3-glucan	
Beta-1,3-glucan Max (Chisolm)	37
Creatine	
Creatine Monohydrate, bulk powder (NYBC)	38
Digestive Enzymes	
Plant Ultra Enzymes (NYBC)	38
Glucosamine/Chondroitin	
Glucosamine/Chondroitin (Jarrow)	39
N-Acetyl-glucosamine (NAG) (Jarrow)	39
NADH	
NADH (Enada)	39
Saccharomyces Boulardii	
Florastor (Biocodex)	40
TMG (Trimethylglycine)	
TMG (Jarrow)	40
VIII. Miscellaneous	
<i>Healing HIV</i> (book) by Jon Kaiser, MD	40
Bags, ziploc (Northland)	40
NYBC T Shirts (NYBC)	40

Treatment Catalog and Guide

Introduction

The material contained in this catalog is designed to inform you about therapies from many sources and traditions that may be useful for people with chronic medical conditions, particularly HIV/AIDS and hepatitis. Be advised that the statements made herein have not been evaluated by the FDA and that these products are not intended to diagnose, treat, cure or prevent any disease. If you have or suspect you have a medical condition, or plan to start any dietary or exercise program, please seek the advice of a qualified healthcare professional first. Do not consult this catalog unless you agree not to hold NYBC liable for any errors or omissions. NYBC does not assume any responsibility or liability for any adverse effects or consequences resulting from the sale or use of any product provided by NYBC or described in any of NYBC's informational materials.

The data reviewed below were compiled by human beings, from published material, or, occasionally, personal communications accompanied by documented blood work. NYBC does not recommend self-diagnosis or self-medication and continues to advocate for serious studies of supplements. However, we see it as our current obligation to review to the best of our abilities all relevant and worthwhile information, from whatever source in the world, about nutritional supplements and how they may sustain or improve health. NYBC supports the evaluation of these products through clinical trials and hopes to see the FDA establish reasonable guidelines for rapid (and not financially burdensome) evaluation of health claims for dietary supplements. Encouragingly, in recent years there has been an increased attention to and clinical evaluation of dietary supplements in the United States, but this work is only beginning!

This first edition of the New York Buyers' Club Catalog and Treatment Guide builds upon an earlier effort that was developed by many contributors associated with our predecessor organization, DAAIR (Direct Access Alternative Information Resources). While NYBC includes fewer items than were featured in the DAAIR catalog, we have focused on the supplements that have shown the best evidence of safety and efficacy. Of course, many interventions lack extensive data support, so our basis for choosing them is rooted in more limited information than we'd like. Our selection of supplements and our suggestions for using them also derive from lived experience and community involvement, and we strongly encourage your participation in this ongoing effort of cooperative learning and education. For example, you're welcome to participate in treatment discussions through our "forum" pages on our website, newyorkbuyersclub.org, where you'll also find references to many other resources.

This Catalog and Treatment Guide is a living document and will continue to be updated. We seek to provide the best information available to help you in making informed treatment choices with the latest data about efficacy, limitations, risks, drug interactions—plus the shared experiences of people using these options. In the procurement of the supplements we feature, we endeavor to obtain products from reputable companies whose products are what they say they are (identity), have the quantities that the label claims (potency), and are of high quality without unnecessary additives or contaminants (purity). These are critical issues in the supplement industry, and since our own well-being and that of our clients depends on these factors, we will continue to make monitoring and assessing supplement quality one of our most important tasks as a buyers' club.

About the New York Buyers' Club

The **New York Buyers' Club** is a not-for-profit, membership-based organization that provides alternative treatment information and therapies for people with chronic illnesses, including HIV/AIDS and hepatitis. Founded in 2004, NYBC has been fortunate in having the collaboration of many former staffers, volunteers, and members of its predecessor DAAIR (Direct Access Alternative Information Resources). As a result, NYBC staff and advisors have much experience with nutritional supplements and their use by people with HIV/AIDS, hepatitis, and other chronic conditions. By providing a low-cost source of important nutrients, a community-oriented buyers' club can make a wonderful difference in the lives of people facing the challenges of chronic illness.

Knowledge = Power

We believe that well-researched information is as important as the quality of nutritional supplements themselves. For that reason, we have developed a library of educational literature accessible on the web and in print. In addition to the catalog

you're about to read, we have a variety of publications that focus on treatment and wellness strategies for people living with HIV/AIDS, hepatitis, and other chronic conditions. These are available in PDF-printable form on our web site.

Affordability

Because we know from experience that managing chronic illness holistically can be costly, our priority is to make high-quality nutritional supplements and botanicals as accessible as possible. We are able to keep our prices low for several reasons: Our not-for-profit status allows us to offset our expenses with tax-deductible donations. Also, we have worked with respected nutrition companies to carefully develop many of our own formulas and individual nutrients and botanicals, and to negotiate very low prices.

Membership

NYBC is a membership-based organization, and we rely on membership dues to help us keep prices low. To make our services available to the broadest range of people, NYBC's annual membership fees are on a sliding scale based on household income, and range from only \$5 to \$25 and up. You may become a member by mail, or by visiting our web site.

Donations

NYBC also welcomes donations, which are fully taxdeductible. You can make a donation online or by mail (see form attached to this catalog). You will receive an acknowledgment including information about our nonprofit status. Please contact us if you wish to donate office supplies, reference materials, etc. We appreciate your help!

Participate

If you'd like to learn more about NYBC activities, we invite you to attend our monthly meetings. Just call or email for time and place. For those who live outside of NYC, we welcome your support, including in-kind donations (check with us first to see what's needed), and of course any comments or suggestions you have to offer.

Treatment Guide and Product Descriptions

In the brief product descriptions below, NYBC has made every effort to assure that each entry is balanced with what we know, what remains uncertain, and any possible risks. For many treatments, more detailed information sheets are available from NYBC. These documents are available in print or on our website, www.newyorkbuyersclub.org.

The following references are cited often in the catalog, and so are referred to simply by name ("Grieve," "Huang," etc.):

German Commission E, a series of monographs produced by the German government that cover a great deal of information on botanical medications.

Hsu, HY. *Chinese Materia Medica*, Oriental Healing Arts Institute, Taiwan, ROC:1986

Huang, KC. *Pharmacology of Chinese Herbs*, CRC Press, Boca Raton, FL:1999.

Grieve, M. *A Modern Herbal* (orig. 1931), Dover Books, New York, NY:1982

Nadkarni, AK. *Indian Materia Medica*, Popular Prakashan, Bombay, India:revised, 1976.

Supplements and People with HIV: Multivitamins and Beyond

Research has shown that PWHIV use up significantly more nutrients and energy fighting chronic viral infection than HIV-negative persons. There is a well-documented depletion of several nutrients, even early in HIV infection, and evidence strongly suggests that supplementing to alleviate these deficiencies can slow disease progression and ease some symptoms. By more advanced stages of HIV, several groups of researchers report that nearly every major nutrient is deficient, and some, like the carotenoids, selenium, vitamin B12, and sulfur amino acids, are extremely low. Other antioxidant defense systems are impaired in many PWHIV, represented by a low level of glutathione. (Glutathione is a tripeptide, or three-part chain of amino acids, and its deficiency has been linked to declining immune function and more rapid disease progression.) Low glutathione levels have been observed in almost everyone with HIV infection, including children.

Researchers from The University of Miami Medical School report that nutrient deficiencies begin early in asymptomatic stages of HIV infection and can directly influence both the functioning of the immune system and the rate of disease progression. They, and other researchers both here and abroad, have documented that correcting such deficiencies as beta carotene, B6, B12, zinc, magnesium and selenium actually resulted in T cell

increases and/or stabilization of immune function.

A number of other studies also point to a clear benefit from early and sustained use of dietary supplements. In a UCLA study Abrams et al. noted that "almost one third of the 296 HIV-positive participants maintaining strict diet and vitamin treatments, were protected from the onset of AIDS over the course of six years." Those who took daily multivitamin supplements were noted to have an average decline of about 30% in the rate of progression to AIDS.

A Johns Hopkins Medical Institution study of 281 HIV positive men taking supplements for up to 6.8 years found a 40 to 48 percent reduction in the rate of progression to AIDS. According to senior author Neil Graham, "data suggest that micronutrient intake needs to be sustained for at least two years and started early in the infection to be most effective." Thus an early start and consistent use of nutritional supplements seems to offer the most benefit to PWHIV.

In 2004, two pivotal studies underscored the importance of a multivitamin in holding back some effects of HIV. One study, conducted in Thailand, showed significantly reduced death rates (mortality) and fewer opportunistic infections among people with low CD4 counts when they regularly took a multivitamin. A separate study in Tanzania confirmed the benefits of using a multivitamin among pregnant women with HIV. Both studies were large and well-controlled.

Studies like these serve as a powerful rationale that everyone with HIV should take a good multivitamin, which can have a substantial impact in slowing disease progression!

Research has also detailed early and progressive immune dysfunction found along the digestive tract (known to be a primary site of HIV infection in many PWHIV), allowing for bacterial, fungal and other microbial infections which, along with other co-factors, worsen nutrient malabsorption. Compensating for this malabsorption is also a benefit of taking a good multivitamin, and provides another reason why vitamin and mineral supplementation should be a cornerstone of any HIV treatment plan.

Along with microorganism-related malabsorption problems, PWHIV also have high levels of strongly inflammatory immune messengers (cytokines) in their blood which generate large amounts of free radicals. These are known to severely disrupt fat metabolism and create malabsorption. These cytokines (known as tumor necrosis factor—TNF, interferon alpha, and interleukins 1 and 6, among others) are also found along the intestinal tract in increased amounts even early in HIV disease and may account for the early malabsorption seen in PWHIV. This is not surprising in light of the fact that nearly 90% of the virus is found in the gut-associated lymphoid tissue

(GALT). Malabsorption is also worsened by the severe body-wide deficiencies in sulfur amino acids, including the cells along the intestinal tract, which would normally act as coenzymes facilitating absorption of many nutrients.

These issues of malabsorption and inflammation motivate some further recommendations, spelled out below, for supplementation with antioxidants and other anti-inflammatory agents.

In 2001, the National Institutes of Health (NIH) released new guidelines for when to start antiretroviral therapy (ARV). In contrast to the earlier and bizarre notion of "hit hard, hit early," they have recognized that people simply cannot sustain the long-term toxic effects of ARV and don't benefit clinically by starting too early. Now the NIH notes that people should consider starting ARV when T-cells are around 350. (The recommendations are a bit more nuanced than that: one has to take into account how fast T cells are declining, the viral load and other issues.)

Those on antiretroviral therapy frequently encounter side effects of their medications, sometimes minor, sometimes so debilitating or difficult to manage that they are forced to abandon ARV for periods of time. As the side effects of HAART were studied through the 1990s and into the new decade, they were recognized as a major new challenge for PWHIV. However, at the same time, in a promising development, studies were being undertaken on nutritional supplements as a means of managing and preventing side effects, including such syndromes as increased cholesterol, neuropathy, pancreatitis, lactic acidosis, and other dangerous and debilitating toxicities. In some cases, as will be explained in detail below, nutritional supplements can play an effective role in reducing or controlling the side effects of ARV.

To repeat our main points: nutritional supplements can be an important means of slowing disease progression, thus delaying the need for ARV therapy as long as possible. Secondly, since most people will eventually require ARV, it is critical that they have the means to help prevent or manage the serious side effects ARV therapy can cause—side effects that have been known to disrupt people's adherence to their regimens. Here again, we believe that nutritional supplements have a significant role to play.

An important note: A recent study evaluated how much of the antibiotic, levofloxacin, got into the blood of healthy volunteers who simply consumed a fortified cereal (with or without calcium-fortified orange juice). Some of the participants got no food (fasting). They noted that there was a reduced amount of antibiotic in the blood of those taking the fortified foods. So if you are on an antibiotic or other drug that requires no food, DO NOT take your multivitamin or other supplement with a minerals in it at the same time! (See *J Clin Pharmacol.* 2003 Sep;43(9):990-995.)

MULTIVITAMINS

Added Protection III Without Iron (AMNI) Each bottle, 180 tabs, a 30 day supply. This superior, highly bioavailable formula, with cutting-edge mineral delivery forms by Albion Laboratories, supplies over 30 basic vitamins, minerals, trace elements and other nutrients, including beta carotene, vitamin K and boron. Added Protection III is unique in that the vitamins are coated to separate them from minerals that can oxidize and weaken them (seen sometimes as black spots on tablets). Beta carotene gives the tablets their pink color. Added Protection III can be taken in up to six separate doses per day if one desires; tablets are documented to disintegrate within 30 minutes following digestion. The minerals found in this multivitamin are chelated forms that are the most bioavailable (easily absorbed) in the industry, according to some studies. (Chelation means that the mineral is embedded in amino acids, in this case, between two glycine molecules.) The dosages of the minerals are also designed to provide optimal quantities but not too much, since too much may be toxic. In addition, the chelated (and other forms) are designed to limit side effects experienced by sensitive individuals. If you experience any stomach problems, nausea, diarrhea or constipation once starting this regimen, you may be experiencing a reaction to this formulation and should stop to see if the problem clears up. Recommended dose: 6 tabs/day (2-3x/day—or more often—with food). Store in a cool, dry place, away from light.

Note that an iron-free multi is probably best for PWHIV, especially if there is liver impairment, such as hepatitis C infection, or if you are on the more liver-toxic antiretrovirals such as nevirapine (Viramune) or ritonavir (Norvir). Iron can be problematic and is not needed for most adult men. While many people with HIV become anemic, this is RARELY due to iron deficiency. Moreover, anyone with liver disease should probably avoid iron supplementation, trying to assure enough is obtained through food instead. (However, menstruating women often need extra iron to offset what is lost through the loss of blood.)

B Complex vitamins:

Vitamin B1 (thiamine mononitrate)	100 mg
Vitamin B2 (riboflavin)	50 mg
Niacin (a form of Vitamin B3)	40 mg
Niacinamide (a form of Vitamin B3)	150 mg
Pantothenic Acid (B5, d-calcium form)	400 mg
Vitamin B6 (pyridoxine HCl)	50 mg
Folic acid	800 mcg
Vitamin B12 (on ion exchange resin)	100 mcg
Biotin	300 mcg
Choline (bitartrate)	150 mg

Other Vitamins:

Vitamin A (palmitate, water soluble)	10,000 IU
Beta Carotene (added Vitamin A activity)	5,000 IU
Vitamin C (ascorbic acid, corn-free)	1200 mg
Vitamin D-3 (fish liver oil)	200 IU
Vitamin E (d-alpha tocopheryl succinate)	400 IU

Vitamin K-1 (phytonadione) 60 mcg

Minerals:

Calcium (citrate ascorbate) 500 mg
Magnesium (aspartate-ascorbate complex) 500 mg
Potassium (aspartate-ascorbate complex) 99 mg
Copper (amino acid chelate) 2 mg
Manganese (aspartate-ascorbate complex) 20 mg
Zinc (amino acid chelate) 30 mg
Iodine (kelp) 150 mcg
Chromium GTF (bioactive ChromeMate form) 200 mcg
Selenium (amino acid complex) 200 mcg
Molybdenum (amino acid chelate) 150 mcg
Vanadyl sulfate (vanadium amino acid chelate) 200 mcg
Boron (aspartate-citrate) 2 mg

Other Ingredients:

PABA (para-aminobenzoic acid) 50 mg
Inositol (B-complex growth factor) 50 mg
Bioflavonoids (from citrus fruit) 100 mg
Methionine (DL-form, amino acid) 62.5 mg
Cysteine (L-form, amino acid) 250 mg

Added Protection III with Iron (AMNI) Each bottle, 180 tabs, a 30 day supply. This product is identical to the preceding, but also contains Iron (carbonyl) 20 mg.

WARNING: Accidental overdose of iron-containing products is a leading cause of fatal poisoning in children under the age of 6. KEEP OUT OF THE REACH OF CHILDREN. In case of accidental overdose, call a doctor or poison control center immediately.

Custom Multivitamin without Iron (NYBC) Each bottle, 270 tabs, a 30-day supply. This sophisticated formula was designed specifically for PWHIVs and those with other inflammatory conditions and is a 9 tablet per day multivitamin. It contains a substantial 2,900 mg of biological sulfur called OptiMSM (a patented form from Cardinal Nutrition). Sulfur loss in HIV infection can be extremely severe, totalling 7 or more grams per day. This loss is mostly in the form of the sulfur amino acid cysteine. MSM has been shown in both laboratory animals and in humans to be converted into several sulfur amino acids, including cysteine, as well as another deficient sulfur amino acid, methionine. Supplementing with MSM may be yet another mechanism for reversing the extreme sulfur losses that figure as a major factor in immune dysregulation and HIV progression. Our Custom Multi also has higher amounts of B vitamins, including a full 1,000 mcg of B12, as methylcobalamin in its most bioavailable form. Significant B12 deficiency is very common, even in early HIV infection. PWHIV's who are B12 deficient have been shown to progress to AIDS much more rapidly than those who were not B12 deficient. Finally, it has a substantial 400 mcg of selenium in a highly bioavailable form. This critical micronutrient has significant therapeutic value even when PWHIVs do not show any deficiency. This may be because selenium provides powerful antioxidant protection to the body through the selenium-containing enzyme glutathione peroxidase. It is considered one of the most crucial of all nutrients for the maintenance of immune competence,

because it allows for greater distribution of nutrients throughout the day.

Note that the minerals found in this multivitamin are chelated forms, which are the most bioavailable (easily absorbed) in the industry, according to some studies.

Recommended dose: 9 tabs/day (3 taken 3 times per day, with food). Store cool, dry, away from light. Each NINE tablets provide:

Vitamin A (33% (7,500 IU) from fish liver oil and 67% (15,000 IU) as natural carotenes (alpha, beta, cryptoxanthin, zeaxanthin and lutein) from *D. salina*) 22,500 IU
Vitamin C (as calcium ascorbate and magnesium/potassium ascorbate complex) 1,200 mg
Vitamin D3 (from fish liver oil) 400 IU
Vitamin E (as d-alpha tocopherol succinate plus mixed tocopherols) 400 IU
Vitamin K1 (as phytonadione) 60 mcg
Vitamin B1 (as thiamin hydrochloride USP) 200 mg
Riboflavin USP 150 mg
Niacin (75% as niacinamide USP and 25% as niacin USP) 200 mg
Vitamin B6 (as pyridoxine hydrochloride USP) 100 mg
Folic Acid (50% as folic Acid and 50% as 5-methyltetrahydrofolate) 800 mcg
Vitamin B12 (as methylcobolamin) 1,000 mcg
Biotin USP 500 mcg
Pantothenic Acid (as d-calcium pantothenate USP) 400 mg

Minerals
Calcium (76% as calcium citrate-malate and 24% as calcium ascorbate) 500 mg
Iodine (from kelp) 150 mcg
Magnesium (75% as magnesium aspartate/ascorbate complex and 25% magnesium amino acid chelate) 600 mg
Zinc (as zinc amino acid chelate) 20 mg
Selenium (as selenium amino acid complex) 400 mcg
Copper (as copper amino acid chelate) 2 mg
Manganese (as manganese amino acid chelate) 10 mg
Chromium (as chromium polynicotinate) .200 mcg
Molybdenum (as molybdenum/amino acid chelate) 150 mcg
Potassium (as potassium aspartate complex) 99 mg
Boron (as boron aspartate/citrate) 2 mg
Vanadium (as bis-glycinato oxovanadium) 100 mcg
Choline (as choline bitartrate) 150 mg
Inositol 50 mg
PABA (para-aminobenzoic acid USP) 50 mg
Methylsulfonylmethane (MSM) 2,900 mg

Other Ingredients: carboxymethylcellulose sodium, cellulose, silicon dioxide, vegetable stearine, gum ghatti, magnesium stearate, natural tangerine flavor and cellulose coating.

Custom Multivitamin with Iron (NYBC) Each bottle, 270 tabs, a 30-day supply. Same as above, but with Iron (as Iron Amino Acid Chelate) 20 mg, and therefore **not**

recommended for most PWHIVs and for those with liver impairment.

WARNING: Accidental overdose of iron-containing products is a leading cause of fatal poisoning in children under the age of 6. KEEP OUT OF THE REACH OF CHILDREN. In case of accidental overdose, call a doctor or poison control center immediately.

Multi 1-3 (Jarrow) Not only does this formula contain the highly bioavailable forms of these nutrients, but it is iron-free, odorless, and high in antioxidants. Each bottle, 100 tablets. Each THREE tablets contains:

Fat Soluble Vitamins:

Beta Carotene (18,750 IU)	11 mg
Vitamin A (palmitate)	5,000 IU
Vitamin D-3 (cholecalciferol)	400 IU
Vitamin E (d-alpha tocopheryl succinate)	237 IU

Water Soluble Vitamins:

Vitamin C (calcium ascorbate)	500 mg
B1 (thiamine)	50 mg
B2 (riboflavin)	50 mg
B3 (niacin)	50 mg
B3 (niacinamide)	50 mg
B5 (d-calcium pantothenate)	100 mg
B6 (pyridoxine HCl)	50 mg
B12	100 mcg
Folic acid	400 mcg
Biotin	300 mcg
Choline (from choline bitartrate)	48 mg
Inositol	100 mg

Botanicals:

Odor-modified garlic (Pur-Gar)	450 mg
Horsetail herb extract 4:1 (silica)	20 mg
Grape Skin Extract	300 mg
Rosemary Antioxidant	110 mg

Mineral Balance Capsules (Three white capsules):

Calcium (as hydroxyapatite)	500 mg
Calcium from bovine hydroxyapatite)	400 mg
Calcium from calcium ascorbate	100 mg
Magnesium (as oxide)	300 mg
Potassium (as chloride)	99 mg
Zinc (as monomethionate)	15 mg
Copper (as gluconate)	2 mg
Iodine (from kelp)	225 mcg
Manganese (as citrate)	5 mg
Selenium (as l-selenomethionine, sodium selenate 50/50)	100 mcg
Chromium (from nicotinate-citrate complexed to niacin)	100 mcg
Molybdenum (sodium molybdate)	200 mcg

SINGLE VITAMINS

Vitamin A, Beta Carotene and Carotenoids

Beta carotene is a water-soluble precursor of the fat-soluble vitamin A. There is a documented severe deficiency of the carotenoids (the family which includes beta carotene and other substances like xanthophylls, lutein, leucopene, etc.) in a significant number of PWHIV. Beta carotene is important to membrane integrity (protecting the outer layer of all cells) and thymus production. Some small studies have shown improvement in immune function in those

given beta carotene, while other research has documented deficiencies in people with HIV at all stages of infection. Some studies have also shown small increases in CD4 counts using beta carotene supplements while others showed improvements in natural killer (NK) immune cell numbers. However, the studies are conflicting and don't always show benefit when beta carotene is used alone, even at high dosages.

Vitamin A, along with vitamins D, E and K, is fat-soluble, and therefore poorly absorbed in PWHIV. It may also be toxic in high doses, in some people more than others, causing headaches, blurred vision, nausea and hair loss. Beta carotene is happily devoid of such toxicities, even at high doses. Several studies, including one at Yale University, indicated that very high doses of beta carotene (100,000–198,000 IU), particularly in advanced HIV infection, may increase CD4 cells. Subsequent data have not borne out the promise of beta carotene, particularly when used alone. But this finding probably only underscores the need to take an array of antioxidants, rather than just a single substance, when attempting to balance the reduction/oxidation reactions that occur with HIV, hepatitis C and other chronic infections. (Reduction and oxidation are chemical reactions involving the exchange of electrons. These are reactions that must be in balance in the body to avoid disruptions and damage. When there is too much oxidation, damage to cells and their component parts occurs. Unfortunately, HIV and HCV act as catalysts that increase oxidation, causing body-wide damage, from the gut to the lymph nodes to the brain.)

Most studies have shown that beta carotene alone didn't prevent HIV being transmitted from a mother to her unborn baby—but a multivitamin had a statistically significant benefit. Thus, while beta carotene—and the family of carotenoids—has an important antioxidant effect, it's probably most useful in context with all the other vitamins and minerals. Relying on individual antioxidants for a disrupted system is unlikely to be as effective as a more comprehensive protocol. We will add that there is a need for more research on carotenoids, since most studies looked at just beta carotene, and there are many members in the carotenoid family that possess interesting antioxidant capacities.

Beta carotene is non-toxic except for diabetics and those with advanced liver impairment. One should watch the palms and if an orange color develops, reduce the dose. Studies suggesting no benefit in very heavy smokers underline the necessity of quitting smoking!

Carotenoid Complex Ultra Antioxidant (NYBC) Each bottle, 90 capsules, consisting of a wide range of carotenoid compounds including alpha and beta carotene, lutein, lycopene, etc., derived from natural vegetable sources including broccoli, spinach, tomato, etc. This sophisticated formula was designed for PWHIV and others with chronic inflammatory conditions. It is meant to be part of a

comprehensive protocol for managing inflammation and the body-wide damage caused by excessive free radicals and oxidative stress. The sources of carotenoids include three distinct forms of sea algae, palm oil, tomatoes, marigolds, among others. This formula contains clinically significant amounts of a variety of carotenoids; the amounts of both lutein and lycopene, for example, are identical to amounts used successfully in research studies.

Astaxanthin is supplied in its correct natural form derived from Hawaiian sea microalgae at a 1.5 mg dose. Most studies, though, have looked at doses of 40 mg. One study determined that it is better absorbed with fat (*Eur J Pharm Sci.* 2003 Jul;19(4):299-304). There are also substantial amounts of other patented natural mixed carotenoids. Finally, the formula includes 5 mg of sulforaphane, not a carotenoid, but an extremely potent stimulator of the Phase II detoxification system as well as an initiator of several other antioxidant enzymes, making it one of the most potent free radical neutralizers yet studied. New varieties of carotenoids are constantly being discovered, so this should NOT replace a diet rich in colorful foods, but should be used to supplement your diet. Eat your fruits and vegetables—and lots of them! Specifically, each capsule contains:

Vitamin A as CaroCare beta carotene	13,600 IU
Lutein (Floraglo, marigolds)	6 mg
Zeaxanthin	300 mcg
Lycopene (as Lyc-O-Mato)	5 mg
Caromix standardized mixed carotenoids	17 mg
Astaxanthin (from LeHaye USA)	510 mcg
Gamma carotene	90 mcg
Astaxanthin Complex	1.5 mg
Broccoli Extract 0.5% (yielding 5 mg sulforaphane)	1,000 mg

Vitamin B Complex

Along with a multivitamin and an antioxidant complex, a good B-complex is another essential core nutrient for PWHIVs. It has been established that several B vitamins (especially B6 and B12) are required in greater quantities than the Recommended Daily Amount for PWHIVs. Moreover, the B-vitamins, along with vitamin C, are water soluble and easily excreted by the body in a short period of time, so one should continuously re-supply them by taking these supplements regularly.

Several B vitamins depleted in HIV disease (notably B2/riboflavin, B6, B12) exercise critical functions in the body. B2 is used up by the increased production of several key antioxidant enzyme systems inside of cells, which utilize scarce sulfur amino acids to protect against abnormally high levels of oxidative stress and also act as coenzymes for the recycling of many other antioxidants. B6, responsible for the conversion of amino acids into various more complex protein complexes, is depleted by the over-production of antibodies (proteins), which is a common immune over-activation trait in HIV infection. And finally, in PWHIVs, B12 may lack enough

sulfur-based amino acids in order to be absorbed into the intestinal tract.

All three of these B vitamins are also critical to immune function in other ways, acting as coenzymes in many other cellular reactions. In addition, the B vitamins (particularly riboflavin and B1, thiamine) are a crucial component to offset the sub-clinical increases in lactic acid that, in more severe cases, can become the potentially fatal condition, lactic acidosis. This condition is one of the elements of the so-called *lipodystrophy syndrome* that can occur with a long-term regimen of HIV antiretroviral drugs. We'll also note that vitamin B3 (niacin), if used with care, can be helpful in lowering elevated LDL cholesterol, triglycerides and improving the "good" HDL cholesterol count. Thiamine (vitamin B1) can also play a useful role for PWHIVs, helping to metabolize carbohydrates, maintain appetite and normal digestion and promote nervous tissue function.

Super B Complex (ARG) Each bottle, 120 capsules. Store in refrigerator, dry, unfrozen. One capsule of Super B Complex provides:

Vitamin B1 (thiamine HCl)	25 mg
Vitamin B2 (riboflavin-5'-phosphate)	25 mg
Vitamin B-3 (niacinamide)	75 mg
Pantothenic acid (calcium pantothenate)	125 mg
Vitamin B6 (pyridoxine HCl)	50 mg
Vitamin B6 (pyridoxal-5'-phosphate)	1.5 mg
PABA (para-aminobenzoic acid)	50 mg
Inositol (B-complex growth factor)	50 mg
Choline bitartrate (many biological functions)	125 mg
Biotin	100 mcg
Cyanocobalamin (Vitamin B12)	100 mcg
Folic acid	200 mcg

Vitamin B1 (Thiamine)

Thiamine is important for carbohydrate metabolism; maintaining normal digestion and appetite and is essential for nervous tissue function. It is found in many foods, especially whole-grain cereals, peas, beans, peanuts, oranges, brewer's yeast. It is very safe: in one German study, they used 320 mg/day for treating neuropathy.

Allithiamine (Ecological Formulas) Each bottle, 60 capsules. Each capsule, 50 mg of a fat-soluble source of vitamin B1 (thiamine tetrahydrofurfuryldisulphide or "TTFD") and other nutritional co-factors found in garlic. Water-soluble thiamine is not absorbed as well. According to the manufacturers, the fat-solubility improves tissue absorption. May be a superior form for preventing or minimizing neuropathy. *Suggested use is two per day. While supplies last!*

Vitamin B5 (Pantothenic acid)

Pantethine is the reactive component of coenzyme A as well as acyl-carrier protein. These proteins are involved in the regulation of carbohydrate, lipid and amino acid metabolism. Various studies have shown that pantethine

may help lower blood fats, particularly cholesterol. Pantethine is the oxidized form of vitamin B5 (pantothenic acid), which is a critical component of the "Kreb's cycle" (also known as the tricarboxylic acid or TCA cycle). This is the set of chemical reactions occurring as cells produce the energy molecule ATP and involves a variety of enzymes and reactions. Coenzyme A is important as a cofactor in many enzymatic pathways, including ones involved with fatty acid oxidation, carbohydrate metabolism, pyruvate degradation, amino acid catabolism and so on. Small human studies have shown benefit for reducing triglycerides (*Minerva Med.* 1991 Oct;82(10):657-663). In mice made artificially obese, pantethine "lowered food intake and mean body weight, insulin and glucose levels and decreased the content of triglycerides, total cholesterol and cholesterol esters in serum and adipose tissue" (*Exp Toxicol Pathol.* 2001 Oct;53(5):393-398).

Pantethine (Jarrow) Each bottle, 90 softgels. Each gelcap, 300 mg of pantethine. Softgel consists of gelatin, glycerin, water, natural annatto and carob as a light barrier. *Suggested use is 300 mg (1 capsule) taken three times per day.*

Vitamin B12

Vitamin B12 is an important and commonly deficient nutrient with multiple quality-of-life effects. **Research at Johns Hopkins showed an 89% increased risk of developing AIDS in those PWHIVs most deficient of B12. Correlations with deficiencies of vitamins A and E were also observed.** B12 deficiency can be a significant underlying factor in many symptoms, including fatigue and neurological complications (memory loss, confusion, depression, slowed mental reactions, peripheral neuropathy [numbness, "pins and needles", particularly in extremities, or muscle weakness])—all common problems in HIV infection at varying stages of the disease.

Unfortunately, the standard blood tests for B12 deficiency are often inaccurate, and depletion in the tissues can occur over a year before blood levels show a significant decline. It may take over 8 weeks to replenish depleted B12 levels, so be patient; symptoms may take time to show improvement. You may want to ask your health care provider for weekly or twice-weekly shots of B12 between 1,000–2,000 mcg for up to 10 weeks to restore normal levels. If you notice acne developing (or worsening), cut back the dose

There is a definite connection between the sulfur amino acids and some of the B vitamins, so you might want to try taking NAC or glutathione with B12.

If you are using AZT, B12 may very well help prevent or alleviate the occurrence of anemia and bone marrow toxicity, especially if you aggressively supplement.

B12, Methylcobalamin (Jarrow) Each bottle, 100 lozenges. Each lozenge, 1,000 mcg of this superior form of vitamin B12. Studies do appear to support the notion that this is the best form of B12. It has been studied in diabetic neuropathy and shown to produce modest improvements. It may also help the body's production of its own melatonin and has been suggested as a therapy in alleviating Seasonal Affective Disorder. It also acts as a methyl donor, particularly for turning homocysteine into methionine, which may be helpful in reducing cardiovascular disease. If it donates methyl groups to NF- κ B (nuclear factor kappa B, needed in HIV replication), it may also have some effect on inhibiting HIV production in infected cells. A combination of this form of B12 with SAME and folic acid may provide a more effective punch, according to one hypothesis. (*Med Hypotheses*, 1993 Feb;40(2):93-94). *Suggested use is 1 lozenge two to three times a day.*

Vitamin C

Vitamin C is another critical nutrient that should be in any HIV protocol. It's an antioxidant and highly efficient free radical scavenger, and also has antiviral, antibacterial and antifungal properties. Vitamin C reactivates key antioxidants, particularly vitamin E, beta carotene, and glutathione, via the *redox process*. (This process involves neutralizing free radicals that are behind the damage caused in inflammation.) Because it's rapidly used in biological processes, it's best to replenish it frequently by taking it on a regular basis.

Vitamin C may be in the reduced (ascorbic acid) or oxidized (ascorbate) forms. It may be found as ascorbic acid or complexed to calcium, sodium or other minerals as ascorbates. The mineral and esterified forms of ascorbate are advantageous because they are absorbed by the body more quickly, and are buffered so as to be less acidic and thus more easily tolerated by the stomach and kidneys than ascorbic acid (and also result in less urinary excretion of oxalates). However, PWHIV may have *low* stomach acid, so taking acidic supplements, like ascorbic acid, and NAC, with your food, may help offset this problem and allow for better digestion. Laboratory studies by Jonathan Wright, MD, found that esterified vitamin C was absorbed into white blood cells at double the level of ascorbate (granular vitamin C mixed with minerals) and quadruple the level of ascorbic acid (pure vitamin C). Whether these *in vitro* results translate into living humans is not known.

We'll mention that the Vitamin C Foundation states that ascorbic acid is the only worthwhile vitamin C and everything else is just marketing nonsense. They claim there is no convincing evidence to support superior bioavailability of the other forms that would justify their higher cost. In particular, on their website, www.vitaminfoundation.org, they quote vitamin C guru, Robert Cathcart, III, MD as arguing that ascorbic acid, since it carries 2 extra electrons, is a much superior free

radical scavenger in comparison to mineral ascorbates—and therefore much more effective in reactivating antioxidants.

Balancing the Vitamin C Foundation point of view, we must add that ingesting ascorbic acid powder can lead to tooth decay, never a good idea to begin with and especially bad for people whose continued good health depends so much on good nutrition and good eating habits.

Note that tissue saturation, or "bowel tolerance," is the level of vitamin C intake just below that which causes diarrhea; this is when the optimal antioxidant levels are reached. Increase the dose gradually over a few days. Then, when diarrhea occurs, cut back to and maintain the dose taken the day before diarrhea occurred.

WARNING: Never suddenly stop high doses of vitamin C (above 5 grams per day) but instead reduce gradually over an extended period.

C, Mineral Ascorbates (NYBC) Each bottle, 180 tablets. *Suggested use is 3 or more sustained release tablets per day with food.* Each tablet contains:

Vitamin C (as mineral ascorbates)	790 mg
Elemental calcium (from ascorbate)	150 mg
Elemental magnesium (from ascorbate)	50 mg
Elemental zinc (from ascorbate)	5 mg
Elemental potassium (from ascorbate)	0.5 mg

Esterol (Allergy Research Group) Each bottle, 200 tablets. Each tablet contains 675 mg of ester C polyascorbate, 75 mg of calcium polyascorbate, 50 mg of rutin, 25 mg of quercetin, and 2.5 mg of grape seed proanthocyanidins (antioxidant compounds which are also found in high concentrations in blueberries). *Suggested use is 1-3 per day.*

Vitamin E

REMEMBER: Do not take extra vitamin E if using the protease inhibitor drug, amprenavir (Agenerase). The newer drug, fosamprenavir (Lexiva) does NOT have this problem, fortunately.

This is a fat-soluble vitamin that works best with the mineral selenium. It is a powerful antioxidant and helps to maintain the integrity of the membranes that surround cells. In addition, it has indirect activity against HIV. Vitamin E belongs to a class of antivirals which, in the laboratory, inhibit a section of the virus called the Long Terminal Repeat (LTR) which is basically the viral "on/off switch." It is also helpful with Hepatitis C. Research has shown that, like the other antioxidants, vitamin E is synergistic (works together in a more powerful manner) with other antioxidants. In particular it is recycled (returned to a state of being able to control free radicals) inside of the cell by glutathione. Glutathione, in turn, is reactivated by vitamin C. This is why it is important to take a balanced combination of antioxidant substances for the greatest effect.

In 2004, a review of various studies was undertaken (called a *meta analysis*) which suggested a very slight increased risk of cancer in people taking more than 400 IU of vitamin E. First, this finding is uncertain at best. Yet it has been trumpeted as an established risk by the mainstream media. However, as with giving beta carotene alone, it is not surprising that by adding just ONE antioxidant into the mix that are needed to maintain a balance, you throw off the rest of the system. And, as with beta carotene, Vitamin E is just one member of a class of substances (called tocopherols). Thus, it is probably prudent to use a mix of vitamins and minerals as one finds in a multivitamin rather than rely upon single agents like vitamin E, especially in the context of a chronic infection.

If you are taking AZT, Vitamin E is particularly important for reducing bone marrow toxicity. Laboratory research at Tulane University revealed that vitamin E may potentiate the effectiveness of AZT and reduce AZT's toxicity.

E-400 (Jarrow) Each bottle, 250 softgels. Each softgel, 400 IU of vitamin E (d-alpha tocopherol) derived from soy bean oil. Other ingredients include gelatin, glycerin and water. *Suggested use is 1 cap per day with a meal or as directed.*

WARNING: People with hemophilia or low platelet counts should ONLY supplement with vitamin E under the consultation of their health-care provider.

Famil-E (Jarrow) Each bottle, 60 softgels. Each softgel, a blend of various forms of vitamin E (tocopherols and tocotrienols) derived from soy bean oil. Other ingredients include gelatin, glycerin, water and carob as a light barrier. *Suggested use is 1 cap per day with a meal or as directed.*

From Jarrow's website:

Famil-E protects cardiovascular function by reducing the oxidation of low-density lipoproteins. Squalene is naturally found in the liver and is a building block for hormones. Lutein is a xanthophyll (oxygenated carotenoid) that occurs in nature with zeaxanthin, a closely related carotenoid. An experimental study indicates that lutein protects vascular health by inhibiting monocyte migration into the arterial cells. Pantethine (Pantesin©) is the stable disulfide form of pantothenic acid (Vitamin B5), and it is the physiological coenzyme A precursor in the Krebs cycle. Pantethine supports lipid metabolism by its ability to raise levels of CoA, a cofactor involved in several metabolic pathways including carbohydrate and lipid metabolism.

Each softgel contains:

Vitamin E (alpha tocopherol)	41 mg (60 IU)
d-beta tocopherol	6.3 mg
d-gamma tocopherol	250 mg
d-delta tocopherol	84 mg
Palm fruit distillate	100 mg
(Providing the following nutrients):	
d-beta tocotrienol	1.5 mg

d-gamma tocotrienol	22 mg
d-delta tocotrienol	5 mg
d-alpha tocotrienol	2 mg
Squalene	10 mg
Phytosterols	3.5 mg
Lutein (from 20 mg esters) (<i>Tagetes erecta</i> ; marigold petal extract)	10 mg
Zeaxanthin (as esters) (<i>Tagetes erecta</i> ; marigold petal extract)	0.5 mg
Pantethine	100 mg

WARNING: People with hemophilia or low platelet counts should **ONLY** supplement with vitamin E under the consultation of their health-care provider.

Minerals

Multiple Mineral Formulations

In general, intake of minerals is safe, however certain precautions should be taken. For example, it may be best to use multivitamins without iron for people with HIV, especially for those who are co-infected with chronic hepatitis viruses (like Hep C) or have other liver problems. Taking more than around 600 mcg of selenium may be contraindicated. If you have kidney problems, discuss with your doctor safe intake levels of minerals, as some should be avoided even to the point of modifying your diet. On the positive side, calcium intake probably is not related to formation of stones as much as eating acid-rich foods like meat (see the Calcium section for more info). Finally, there are issues around ideal times to take minerals. Calcium and magnesium compete for absorption, as do zinc and copper. To try to take all of these minerals at the best possible time might be possible for some very diligent people, but practically, this would be difficult to manage on a routine basis. The evidence for deficiencies in minerals like magnesium and selenium, as well as the effect of ARV on bone deterioration and the consequent need for calcium, point to the need for a balanced intake. The following formulas may be helpful for those in need of balancing their mineral intake:

Mineral Balance (Jarrow) Each bottle, 120 capsules.

Contains no iron.

Each **SIX** capsules contain:

Vitamin A (as palmitate)	5000 IU
Vitamin D3 (as cholecalciferol)	400 IU
Calcium (as hydroxyapatite)	1000 mg
Iodine (from potassium iodide)	225 mcg
Magnesium (as magnesium oxide)	600 mg
Zinc (as monomethionate)	15 mg
Selenium (as L-selenomethionine/selenate-50/50)	100 mcg
Copper (as gluconate)	2 mg
Manganese (as citrate)	1 mg
Chromium (from <i>Saccharomyces cerevisiae</i>)	200 mcg
Molybdenum (trivalent sodium molybdate)	200 mcg
Potassium (as chloride)	99 mg

Other ingredients: Rice powder and magnesium stearate.

Capsule consists of gelatin Contains no binders, coatings, soy, wheat, yeast, sugar, salt, starch, artificial color or preservative.

Lithium

Lithium orotate (Advanced Research) Each bottle, 200 tablets, each tablet 120 mg lithium orotate (4.6 mg elemental lithium). This is a salt of lithium and orotic acid, which is also known as uracil-6-carboxylic acid, a precursor in the formation of pyrimidine nucleotides (DNA building blocks). *Suggested use is 2-3 tablets per day.*

WARNING: Do not forego mainstream medical treatment and inform your healthcare providers of your decision. They **NEED** to know what people are trying and one can only hope they will support your decision in the meaningful and scientific way of monitoring its effects.

Do not use if you have hereditary orotic aciduria or ornithine transcarbamylase deficiency.

Do not use lithium orotate if you have a disorder of the heart or kidneys; do not use if pregnant or if using diuretics.

More on orotates...

The primary proponent of minerals bound to orotic acid (*orotates*) is the late Dr. Hans Nieper of Germany. He had studied mineral delivery systems, including the orotates (and calcium EAP) since the 1970s. Nieper did extensive case-reporting of these products in people with conditions ranging from Lou Gehrig's disease (ALS) to chronic hepatitis and multiple sclerosis. Nieper claims orotic acid is a stealth mineral drug delivery system; being selectively and more readily taken in by certain parts of the cell. The numbers of patients on various protocols were relatively few but Nieper said results had been, sometimes to his surprise, encouraging. This is the same lithium used to treat "bipolar disorder" and other cognitive aberrations. (For these conditions, lithium carbonate or citrate forms have been used at higher, more toxic doses.)

Due to the extremely low blood levels of lithium needed for absorption in the orotate form, there have been no reported toxicities from this form. Most of the toxicities related to other forms arise from the higher doses that are required because they are very poorly absorbed, increasing the risk of toxicities from excessive lithium intake. Our predecessor DAAIR received several reports of dramatically reduced depression and mood stabilization using the orotate form.

Nieper has also reported its use along with calcium orotate and claims it is a potent anti-inflammatory in liver cells. The idea here is not merely to add calcium or lithium, but to help normalize the electric potential found in cell membranes. Several people with Hep C (PWHCV) have tried this combination and noted approximately 50% reductions in liver enzymes after one month. Nieper's suggested protocol calls for a three month trial period to establish its full effect.

However, other than sparse anecdotal reports, there are few data to support or refute the idea that these compounds affect membrane potentials in humans or what effect that may have. Given that NIH steadfastly refuses to study these types of interventions, you might try doing your own "n of one" clinical study with these. Start

by stabilizing your regimen and getting blood work on or about the same day you start the combo. For example, if you have moderately elevated liver enzymes, see if the combination of lithium and calcium orotates helps reduce them to normal levels; you could also follow your Hep C viral load, if any, to see if there is any reduction. According to Nieper, these changes should be apparent within 2 months of use.

One potential concern, however, is if long-term administration of orotates may increase cancer risk or damage to the kidneys. Orotic acid has been shown in a test tube study to enhance proliferation of tumorous cells. Whether this happens in humans is not at all clear at the dosages used by Nieper. A rat model used 1% of the rat's diet, resulting in liver cancer over five weeks; but that is also a significant amount of orotic acid, way beyond what humans use. Similarly, high doses (0.3 to 0.6 grams/kg!) resulted in damage to kidneys of tortured...er...treated cats. Still other test tube data suggest that exposure to orotic acid may increase the amount of uridine nucleotides while diminishing the pool of adenosine nucleotides. One must bear these concerns in mind, but overall, the risk seems relatively low.

Magnesium

Magnesium has been found to be seriously depleted by researchers at all stages of HIV disease. Commonly used for CFIDS and fibromyalgia, but NYBC hasn't seen any research besides anecdotal reports for supplementing. It's very important for preventing and managing diabetes. But too much can cause diarrhea!

Magnesium malate (Source Naturals) Each bottle, 180 tablets. Each tablet, 1,000 mg of magnesium malate, yielding 152 mg magnesium and 825 mg of malic acid. Muscle cramps, weakness and fatigue are all anecdotally said to improve using this. The CFIDS Health Resources Buyers' Club says it may help aching muscles, and improve proper muscle function by increasing ATP. It may increase stamina (malic acid is used to help convert fats and sugars to ATP). Malic acid has the added benefit of chelating (grabbing) aluminum. Source Naturals states that free form malic acid may promote undesirable absorption of aluminum. They state further that magnesium malate allows absorption of both compounds, and makes it easier for the malic acid to exchange the magnesium for aluminum (and remove it from the body, one hopes). The rest of the malic acid may get into cells where it is normally found and participate in the Krebs cycle (a complicated series of reactions that starts with pyruvic acid and results in liberation of energy). Eat more apples, too, which are high in malic acid! *Suggested use is 1-3 tablets per day with meals.*

Selenium

This is the mineral selenium bound to the amino acid methionine. Numerous studies have been conducted with NYBC © 2005

rather mixed results as to which form is the best or most available (selenomethionine or the inorganic form, sodium selenite). They can come up with completely opposite viewpoints, with some studies showing for example that one works as well as another for improving the level of certain enzymes, such as glutathione peroxidase. Other data show a potential benefit for offsetting problems related to autoimmune thyroiditis, cystic fibrosis (when given with other antioxidants), and in a study of healthy volunteers, lowering the rate of cell suicide (apoptosis) which has been shown to be increased in people with HIV. One study conducted among 10 HIV+ people showed that those who received either 100 mcg of selenomethionine or 30 mg of beta carotene saw no increase in two factors (von Willebrand factor and thrombomodulin) that are related to damage to cells (endothelium) that may predict atherosclerosis. By contrast, those receiving a placebo did see these factors increase over the year of the study. Suffice it to say, this can be an important addition to a comprehensive program.

However, TOO much is not a good idea. A maximum daily dose of about 400-800 mcg per day is considered safe (again, conflicting opinions as to where toxic levels might develop). One a day may be good, especially if you are also getting the selenite or selenate form.

WARNING: *Before adding this, check your other supplements. Due to the importance of selenium, fairly high quantities are found in multivitamin formulae as well as many of the botanical formulae that are available on the market.*

OptiSel (AMNI) Each bottle, 100 tabs. Each tablet, 200 mcg of selenium, combining two bioavailable sources: 50 mcg of selenomethionine and 150 mcg of sodium selenate. An important antioxidant trace mineral (a metal found in the body in very small amounts) already incorporated into our multivitamin and antioxidant complex, selenium helps prevent free radical damage while boosting the power of vitamin E. Selenium is also a vital part of the complex glutathione system, particularly important for red blood cells. Check sources from other vitamins you may be using and *do not exceed 800 mcg per day.*

Sulfur (see NAC as well)

Methylsulfonylmethane (MSM) is a rich source of sulfur, and an indispensable element in human nutrition. It binds with a variety of toxicants through sulfur conjugation, a major detoxification pathway in the body, and lessens a variety of allergic reactions. MSM is a naturally occurring sulfur compound derived from DMSO (dimethyl sulfoxide). It is used in treating food and drug allergies, administered in 100-1,000 mg concurrently with the allergen or irritant, and may help to either reduce or eliminate allergic reactions.

MSM also has a history of use in reducing chronic inflammatory pain and generalized muscle soreness

including leg and back cramps. Other sources of sulfur include NAC, SAME, dimethylsulfoxide (DMSO), taurine, glucosamine or chondroitin sulfate, and reduced glutathione. Sulfur is significantly depleted in people with HIV/AIDS, according to research published by glutathione guru Dr. Wolf Droge in 2000 (*AIDS Res Hum Retro*, 275(5):3693-98). This loss is associated with loss of the amino acid cysteine (see NAC entry). MSM was observed to be incorporated into methionine (guinea pig study) and, to a lesser degree, into cysteine residues, thereby possibly serving as a valuable secondary source of supplementation when dealing with the severe depletion of sulfur amino acids that is characteristic of HIV infection. Unfortunately, there are no published clinical studies of MSM in humans.

MSM (NYBC) Each bottle, 1,000 grams of methylsulfonylmethane (MSM) powder. This form is well tolerated, odor-free, and bioavailable. Also available in a powder form, 1,000 grams per bottle. Use with vitamin C and the mineral molybdenum, which assist metabolism of sulfur. *PWHIV who want a standard prophylactic dose or want a truly global and varied mix of sulfur (thiol) sources take 1,000–2,000 mg per day.*

NOTE: Custom Multivitamin (NYBC) and ThiolNAC (NYBC) also contain MSM.

Zinc

Zinc has been found to be severely deficient, even early in HIV infection, and researchers at the University of Miami have recommended PWHIV supplement with a minimum of 75 mg per day. Others feel this is way too much—the controversy is not yet settled.

Please check the zinc sources in your multivitamin and antioxidant complex before adding additional zinc to your protocol.

Before adding additional sources of zinc in excess of 40 mg per day you should consult your health care professional. Excess doses (above 100 mg) may decrease phagocytic activity, neutrophils and macrophages, translating into a damaged immune response.

Do not ingest more than 50 mg of zinc daily if you have Candida albicans or a bacterial infection! *Zinc limits phagocytosis in monocytes; also infants fed a zinc supplemented diet had more cases of candidiasis. One test tube experiment revealed that calprotectin is an important anti-candida protein found in abundance in neutrophils. It is inhibited by zinc.*

Another study suggested that women with AIDS may have lower zinc concentrations than men. This was particularly acute when they had less than 250 T cells. Both men and women were found to have high levels of copper. These imbalances seemed to be corrected, though, after they started using antivirals.

Zinc is a critical nutrient in the immune response.

Studies have shown that, taken in the proper amount, it can increase natural killer cells, cell-mediated immunity and phagocytosis (the ingestion of foreign or damaged material by your immune cells). It is essential for the health of the thymus gland and lymph nodes. For optimal absorption take along with pyridoxal-5'-phosphate (B6) and vitamin A. We'll also mention that zinc has been reported to be helpful in correcting problems of taste and smell, as well as helping with various skin disorders.

Important Note: Zinc and copper compete for absorption and long term zinc use can drive copper out of the body. Common signs of a copper deficiency are heart flutters or palpitations. One study has suggested that people with HIV doing zinc supplementation suffered from faster progression. We do not know if this was an artifact of the study or whether it was due to people not doing zinc in the morning and balancing it with copper in the evening. However, most people with HIV appear to have levels of copper that are too high. If there is too much zinc and it wipes out copper stores, this could be a problem. Still, since we do not know, it may be best to err on the side of safety and not take extra zinc beyond that which is found in your multiple formulas.

Optizinc (AMNI) Each bottle, 100 tablets. Each tablet, 30 mg of zinc in the form of zinc monothionine). Be careful not to exceed about 80-100 mg of zinc per day without the advice of a healthcare provider. That means checking your multi to see how much it provides daily as well! More information forthcoming on this product shortly.

Amino Acids

Supplementation with amino acids has also been identified as a means to slow disease progression in PWHIV and counter some side effects of HIV medications. Amino acids, the building blocks of proteins, perform many critical metabolic functions in the body, and as with vitamins, have been the subject of many studies highlighting certain deficiencies in PWHIV. Over the years, research has also accumulated that makes it possible to set reasonable strategies for supplementing these critical substances.

We begin by referring to Don Tyson of Montiff, Inc., a leading authority on amino acid supplementation, who bases his observations on studies involving over 2,500 PWHIV. When amino acid chromatography tests were conducted on blood and urine samples, some significant differences were noted between PWHIV and uninfected individuals. Specifically, anywhere from 7 to 13 amino acids were found to be below or borderline normal in all the people with HIV/AIDS looked at. The deficiencies were found in methionine, taurine, cysteine, threonine, valine, glutamine*, alanine, tryptophan, tyrosine, the arginine/lysine ratio, ornithine, citrulline*, aspartic acid and histidine*, (*low or borderline normal). Some amino acids were found to be above normal, including

phosphoserine, L-methylhistidine, 3-methylhistidine, anserine, carnosine (not carnitine) and a variant of alanine.

There are probably numerous causes for this dysregulation of amino acids, including leaky gut syndrome, infections like candida or CMV, herpes, malabsorption and other problems. Whatever the cause of the deficiencies, it is clear that they have a ripple effect through the body's systems, resulting in damaging processes such as oxidative stress and the disruption of cells' ability to convert fats to energy. It also seems evident that, as is the case with vitamins, supplementation probably makes the most sense when it aims to restore balance to the whole system of amino acids, not just one of them in isolation.

Note: A general rule is to take all amino acids on an empty stomach 20 minutes before or 90 minutes after eating. However, one must be realistic about complying with a nutrient protocol. If taking pills at odd or special times of the day means you probably won't take them at all, or only sporadically—or worse yet—get overwhelmed and stop taking everything, then please do take them at more convenient times, like before or right after meals. Many mix their amino acid powders together or put them in their daily protein powder first thing before breakfast. Also, see the discussion on stomach acidity and NAC below.

Amino Acid Supplements

Arginine

Arginine is thought to aid in the body's production of human growth hormone (HGH), and is used to enhance lean tissue growth. Evidence suggests it can do this to some degree and possibly improve T-cell counts when taken with glutamine and HMB (as in Juven). However, it may ALSO increase herpes flare-ups or their severity.

Arginine (Jarrow) Each bottle, 100 capsules. Each capsule provides 1,000 mg of the amino acid, arginine in a free-form, pharmaceutical grade. Capsule is made of gelatin; contains magnesium stearate. *Suggested use is 2 capsules, 1 to 3 times a day between meals or at bedtime with a carbohydrate drink to enhance absorption.*

Carnitine/Acetylcarnitine

Several reports indicate that systemic carnitine deficiency occurs in HIV disease, and that primary and secondary carnitine deficiency leads to critical metabolic dysfunction. In a 1993 Italian study of 28 PWHIV, six grams of carnitine were administered for just two weeks. Immune response was greatly enhanced and there were significant reductions in beta-2 microglobulin, a disease progression marker.

Most importantly, tumor necrosis factor (TNF) levels were normalized in the two study participants who had abnormally high levels, while triglyceride levels were reduced on average approximately 35% (triglyceride levels are a secondary marker for inflammatory immune messenger [cytokine] cells in the body like TNF and

others). High TNF levels have been strongly associated with opportunistic infections, which is no surprise since they are also linked to increased HIV replication and loss of T cells.

Several reports have implicated L-carnitine deficiency in AZT-related muscle wasting (myopathy) and the authors of the Italian study suggest that carnitine supplementation may prevent the development of myopathy when used together with AZT. This may be accomplished by reducing AZT's toxicity to cellular mitochondria (the energy producing factories of the cell)—a cellular target particularly sensitive to AZT's destructive effects.

The acetylcarnitine form has been used as a "smart drug" to enhance memory and other cognitive functions. A small study in 2000 also showed some benefit for this form of carnitine in offsetting "nuke" neuropathy.

Please note: *over-the-counter L-carnitine and acetylcarnitine are expensive but there is a pharmaceutical (prescribed) form of L-carnitine which medical insurance plans (including state-run Medicaid programs) will pay for, so you can ask your doctor to write a prescription for the following: Carnitor Tablets, Sigma Tau, 330 mg, 3 tablets, 3 times per day.*

Note of caution: *DO NOT USE carnitine if you have a low thyroid activity (hypothyroidism) especially if you are using a hormone like Synthroid to improve thyroid function). By contrast, if you have a hyperthyroid condition, carnitine may be helpful. Consult with your doctor.*

Acetylcarnitine (NYBC) Each bottle, 100 capsules. Each capsule, 500 mg. Several European studies have found it useful in improving memory and recall in Alzheimer's patients. Acetylcarnitine has been used for years as a "smart drug" and reportedly increases mental function in healthy individuals. Test tube studies of this form showed that it improves the ability of immune cells to proliferate and also stopped the cells from producing TNF. There are also several laboratory studies which revealed dramatic reductions in CD4 cell apoptosis (programmed cell suicide). Apoptosis may contribute to the substantial loss of *uninfected* T-cells. Some PWHIV have tried high doses (2-3 grams/day) when they had low or undetectable viral loads, yet still decreasing T cell numbers. In roughly six cases, T-cell declines were turned into substantial T-cell increases. (The falling T-cell numbers may have been caused by immune hyperactivation-driven apoptosis rather than direct viral/cell related death.) *Suggested use is 1-2 capsules (6 grams) per day on an empty stomach or as directed by your healthcare provider. **Keep refrigerated.***

Some PWHIV are using 2 to 4 grams per day in an attempt to offset cellular mitochondrial damage caused by nukes like AZT (see above).

Carnitine, elemental (Jarrow) Each bottle, 100 tablets. Each tablet, 750 mg carnitine tartrate (250 mg tartaric acid,

500 mg L-carnitine). Try to get it paid for by insurance if at all possible (in the form of Carnitor). This elemental, free-base, non-salt form of L-carnitine is the most concentrated form of L-carnitine available. Carnitine is essential for the transport of fatty acids across the mitochondrial membrane, a process required for the use of fat as an energy source. Many PWHIV take about 1,000 mg (1 gram) per day to manage antiviral toxicity, increased triglycerides and suspected TNF elevation (not an easy blood test to get, unfortunately). *Some PWHIV are taking from 1–3 grams of elemental carnitine per day.*

Glutamine

Glutamine is used to treat "leaky gut" syndrome, which results when intestinal tissues are damaged. Glutamine is taken up in cells of the intestine and then oxidized, strengthening the overall structure.

Anecdotally, people with protease-inhibitor diarrhea find relief using 30-40 grams per day. Start with about 15 grams per day and increase the dose until the diarrhea is controlled. For those using the powder form, each kitchen teaspoon is about 5 grams. A daily maintenance dose is one teaspoon a day.

Unless you have diarrhea or other signs of malabsorption, a daily dose of about 5 grams a day is probably enough. One concern NYBC has is that glutamine may readily transform into glutamate—and this could cause problems. Excessive levels of glutamate may interfere with the function of nerves and even block the cell's uptake of cysteine (which in turn means less glutathione being synthesized within a cell). However, data suggest that higher doses are helpful for people suffering from diarrhea or malabsorption problems.

Additional note: glutamine stimulates skeletal muscle protein synthesis as well and researchers at Case Western feel it may help, as a possible treatment for cirrhosis, to lower the levels of cytokines like IL-1, IL-6 and TNF which are also elevated in chronic HIV infection.

If at all possible, take this amino acid three times per day before/after or at the very beginning of meals for it to work effectively along your GI tract. Look into getting it prescribed—New York state Medicaid covers it, for example.

Glutamine (NYBC) Each bottle, 100 capsules. Each capsule, 500 mg of L-glutamine. *PWHIV are using from 1–30+ grams per day, between meals or before the beginning of a meal. If you have diarrhea, use the higher amount (20-30 grams per day) until it subsides; on a routine basis for gut health, about 5 grams a day is probably fine. Of course, get diarrhea that persists diagnosed!*

Glutamine, powder (NYBC) Each bottle, 1,000 grams of powder (a kilogram or 2.2 pounds). Each 1/4 kitchen teaspoon has 700 mg. *Suggested use is a quarter teaspoon*
NYBC © 2005

(700 mg) in juice 1–3 times a day, between meals. However, some PWHIV are using a loading dose of up to 9 grams per day for 4 to 6 weeks, and then tapering it down by 50% in the hopes of reducing infections, increasing absorption and lessening severe inflammation along the GI tract. Higher doses—up to 30+ grams per day—are being used for weight gain and/or very severe intestinal inflammation. Many mix their amino acid powders together or put them in their protein powder.

Glutathione (or GSH, which is the abbreviation for the reduced form of glutathione)

The body's response to an infection can damage tissues because too many free radicals (unstable, highly reactive molecules with an odd number of electrons) are generated in the process. Think of it as a "fire"—which can be quenched by chemicals inside cells. Among the most important of these "fire" quenching chemicals (antioxidants) is glutathione. Glutathione (GSH) is actually a piece of protein (a peptide) consisting of three amino acids: cysteine, glycine and glutamic acid. (Some amino acids contain the element sulfur, and thus are known as "sulfur-containing amino acids." Cysteine is a sulfur-containing amino acid.)

Because HIV is a chronic condition, the body is in a continual state of response to the infection, and thus is constantly generating damaging free radicals. Putting out this "fire" by "quenching" free radicals, in turn, has the result of using up glutathione inside cells. Studies have documented dramatic deficiencies of glutathione in people with HIV.

Dr. Wulf Droge, one of the researchers who discovered GSH deficiency in the 1980s, released a research report suggesting that AIDS can be viewed partly as the result of a virally-induced cysteine deficiency. This observation arises from studying GSH levels in several primate (monkey) models that do not proceed to immune suppression after being infected with HIV. He discovered that these monkeys, unlike similarly infected humans, never lose the substantial amounts of GSH and sulfur (also called "thiols") within their blood or their immune cells. Subsequent research in humans underscores the effects of this loss of sulfur and glutathione and its relationship to disease progression.

Droge and his group noted a massive loss of sulfur in people with AIDS, largely as a result of the depletion of the glutathione pool and cysteine loss. The observed global sulfur (thiol) deficiency was seen as accelerating disease progression and stimulating HIV replication. That's because the loss of this critical group of sulfur amino acids, mainly cysteine, interferes with the host defense system, depriving it of the means to mop up all the free radicals generated in the battle against HIV. Thus, there is considerable "collateral damage" to healthy cells and tissues, particularly in the gastrointestinal (GI) tract.

Here's how the "collateral damage" occurs: excess free radicals set off a chain reaction with a whole string of nasty

consequences. A superoxide or reactive hydroxyl molecule will bounce around (so to speak) and give off its unpaired "hot potato" electron to the nearest available molecule. That molecule won't want this "hot potato" either and will try to pass it off again. In the process, the molecule may have sustained damage to its structure--which may mean damage to the DNA, to the cell's membrane, or to other organelles like the mitochondria (the cell's energy-producing centers).

With the right antioxidants around, however, this kind of damaging chain reaction can be thwarted. When an antioxidant, or reduced form of a chemical, "quenches" a free radical, it becomes oxidized, setting off a cycle of chemical reactions with ultimately stabilizing effects. The cycle might start with the antioxidant vitamin E donating an electron to a lipid peroxide. This prevents that lipid peroxide from damaging cellular fats, like those found in membranes. However, the vitamin E is now "oxidized" and needs an electron. Vitamin C provides that, and regenerates the E. But now that vitamin C is oxidized, and may be reduced by, for example, alpha lipoic acid. Etc., etc.—you get the idea! The main point is this: as it turns out, many antioxidants, such as Vitamins C and E, have a role in this "quenching" of damaging free radicals—but it is glutathione that plays an extraordinarily significant part, contributing to the reduction of many oxidized forms (such as those of Vitamin C and E) and thus working to keep oxidative damage in check.

Restoring and maintaining glutathione levels in HIV/AIDS (and Hepatitis C) is therefore essential for restoring vital vitamin C and E antioxidant action, protecting cells/organs against oxidative damage, and slowing or stopping chronic intracellular viral activation. By restoring and maintaining levels of GSH, you may help restore cellular immune responsiveness and improve immune function overall.

For example, adequate levels of GSH are required for several aspects of the immune response, including mixed lymphocyte reactions, T-cell proliferation, T- and B-cell differentiation, cytotoxic T-cell activity, and natural killer cell activity. Replenishing GSH inhibits HIV transcription and replication in models of acute and latent HIV infection. In the laboratory, glutathione has been shown to either dramatically inhibit active viruses, including HIV and herpes viruses, or stop the reactivation of virus inside quiescent (non-active) cells.

Now let's talk about the absorption of glutathione, and the best strategies for supplementing this very important substance. While oral consumption of GSH gets into cells along the GI tract, studies are very mixed as to whether it gets further into the system (for example, into blood plasma). Some studies show (in animal models) a blood plasma half-life that is very short (about 2 minutes!) Others clearly show increases in both intestinal epithelial cells and even in plasma when taken orally (as opposed to by injection).

NYBC © 2005

Another issue to consider in developing an effective way of supplementing to counteract glutathione deficiency is that various forms of cysteine (needed for glutathione production in the cells) are blocked from being used by immune cells because of the high amino acid glutamate levels in HIV infection. Thus the wisest course of action in attempting to resupply glutathione is probably a mixture of different sulfur amino acids, along with glutathione itself. (And, as an aside, we'll also mention that we don't think long-term use of very high dose glutamine is a good idea, since it is readily transformed into glutamate. This is certainly an area for clinical research.)

But there is good news as well when it comes to developing supplementation strategies for dealing with glutathione depletion and cysteine loss in PWHIV. Research has shown that N-Acetyl-Cysteine (NAC), whey protein powders, and alpha lipoic acid can be very useful and effective when it comes to restoring and maintaining GSH levels and making up for cysteine loss. In the sections below on NAC, whey protein, and alpha lipoic acid, you'll find more details on how these substances address glutathione and cysteine deficiencies, and you'll also find spelled out our recommendations for using them as part of a supplementation strategy.

Glutathione Reduced: Capsules (Jarrow) Each bottle, 60 capsules. Each capsule, 500 mg. Some research suggests that the most effective dose is 15 mg per kilogram (2.2 lb) of body weight. Thus, 2-3 capsules is good for a 150 lb person.

Take GSH on an empty stomach, 20 minutes before or 90 minutes after eating. Again, PWHIV find that the best time to take this is the first thing in the morning when they get up.

Some researchers are investigating dosages of 3 grams per day (or 12 capsules per day). These data were never published, suggesting they failed to find evidence of absorption into the bloodstream. One study of dietary intake of glutathione (which is found in cooked meats like chicken as well as in cooked asparagus, fresh oranges, raw carrots and some other foods) showed that it appears to get into the intestinal tract epithelial cells—which is perhaps where it is most needed (see *Methods in Enzymology*, 1995;252:3-13). However, there are no data as of early 2005 to suggest that glutathione taken orally will go beyond the GI tract.

Lysine

Lysine is an essential amino acid, meaning your body doesn't synthesize it. You get it from diet mostly, including from milk and dairy products, potatoes and brewer's yeast. While a couple of smaller studies have shown little benefit, their methodology has been criticized (too few people, too short, too little lysine). One large study at the Mayo Clinic using 1,248 mg daily (double-blind, placebo-controlled) showed a consistent effect in reducing the recurrence rate

of herpes outbreaks, compared to placebo or a lower dose. However, it did not affect the duration or severity of an active outbreak. In another area, one small study showed a benefit in aiding growth hormone secretion when 1,200 mg was used with 1,200 mg of arginine. See the Arginine entry above.

L-Lysine (Jarrow) Each bottle, GEORGE 250 tablets. Each tablet, 500 mg of L-lysine, from L-lysine hydrochloride. Lysine is an “essential” amino acid, meaning that you have to consume it in the diet as the body does not synthesize it. It may help to suppress outbreaks of herpes. Also contains cellulose, magnesium stearate and silica. *Suggested use is to take one tablet, 1-3 times a day, preferably on an empty stomach.*

N-Acetyl-Cysteine (NAC)

In a Pasteur Institute study of people with HIV, NAC stopped premature apoptosis (programmed cell death), one of the leading models for immune cell loss. Remember that the majority of CD4+ T cells that are lost during HIV disease are not infected (see, e.g., *Retrovirology*, 2004 Jun 23;1(1):12 or *Nat Med* 1995, 1:129-134). NIH laboratory studies have also demonstrated that NAC is effective as an antioxidant and reduces apoptosis. Early test tube studies showed that NAC elevates glutathione inside cells and also inhibited HIV production.

Early clinical studies, however, traced a somewhat confusing picture, which has only gradually been clarified. One NIH study of 23 people with HIV using various doses found no effect on elevating glutathione nor any effect on p24 antigen or CD4 counts. However, this trial lasted only six weeks and evidence suggests a longer period is necessary. Further, the NIH study looked for NAC in the blood, but it is converted in the tissues (particularly the liver) to glutathione, so it is not surprising that NAC was not found in the blood. It is clear that NAC does work for acetaminophen overdose and other disorders, so the NIH study came to seem suspect.

A Stanford University study of NAC subsequently refuted the NIH results. First, the Stanford study's 27 people using NAC did obtain increases in glutathione inside cells. They also showed a very strong correlation between increased progression rate and low glutathione levels.

Lower doses of NAC than those used in the Stanford study (which were as high as 8,000 mg) have been suggested by Wulf Droge (perhaps 1,800 mg every other day) and by René Olivier's apoptosis study (600 mg per day) suggest a physiologically relevant role for NAC supplementation. Apoptosis reductions seen in Olivier's study did not occur before six months. The dose that produced reductions in the degree of apoptosis was 600 to 1,200 mg/day. Subsequent data indicate that the useful dose may depend on one's current condition and level of intracellular glutathione.

NYBC © 2005

Another rationale for using NAC is to offset an increase in glutamate levels. PWHIV have moderately elevated levels of glutamate which prevents cysteine from getting inside cells where it is needed to make more glutathione. As Drs. Droge, Breitzkreutz and colleagues reported in a 2000 *J. of Molecular Medicine* article that compared NAC recipients to those receiving a placebo, those who received NAC had significantly improved immune function, perhaps through offsetting the massive loss of sulfur that they had previously reported upon. Finally, if you must use acetaminophen (Tylenol), you should probably also use NAC (which some European brands even add to acetaminophen). In Europe, NAC is also used as an IV treatment for acute acetaminophen poisoning. *Most PWHIV are taking between 1–2 grams (1,000 to 2000 mg) of NAC per day. How anyone arrived at this dose is unclear. 600–1,200 mg/day may be sufficient. NAC is used as a treatment by doctors for chronic bronchitis and sinusitis in Europe. Some PWHIV with chronic sinusitis find they can keep it under control with between 3–5 grams of NAC per day. It has been suggested that taking highly acidic NAC on an empty stomach chronically for years may not be sensible. Take NAC (and vitamin C) with food where their combined acidity may also counteract the recognized low stomach acidity common in HIV infection and increase food and supplement absorption.*

ACC akut 600 NAC (Hexal) Each bottle, 20 wafers. Each wafer, 600 mg of effervescent NAC. This is pharmaceutical grade NAC from Germany. Plop it in water and it fizzes. It does contain artificial sweeteners as well as some vitamin C. Tastes great and no odor. More expensive than the rest by a long shot but some of us really like it!

NAC (NYBC) Each bottle, 200 tablets. Each tablet contains 500 mg of NAC. A very economical, high-quality form.

THIOLNAC (NYBC) Includes 500mg NAC, 200mg Lipoic Acid, and 250mg MSM (biological sulfur) See **Other Micronutrients**, Alpha Lipoic Acid for more details on the use of this form.

Protein Powders

Proteins are made up of individual amino acids. A string of amino acids that doesn't quite constitute a full protein is called a peptide. Glutathione, for example, is a tripeptide consisting of three amino acids (glycine, cysteine and methionine). When proteins are consumed, they are first broken down into peptides. As they travel from the stomach and into the intestines, they are further broken down into smaller pieces and finally into individual amino acids. There are several studies showing that smaller peptides are better absorbed. Absorption is critically important, since one of the hallmarks of HIV infection is the loss of lean

body (or muscle) tissue, which is made up of proteins.

A study was conducted in children with HIV-related wasting. This study was suggested in part by test tube research that showed undenatured whey inhibited both HIV production and cell suicide (apoptosis). (*Undenatured* means that the protein is in its natural shape and not disfigured by heat or chemicals.) Another test tube study showed that lactoferrin (found in undenatured whey) has anti-HIV activity. In three people with HIV using about 25 grams/day of undenatured whey (about 1 scoop), all gained weight and two normalized their weight. Initial low levels of glutathione were increased in all three. The claim to extra antimicrobial benefit in people isn't very solid.

The same researchers from the Montreal Children's Hospital also showed that mice consuming whey increased their levels of glutathione. This was found to be a more effective way to increase glutathione in these aged mice than use of cysteine or other protein sources (like egg white, beef and fish proteins, etc.)

A 2002 European study (Mainz University Hospital, Germany) among PWHIV compared two whey products called Protectamin and Immunocal. They found that the former resulted in a substantial increase in glutathione level that persisted out to 6 months of the study. They used 45 grams of protein a day. Body weight, T cell count and other parameters did not change. They saw no improvement in glutathione using Immunocal and switched everyone to the Protectamin product after two weeks.

Designer Protein (Next Nutrition) Each jar, 2 pounds (908 grams) of protein derived from undenatured whey. Flavors available include Chocolate, French Vanilla, Strawberry or Natural.

This product also contains very little lactose, to which many people with HIV are sensitive. It also contains glutamine, useful for maintaining gut wall integrity. In the natural form, **ONE** scoop contains:

Calories	100
Calories From Fat	15
Total Fat	1.5 g
Protein	18.5 g
Saturated Fat	1 g
Cholesterol	30 mg
Sodium	40 mg
Total Carbohydrate	2 g
Dietary Fiber	<1 g
Sugars	<1 g
Calcium	100 mg
Phosphorus	80 mg
Potassium (as dipotassium phosphate)	90 mg
Magnesium (as Mg aspartate, oxide)	100 mg
Zinc (as Zn monomethionine, aspartate)	5 mg
Vitamin B1 (as thiamine)	1.13 mg
Vitamin B2 (as riboflavin)	1.28 mg
Vitamin B6 (as pyridoxine)	1.75 mg
Vitamin B12	4.5 mcg

The ingredients of the natural-flavored version are: APT Full Spectrum Whey Peptides consisting of modified molecular weight and partially pre-digested (hydrolyzed)

whey protein concentrate (including ~14% glyco-macropptides of molecular weight ~6.7kD), 100% non-denatured whey protein isolate (98% pure protein dry basis); Whey Glutamine Peptides (including natural glutamine peptides) along with L-taurine, L-leucine and L-phenylalanine. Also contains Glutasynt (a blend of D-glucose, L-glutamine, oligofructose, glutamine peptides), lecithin, Zinmag-6 (magnesium oxide, magnesium aspartate, zinc aspartate, pyridoxine, zinc monomethionine), malic acid, dried cream extract, potassium chloride, natural vitamin E, lactoperoxidase.

Note that ingredients of other flavors vary.

The suggested dose is one scoop per day (about 22 grams, supplying 34% of your daily protein needs), mixing the powder with 1/3 cup of water, milk, or juice. Stir until dissolved. Some PWHIV are taking up to 4 scoops per day as a loading dose for one month and then 2-3 scoops thereafter. Don't mix with citrus juices.

Nutrivir (BioNexus) Each container, 22.4 ounces (560 grams). This is an excellent and tasty product of multiple nutrients in a base of whey proteins, fructose, maltodextrin, natural vanilla flavor, vanillin, dextrose, and a blend of digestive enzymes (amylase, lipase, cellulase amyloglucosidase, protease and acid protease). It breaks down as 6.5 grams of fat (5 as saturated fats; 4 g as readily burned medium chain triglycerides), 65 mg cholesterol, 95 mg sodium, 175 mg potassium, 11 grams of carbohydrates and 21 grams of protein per serving. Since it has some costly components like carnitine, it ain't cheap, particularly if used as directed. One bottle is only a 7 day supply! This product has been reformulated and contains considerably less sugar than it used to. Each **THREE ROUNDED SCOOPS** contain:

Protein	25 g
Carbohydrates	11 g
Fiber	2 g
Sugars	1.5 g
Fat	6.5 g
Saturated fat	5 g
Medium chain triglycerides	4 g
Vitamin A (as retinyl palmitate and 50% as beta carotene)	5,000 IU
Vitamin C (sodium ascorbate)	1,000 mg
Vitamin D (cholecalciferol)	200 IU
Vitamin E (d-alpha tocopheryl succinate) 400 IU	
Thiamine (thiamine mononitrate)	1.5 mg
Riboflavin	1.7 mg
Niacin (niacinamide)	10 mg
Vitamin B6 (pyridoxine HCl)	25 mg
Folate(as folic acid)	800 mcg
Vitamin B12	
(as cyanocobalamin; 50% as dibenocozide)	1,000 mcg
Biotin	300 mcg
Panthenic Acid (D-calcium pantothenate) 50 mg	
Calcium (from whey and as dicalcium phosphate)	160 mg
Phosphorus (from whey and as dicalcium phosphate)	120 mg
Iodine(as potassium iodide)	37.5 mcg
Magnesium (as magnesium	

oxide, from L-carnitine magnesium citrate and whey)	240 mg
Zinc (as zinc arginate)	5.25 mg
Selenium (as selenomethionine)	200 mcg
Manganese (as manganese sulfate)	2 mg
Chromium (as chromium dinicotinate glycinate)	200 mcg
Molybdenum (as sodium molybdate)	.11.25 mcg
N-acetyl cysteine (NAC)	2 grams
L-Carnitine magnesium citrate	1 gram
Taurine	500 mg
Lipoic acid	100 mg
Choline (as choline bitartrate)	100 mg
Inositol	100 mg
Inosine	50 mg
Pyridoxine alpha-ketoglutarate	25 mg
Lutein	6 mg
Lycopene	3 mg
Boron (as boron amino acid chelate)	1.5 mg
Vanadium (as vanadyl sulfate)	50 mcg

Ultimate Balance (Ultimate Balance) Each bottle, 750 grams in a natural, vanilla or peach-mango flavor. One 25-gram scoop of whey protein isolate along with soy lecithin (in the natural flavor) contains 22.5 grams of protein (a total of 91.5 calories). This is one of NYBC's most popular whey supplements, the whey being produced from a "Cross-Flow Microfiltration" process that maintains protein conformation (not "denatured" or broken down). This system filters the raw material through a ceramic filter, removing excess fat, lactose and denatured proteins (part of the reason it mixes so easily). It mixes very easily, producing a slightly frothy, well-blended drink. The peach-mango and vanilla flavors contain sweeteners and flavorings, making the total carbohydrate content 2.75 grams versus 0.25 g in the natural flavor (all as sugars, no dietary fiber or other carbohydrates). **Contains no lactose, fat or cholesterol.** Don't mix with hot liquids or citrus fruit juices (which can damage the protein structure). *Suggested use is 1 scoop per day which contains (in the natural; the flavored versions vary somewhat; peach mango has 20 g protein, for example; the others have 22.5. The flavored forms also have 2.75 grams of carbohydrates):*

Calories	91.5
Calories from fat	0.25
Protein	22.5 grams
Total fat	0 gram
Carbohydrates (total/sugars)	0.25 grams
Cholesterol	0 mg
Sodium	62.5 mg
Potassium	75 mg
Calcium	150 mg

Whey (Jarrow) Each natural flavor container, 2 pounds (908 grams). Jarrow's whey is not hydrolyzed (broken down). It is an ultrafiltered whey with no added artificial sweeteners or sugar (but contains about 3 grams of fructose, depending on the flavorings). It contains about 2 grams of fat. This is the least expensive whey protein. *Suggested use is 2 scoops per day (about 40 servings) taken in a cold drink or sprinkled over fruit, mixed with yogurt or mixed*

with rice or soy beverages. Each scoop (24 grams)

contains:

Protein	18.5 grams
Total fat	1.5 gram
Saturated fat	1 gram
Carbohydrates (total)	2 grams
Fiber	0
Sugars	2 grams
Cholesterol	30 mg
Sodium	40 mg
Potassium	90 mg

Other Antioxidants, Essential Fatty Acids

A brief overview of viral growth and development: HIV, after infecting a cell, inserts its genetic machinery into the genes of the human cell in order to replicate. HIV is a retrovirus and uses RNA pieces that must be converted into DNA in order to grow. HIV uses an enzyme (enzymes, among other things, accelerate the rate reactions occur) called **reverse transcriptase (RT)** in order to convert its viral RNA into DNA. RT is a very error-prone enzyme, with a high mutation rate. While this often results in producing uninfected HIV, it also helps to produce copies of HIV that are resistant to antivirals.

Understanding the replication cycle of HIV is important in understanding different targets in that cycle on which a therapy might have an impact. AZT, ddI, ddC, d4T, 3TC (NRTIs) and the non-nucleoside reverse transcriptase inhibitors (NNRTIs: nevirapine/Viramune, delavirdine/Rescriptor and efavirenz/Sustiva), all inhibit RT, the first step in HIV's replication cycle after the virus attaches to the cell and injects its RNA and other enzymes into the cell. The HIV DNA is "integrated" into the cell's DNA with the help of the enzyme, integrase. After that, an activated cell starts to produce new HIV. The first big clump of protein must be cut up by the HIV protease -- the enzyme that is inhibited by protease inhibitors. Drugs are in development to inhibit the HIV integrase enzyme. However, many other products may be capable of interfering with viral replication besides these classes of drugs. Some that have been investigated include curcumin, glycyrrhizin, boxwood extract (formerly, SPV-30 known now as FluGuard, from *Buxus sempervirens*) and bitter melon. There are many others that are being investigated, though most of the data are only from the lab. So far, these interventions are not as powerful in their effect as antiviral drugs, but they are also generally much less toxic.

Once the virus has used the RT enzyme, the nucleoside analogs and NNRTI drugs no longer control HIV replication. These cells are already infected and are known as chronically infected cells.

Unfortunately, perhaps in part because of the high error rate when RT makes HIV DNA, mutations occur in the translation of retroviral RNA into DNA. As these mutations increase in number, the structure of the viral products changes and the drugs designed to bind to the viral surfaces no longer fit properly and become ineffective.

Scientists call this "viral resistance" to the particular drug.

Others suggest that viral variants are "already there" and simply take over when their drug susceptible brethren are wiped out by antiviral therapy. Arguing against this notion is the observation that people seem to be initially infected with only one specific strain of HIV. Others point to data suggesting that when a person is infected, HIV very rapidly disseminates throughout the body, mutating along the way and creating all the different versions of HIV, some of which tend to predominate. That virus that predominates is considered a "wild type" virus.

The *long terminal repeat* (LTR) is the part of the HIV DNA which controls the rate and degree of viral production. Either end of the HIV genome consists of repeating sequences of nucleotides (the LTR). In the middle are all the genes that will express other HIV proteins (like envelope proteins) when the cell is activated. But the end pieces are vital for turning on the production of these proteins and controlling how much of them are produced. Thus, one can classify HIV proteins as either structural (the ones that make up HIV's body) or regulatory (the ones that control its growth). Among the latter, the gene products include tat, nef, vif, vpr, vpu and rev. Altogether, HIV makes some 15 proteins.

In order to replicate, HIV also must use parts of the human cell (referred to as "cellular" as opposed to viral parts). The good thing about these cellular components of viral growth is that they are human proteins and molecules rather than RT and are, therefore, much less likely to mutate. When cells become "activated," their DNA is turned on to produce various types of proteins. In this process, a variety of other protein factors are brought into play to help this activation, including proteins known as transcription factors. An important one for human gene expression is called nuclear factor kappa B (NF- κ B). HIV replication needs this NF- κ B transcription factor (among others) in order to replicate. The NF- κ B binds to the LTR and these together function as an "on/off switch."

NF- κ B is used in many different human cells, particularly immune cells, in the activation process. NF- κ B is activated by critical immune messengers called cytokines, which the body uses as a signaling system between immune cells. Many of these immune messengers have been found to be excessively produced during HIV infection and several of them, notably tumor necrosis factor (TNF), actually direct the body to produce more free radicals and are therefore called inflammatory cytokines (see the Antioxidant section for a review of free radicals and inflammation). TNF has been shown to upregulate NF- κ B activity and thus produce more HIV.

So, HIV is an infection which causes inflammation in the immune system and other organs. This inflammation results in the production of free radicals. These free radicals in turn play a role in activating immune cells to produce cytokines like TNF. The TNF then activates NF- κ B which in turn creates more HIV. Thus, HIV is actually forcing

immune cells to produce the very inflammatory products and cytokines which increase viral growth. Free radicals also increase the production of other tissue-damaging free radicals. Some of the cytokines may also be involved in directing uninfected cells to kill themselves off (apoptosis). ***Thus a vicious, self-sustaining cycle is created called oxidative imbalance, where we have few antioxidant stores and many free radicals and increasingly damaged tissues in the lymph nodes, intestines, spleen, and elsewhere.***

Antioxidants, which diminish free radicals, have been shown in a number of laboratory studies to inhibit HIV growth by inhibiting NF- κ B binding to the LTR. Laboratory studies of viral inhibition have been completed for vitamin E derivatives, vitamin C, glutathione (which also slows viral incorporation into acutely infected cells), NAC, alpha lipoic acid, B12, as well as the bioflavonoid quercetin, amongst others.

These compounds, by either stopping viral activation or slowing it down in chronically infected cells in which RT inhibitors are ineffective, represent, at the very least, an additional mechanism for slowing disease progression. Like other complex disease processes, HIV replication may be best controlled with a combination of different approaches working against different parts of the virus in different virus/cell populations. It is also important to remember that this is not just a battle to fight the virus, but also to improve immune function and help to repair damaged tissues. Antioxidant use represents only one part of a multifactorial combination strategy to either halt or slow down disease progression. So please keep in mind this background as you read more about individual antioxidants described below.

Alpha Lipoic Acid (ALA)

A potent antioxidant and liver protective agent, research in Germany suggests that it is even stronger as an antioxidant than NAC, while also demonstrating capacity to protect many organs and tissues from free radicals. Alpha lipoic acid (ALA) contains a short-chain fatty acid in its structure and sulfur as a disulfhydryl coenzyme. It has been long used to treat neuropathy in diabetics and may have value for both neuropathy and dementia among PWHIV. One small study using 600 mg showed stabilization in cognitive function among people with Alzheimer's. ***This dose, 600 mg, appears to be commonly used in studies (e.g., diabetic neuropathy). Often, it is administered intravenously (IV) and there are some concerns about its oral bioavailability. Recent data put to rest some of the concerns (see J Clin Pharmacol. 2003 Nov;43(11):1257-67), suggesting good absorption when taken orally.***

German clinical research also shows alpha lipoic acid to be a potent inducer of glutathione synthesis. This is very important information and represents the first human study that has documented increases in glutathione. Alpha lipoic can act to help reduce vitamin E, vitamin C and glutathione,

making it a very versatile and powerful antioxidant. Because the structure of the molecule carries both water-soluble (hydrophilic) and fat-soluble components (hydrophobic), it can penetrate cellular membranes and get where it needs to go. Among the "free radicals" alpha lipoic is able to "quench" (or provide an electron to prevent damage) are hydroxyl and peroxy radicals, hypochlorous acid, singlet oxygen and nitric oxide, some of which are problematic and increased in HIV disease.

Of course, this also points to how these antioxidant molecules are bound together in a tightly knit dance, and again suggests one of our favorite points: that providing a balance of these nutrients makes the most sense when supplementing.

In laboratory conditions, ALA has been shown to be a more potent inhibitor of the activation of latent HIV (still dormant within cells) than NAC. **Based on these data, many PWHIV and treatment activists have concluded that lipoic acid may be one of the most important core compounds in a comprehensive supplementation regimen.**

ALA is an indispensable agent for anyone who uses long term prophylactic drugs in order to protect against liver damage. An excellent, broad-spectrum antioxidant, fundamental to protecting against free radical damage. Should be a part of the protocol for most PWHIV (or PWHCV).

NOTE: PWHIV should let their doctor know that they are taking alpha lipoic acid. Some people may be able to tolerate higher doses of liver toxic drugs than would normally be the case. Never stop alpha lipoic acid suddenly while continuing to take pharmaceutical agents without closely monitoring your liver enzyme levels.

Suggested use: Some PWHIV take 3–6 per day (100 mg each) if attempting to correct high liver enzyme levels. Others take 3–4 per day if liver impaired. PWHIV also take 2–3 per day if not liver impaired, but protecting from the ill effects of high dose prophylactic drugs. Finally, many PWHIV take 3–4 per day for high-dose, multifactorial antioxidant protection, which helps to recycle other antioxidants (e.g. vitamin C/vitamin E). Many also use the supplement to prevent or manage neuropathy. A dose of 600 mg/day has been used in studies that have shown benefit for this condition (often using an IV formulation).

Alpha Lipoic Acid, (NYBC) Each bottle 180 tablets. Each tablet, 100 mg of high-grade alpha lipoic acid. *Suggested use is as above (about 300 to 600 mg/day in divided doses).*

THIOL NAC UltraAntioxidant (NYBC) Each bottle, 90 tablets, sustained release formula. Each tablet contains 500 mg of NAC, 200 mg of alpha lipoic (thioctic) acid and 250 mg of MSM sulfur. This is an excellent formula for those suffering from liver inflammation. It is also extremely convenient for many PWHIVs who take both NYBC © 2005

NAC and Lipoic Acid since this 3-in-1 combination eliminates the need for multiple pills. *Suggested use is 2 to 3 tablets daily with meal or as directed. Reduce dose if headaches occur.*

Bioflavonoid Complex

Phytoflavonoid Complex (DAAIR) Each bottle, 120 capsules. This excellent bioflavonoid mixture contains many standardized components and is an economical formula. The best source for flavonoids is food, but this may help to augment an imperfect diet. By all means, put the "rainbow" of colorful fruits, vegetables and whole grains in your diet, as Lark Lands recommends—but remember that people with special problems like HIV may not be getting enough even if they eat reasonably well. Bioflavonoids have been shown to increase the effectiveness of vitamin C. They are also potent protectors against free radical damage, and many PWHIV use them as part of a multifactorial approach to control the inflammatory response and hyperimmune activation of HIV disease. Test tube studies have shown that certain bioflavonoids individually have some anti-HIV effect. *Suggested use is 2 capsules 1-2 times per day.* Each **FOUR** capsules contain:

Grapeskin Extract (33% anthocyanidins)	150 mg
Grapeseed extract as ActiVin (92% proanthocyanidins)	150 mg
Green tea extract (<i>Camellia sinensis</i> ; 98% polyphenols, 80% catechins, 45% EGCG)	750 mg
Curcumin extract (<i>Curcuma longa</i> ; min.	
Sabinsa 95% extract)	300 mg
Milk Thistle extract (<i>Silybum marianum</i> ; 80% silymarin)	300 mg
Ginger 6:1 (<i>Zingiber officinalis</i>)	300 mg
Hawthorn Berry	300 mg

CoEnzyme Q10

Coenzyme Q10 (CoQ10) is present in nearly every cell in the body and is responsible for the transfer of energy inside the cell. Because of this transfer capacity, CoQ10 can be thought of as a potent antioxidant since it reduces unstable electrons—free radicals—in the process of cell metabolism. Also, coenzyme Q10 resides in the fatty portions of the mitochondrial membrane where it acts as a potent antioxidant, reactivating vitamin E and sparing the destruction of beta carotene.

Coenzyme Q10 (ubiquinone) plays an important role in proper function of the mitochondrial electron transport system (ETS). The ETS is responsible for the production of adenosine triphosphate (ATP), the molecular source of energy that is used by the cell during cellular respiration. The ETS becomes overworked during times of hypermetabolic conditions, for example, during times of "wasting syndrome."

That's because the body needs more ATP to run things during these periods of "over-drive." But for every molecule of ATP formed, free radicals are generated too. If the necessary local antioxidants are available (glutathione,

catalase, superoxide dismutases), there isn't a problem. But, as we've seen, these diminish or are overwhelmed by the generation of free radicals. Thus the need for supplementation.

CoQ10 operates in the inner membrane of a cellular organ called the mitochondria. Mitochondria produce ATP, which is essential for life; they may be damaged by long-term use of nukes as well as by HIV itself. Whether supplementing with CoQ10 will offset this kind of damage to mitochondria we don't know.

It is clear, however, that supplementing with CoQ10 can help with cardiomyopathy (although improvements in heart rhythms may take several weeks of use). Clinical studies have shown repeatedly that CoQ10 has potent abilities to assist the heart muscle, and is useful as an adjunct treatment for angina, congestive heart failure, arrhythmia, hypertension (high blood pressure), and drug toxicity. Research has also shown that as cellular levels of CoQ10 decrease, HIV disease progresses. Other studies have documented its immune restorative qualities, including restoration of T-cell function.

Due to the typically high inflammatory cytokine levels, absorption of dietary fat-soluble coenzyme Q10 is disrupted in PWHIV, so supplementation may help. Many PWHIV believe CoQ10 is an important nutrient to aid in detoxification if one uses nucleoside analogues (AZT, ddI, ddC, d4T, etc.) or any toxic drug for that matter. Due to impaired absorption, it's best to take a form of CoQ10 that is mixed with lecithin or some other fat to improve its uptake. However, it may be that only very high doses will help (like 200 mg a day!) This won't be cheap.

CoQ10 is very helpful in conjunction with certain drugs. Studies have shown clear benefit when used with a heart-toxic chemotherapy drug called adriamycin. In addition, some have suggested that it is very important to use CoQ10 when taking one of the "statin" drugs, used to manage high LDL cholesterol since the level of CoQ10 in the blood is depleted when using this class of drugs. How well it works or what benefit CoQ10 may have in the context of HIV disease has not yet been clinically evaluated. (How many times do we have to write that???) These studies need to be done!!!)

There is a wide variety of dosing of CoQ10 in the HIV community, however many take their CoQ10 with the fattiest meal of the day in order to increase absorption. Those concerned with drug toxicity (particularly AZT) take a minimum of 60 mg per day. PWHIV who want a broad-based multifactorial strategy use between 30 mg–60 mg per day. Some PWHIV who have high blood pressure, heart complications, or are on a number of different toxic drugs (especially statins for cholesterol) use higher doses still. Studies that have shown benefit used doses ranging from 125 to 200 mg per day. Some folks have used even higher doses. Unfortunately, the higher the dose, the greater the cost for this already expensive supplement.

Late update and a warning: a study published in 2004
NYBC © 2005

showed that people with HIV who had neuropathy saw a WORSENING of neuropathy while using CoQ10.

CoEnzyme Q10 (NYBC) Each bottle 120 softgels. Each 30 mg softgel, ubiquinone (CoQ10) pharmaceutical grade. *Suggested use is about 120 mg per day, particularly if you are using any nucleoside analogs (like AZT, d4T/Zerit) as part of a mitochondria protection protocol. Up to 200 mg/day may be needed, however.*

QSorB: CoQ10 (Jarrow) The best absorbed are those that are in oil/softgels, but these are also a bit more expensive. The varieties available include either 120 softgels, each softgel with 30 mg of CoQ10 and 4 mg of gamma tocopherol or 60 softgels, each with 100 mg of CoQ10 and 4 mg of gamma tocopherol. Other ingredients include lecithin, medium chain triglycerides, while the softgel consists of gelatin, glycerin and water. (Carob extract added as a light barrier.)

Essential Fatty Acids/"Good Fats"

Essential Fatty Acids (EFAs), deficient even at early stages of the disease, are incorporated into the cell membranes and greatly help to reduce inflammatory by-products that are over-produced in the dysfunctional immune response to HIV. The two essential EFAs are alpha linolenic acid (omega-3) and linoleic acid (omega-6). These then are transformed by enzymes to a variety of other forms used by the body. (Essential means the body has to get it from dietary sources and can't produce it on its own.) Used clinically for various skin problems, which abound in HIV disease, EFAs are a good long-term anti-inflammatory particularly suited to use with young children given their extremely low toxicity. Also may help with fatigue and loss of sense of smell and taste.

The following is a breakdown to help you keep track of the different essential fatty acids. Common dietary sources are listed in parenthesis. The different oils include:

Alpha linolenic acid (LNA) (flax, hemp)
Eicosapentaenoic acid (EPA) (cold water fish)
Docosahexaenoic acid (DHA) (cold water fish)
Linoleic acid (LA): (safflower, sunflower,
hemp, soy, walnut)
Arachidonic acid: (meats)
Gamma linolenic acid (GLA) (borage,
evening primrose)
Oleic acid (olive)

Remember to refrigerate all EFAs. Otherwise the oils may become rancid and unhealthy to consume. To check, simply pierce a capsule with a pin and smell. If it smells bad, throw it out! *Note: NYBC sends EFAs by speedy shipping methods to preserve quality.*

Borage GLA-240 (Jarrow) Each bottle, 60 softgels. Each

softgel is 1,000 mg of borage oil along with 10 mg of another form of vitamin E, gamma tocopherol. This is one serving. Each softgel, provides a gram of polyunsaturated fatty acids, including 220 mg of gamma linolenic acid (GLA/omega-3), 360 mg of linoleic acid (LA/omega-6), 170 mg of oleic acid (omega-9), and 250 mg of other fatty acids. From the borage (*Borago officinalis*) plant. This is a good source of GLA, especially in combination with flaxseed oil.

"Borage" has been noted in some reviews as being liver toxic, due to the the potential presence of small amounts of pyrrolizidine alkaloids in some parts of the plant. These chemicals are very toxic to the liver. Happily, according to the late Varro Tyler, former professor of pharmacognosy at Purdue University, the seed oil is not where these are found. The data on its benefits as an antiinflammatory and for arthritis are mixed with some showing modest benefit while other studies failed to find any benefit. *Suggested use is 1-2 softgels per day with meals. If you wish, after opening, refrigerate, unfrozen.*

Essential Balance (Jarrow) Each bottle, 120 capsules. Each capsule, 1,000 mg, consisting of approximately 294 mg omega-3, 294 mg omega-6, 243 mg omega-9 and 1.4 IU of vitamin E (to protect the oils). It contains unrefined oils from flax, pumpkin, high oleic sunflower seeds. The capsule is made from gelatin, glycerin, purified water and carob; contains flax seed particulates.

It contains a 1:1 balance of omega-3 to omega-6 fatty acids. Generally, in western diets, the element that is often missing is the omega-3 fatty acids. ***Remember, your diet is the first, most important issue to address in determining the overall balance of different fats you consume.*** *Suggested use is 3 or more capsules daily.*

Evening Primrose Oil (Jarrow) Each bottle, 250 softgels. Each softgel, 500 mg or 9% GLA EPO which contains 45 mg of gamma linolenic acid (GLA), 370 mg of linoleic acid (LA), 35 mg of oleic acid, and 30 mg of palmitic acid. Hexane free. Cold pressed. According to some studies, it is useful for a wide array of problems, including arthritis, hastening liver healing and diabetes, and, internally and topically, for atopic eczema (allergic inflammatory skin condition). *PWHIV take 1-2 per day. Refrigerate, unfrozen.*

Evening Primrose Oil, 1300 (Jarrow) Each bottle, 60 softgel. Each softgel, 1,300 mg which contains 135 mg of gamma linolenic acid (GLA), 935 mg of linoleic acid (LA), 105 mg of oleic acid, and palmitic acid. Hexane free. Cold pressed. ***Some PWHIV want higher doses of EPO and use up to 3-4 grams per day. Refrigerate, unfrozen.***

Flaxseed Oil, Gels (Jarrow) Two sizes, with each bottle, either 100 or 200 softgels. Each softgel, 1,000 mg organic

Flaxseed Oil provides 570 mg of alpha-linolenic acid (omega-3), 160 mg of linoleic acid (omega-6), 180 mg of oleic acid (omega-9 FA's), 287 IU of beta carotene and 2 IU of vitamin E (mixed tocopherols). Probably the best bet in terms of omega-3 content. Fresh pressed, organic and unrefined, this oil is specially processed to eliminate both light and air during manufacturing, the major cause of rancidity, oxidation, and free radical production. ***Some PWHIV are taking 2-3 per day, along with borage oil (for its high GLA content to balance the A-LA and LA contents of flax) if economically feasible. Refrigerate, unfrozen, particularly since this oil spoils more easily than other oils.***

Max DHA (Jarrow) Each bottle, 90 softgels. Each softgel, 506 mg. This is a fish oil supplement, containing 500 mg each softgel of fish oil (comprised of different fatty acids) in a natural glyceride form. DHA is a form of fat found in large amounts in the brain and this supplement has been proposed as another form of a "smart drug." Omega-3 fatty acids are consumed in higher quantities by different peoples which appears to be associated with improved cardiovascular health. North American diets tend to contain far lower quantities and generally are deficient in omega-3 fatty acids. The primary fatty acid is the DHA or docosahexaenoic acid, which is one kind of omega-3 fatty acid. This constitutes 50% of the fish oil product. Another 20% or 100 mg is EPA, another omega-3 fatty acid (known as eicosapentaenoic acid) and 10% is stearidonic acid (also omega-3). The product also contains 5 mg of gamma tocopherol (in the vitamin E family) and 2 mg of ascorbyl palmitate, which, as antioxidants, protect the long-chain fatty acids from being oxidized. *Suggested use is 1-2 softgels with each meal.*

Remember that the balance of fats you eat is the first, most important step to consider. Dump the hydrogenated fats found in cookies, margarine and lots of things; read labels! Limit saturated fat intake (dairy, red meat, fried stuff), and increase good fat intake (deep sea fish like salmon, tuna; olive oil, hemp oil, etc.)

Botanicals and Blends

Chlorella

Algae are plants among the lowest orders of the plant kingdom, which is to say they are one of the most primitive and oldest life forms on Earth. Algae have no roots, stems or leaves but do contain chlorophyll. They can be microscopic in size or exist as massive seaweeds like kelp (or brown algae). Some forms consist of the simplest kingdom of life, the prokaryotes (which includes spirulina, blue-green algae and bacteria) while others are made up of cells found in the eukaryote kingdom. Eukaryotes include critters, like us, made up of cells that have internal organelles like the mitochondria, a nucleus, etc. Chlorella is

also a eukaryote, a more complex form of life than the other prokaryotic algae. The algae contain many nutritionally important components. To what extent these components may be derived from other sources is as important to consider as how well this particular form is absorbed. In addition, there are many other pigments found in algae that may act as enzymes or coenzymes. A daily (but costly) dose of wheatgrass juice would provide many of these nutrients. Some evidence suggests that these types of interventions may detoxify the body of heavy metals and other poisons. What utility, if any, these may have in human health is uncertain.

Yaeyama Chlorella (Jarrow) Each bottle, 100 grams (3.5 ounces) of bulk, 100% pure chlorella powder, derived from a sub-species of *Chlorella vulgaris*. Some anecdotal reports suggest that after several months of use, energy levels and T-cell counts are improved in some. This has never been clinically evaluated, however. *Suggested use is 1-3 teaspoons per day with juice or water. WHILE SUPPLIES LAST!*

Astragalus (*Astragalus membranaceus*)

This herb is an adaptogen, i.e., it tends to normalize abnormal, stressed physiology. One of the main problems in HIV infection is inflammation: overproduction of inflammatory immune messengers (cytokines), increased free radical generation, and their by-products. This inflammatory response facilitates disease progression. A chief problematic cytokine is tumor necrosis factor (TNF), often overproduced in HIV infection, which generates excess free radicals and therefore can increase viral replication and premature cell loss through the mechanism of apoptosis. Unfortunately, one test tube study indicates that an extract of astragalus caused an increased expression of TNF from peripheral blood mononuclear cells (PBMCs). By contrast, other data indicate a role for astragalus in decreasing inflammatory molecules like IL6, the arachidonate lipoxigenase, leukotriene C4, and PGE2 in human cell cultures, which suggests it could help to minimize the inflammatory milieu. Such conflicting data leave us in the quandary of not being sure if this herb is more helpful, harmful or of no particular value to PWHIV.

However, astragalus has demonstrated clinical benefit in raising or, more often, stabilizing white blood cell counts when used with chemotherapy.

Astragalus (Murdock Madaus) Each bottle, 100 capsules. Each capsule, 400 mg of *Astragalus membranaceus*. Main components are the saponin glycosides, immune-modulating polysaccharides (complex sugars), with glucuronic acid, mucilage, choline, betaine and flavones. *Some PWHIV take 3-6 per day and alternate with Eleuthero (formerly Siberian Ginseng) every 3-4 weeks as an immunomodulator. PWHIV using astragalus on AZT/combos alternate 4-6 astragalus for two weeks with*

3-4 Eleuthero once every 12 weeks. See also Marrow Plus from Health Concerns.

Bacopa monniera

Bacopa monniera (NYBC) Each bottle, 90 capsules. Each capsule, 100 mg of *Bacopa monniera* standardized to 20% bacosides. It is known in the Ayurvedic tradition of India as Brahmi. Bacopa, also known as *Herpestis monniera*, HBK is a plant of the family Scrophulariaceae and is found growing in swampy areas throughout India. Bacopa has a variety of actions, including being a nervine (sedative) and cardiac tonic as well as having laxative and diuretic properties (from the leaves and stalks). There are numerous potential roles that Bacopa may play in neurological physiology, which may explain beneficial effects seen in human studies, including improvements in memory, learning, Attention Deficit Hyperactivity Disorder, Alzheimer's disease and anxiety disorder. Bacopa's activity may include countering oxidative stress; inhibiting acetylcholinesterase with concomitant reduction in acetylcholine levels; choline acetylase activity; reductions of inflammatory molecules IL1, IL6 and TNF; muscarinic cholinergic receptor binding and calcium influx interference. *Suggested use is three capsules taken 30 minutes before each meal (total 3 capsules per day). If possible, take on an empty stomach. Give some time before you eat food for it to be absorbed. Alternatively, you may take 1 capsule 3 times daily with meals.*

Bitter Melon (*Momordica charantia*)

The fruit and leaves of this plant are most often used. The tough part about this product is that the BEST way to use it is as a retention enema. That's right: you prepare the tea and then fill your guts via your butt and hold it until it is absorbed. This works; the oral use isn't as effective, apparently. Is this a pain in the ass, so to speak? It can be difficult, time-consuming and not entirely comfortable. For a minority of people, this treatment does seem to help improve CD4 counts. The limitation on effect may be due in part to the difficulty of administering it as an enema on a routine basis. The capsules offer an alternative. However, for many, whether taken as a tea, enema or in capsules, it does not appear to have a strong benefit when used alone. But then AZT alone doesn't work either! Clinical studies of combinations of botanicals with anti-HIV activity are desperately needed. **WARNING: Do not use during pregnancy.**

Bitter Melon (Tai He Company) Each bottle, 100 capsules. Each capsule, 500 mg. Test tube studies have shown antiviral and immune modulating effects. Highly concentrated to maximize the presence of all three active proteins. It also has a long tradition of use and data showing an effect on regulating blood sugar levels. Antiviral effects from fruits, seeds, leaves and vines using hot water or alcohol extracts have been seen *in vitro*. Each gram is equal

to 25 grams of whole plant. This product is not standardized to any particular protein (e.g., MAP-30). *Take 2–10 per day; the best bet is probably 5 in the morning, 5 in the evening on an empty stomach. Do not use during pregnancy.*

Botanical Blends

Glucose Optimizer (Jarrow) Each bottle, 120 tablets. Each tablet a blend of micronutrients and botanicals. Glucose Optimizer is a comprehensive combination of nutrients that improve glucose metabolism and antioxidant protection. *Suggested use is to take 4 tablets per day with meals, or as directed by your qualified health consultant.*

- Alpha lipoic acid facilitates reduction of blood glucose and supports general metabolism by its effects on energy production.
- GlucoTrim® is an extract of Crepe Myrtle, which contains colosolic acid, an activator of glucose transport. Other herbal extracts that have glucose regulating properties include Gymnema, Bitter Melon, Fenugreek and Eucalyptus.
- Green Tea Extract (45% Polyphenols) supports strength of capillaries and other blood vessels.
- Magnesium is involved in metabolism of glucose and energy production reactions involving ATP.
- Bilberry promotes healthy eye function and circulation.

Green Magma (Green Foods) Each bottle, 150 grams (5.3 ounces) of powdered juice of organically-grown young barley grass along with maltodextrin (a sugar) and brown rice. In addition, a daily dose contains 1,355 IU of beta carotene, 9 mg of vitamin C, 35mg of calcium, 0.5 mg of iron, 52 mg of sodium, 12 mg of magnesium, 238 mg of potassium and 13 mg of chlorophyll in each 2 teaspoon serving. *Suggested use is 2 teaspoons mixed with your favorite juice or in water. Do not take with hot liquids and, if you can, take on an empty stomach. WHILE SUPPLIES LAST!*

Kidney UT (Murdock Madaus) Each bottle, 100 capsules. Each capsule, 465 mg of a proprietary combination of herbs including juniper berries, parsley leaf, ginger root, Uva Ursi leaves, marshmallow root, cramp bark and goldenseal root. May be helpful for sustaining urinary tract health and maintaining healthy kidney function. An oil from Juniper berries has a long tradition of use as a carminative (prevents gas formation in the GI tract), diuretic (makes you pee more) and stomachic (stimulates the action of the stomach), especially for use with indigestion, flatulence and diseases of the kidney and bladder (aside from being the basis for making gin). Grieve notes that the roots and, to a lesser extent, the leaves of juniper are used for helping improve kidney function, primarily by acting as a diuretic. The mallows represent a diverse array of species, with the marshmallow being commonly used as both food and

medicine. The root has long been used to soothe inflammation of the alimentary tract, intestines and urinary tract, with stronger infusions used to treat stones. Cramp bark (Guelder rose), commonly used to help cramps and spasms of all kinds, contains tannins and a bitter called viburnine. Ginger has a long use for helping offset flatulence and improving digestion. Leaves of uva ursi (Bearberry) work as a diuretic but additionally appear to help in disinfecting the urinary tract due to the presence of arbutin; contains a fair amount of tannins as well. The German Commission E, however, says that arbutin should only be used for a week and no more than five times per year, although it's not clear how much arbutin is in this compound. (The Commission is a group of professionals in Germany who have evaluated the evidence for the safety and efficacy of botanical medicines, which are more commonly used there and even often prescribed. Their efforts have resulted in a widely referenced set of monographs and other information.) **Do not use if you have a sensitive stomach; uva ursi may cause nausea or vomiting. Do not use if pregnant.** *Suggested use is to take two capsules two or three times a day with meals. Limit use to a couple of weeks. Take with plenty of water.*

ProGreens (NutriCology) Each bottle, 9.27 ounces of a mix of greens and other nutritious items. Used as directed, this is a 30-day supply. Each scoop contains:

Each serving (approximately 8.8 grams) contains:

Wheat grass powder	350 mg
Barley grass powder	350 mg
Alfalfa grass powder	350 mg
Oat grass powder	350 mg
Spirulina	1,000 mg
Chlorella (cracked-cell)	350 mg
Dunaliella salina	40 mg
Nova Scotia Dulce	30 mg
Licorice root powder	100 mg
Siberian Ginseng	60 mg
Pfaffia paniculata (Sma)	60 mg
Astragalus membranaceus	60 mg
Echinacea purpurea	60 mg
Ginger root powder	5 mg
Lecithin (99% oil-free)	2,000 mg
Wheat sprout powder (gluten-free)	350 mg
Acerola berry juice powder	200 mg
Beet juice powder	200 mg
Spinach octacosanol	150 mg
Royal jelly (5% 10-HDA)	150 mg
Bee pollen	150 mg
Vitamin E (D-alpha-Tocopheryl Acid Succinate)	100 IU
Total count non-dairy probiotic cultures	5.0 billion
Lactobacillus group (<i>L.rhamnosus A, L.rhamnosus B, L.acidophilus, L.casei, L.bulgaricus</i>)	3.5 billion
Bifidobacterium group (<i>B.longum, B.breve</i>)	1 billion
Streptococcus thermophilus	500 million
Flaxseed meal	500 mg
Apple pectin and fiber	1000 mg
Fructooligosaccharides (FOS)	500 mg
Milk Thistle extract (80% silymarin)	60 mg
Ginkgo biloba extract	20 mg
Green tea extract (60% catechins)	20 mg

Grape pip extract (92% proanthocyanidins)	20 mg
Bilberry extract (25% anthocyanidins)	20 mg

Suggested use: As a dietary supplement, add 1 level scoop (8.8 g) to shaker containing 8 oz. of juice or water, drink immediately. Best taken on an empty stomach. More than one scoop per day may be used if desired. Pregnant or lactating women considering taking more than one serving per day should consult their healthcare practitioner prior to use.

Triphala

Triphala is a blend of the fruits of three plants, and has a long history of use in Ayurveda, a major medicinal system of India. The three plants are: *Terminalia bellerica*, Roxb. (bibhitaki), *Terminalia chebula*, Retz. (haritaki) and *Embllica officinalis* (amalaki or amla). This three-part formula is used to help correct a range of digestive disorders, most particularly constipation. Over several months use, it is reputed to help tonify the intestinal tract as well as help the liver to stay healthy. It has also been used to treat diarrhea related to irritable bowel syndrome. While it contains anthraquinones (like those found in herbs like cascara and senna), triphala does not appear to have the same penchant for causing dependency.

This combination addresses the three main aspects of health known as "doshas" of vata, pitta and kapha. These describe characteristics of health that need to be in balance. Among other things, for example, they may be used to describe body types. Vata (represented by the element "air") is akin to very slender individuals. Pitta (fire) relates to a more endomorphic or medium weight body type. Kapha (earth/water) is a solid, heavier individual. It gets much more detailed than this, but that gives you a bit of an idea.

T. chebula or haritaki addresses the vata aspect and is known as the Life Giver. Primary uses include for nervous disorders, chronic constipation and digestion. *T. bellerica* or bibhitaki helps to tonify kapha. It specifically is thought to exert its actions on the respiratory system and to remove mucous out of the digestive tract. This may improve motility and absorption. *E. officinalis* or amla deals with the pitta and has a high concentration of vitamin C. This is the cleanser, tonifying the colon, while helping to relieve inflamed tissue in the stomach and bowel. It is often used to manage dyspepsia, whether arising from an ulcer or otherwise.

Triphala (NYBC) Each bottle, 180 capsule. Each capsule, 500 mg of a blend of these three major Ayurvedic herbs. *Suggested use is 2 tablets, 2-3 times per day.*

Butcher's Broom

Butcher's Broom Extract (NYBC) Each bottle, 90 capsules. Each capsule, 500 mg of extract, standardized to 10% ruscogenins. *Ruscus aculeatus*, Linn. containing the saponins, ruscin and ruscoid. This herb, according to the

NYBC © 2005

German Commission E, has been used to help with problems with the veins, including chronic venous insufficiency and hemorrhoids. Rarely, some people may experience nausea or gastric disorders. Animal studies have shown effects such as an increase in venous tone, reducing fever, diuretic effects and an electrolyte-like reaction on capillary walls. (This herb should not be confused with the toxic botanical, Scotch broom, which is a different family). *Suggested use is 1 capsule, 1-2 times daily with meals. A daily dose equivalent to 7-11 mg of ruscogenins is a standard dose noted by the German Commission E.*

Chinese Herb Blends

Clear Heat (Health Concerns) Each bottle, 336 tablets. Each 750 mg tablet contains a proprietary blend of *Isatis* extract, *Oldenlandia*, *Lonicera*, *Prunella*, *Andrographis*, *Laminaria*, *Viola*, *Cordyceps* and licorice. This combination is designed for maintaining liver health. Health Concerns does not state concentrations of individual herbs in their blends. This formula may be used for other viral, bacterial or fungal infections, chronic herpes, viral warts and/or chronic fatigue syndrome. If at all possible, consult with a practitioner of Chinese medicine. In Chinese medicinal terms, it is intended to clear heat, tonifying the kidney essence and lung yin. *Take two or three tablets 3-4 times per day between meals for a total daily dosage of 6-8 tablets.*

Coptis Purge Fire Formula (Health Concerns) Each bottle, 90 tablets. Each 500 mg tablet contains coptis (huang lian), lophatherum, bupleurum, rehmannia, tang kwei (dang gui), peony (bai shao), anemarrhena (zhi mu), akebia (mu tong), sophora (ku shen), scute (huang qin), phellodendron (huang bai), alisma (ze xie), plantago seed (che qian zi), gentiana (long dan cao), forsythia (lian qiao), gardenia (zhi zi), licorice (gan cao). This formula is designed to be used for a short period of time, specifically for various conditions such as a skin eruption (herpes) or strep throat exists, eczema, facial flushing, red eyes, migraines, urinary tract infections and constipation related to illnesses with high fevers. *Suggested use is 3 tablets, 2 time per day. Long periods of use, however will damage the Spleen and Stomach and the Yang.*

Digest Ease (Pacific BioLogic) Each bottle, 100 tablets. Each tablet, 255 mg of herbal formula consisting of ginger, rhubarb, elecampane (*Inula helenium*), gentian, long pepper, tropical almond, emblic myrobalan (*Embllica myrobalan*), Beleric myrobalan (*Terminalia bellerica*), Glauber's salt (*Natrium sulphuricum*) and kaolin (*Kaolinum ponderosum*). Derived from a Tibetan medicine formula, it is designed to help the function of the gastrointestinal tract, helping to optimize the course of digestion and colonic function, particularly problems arising from bad dietary habits. There may be a brief period

of diarrhea or constipation at the beginning of using this product. *Suggested use is 1-3 tablets after meals or when symptoms occur. Start with one tablet per day, work up to 2-3 tablets a day; for optimum benefit, use for four weeks.*

Ecliptex (Health Concerns) Each bottle, 270 tablets; each tablet, 750 mg of a combination of herbs which includes Eclipta concentrate, milk thistle, curcuma, salvia, lycium fruit, ligustrum, bupleurum, schizandra, tienchi ginseng, tang kuei (Dang Gui), plantago seed and licorice. This formula is designed to help improve liver function. *Suggested use is 3 tablets, 2-3 times per day between meals.*

Enhance (Health Concerns) Each bottle, 420 tablets of a proprietary blend of 650 mg each of various botanicals, including Ganoderma (Ling Zhi), Isatis extract (Ban Lan Gen and Da Qing Ye), Milletia extract (Ji Xue Teng), Astragalus (Huang Qi), Tremella (Bai Mu Er), Andrographis (Chuan Xin Lian), Lonicera (Jin Yin Hua), Aquilaria (Chen Xiang), Epimedium (Yin Yang Huo), Oldenlandia (Bai Hua She She Cao), Cistanche (Rou Cong Rong), Lycium fruit (gou Qi Zi), Laminaria (Kun Bu), Tang kuei (Dang Gui), Hu-chang (Hu Chang), American Ginseng (Xi Yang Shen), Schizandra (Wu Wei Zi), Ligustrum (Nu Zhen Zi), Atractylodes (Bai Zhu), Rehmannia (Shu Di Huang), Salvia (Dan Shen), Curcuma (Yu Jin), Viola (Zi Hua Di Ding), Citrus (Chen Pi), Peony (Bai Shao), Ho Show Wu (He Shou Wu), Eucommia (Du Zhong), Cardamom (Sha Ren), Licorice (Gan Cao).

A formula designed for immune regulation, especially for conditions of chronic viral inflammation as with HIV or chronic fatigue syndrome. Addresses fatigue, weight loss, night sweats, fever, digestive disorders, muscle aches, inability to concentrate, swollen nodes, etc. A concentrated form of Milletia was chosen for its ability to help improve bone marrow function; it is used for this purpose in China to offset bone-marrow suppressive effects of chemotherapy. It was developed as a primary protocol for people with HIV by Misha Cohen, OMD, L.Ac. of the Quan Yin Institute in San Francisco, CA. Ganoderma and Isatis are used by tradition to treat hepatitis with Isatis being a potent antiviral. Andrographis has also been studied in the test tube and in people and found to have anti-HIV activity.

However, Misha Cohen has reported little difference between groups randomized to receive either a combination of herbs or a placebo. It may be good for some things, but doesn't seem to slow progression. It seemed to help with low red blood cell counts. *Suggested use is to take 5 tablets, four times per day between meals. Warning: During a high fever, discontinue for a few days.*

Marrow Plus (Health Concerns) Each bottle, 270 tablets. Each tablet 750 mg of *milletia*, ho-shou-wu, *salvia*, *Codonopsis*, *Astragalus*, *Ligusticum*, raw and cooked

Rehmannia, *Lycium*, tang kuei (Angelica), lotus seed, citrus, red date extract, oryza and gelatinum. A formula designed specifically to offset the bone marrow suppressive effects of drugs like AZT and DHPG (ganciclovir, an antiviral used to treat CMV). May also help to reverse anemia. This formula is also based on one derived by Misha Cohen, Lic. Ac., of Chinese Chicken Soup (SF, CA) who designed many of these formulae for Health Concerns for people living with HIV. *Suggested dose is 2-3 tablets taken 3-4 times per day, for a total of 6-12 tablets per day.*

Quiet Digestion (Health Concerns) Each bottle, 90 tablets. Each tablet 750 mg of *Poria*, *Coix*, shen chu (a dried mass of wheat flour, fresh aerial parts of *Artemisia annua*, *Xanthium sibiricum*, *Polygonum hydropiper* and water), *Magnolia*, *Angelica*, *Pueraria*, red *Atractylodes*, *Saussurea*, *Pogostemon*, *Oryza*, *Trichosanthes* root, *Chrysanthemum*, halloysite (a mineral product that contains aluminosilicates), citrus, *Mentha* and malt. Used to reduce gastric distress including pain, cramping, nausea, vomiting, diarrhea, regurgitation, poor appetite; treats viral or bacterial gastroenteritis as well as motion sickness, hangover and jet lag effects. Some resources suggest the hallyosite contains ferric oxide (and extra iron may not be good in the case of liver disease). *Suggested use is 2 tablets taken after meals, 3 times per day; also may be taken between meals or as needed.* Chew for best results.

Resist (Pacific BioLogic) Each bottle, 180 capsules. Each capsule, 750 mg of *Astragalus*, *Ganoderma lucidum* (Reishi), *Ligustrum* and 15 other herbs, including Chinese yam root, relative root, *Atractylodes*, dodder seeds, sand root, privet fruit, *Milletia* root, *Rehmannia*, balloon flower root, *Schizandra*, ginger root, jujube fruit, licorice root, tangerine peel and peony root. Used as an immune system tonic to offset stress induced by viral infections, environmental or physical stress. The effect you should see in your blood work is an improvement in your white blood cell count. Resist may also promote phagocytosis (cells eating other infected cells). Other herbs may improve T-cell counts (*Astragalus*, *Ligustrum* and *Ganoderma*) while these and *Codonopsis*, *Milletia*, *Dioscorea*, peony, *Rehmannia* and *Schizandra* have all been shown to promote the development of B-cells into antibody-secreting plasma cells. *Codonopsis* has additionally been shown to improve red blood cell counts and hemoglobin levels and may also lower blood pressure. If your white or red blood cell counts are low, you might try this to see if it improves the numbers. *PWHIV take 2-4 capsules, 3 times daily. Discontinue use during cold or flu.*

Coleus forskohlii

***Coleus forskohlii* (NYBC)** Each bottle, 90 capsules. Each capsule, 250 mg of *Coleus forskohlii*, standardized to 10% forskolin. This diterpene has not been studied

extensively in humans; preliminary data are a bit mixed. A more water-soluble form taken by injection has shown improvements in heart blood flow rates in one study and in asthma management in another. It may have some benefit for asthma, heart disease (two studies showed modest benefit) and for glaucoma, based on numerous test tube and animal studies. Traditionally used in Ayurvedic medicine, its value may stem partly from its capacity to increase cAMP levels inside cells. Cyclic AMP (cAMP) is an important regulator of a range of important systems, including the amount of calcium ions inside cells, a balance which must be maintained for healthy cell functioning, particularly for skeletal and heart muscle. Too much calcium, for example, causes cells to die. Increases in cAMP result in relaxed smooth muscle tissue (which may explain any benefit in asthma) as well as lower blood pressure through relaxation of vascular tissue. There is a remote chance that it may help with excessive fat accumulation, but this is not known. If it lessens accumulated fat, though, one might also worry that it could lessen peripheral fat, causing a worsening of lipoatrophy. **Warnings: Probably best NOT to use with blood pressure lowering or blood thinning medications that reduce clotting as it reduces blood pressure and platelet aggregation. Suggested use is 1 capsule, 1 to 3 times daily with meals.**

Curcumin (Turmeric; *Curcuma longa*)

A Search Alliance (now AIDS ReSearch Alliance) study of curcumin found a significant reduction in viral load among 18 PWHIV over 20 weeks. Overall, the viral load results were variable. The average T cell count was around 100. As the late and marvelous Greg Haas reported in the 1994 edition of *The Common Factor* (from the Committee of Ten Thousand, referring to people like Greg who acquired HIV from tainted Factor VIII used to treat hemophilia), the group took three 285 mg capsules three times a day. Two of the 19 stopped taking study medication due to gastrointestinal side effects. Overall viral load declines from 1-2 logs were observed in the majority of participants. (It may be that these benefits were not sustained due to many receiving flu shots that caused spikes in viral load.)

This compound works against a part of HIV called the long terminal repeat (LTR), and that activity was the basis for a couple of small clinical studies to evaluate its antiviral effect. Curcumin, known as a potent anti-inflammatory and antioxidant, has been in use in Ayurvedic medicine for several thousand years. Work at Harvard University showed it to inhibit HIV's incorporation into cells, as well as check viral activity in already infected cells (that is, when virus has already been incorporated into cells and is actively replicating).

A study conducted by the New England CRIA found no effect using a low or high dose on viral load. This study, however, was conducted for only 8 weeks, which may not have been long enough to see effects. There was a slight

rise in CD4 count in the high dose group. High dose was four caps taken four times a day, low dose was three caps taken three times a day. These studies are reviewed in *AIDS Treatment News* #242 of March 1, 1996.

While we don't know if the way they suppress HIV is similar, it may be noted that SPV-30's effects also take 4-6 months before they are seen. This may be true of various therapies that either rely on re-regulating cellular function or inhibiting latent HIV as opposed to preventing cells from being infected. Results of the Search Alliance curcumin study lasted five months and benefit was seen only after about three months. But, like SPV-30, curcumin used alone has not been shown to be all that powerful in terms of fighting HIV. (Of course, AZT used alone isn't that good, either!)

Caution: due to curcumin's effect on inhibiting platelet aggregation, some people may notice a loss of platelets. One NYBC member experienced this: if your platelet level drops, stop the curcumin.

Curcumin (Jarrow) Each bottle, 60 capsules. Each capsule, 500 mg turmeric extract (95% curcumin) in a base of brown rice. *PWHIV are taking 3 grams per day: 2 capsules 3 times per day always with food when attempting an antiviral dose. Lower doses (1-2 grams per day) are used when including curcumin in a broad-spectrum antioxidant protocol. The higher dose may cause GI distress and gas in some. Start with a lower dose and work your way up over a week or so.*

Elderberry (*Sambucus nigra*)

Elderberry is known by its Latin name, *Sambucus nigra*, as well as the Black Elder, Common Elder, Pipe Tree, Bore Tree, etc. There's quite a long entry in the excellent book *A Modern Herbal* by Mrs. M. Grieve. She notes numerous recipes as well as a history of use ranging from Greek and Roman times to the present. Medicinally, the bark, leaves, flowers and berries have all been used. Particularly by the English (and Israelis), the flowers have been used to treat a wide range of ailments, including as an ointment to ease the pain of hemorrhoids. Other traditional uses include bronchial and pulmonary infections, scarlet fever, measles and other eruptive diseases (although current pharmaceutical treatments or vaccines are generally more effective). It may act as a gentle laxative, may induce perspiration and can promote "expectoration in pleurisy" (that is, helps people spit who have a lung inflammation). The wood (inner bark or fresh new shoots) has been used to help elimination (as a purgative and diuretic). The leaves are also used for this, but may cause nausea. They also work as expectorants and can increase perspiration. (Ointments from the leaves have also been used for wound healing, sores and for piles.) Physicians from earlier centuries also touted the benefits of preparations of the seeds. Again, Grieve provides several recipes and a good deal more information. *A Modern Herbal* is one to have on

the bookshelf!

Elderberry Berries, liquid (Cardiovascular Research)

Each bottle, 4 ounces of liquid, 80% from the berries and 20% derived from the flowers. May help to knock out the flu. Comes in a super-sweet, honey base. *Caution: since this is a diuretic (increases urination frequency), it may tend to lower potassium levels if used in excess; keep an eye on your blood work. To compensate, eat bananas and potatoes, which are high in potassium. Mixing with glycyrrhizin/licorice may add to this problem! The suggested use is 1/2 oz per day to attempt an antiviral effect.*

Eleuthero (*Eleutherococcus senticosus*, formerly known as Siberian ginseng) The term "adaptogen" was coined to describe the qualities of this herb (*Eleutherococcus senticosus*). An adaptogen is used to rebalance disrupted physiology back toward normal. Major constituents of this item are saponins (eleutherosides and ginsenosides), trace minerals, vitamins and oils. Thirty years of Russian research suggests that Eleuthero exerts a balancing effect, helping to correct either an excess or deficiency in the body. One method some PWHIV use is to take Eleuthero for three to four weeks and then alternate with *Astragalus*, another adaptogen (see above). Eleuthero is **not** *Panax ginseng*. **Do not use if pregnant or if you have high blood pressure or if you have a fever. All Eleuthero products should be avoided in cases of hyperactivity or extreme nervous anxiety.**

CM4 (Omega Pharmaceuticals) Each bottle, 60 ml. It contains a proprietary glycoside formulation derived from Eleuthero. It has a lot of test tube and animal data that suggest it can lower TNF, increase heat shock proteins (though whether this is good or not is unknown), suppress expression of HIV co-receptors, increase spleen cell proliferation, increase interferon gamma as well as IL6. (But increasing IL6 may NOT be a good idea.) It is said to increase the ability of macrophages to consume foreign material (*phagocytosis*) and may enhance B-cell secretion of antibodies (which is related to the increase of IL6).

You might recall a treatment for HIV called PCM-4, which included a combination of pig spleen extract and ginseng: this is the CM4 without the pig spleen. Studies of that product in the early 90s for HIV (before more widespread use of HAART) showed, among a few people, what appeared to be a stabilization of disease. Perhaps the most intriguing result for this mixture was the potential effect on human papilloma virus (which is a family of viruses some of which cause warts, etc.).

The CM4 may also have some modest antiviral activity. However, don't take at night as it may keep you up. (One of CM4's best benefits may be to increase alertness and mental acuity.)

Other researchers have noted it may enhance the antibiotic effect of mycin drugs used to treat colitis.

Don't take if you have a fever or uncontrolled high blood pressure. From the manufacturer's website: "Because of the stimulant property of CM4 on alertness and metabolism, untreated, uncontrolled hypertension is a contraindication. If one has treated and controlled blood pressure problems, one should start CM4 with 1/2 dropperful (1/2 ml) twice daily and monitor the blood pressure over the initial week. With no significant rise above the previous "controlled" level of pressure, CM4 can then be increased to the full dropper (1 ml) twice daily, while still monitoring the blood pressure response. It is recommended that both doses be taken by at least 2 PM daily as this same stimulant property may cause insomnia or night time restlessness. Since the active ingredients are stabilized in alcohol, persons with sensitivity to even small medicinal quantities of alcohol can heat CM4 slightly to evaporate the alcohol off. Most children and adults will have absolutely no problems taking the medication in fully prescribed dosage, adjusted for age (see recommended dosage schedule)."

Suggested use for adults is 1 ml at breakfast and 1 at lunch. May be taken with water or tea.

Garlic (*Allium sativum*)

High dose garlic (between 5 and 7.5 grams per day) is suggested for anyone who is interested in a broad range of anti-bacterial/fungal/viral activity. Some studies suggest an ability to improve immune function. In a German study among 10 people with AIDS, it improved CD4/CD8 ratios, and normalized low natural killer cell (NK) activity. Partial symptom resolution was also reported (e.g. cryptosporidial diarrhea, recurring genital herpes and aggressive candidiasis). It is best consumed raw to preserve the sulfur-containing thioallyls like allicin, an active ingredient. In addition, garlic can have important benefits for managing cholesterol and can be an important part of a holistic management program.

A study of high-dose garlic extract to treat cryptosporidiosis was conducted by the AIDS ReSearch Alliance. After six weeks, 10 of 16 exhibited significant improvement in symptoms. Eight who remained on the allicin for longer than 8 weeks had repeatedly negative stool cultures. They used a 30 mg concentrate (Allicin) orally at least once a day. A second dose, at will, was taken as a retention enema, however, due to the diarrhea, these were poorly retained in general. Other than garlic taste and smell, few side effects and limited gastrointestinal effects were reported. These are highly encouraging results since all involved had less than 30 CD4 cells.

Garlic may also be useful for some in helping to control *Candida albicans*, particularly if your diet is changed to reduce the amount of foods you eat like yeast, simple sugars, beer, etc. which encourage the growth of candida. (Try, for a couple weeks, an Atkins-like diet! More protein,

low to no carbs and good fats.) Garlic is being intensively studied for its many potent biological qualities. In test tube studies, garlic extracts inhibit many microbes that commonly cause opportunistic infections in AIDS, including cytomegalovirus (CMV), herpes simplex 1 and 2, staph infections, salmonella, parasites, TB, *Entamoeba*, histoplasmosis, and *Mycobacterium avium*. However, if you are diagnosed with any of these, please do not rely on garlic as your sole treatment! As an additional therapy, garlic makes good sense if you don't have any trouble tolerating it but it is not a substitute for complete diagnosis and treatment.

Warning: A study in HIV-negative volunteers found that garlic supplements caused a reduction in the level of the protease inhibitor, saquinavir. So it may be best to avoid garlic supplements if using a protease inhibitor.

Warning: Garlic should not be taken by PWHIV with extremely low platelets or if on blood thinners.

Those interested in a high dose take 10–15 per day (5 grams–7.5 grams) especially if fighting candida. A suggested minimum dose is 4 per day.

Allicin (Tai He) Each bottle, 30 capsules. Each capsule 20 mg of grade allicin, a 98.5% pharmaceutical extract of garlic. Allicin is thought to possess the greatest activity of garlic's various components. The garlic used in the studies came in 30 mg ampules. Dr. Zhang, who supplied the garlic for the Search Alliance trial and manufactures the product in China, suggests the following: For crypto and microsporidiosis, 2 weeks at three capsules taken 3 times per day has resolved these infections in a small group of patients in his practice.

For bacterial infections susceptible to garlic, the suggested treatment dose is two capsules 3 times per day. Dr. Zhang reports one person claiming to have cleared bacterial pneumonia in 5 days using three capsules 3 times per day. He also suggests one capsule per day as a preventative for crypto- and microsporidiosis; in addition, he reports good results with fungal infections. Allicin has been used to treat cryptosporidiosis and microsporidiosis in babies in China as standard practice and the dose is similar. These recommendations are Dr. Zhang's, who is manufacturing the product and also has a financial interest. But some study findings as well as the experience of NYBC and DAAIR clients suggests it is worthwhile to consider this therapy.

The product used in the Search Alliance trial was helpful in treating cryptosporidiosis. People with cryptosporidiosis took the equivalent of 30 mg of active ingredient per day for only 6 weeks and of the 16 who were evaluable, 10 achieved significant symptomatic improvement, including reduction in stool volume and frequency and improvements in stool consistency, as well as weight stabilization or gain. Remarkably, 4 out of 8 who remained on the therapy longer than 8 weeks became negative for cryptosporidia by stool exams, an achievement not witnessed in any drug therapy
NYBC © 2005

to date. *Suggested use is 1 capsule per day or as directed.*

Glycyrrhizin–Licorice–(GL)

Glycyrrhizin is an extract of licorice and has been used extensively in Japan for years. It is employed there to treat ulcers and other inflammatory disorders and is a therapy with a variety of effects. Several clinical studies in HIV+ people have indicated clinical stabilization of disease in recipients with over 7 years of use. While T cells were not seen to increase, progression to AIDS was significantly slowed for some. Glycyrrhizin is also an excellent liver tonic and is used to treat not only viral hepatitis but other liver disorders. Use of pharmaceutical-grade licorice extract in 4 people with hemophilia and liver damage related to antiretroviral use and Hepatitis C co-infection resulted in a normalization of liver enzymes within 10 days (initial ALT ranging from 280 to 480 IU/L). This was reported in the *Jpn. J. Infect Dis* in 1999 and all four were able to resume or continue ARV therapy.

Glycyrrhizin also seems to help those with impaired kidney function (particularly the IV formulation).

It operates directly against lipid-enveloped viruses (like herpes viruses) as well as several other pathogens such as TB, staph infections, MAI and others. It affects an enzyme called protein kinase C (PKC) which HIV uses for its growth. (PKC is affected by vitamin E as well). In its HIV fighting capacity, there is evidence to show that licorice extract inhibits chronically HIV-infected cells (like macrophages), stops clumping of cells and interferes with cell-to-cell and virus-to-cell binding. It acts as an antioxidant, reducing damaging inflammatory chemicals like prostaglandin E2 (PGE2), leukotriene C, excess cortisol and other reactive oxygen species. In terms of cytokines, it helps reduce pathologically elevated levels of TNF and acid-labile interferon while encouraging IL-2 and interferon-gamma production, as well as MHC-I expression.

WARNING: Persons with a history of high blood pressure or a heart condition should not take licorice extracts. It is also important while using these extracts to monitor your potassium level as well as blood pressure. Eat bananas, peaches, dates, raisins, apricots, and yes, potatoes!
Please let your health care provider know if you are using licorice extracts.

Glycyrrhizinate Forte (Jarrow) Each bottle, 100 capsules. Each capsule 300 mg containing mono-ammonium glycyrrhizinate 75 mg; glycyrrhetic acid 98% 75 mg; glycine 75 mg; L-methionine 75 mg. Many PWHIV with kidney impairment or inflamed organs (including pancreas) use up to 9 per day and have reported substantial improvements in their conditions. *Most PWHIV generally take only 3/day.*

Liver Support

Hepato-C (Pacific BioLogic) Each bottle, 100 capsules.

Each capsule, 500 mg made up of a Chinese Herbal Formula for Hepatitis C: *Astragalus membranaceus* radix (root; huang qi), *Artemisia capillaris* herba (shoots and leaves, yin chen/mian & hao), *Citrus aurantium* fruit (bitter orange fruit, zhi ke), *Codonopsis pilosula* radix (high grade root, dang shen), *Dryopteris crassi* rhizoma (root, guan zhong), *Heydyotidid diffusa* herb (bai hua she she cao), *Lycium barbarum* fructus (lycium fruit, gou qi zi), *Magnolia officinalis* cortex (bark, hou po (reg)), *Paeoneae rubrae* radix (red peony root, chi shao), *Polygonum cuspidatum* rhizoma (knotweed rhizome, hu zhang), *Polygonum multiflorum* radix (root, he shou wu), *Polyporum umbellatum sclerotium* (zhu ling), *Rhodiola sachelanensi* radix (root, hong jin tian), *Salvia miltiorrhiza* radix (root, dan shen) and *Scutellaria barbata* herb (barbat skullcap herb, ban zhi lan). **This formulation has been specifically designed for hepatitis C infection.** *Suggested use is 2-3 capsules in the morning and evening for the first 3 months. Thereafter, reduce to 2 capsules in the morning and evening.*

Hepato-Detox (Pacific BioLogic) Each bottle, 100 capsules. Each capsule, 500 mg of an herbal formula designed to strengthen liver function. Combination includes salvia, codonopsis, lycium, polygonatum rhizome, astragalus, reishi, privet fruit (ligustrum), ginseng root (red ji lin) and Cornelian Asiatic cherry. *Suggested use is 2 daily before bedtime. For those who want a remedy for alcohol use, 2 capsules before and after drinking.*

Stimuliv (Ayurved Formulas/Jarrow) Each bottle, 100 tablets. Each tablet, 500 mg. A potent liver detoxifier containing a blend of 10 herbs, including *Andrographis paniculata* 8% (200 mg), *Phyllanthus niruri* 10:1 (100 mg), *Eclipta alba* 4% (100 mg), *Picrorhiza kurroa* 6% (100 mg), *Boerhaavia diffusa* 8:1 (50 mg), *Berberis aristata* 8% (25 mg), neem leaf 10:1 (50 mg), *Solanum nigrum* 10:1 (25 mg), *Tephrosia purpurea* 9:1 (25 mg) and *Ipomoea trurpethum* 30% (50 mg). *Suggested use is to take 1-2 tablets twice per day with meals. Some PWHIVs might want to try a regimen that includes this product for two to three weeks every three months.*

Milk Thistle: Silymarin (*Silybum marianum*)

A potent liver-strengthening herb, it stimulates the liver to regenerate itself by producing new liver cells. It also shows strong antioxidant action, helping to prevent lipid-peroxidation of cell membranes. When given to seven patients receiving tuberculosis drugs (INH and ethambutol), a standardized silymarin extract normalized elevated liver enzymes after three months treatment. Many people with hepatitis C use milk thistle. It is extremely safe. Some studies suggest it may help reverse the scarring known as fibrosis. Chilean researchers have discovered that silymarin can increase glutathione in the liver, stomach and intestines

by over 50%—although it was not shown to increase GSH levels in other organs. Milk thistle may interact with cytochrome P450—specifically the 3A4 enzyme used by many AIDS drugs. A study by Piscitelli, et al., happily, found no effect on the plasma level of indinavir (Crixivan). Now we need a study evaluating the potential benefit of silymarin against the liver toxicities of drugs like nevirapine and ritonavir (Norvir). Anecdotal reports suggest that it may delay CD4 increases with ARV.

SPECIAL NOTE: Mount Sinai Medical Center, in conjunction with the Foundation for Integrative AIDS Research (FIAR) is conducting a study of milk thistle in people with HIV and hepatitis C; please contact Eileen Chusid at 212-241-8902.

Silymarin 80% (Jarrow) Two sizes, each bottle, either 100 or 200 capsules. Each capsule contains 150 mg of Milk Thistle standardized for 120 mg of Silymarin (standardized 80%). This brand has smaller capsules since they do not use a turmeric base. Some find this more convenient to use. *PWHIV and PWHCV use 3–6/day.*

Olive Extract (*Olea europa*)

Aside from the healthful oil from the fruit of olives, the leaves have recently been found to be a source of powerful antioxidants, one in particular known as oleuropein. After many NYBC members tried even very high doses, no effect was seen on HIV load. However, it may have other uses. Judging from several anecdotal reports of improvements, it may help ameliorate herpes virus infections. If at all possible, use whole olive leaf and make it into a tea. However, there are anecdotal reports of increases in energy with the capsules, and good results with chronic fatigue. There are few studies on oleuropein. One study showed oleuropein can inhibit the growth of some bacteria in the test tube. Making the tea may be more work but it seems to produce better results (particularly in terms of increased energy).

It is suggested that vitamin C and magnesium be used along with this supplement. Since it is a strong detoxifier, mild flu-like symptoms may result; if they do not resolve by lowering the dose or within a day or two, stop taking this for a few days and then resume at a lower dose. If these symptoms recur or persist, discontinue use. Some PWHIVs have reported that taking this extract late in the day keeps them awake at night.

There is more to olive than oleuropein. Another ingredient is calcium elenolate, which may be responsible for any antiviral activity that has been reported from some alternative medicine physicians.

Whole Bulk Olive Leaf (San Francisco Herb Company) Each bag, 1 pound bulk sun-dried olive leaves to be made into a strong tea. Each 1 pound bag will make you enough tea at 2 half cups per day (4 ounces each) for one month. Mark Konlee reports that the following recipe

resulted in about 213 mg of oleuropein per half cup (whereas the capsules had as little as 1 mg per capsule). This form is also considerably less expensive, though more inconvenient. Some find the taste unpleasant, but mixing with cranberry juice has been reported to improve the flavor.

Directions: You will need: 1) 1/2 pound (8 ounces) sun-dried, not high temperature oven dried, whole olive leaves; 2) 1 gallon distilled water; 3) 5 quart Crock Pot; 4) 2 two-quart glass bottles. Place the bag of leaves in a bowl and rinse them by covering the leaves with water; drain out water; add leaves to a Crock-Pot and add one gallon distilled or spring water; turn on low and leave for 12 hours. If you have a thermometer, check periodically to see if the temperature is maintained between 175° and 185°F. After 12 hours turn off and wait another 5-6 hours for liquid to cool; scoop out liquid with a cup and place in glass jars; always keep refrigerated.

Dose as per *Keep Hope Alive's* Mark Konlee: Adults use two, 1/2 (4 ounce) cups per day. It tastes very bitter so it should be mixed with lots of water or ginger ale to make it taste like ice tea. If lab results show promise, increase the dose to three 1/2 cup per day to see if better results can be obtained. Don't heat longer than 12 hours or there will be a progressive loss of active ingredients.

Policosanols

Policosanols (*Source Naturals*) Each bottle, 60 tablets. Each tablet, 10 mg. Source Naturals recommends that a minimum of 15 mg of Coenzyme Q10 be taken daily per each of these 10mg tablets, since some studies indicate that CoQ10 levels in the body are lowered by compounds that work on a similar metabolic pathway as policosanols. Whether this is applicable with policosanols is unclear. *Suggested use is one to two tablets, in the evening, for the first three months. Thereafter 1-2 tablets daily.*

Policosanols are plant-derived compounds (long chain fatty alcohols, to be exact) that have been extensively studied in recent years as a means to reduce cholesterol and triglycerides. (NYBC stocks policosanols derived from sugar cane wax, the same type used in the most significant clinical trials.) Although the mechanism of action of policosanols is still incompletely understood, they appear to inhibit cholesterol synthesis in the liver, and also decrease platelet aggregation.

In studies involving healthy individuals as well as those with type II diabetes and type II hypercholesteremia, policosanols were found to significantly decrease total cholesterol, and also lower LDL (low-density lipoprotein) cholesterol and the ratio of LDL cholesterol to HDL (high-density lipoprotein) cholesterol. They also appear very safe (for example, less than 0.1% adverse results noted

in a study of 27,879 patients using policosanols over an average of 2.7 years).

Additional studies comparing policosanols with statins (a class of drugs commonly prescribed in the USA to reduce cholesterol and improve lipid profiles) have shown that policosanols often perform better and with fewer side-effects. Although more research is needed to confirm these findings, the clinical trials conducted over the last decade point strongly to policosanols as a very useful supplement for stabilizing and maintaining cardiovascular health.

Warnings: If you take medication to counteract platelet aggregation, such as daily aspirin, consult your doctor before using this supplement. Also, policosanols should not be taken by pregnant or breast-feeding women.

Rhodiola rosea

Rosavin (Ameriden) Each bottle, 60 capsules. Each capsule, 100 mg of *R. rosea* extract standardized to 1% Rosavin. This is an adaptogenic herb that helps to support mitochondria function; some former-Soviet Union studies suggest that it helped to significantly increase production of ATP in athletes. As an adaptogen, it may help for weight loss by helping the body better utilize fatty acids. Improving your diet and exercising are important! From the one resource on this, this looks like a good bet. Since it is an adaptogen (= normalizes function), NYBC does not believe it will worsen fat loss, however this is a concern we cannot completely discount. *Suggested use is approximately 300 mg a day.*

Saw Palmetto (*Serona repens*)

A significant amount of clinical data suggests that this species of saw palmetto (*S. repens*) has good effect at reducing an enlarged prostate. The prostate gland surrounds men's bladders and when it enlarges, can cause constriction and difficulty in urinating. This problem arises due to difficulties in metabolizing testosterone. Several controlled studies have shown that supplementation with extracts of the berries resulted in significant improvement (such as reduced urinary frequency and prostate size). Note that the *S. officinalis* often found in stores is the wrong species. Make sure to get a definitive diagnosis of an enlarged prostate.

There is evidence to suggest that Pygeum (*Prunus africana*) is good for reducing an enlarged prostate (see, e.g., *Urologie A.* 2002 Sep;41(5):447-451 and *J Urol.* 2004 Nov;172(5 Pt 1):1792-1799). This African evergreen tree has been pretty well characterized and shows activity. One study showed that it helped to reduce urinary frequency, urgency and flow rate. These herbs appear to work partly by blocking the conversion of testosterone to dihydrotestosterone. Unfortunately, there are no studies of the combination that we are aware of, though it seems

reasonable to hope that the combination of the two might have synergistic effects. Further research will tell. (Along with these two herbs, essential fatty acids, especially omega-3 fatty acids, may be a good idea to help treat "benign prostatic hyperplasia," the fancy way of saying an enlarged prostate).

A recent review noted that "Based on the information available today, [...] botanical therapies can be used for treatment of a number of objective and subjective symptoms in patients with BPH, stages I and II" (see *Ann Pharmacother.* 2002 Sep;36(9):1443-1452). The particular herbs referred to in the article include Saw Palmetto, Pygeum, *Urtica dioica* and *Cucurbita peponis* seeds.

Saw Palmetto (Jarrow) Each bottle, 120 softgels. Each softgel 160 mg, an extract of the berry. *Suggested use is 1 softgel twice per day with meals.*

Saw Palmetto with Pygeum and Pumpkin Seed Oil (Jarrow) Each bottle, 120 softgels. Each softgel contains 80 mg of Saw Palmetto berry extract, 25 mg of the bark of *Pygeum africanum* and 750 mg of pumpkin seed oil. There are only empirical data (observations) showing effects of pumpkin oil as an antioxidant against fever. So far, no clinical data but it seems pretty safe used as directed. It is commonly used for irritable bladder or prostate complaints and basically helps with the effects that an enlarged prostate may cause. *Suggested use is 2 softgels twice per day with meals.*

Siberian Ginseng See *Eleuthero*.

Silymarin See *Milk Thistle*.

SPV-30/"Flu Guard" (Boxwood, *Buxus sempervirens*)

This herb has been the subject of an open label study (that is, all participants knew what they were taking) in the United States. The results suggest a moderate reduction in viral load for PWHIV who had a viral load higher than 40,000 at the start of the study. Improvement in quality of life parameters were recorded by some. Oddly, people who either added antivirals or did not use antivirals at all saw better results in terms of viral load decreases than those who remained on stable antiretroviral therapy. The effects on viral load were not very strong (about 34% lower after 6 months) and lie within the variability of the viral load test. As a monotherapy, SPV-30 has minimal antiviral effect.

A controlled French study indicated disease stabilization in asymptomatic people. There was no effect on viral load compared to placebo; indeed, a higher dose was comparable to placebo. At the standard dose, what was seen was a slower increase in viral load compared to people on placebo. In other words, a modestly slowed progression rate. There was no significant effect on CD4 counts. So alone it doesn't do much--but neither does AZT alone!

This herb may operate as an antioxidant or by

suppressing overactive immune function, and, as the evidence suggests, may be useful as part of a combination approach rather than as a stand-alone therapy.

One of the most important things about the SPV-30 trial was that it happened at all. As a result, we now have better information for making treatment choices. Indeed, this trial underscores the fact that the clinical effect of herbs CAN be meaningfully investigated. Further research with combinations of anti-HIV botanicals is assuredly warranted.

Flu Guard (formerly, SPV-30) (Health From the Sun)

Each box contains 90 capsules, a months' supply. Each capsule contains 330 mg of boxwood leaf powder. Vegetarian capsules are a cellulose derivative.

PWHIV take 3 per day 8 hours apart with or without food. Do not refrigerate. Do not exceed three per day.

Terminalia arjuna

This botanical has a long history of use in Indian traditional systems such as Ayurveda, most commonly for heart disorders. Some benefit may be found for disorders such as angina, hypertension, and heart failure in the elderly. It may help to increase the contractile force of the heart as well as lower cholesterol. Antioxidant chemicals found in the herb further help vascular health. In the Ayurvedic tradition, the bark is used, pounded and added to various recipes. The astringent nature of these compounds may explain the empirically observed effects of reducing or eliminating blood in the sputum from TB and blood in the stools from dysentery. It is also used as a heart tonic.

***Terminalia arjuna* 2% (NYBC)** Each bottle, 90 capsules. Each capsule, 500 mg of *Terminalia arjuna* bark extract with 2% arjunolic acid and 45% tannins. *Suggested use is one capsule 1-3 times a day with meals.*

Turmeric See *Curcumin*.

Zoological Substances

Adrenal Cortex (ARG) Each bottle, 75 capsules. Each capsule contains 250 mg of adrenal cortex extract, from Australian cattle that are free-ranging and who have not been fed any hormones or antibiotics. Taken from whole adrenal gland, but not the Adrenal Medulla. *PWHIV take 1-4 per day in the morning (all at the same time).*

Colostrum Specific (Jarrow) Each bottle, 60 capsules. Each capsule, 500 mg of bovine-derived colostrum which contains a minimum of 35% immunoglobulins, which is double the strength of typical colostrum products because it is from the first-milking after calving. Colostrum Specific is also enteric coated to protect immunoglobulins from being broken down in the stomach. The product is collected within 12 hours of calving from pasture-fed cows (during

non-winter months) and is freeze-dried (lyophilization process under -40° celsius). This low temperature processing ensures that the different colostrum immunoglobulin fractions and growth factors retain their biological activity and are not denatured. Colostrum Specific™ is free of antibiotics and hormones and is USDA certified for import.

DHEA (Dehydroepiandrosterone)

This is the most abundant steroid found in human beings. It declines as AIDS develops and this decline is matched by increases in another steroid, cortisol. ***Have your blood or saliva level of DHEA tested before using. People with higher T-cell counts may have TOO much DHEA; people with KS, prostate, or breast cancer tendency/history should NOT take DHEA.***

PWHIV are often deficient in DHEA and some with very low DHEA levels may want to use higher doses. Evidence suggests that you want to be in the high normal range regardless of age. *Since it increases IL-2 in human cells, it may have varying effects. People with under 250 T cells may have an increased viral load, so an antiviral strategy driving HIV below detectable is strongly urged for anyone considering using DHEA (unless your T cell count is around 300-400, just to be on the safe side).* In general, women should not use more than 50 mg/day. The dosage that is commonly mentioned in supplement industry literature is a dose between 25 and 100 mg for men and 15 to 50 mg per day for women. Some feel this is more rational than the much higher dosages used in some clinical trials. However, some PWHIV severely deficient in DHEA may want to use a higher 250 mg dose. Remember, you want to be in the high normal range regardless of age. Dose also depends on your age, weight, current physical condition, DHEA level and gender (male/female). Since you can easily get your DHEA level measured, choose a dose, supplement with it for a few weeks, and then get retested again to see whether the dose is effective or not. ***Once you choose a fixed dose, have your DHEA level measured every six months to make sure your dose is still placing you in an appropriate DHEA range. Modify the dose as needed.***

7-Keto DHEA (Source Naturals) Each bottle, 60 tablets. Each tablet, 50 mg of 7-oxo DHEA sulfate (specifically, 3-acetyl-7-oxo-dehydroepiandrosterone).

Thymus Glandular

Glandulars are basically ground up organs from various animals. These can be derived from thymus, thyroid, liver, spleen or adrenal cortex. While little used in the U.S., they are fairly popular in Europe. They are controversial since the idea is that consuming them results in migration of the cells to the appropriate organ to help provide replenishment to it. This theory suggests that the cells are not species-specific but organ-specific. It may be that some of

the hormones and other chemicals found inside these cells are what induce the activity and that they are enough alike between a cow or pig and a human to exert a similar effect.

According to theory, cells are able to be absorbed and appropriately directed toward the organ in need (e.g., thymus glandulars go to the thymus) where they contain all the ingredients (hormones, peptides, enzymes, nutrients) to help restore function. Neonatal glandulars are preferred since they are less likely to contain heavy metals or other toxins. Clinical data to support this theory are non-existent. How oral administration would be successful further stretches credulity.

Note: Glandulars should never be stopped suddenly, but reduced gradually in order to assure a feedback inhibition (decreased productivity) of the gland does not occur. Glandulars from Allergy Research Group are derived from animals raised in New Zealand or Australia, reducing worries about BSE or “mad cow” disease. These are range-grazed, government-inspected animals who are not exposed to pesticides, antibiotics or hormones.

The thymus is the organ where immune cells (CD4 and CD8) are graduated into different varieties. As people age, the thymus shrinks (involutates) and this process is hastened by HIV infection. Whether this product will help to reverse or inhibit that deterioration is not yet known. It is also unclear whether these orally-consumed proteins have any effect on thymic development or if they are simply broken down in the gut during digestion. Indeed, a study showing benefit for cats with FIV (similar in ways to HIV) used a subcutaneous injection which bypasses digestive processes that might break the product down. Anecdotal reports by physicians using thymic protein A suggest improvements in stamina, energy, well-being and the ability to ward off infections. HIV+ or HCV+ people who choose to use this product, should see if it improves CD4 and/or CD8 count. HCV+ people should first evaluate blood work for signs of autoimmune problems and should not use this product if they are present (for example, cryoglobulinemia).

Start by getting your blood work done, stabilize whatever regimen you are on at least four weeks before beginning and then, after starting the product, see what happens with your next blood work. Also, keep a sharp eye on your viral load. Not to be used by those with autoimmune diseases.

Thymus (Allergy Research Group) Each bottle, 75 capsules. Each capsule, 500 mg of lamb-derived thymic tissue. *PWHIV are taking 1 capsule 2 to 3 times per day with meals.*

Other Special Substances

Acidophilus/Bifidus Products

These products are considered essential for most PWHIV due to malabsorption, antibiotic use and general GI tract

dysfunction so common in HIV disease. **Note: the products below should be refrigerate, since the organisms tend to die as time passes and will expire more rapidly at room temperature. (The exception being Jarro-Dophilus EPS—see below.)**

L. acidophilus supports GI tract function, promoting resistance to infections which may in turn enhance immunity to certain diseases. In addition, it has been shown to displace undesirable and potentially destructive bacteria and yeast in the gastrointestinal tract. These organisms facilitate the digestion of protein, help to produce B-vitamins, enhance calcium absorption and stimulate enzymatic activities involved with absorption of nutrients.

Bifidus Balance (Jarrow). Each bottle, 100 capsules. Each capsules, 280 mg of probiotics. Bifidobacteria are anaerobic (live without oxygen) and are found predominantly in the lower intestines. *Suggested use is to take 1 to 3 capsules per day, with unchilled water or dissolve in mouth 20-60 minutes after eating. For infants and children, empty one-half to one capsule onto food. Or, use as directed by your qualified health consultant.*

Each capsule contains:

FOS (FructoOligoSaccharides)	210 mg*	
Probiotic Bacteria	2 Billion Organisms*	
<i>B. breve</i> R-070	800 Million	40%
<i>B. longum</i> BB536 (Morinaga)	800 Million	40%
<i>B. bifidum</i> R-071	300 Million	15%
<i>B. infantis</i> R-033	100 Million	5%
Total	2.0 Billion	100%

* Daily Value not established. Other ingredients: Maltodextrin, magnesium stearate and ascorbic acid. Capsule consists of gelatin. Contains no dairy, wheat, yeast, soy, corn or other common allergen.

JarroDophilus+FOS: Capsules (Jarrow) Each bottle, 100 capsules. Each 280 mg capsule contains more than 3.36 billion beneficial intestinal organisms (at the time of manufacture), along with 210 mg of fructo-oligosaccharides (FOS) that help their replication. The health-promoting bacteria included are:

<i>Lactobacillus rhamnosus</i> type B	20%	672 million
<i>L. casei</i>	20%	672 million
<i>L. plantarum</i>	20%	672 million
<i>L. acidophilus</i> R052	10%	336 million
<i>Bifidus longum</i>	10%	336 million
<i>Bifidus bifidum</i>	10%	336 million
<i>Bifidus breve</i>	10%	336 million

PWHIV take 1–2 capsules 30 minutes before or 20–40 minutes after eating each meal. Refrigerate, unfrozen as organisms tend to die as time passes and more so at room temperature.

Jarro-Dophilus EPS (Jarrow) Each bottle, 60 capsules. Each capsule contains 4.4 billion probiotic organisms, including various species of *Lactobacillus*, *Bifidus*, *Pediooccus acidilactici* and *Lactococcus diacetylactis*.

These capsules are enterically-coated to preserve them **without refrigeration**, which makes this an ideal product for use while travelling. However, if at home, refrigerate anyway, just to preserve them as well. Blister packed. *Suggested use is 1-2 capsules per day, if possible, without food.* Dairy-free and vegetarian formulation. Also contains potato starch, magnesium stearate and ascorbic acid.

Beta-1,3-glucan

This substance is derived from the cell walls of Baker's yeast, *Saccharomyces cerevisiae*. This is not the same yeast that causes candidiasis (*Candida albicans*). This component is basically a string of glucose (simple sugar) molecules that are strung together in a branched formation. This particular formation can interact with receptors on the surface of the important immune system cells known as macrophages, activating them. When activated, they seem to be better able to attack certain bacteria and even herpes viruses. Lab and clinical results suggests it also acts as an antioxidant and it has been shown to dramatically suppress radiation damage to the skin in those undergoing this form of cancer therapy. It has also been used for topical applications for skin ulcers and other wounds with considerable success.

There are some serious concerns, however. While this supplement may be good for offsetting some diseases, it may not be a good idea for long term use in people with HIV. One problem is that it induces expression of certain cell messengers (cytokines) that seem to be part of the problem in AIDS. Specifically, secretion of IL-1, IL-6 and TNF is increased. If taking this supplement does indeed have this effect, it may be a bad idea for people with HIV.

Until such issues are resolved by more study, it is difficult to say whether PWHIV will benefit or be harmed by this supplement. **Anecdotal evidence: two people experienced problems with this supplement, one manifesting worsening neuropathy and the other worsened bursitis with daily use lasting more than a few weeks. Short term use (at most) is recommended. See below for a discussion of some of the beneficial effects.**

Beta 1,3-Glucan (Chisolm) Each bottle 60 capsules, each capsule 500 mg. Beta-1,3-glucan is a yeast cell wall polysaccharide (specifically, beta-1,3-glucopyranose polysaccharide from *Saccharomyces cerevisiae*.) The intention here is to stimulate macrophages (large immune cells that help turn on other immune cells). Various test tube and animal studies suggest an additional value as an antioxidant, for tissue regeneration and repair, enhancing effects of antibiotics, antifungals, antivirals, antiparasitics and against some cancers. (One study showed interesting results when glucan was injected directly into tumors). A mouse study showed some benefit against *Staph* infection. Another mouse study showed improved survival and decreased necrosis in mouse viral hepatitis at a dose of 22.5 mg/kg. Purely anecdotally, using this product has

dramatically shortened flu-like infections in this reviewer (far more rapidly and profoundly than echinacea and other such interventions). **Please note that long-term use is NOT recommended for people with HIV; it may worsen peripheral neuropathy for some PWHIVs (see above).** Dosage recommendations are based on weight and the intended indication. For example, using a low dose of 10 mg/kg, the numbers of milligrams/day are 227 mg for a 50 pound person, 455 mg for a 100 lb person, 682 mg for 150 lb, 909 mg for 200 lb and 1,136 mg for 250 lb.

Creatine Monohydrate

Strenuous anaerobic exercise and even hypermetabolic conditions cause the body, lean body tissue mostly, to rely heavily on creatine phosphate for muscular contraction and other energy requirements within the cell. Creatine comes most often in either a monohydrate or phosphate form. The monohydrate form appears to be more readily absorbed than creatine phosphate. The monohydrate is carried into the bloodstream where it is transformed into the creatine phosphate form that the muscles use. Muscles use it up rather quickly during exercise—and during a chronic infection like HIV. Supplying this form allows the muscles to replenish levels quickly and sustain high levels, since skeletal muscle doesn't create its own but imports it from the bloodstream. It also helps recycle the important energy providing molecule, adenosine triphosphate (ATP). Red meat also provides a good source, although not nearly as concentrated as a supplement. Those who abstain from or have reduced their consumption of red meat may especially benefit from using this.

People with diabetes (and/or hypo- or hyperglycemia) should consult their physician before using creatine and, if using, monitor their blood sugar closely. Be cautious about using creatine if you have kidney problems. Excessive use may cause acne; drink plenty of fluids. Part of creatine's effect is to increase the amount of water in muscle cells, plumping them up. Adequate hydration (drinking enough water) to keep up with the added needs as well as to help your kidneys makes sense.

Creatine monohydrate (Jarrow) Each container, one kilogram (1,000 grams) of micronized creatine. The muscle-building benefits for those who work out are widely recognized. It is found in high quantities in muscles where it provides fuel for their contraction. Its main benefits seem to be helping reduce fatigue and hasten post-workout recovery time. One heaping teaspoon contains approximately 5 grams. Consume approximately 20 grams in divided doses per day. *Suggested use is a teaspoon (5 grams) four times per day for the first five days. Then use 1 teaspoon after exercise (which should occur at least once daily).*

Digestive Enzymes

Enzymes produced by the pancreas are essential for proper NYBC © 2005

digestion. Some antiretroviral drugs (and alcohol) as well as HIV can place considerable stress on pancreatic function. Supplements may be a very worthwhile investment for PWHIV. Enzyme supplements that contain betaine hydrochloride may be helpful (with meals!) for those with low levels of stomach acid, which is also not uncommon in people with HIV. (Just to clarify, betaine hydrochloride is similar to but not the same as the anhydrous betaine that is also known as trimethylglycine, or TMG.)

Caution: excessive/chronic use of digestive enzymes may lead to the body's decreasing ability to produce these substances on its own; however, this concern must be balanced with the need to counter one of the most typical and debilitating syndromes associated with HIV, malabsorption of nutrients.

- One USP unit of Amylase activity digests 1 mg of dry USP potato starch
- One USP unit of Protease activity digests 1 mg of casein (milk protein).
- One USP unit of Lipase activity digests 1 mg of acid per minute at the pH of 9.0 at 37°C.
- One AGS unit of alpha galactoside digests 1 mg of the carbohydrates raffinose and stachyose.

Plant Ultra Enzymes (NYBC) Each bottle, 90 tablets.

This is a very potent formula! *PWHIV take 1 tablet before each meal.* Each tablet contains:

Lipase (390 FIP)	200 mg
Amylase (1,100 SKB)	200 mg
Protease (16,500 HUT)	200 mg
Cellulase (1,575 CU)	200 mg

Glucosamine/Chondroitin

Glucosamine plays an integral part of all connective tissue in the body. It is especially important in the formation of the intestinal mucosa and the production of hyaluronic acid for joint (synovial) fluids. As such, it has been used to offset the ravages of arthritis or osteoarthritis. It is sold in two forms; some suggest it may improve absorption to use both. These are the N-acetyl-glucosamine form and glucosamine sulfate. Note that Vitamin C also plays an important role in supporting and healing joint tissue..

Glucosamine & Chondroitin (Jarrow) Each bottle, 120 tablets. Each tablet, 500 mg glucosamine and 400 mg of chondroitin, both in the sulfate form. **Please note: Some clinical studies have suggested that glucosamine sulfate may increase insulin resistance.** Chondroitin is commonly used in conjunction with glucosamine to offset the pains and inflammatory damage of arthritis and joint-related pain. (Make sure your multi also has manganese, which is needed for cartilage production.) **If you are at risk for diabetes, or are taking protease inhibitors and seeing signs of insulin resistance in your blood work, NYBC recommends that you not use**

this product. Suggested use is 2 twice per day. Studies for inflammation suggest 1.5 grams per day. Start slowly and build up the dose over a few days.

NAG: N-acetyl-glucosamine (Jarrow) Each bottle, 120 capsules. Each capsule, 750 mg of glucosamine. This acetylated form is more readily absorbed than other forms of glucosamine. Suggested use is 1–3 capsules per day.

Inositol hexaphosphate (IP6)

IP6 (Jarrow) Each bottle, 100 capsules. Each capsule, 500 mg of inositol hexaphosphate (also known as phytic acid). Found in high concentrations in soy beans or brown rice bran, the test tube and animal research indicates it may enhance natural killer (NK) cell activity. One mouse study published in 1989 showed an increase in NK activity in mice challenged with an inhibitory chemical. This group's studies also showed that it inhibited development of colon cancer. Another study showed inhibition of parasites that invade red blood cells (like the malarial *Plasmodium falciparum*). Research has also indicated its use in lowering blood fats, including cholesterol, so this may be helpful with this aspect of lipodystrophy. A combination of pronase and inositol hexaphosphate was shown to remove toxin from diphtheria-infected monkey kidney cells.

However, several studies show that diets high in phytic acid can substantially DECREASE absorption of iron, zinc, manganese and other minerals. *Take your minerals separately*—maybe even skipping a day. By contrast, it does help to get rid of excess iron, which can be good if you have hepatitis—but really bad if you've got the SPECIFIC type of anemia caused by iron deficiency. (Don't forget that some types of anemia may be caused by drugs like AZT, ribavirin or from vitamin B12 deficiency.) People with HIV have been observed to have higher levels of iron-free radicals. If you have a high soy diet, you probably don't need this. (Incidentally, the reason soybeans may be less likely than peanuts to produce liver-destroying aflatoxins may be due to the protective effects of phytic acid.) Also, one study suggested that soy derived phytic acid may not affect zinc metabolism. Suggested use is 2-4 capsules per day always taken in between meals or other nutrients.

NADH

NADH is the reduced form of NAD and its primary role is to grab electrons. It is often used with chronic fatigue (CFIDS) and fibromyalgia. A 2002 study indicated improvement in 4 cognitive test measures ($p < 0.05$) among 18 people randomly assigned 20 mg of NADH compared to 17 placebo recipients. They were healthy people who had taken a 4-hour flight from the west coast to the east coast, given the supplement at the end of the flight. By contrast, a study using 10 mg/day in people with mild to moderate Alzheimer's saw no benefit. In a study of chronic

fatigue patients, 31% "responded favorably" in the treatment group versus only 8% in the placebo group; again, using 10 mg/day over a 4-week period. **Note that people at DAAIR who tried NADH almost all broke out in a rash that subsided when they stopped using NADH.** This may be due to conversion of NADH to niacin—and indeed, this may simply be a fancy, costly way of taking niacin.

NADH (Enada) Each bottle, 60 tablets. Each tablet, 1.8 mg. NADH is nicotinamide adenine dinucleotide, an enzyme that is essential for a whole host of cellular reactions. Suggested use is two or more tablets per day in divided doses. Clearly, the study described suggests a significantly higher dose, but that may not make sense on a routine basis!! **While supplies last!**

Saccharomyces Boulardii

This "friendly" yeast has a proven ability to improve the immune response in the GI tract and has helped to control chronic diarrhea in some PWAs. Part of the way this works is to replenish vital intestinal flora that have the added benefit of competing for the site of other organisms that cause infections. It may be a good idea to use this product if you are taking antibiotics. One problem with chronic, long-term antibiotic use is that it can cause the eruption of a bacterial infection known as clostridium (*C. difficile*) which can cause serious diarrhea.

One patient who had been through the range of antibiotics was reported to gain complete relief from *C. difficile* induced diarrhea when she used two 250 mg capsules twice a day over 2 months. This dose constitutes about 2 billion viable cells. (At the end of which she took one capsule a day for 10 days). This was reported by Kimmey et al. (*Digestive Diseases and Sciences*, 1990; 35(7):897–901). Anecdotal data from NYBC members using it to treat *C. difficile* tend to support this. A 2002 study further underscored the benefit of this, acidophilus or bifidus in managing *Helicobacter pylori* infection compared to placebo, showing a lower incidence of diarrhea and taste disturbance (*Am J Gastroenterol*. 2002 Nov;97(11):2744-2749). A meta-analysis published in the British Medical Journal in 2002 can help prevent antibiotic-induced diarrhea, and recommended that further studies be undertaken.

S. boulardii, when given with mesalamine, resulted in only 6.25% of individuals relapsing. Those given mesalamine alone had a 37.5% relapse rate. Another study showed a reduction in numbers of bowel movements compared to placebo. These preliminary data are strong indicators that this is well worth a try!

In addition, a study in healthy humans was conducted to assess the effects of *S. boulardii* on immune function. Basically, what they found was there were increases in different blood cell types, particularly erythrocytes and white blood cells (particularly neutrophils and polymorphonuclear cells). Numbers of some members of a

set of molecules called complement, which are important infection-fighters, were also elevated.

Do not rely on this product as a sole treatment for diarrhea! If you have serious, severe diarrhea, it is essential that you get an accurate diagnosis. This may require SEVERAL stool samples, blood work and other diagnostic procedures. The cause of the diarrhea must be clearly determined so appropriate therapy can be undertaken.

Florastor (Biocodex) Each bottle, 20 capsules. Each capsule contains 50 mg of *S. boulardii*. Biocodex has been manufacturing and selling saccharomyces worldwide from their base in France for over 50 years. *Suggested use is 2 capsules in the morning and in the evening.* **The company has informed NYBC that persons with yeast allergies may safely use this product and that it does not require refrigeration.**

TMG (trimethylglycine)

TMG tablets (Jarrow) Each bottle, 120 tablets, each tablet 500 mg of trimethylglycine (anhydrous betaine). TMG is extracted from sugar beets. It consists of the amino acid glycine with three methyl (CH₃) groups attached. For hypermethylation it makes the most sense when used in conjunction with B6, folic acid and B12. Along with vitamin B6 and folic acid, TMG (also known as betaine) reduces homocysteine levels, increases of which are associated with atherosclerosis. Most of TMG's activity appears to occur in the liver. TMG may help to increase S-adenosylmethionine (SAME) levels. Also, it may increase plasma and cerebrospinal levels of SAME which have been observed to be reduced in some people with HIV. *Due to one test tube study that showed enhanced bacterial growth, you might want to drop this supplement during an infection. It is not clear if this happens in humans, but prudence dictates caution. Suggested use is 1-2 tablets daily with meal or as directed. Reduce dose if headaches occur. Note that a 2002 Finnish study showed a significant decrease in homocysteine levels—but they used a fairly high dose of 6 grams per day. Lowering homocysteine may reduce risk for heart problems.*

Remember: One should always begin—or stop—a protocol **gradually**. Start new programs with one quarter the intended dose and every three to five days increase the amount one quarter until you have reached the desired level. If you have a history of drug allergies or are highly sensitive to various allergens it might be a good idea to begin your protocol with only one substance at the recommended dose, while slowly adding additional products one at a time, every five days, until reaching the full dosages. *This is equally as true if you are planning to stop any part of your protocol.* Cut your dosages back slowly over a few days.

OTHER ITEMS

Healing HIV: How to Rebuild Your Immune System by Jon Kaiser, MD. Published by HealthFirst Press, Mill Valley CA, 1998. This is a little old but still a terrific review of the many methods and means one can use to manage HIV disease. An excellent book to review and consider. You can also learn more about Dr. Kaiser's up-to-date methods for managing HIV disease at <http://www.jonkaiser.com> or by calling Integrative Health Consulting, Inc. at 1877-375-2473.

Bags, ziploc (Northland) Each packet comes with 30 ziploc bags for storing doses of supplements. These are an essential part of maintaining sometimes complicated regimens. Use the bags to divide up your doses of different pills.

NYBC T-Shirts are Here! (NYBC) All cotton T-shirts with NYBC's logo emblazoned on the chest. In a beautiful, NYBC pale blue; comes in small, medium and large sizes.