

# detoxification

*... detoxify in a toxic world*



Practitioner Guide

# WE ARE ALL TOXIC!

**this may be a bold statement, but recent studies suggest this is true**

Each year chemical companies in the United States manufacture over 6.5 trillion pounds of 9,000 different chemicals and release over 7.1 billion pounds of 650 different chemical pollutants into the atmosphere and water. In addition, heavy metals are released into the environment from industrial manufacturing plants and fossil fuel combustion, including 48 tons of mercury annually. Exposure to these ubiquitous chemicals has created an overall toxic burden that extends from the old to the very young.

The Environmental Working Group (EWG), in collaboration with Mount Sinai Medical School, conducted a study that assessed levels of 219 industrial chemicals in nine adult volunteers with no known toxic exposure. A total of 167 chemicals (with an average of 91) were found in the blood and urine of the participants, including 76 carcinogens, 94 chemicals known to be toxic to the brain and nervous system, and 79 that can cause birth defects or abnormal development. Another EWG study found an average of 200 industrial compounds, pollutants, and other chemicals in umbilical cord blood of 10 newborn babies. Chemicals found included the organochlorine pesticides DDT and dieldrin, perfluorochemicals, brominated fire retardants, PCBs, polyaromatic hydrocarbons, polychlorinated and polybrominated dioxins and furans, polychlorinated naphthalenes, and mercury.

In a study of 2,540 individuals who participated in the third National Health and Nutrition Examination Survey (NHANES), researchers looked specifically for urinary phthalates and their metabolites. Phthalates are commonly used in the manufacture of plastics. Over 75 percent of participants in the study had detectable levels of four phthalate metabolites, suggesting widespread exposure. Researchers at the Centers for Disease Control and Prevention recently detected bisphenol-A, a chemical used in plastics, in 95 percent of nearly 400 U.S. adults.

Added to this toxic burden from external sources are myriad endogenous biochemicals, hormones, and metabolites created within the human body. This cumulative exposure creates significant challenges to the organs of detoxification and elimination, and must be addressed before many patients can respond to therapies and achieve a higher state of wellness.

The liver is responsible for the greatest share of the detoxification load; therefore, in addition to identifying toxic exposure, the liver's activities must be supported to effectively perform its duties. It must metabolize toxic substances into non-toxic, water-soluble compounds that can be eliminated by the kidneys and intestines. The liver and other tissues involved in detoxification must be supplied with the essential nutrients needed for this task, as well as botanicals that assist detoxification and aid in preventing damage to the body's tissues during the cleansing process.

## Laboratory Testing for Toxicity

Several laboratories provide cutting-edge testing for heavy metals, detoxification potential, and metabolites of toxic compounds. For instance, a urine organic acid test\* may be a useful tool. Organic acids are metabolic intermediates produced during various bodily processes including detoxification. High levels of specific organic acids in the urine can signal potential accumulation of particular toxins. In addition to testing for toxin metabolites, urine organic acid profiles can be used to detect deficiencies of specific nutrients that provide necessary cofactors for enzymes of detoxification.

The efficiency of phase I and II liver detoxification can also be examined via urinary levels of D-glucuronic acid (phase I) and mercapturic acid (phase II).\*\* Other compounds can be used to assess phase I and II detoxification capacity, including salivary and urine metabolites of caffeine, acetaminophen, and acetylsalicylic acid.\*\*\*

Several labs provide urine testing for toxic metals such as aluminum, arsenic, cadmium, lead, and mercury (see contact information in the back of this booklet). In general, six- to eight-hour collection profiles are used for patients receiving oral or IV metal chelating agents to mobilize toxic elements from body pools (challenge tests). A 24-hour collection profile may be used with or without administration of chelating agents to assess the rate of excretion of the elements reported. The total output of urine over 24 hours is collected and the toxic elements levels are determined. Clinicians can select from challenged and unchallenged protocols. In addition, hair analysis can be used as a general screening for the presence of heavy metals.

\*Organix Comprehensive Profile by Metamatrix

\*\* Hepatic Detox Profile by Doctor's Data

\*\*\* Detoxification Capacity Test by Metamatrix;  
or Comprehensive Detoxification Profile by Genova

## The Toxic Home

A Total Exposure Assessment Methodology (TEAM) study by the U.S. Environmental Protection Agency (EPA) found the greatest personal exposure to volatile organic compounds (VOCs) occurs from air in the home and not from outside air. In addition to avoiding exposure to environmental pollutants as much as possible, air cleaners can be utilized to remove VOCs from indoor air. Several good indoor air filters work well for this purpose. Some indoor houseplants may also be used to accomplish this goal, including philodendrons, spider plants, aloe vera, English ivy, golden pothos, Boston fern, and bamboo palm. It is also highly recommended that as often as possible doors and windows are opened to allow fresh air inside — even for only 5 to 10 minutes in the winter, remove clutter which collects dust, and try to initiate a 'no-shoes-indoors' policy. According to experts, lead, pesticides, PCBs and other chemicals adhere to dust particles, which enter homes on the bottoms of shoes. A National Cancer Institute study found residues of 34 toxic chemicals in household carpet dust.

## Acid-Alkaline Balance

The majority of environmentally injured people are too acidic resulting from their overworked detoxification processes. All of our detoxification pathways run better in a slightly alkaline environment. The best way to achieve an alkaline body and blood pH is to consume adequate amount of vegetables to balance to acid forming proteins and carbohydrates. Consuming "green" drinks and supplements like barley green and blue green algae can also shift the balance to a more alkaline environment in a gentle and natural manner. Some recommend trying to maintain a urine pH between 6.5 and 7.0.

## HOW THIS PROGRAM WORKS

After you have determined your patient's problem is toxin related, a comprehensive program of avoidance, supplementation, and cleansing needs to be started.

Patients who have problems secondary to toxin overload generally fall into two categories:

Persons whose symptoms began acutely from a known exposure to chemical toxins, with the symptoms persisting despite treatment.

Persons whose symptoms began over time, or acutely, without any known chemical exposure (just exposure through daily living).

For patients in this second category, the following are "rules of thumb" for diagnostic workup:

- ALL persons have toxic compounds in them. The question is whether the toxicity has caused a health problem, is preventing healing, or is not an issue.
- If the person has a health problem highly associated with chemical overload (such as autoimmunity, chemical sensitivity, bone marrow malignancies, neurological illnesses), they need cleansing.
- If they have defied allopathic and/or naturopathic treatments that generally have a high degree of effectiveness, strongly suspect toxicity.
- If they were exposed to chemicals during a time of high stress, they are more toxic.
- If they were/are a smoker, have spent time in a smoking environment, or have "silver" dental amalgams, they are heavy-metal burdened.
- If they exhibit any adverse symptoms with chemical exposure (perfumes, paints, etc.,) they are burdened with chemicals and probably heavy metals.
- If they have silicone implants, they are toxic.

The following supplement program was designed by Dr. Walter Crinnion, chair of environmental medicine at Southwest College of Naturopathic Medicine in Tempe, AZ.

## AVOIDANCE

After identification of an offending substance, avoidance of further exposure is critical. This may involve avoiding new paint, new carpet, new fabric, dry cleaning establishments and dry cleaned clothes, tobacco smoke, gasoline and diesel fumes, and exhaust. It may be necessary to switch to organic foods to avoid pesticide and herbicide exposure.

More on avoidance is available from several sources, including the books ***Success in the Clean Bedroom*** by Natalie Golos, and ***Your Home, Your Health, Your Wellbeing*** by Rousseau and Rea.

## SUPPLEMENTATION

With any toxicity, the body uses essential nutrients to detoxify the offending substance. It is imperative that these nutrients are replaced so the body can fully and successfully detoxify. Other nutrients and botanicals have been shown to improve liver and bowel function, and others are helpful in removing toxic matter from the body.

## CLEANSING

The first step in cleansing is to ensure the bowels are fully functioning. The bowels have a very efficient recycling mechanism and, given the chance, will recycle to the bloodstream toxins that have already been detoxified by the liver and dumped into the intestines. This recycling can create numerous headaches (literal and otherwise) for those trying to cleanse without having the bowels eliminating optimally.



**The following are changes suggested for a more healthful personal environment. Not everyone will have the incentive to take all these steps – however, each change made will make a difference.**

- Avoid ALL scented products (“fragrance” as an ingredient) – including all perfumes, colognes, after-shaves, personal-care products, air fresheners, pot-pourri, etc. Be careful about certain “unscented” products that use “masking fragrance” to cover up the original fragrance – these are doubly toxic.
- Avoid ALL fabric softeners, dryer sheets, bleach, scented detergents, etc. These products are VERY toxic and very harmful to the environment as well.
- Avoid ALL pesticides, fungicides, herbicides, and fertilizers. Pesticides are neuro-toxins (affect the central nervous system), and they don’t know the difference between the BUGS and YOU! For fleas, roaches, ants, etc., use diatomaceous earth, boric acid, and nematodes. You can get these from health food stores and pet supply stores.
- Use only non-toxic cleaning products and personal-care products.
- Drink and bathe in filtered water. Taking a shower in chlorinated water causes the chlorine to go right into your blood stream. You can purchase shower filters that easily attach to your shower nozzle from water-supply stores. The best water filters are either the reverse osmosis type or a water distillation system. Also avoid swimming in chlorinated pools.
- Eat organic food (food grown without pesticides or fertilizers) as often as possible. Wash all vegetable and fruits unless you are going to peel them, even organic produce. Avoid processed foods, foods with colors and dyes, preservatives, etc. NEVER consume products containing “NutraSweet” (aspartame).
- Wear only natural-fiber clothing (100% cotton, bamboo, soy, linen, wool, or silk). Make sure the clothes are NOT “permanent press” or “wrinkle resistant” – these fabrics have been treated with formaldehyde that does NOT wash out!
- Use only 100% cotton, linen, bamboo, wool, or pure silk bed linens and blankets. Avoid “no-iron” or “wrinkle-resistant,” a good brand is “Simply Cotton”, marketed by Martex and The Company Store has both bamboo sheets and organic cotton jersey sheets.
- As much as possible, avoid plastics (store food in glass jars), plastic wrap, particle board, plywood, glues, inks, paints (look for brands that say no or low VOC), foam rubber, vinyl, carpet, synthetic rugs, varnishes, solvents, etc.
- Open your windows as often as possible. Even in the most polluted cities, the outdoor air has been found to be less toxic than the indoor air.

## Why do we manufacture nutritional supplements in capsules, not tablets?

Making tablets requires that other ingredients be added, in addition to just the nutrients. Binders, lubricants, coatings, disintegrants, and other excipients are the ingredients most commonly added by tablet manufacturers. These ingredients must be added to make the tablet stay together, to make it shiny, and to make it break apart. Tablets are made in machines called tablet presses, which compact the powdered nutrients together (that have already been mixed with binders and lubricants) with a tremendous amount of force. Then, to make them shiny and easier to swallow, the tablets are often sprayed with shellac, like the shellac found on furniture, but it's labeled "pharmaceutical glaze," or coated with a "vegetable protein," most often a protein derived from corn.

At Thorne Research, our manufacturing practices are as pure as our nutrients. We only use pure nutrients and we only put them in vegetarian capsules. We never add binders, shellac, or any other unnecessary or hidden ingredients. A simple concept, yes, but the only one that ensures our customers always get the finest quality, purest, most hypoallergenic supplements in the world.



**When you need to rely on the purity of the products you choose for your most toxic patient ... who do you trust?**

## Vitamin Dilutions — Purity is in the Details

Most supplement manufacturers purchase micro-dose vitamins, such as vitamin D, vitamin K, and vitamin B12, from raw material suppliers as premixed dilutions to facilitate the mixing process. Unfortunately, the diluents used in these premixes frequently contain potentially detrimental ingredients such as lactose and the preservatives BHT, BHA, sodium benzoate, and sorbic acid.

At Thorne, our promise is to give you the purest supplements humanly possible. Therefore, we do not use pre-diluted nutrients such as these. Instead, we purchase pure, undiluted nutrients and create our own dilutions when necessary, utilizing pure, hypoallergenic ingredients. The resultant nutrient mix is then added to our supplements, ensuring the proper amount of each pure nutrient is contained in each capsule.

- a unique multiple product designed for a toxic world
- use as part of a complete cleansing program
- use as a stand alone product for prevention

## Basic Detox Nutrients™

**a comprehensive multiple vitamin-mineral with additional nutrients to aid in detoxification – now with plant phytosomes for enhanced absorption**

Basic Detox Nutrients was designed for all individuals with environmental toxicity. It can be used within a cleansing program or as a stand-alone product for preventive use. Basic Detox Nutrients is a complete multi-vitamin mineral formulation with higher levels of nutrients commonly found deficient in those with chemical overload, as well as nutrients and botanicals that help the body handle the toxic load, including:

**B vitamins:** Thiamine (vitamin B1) is essential to restore oxidized glutathione and lipoic acid and is depleted by chlorinated pesticides and formaldehyde, two ubiquitous toxins. Riboflavin 5'-phosphate (active form of vitamin B2) helps block free-radical damage by recycling glutathione. Pyridoxal 5'-phosphate (active form of vitamin B6) is depleted by many toxic substances, and a B6 deficiency makes it difficult for the liver to detoxify.

**Other important detox nutrients:** Magnesium citrate-malate is a well-absorbed form of magnesium, one of the most commonly deficient nutrients in the chemically toxic individual. Choline is needed for the production of hepatic cytochrome P450 detoxification enzymes, N-acetylcysteine increases glutathione levels in the body, MSM provides sulfur for detoxification reactions, and R-lipoic acid is a powerful antioxidant that increases glutathione levels.

**Botanical extracts:** Green tea extract is an herbal antioxidant shown to prevent the occurrence of cancer, particularly skin cancers. Milk thistle has proven its ability to increase liver glutathione levels and prevent liver cell damage from toxins. Curcumin extract (from turmeric) is hepatoprotective and has been shown to suppress the mutagenicity of several common chemical carcinogens. These three herbs are provided as plant phytosomes for enhanced absorption. Both broccoli extract and dandelion root also enhance liver detoxification.

Basic Detox Nutrients contains 1,600 IU of vitamin D3 in a full daily dose.

## Basic Detox Nutrients

### Supplement Facts

Serving Size: Twelve Capsules Servings Per Container: 30

Twelve Capsules Contain:	% DV
Vitamin A (from 25,000 IU Mixed Carotenes and 2,500 IU Palmitate)	27,500 IU. 550%
Vitamin D (as Vitamin D3)	1600 IU. 400%
Vitamin E (as d-Alpha-Tocopheryl)	400 IU. 1333%
Vitamin K	100 mcg. 125%
Vitamin C (as Calcium Ascorbate)	1000 mg. 1667%
Thiamine (as Thiamine HCl)	200 mg. 13333%
Riboflavin (as Riboflavin 5'- Phosphate)	50 mg. 2941%
Niacin (from 30 mg Niacin and from 100 mg Niacinamide)	130 mg. 650%
Vitamin B6 (as Pyridoxal 5'- Phosphate)	100 mg. 5000%
Folate (500 mcg as Calcium Folate and 500 mcg as 5-Methyl-tetrahydrofolate)	1000 mcg. 250%
Vitamin B12 (225 mcg as Adenosylcobalamin and 225 mcg as Methylcobalamin)	450 mcg. 7500%
Biotin	400 mcg. 133%
Pantothenic Acid (as Calcium Pantothenate)	400 mg. 4000%
Calcium (as Calcium Citrate-Malate)	300 mg. 30%
Iodine (as Potassium Iodide)	150 mcg. 100%
Magnesium (as Magnesium Citrate-Malate)	500 mg. 125%
Zinc (as Zinc Picolinate)	30 mg. 200%
Selenium (as Selenium Picolinate)	200 mcg. 286%
Manganese (as Manganese Picolinate)	6 mg. 300%
Chromium (as UltraChrome®)	200 mcg. 167%
Molybdenum (as Molybdenum Picolinate)	100 mcg. 133%
Potassium (as Potassium Citrate-Malate)	90 mg. 2.5%
Boron (as Boron Picolinate)	3 mg. *
Choline Citrate	300 mg. *
Inositol	60 mg. *
Vanadium (as Vanadium Picolinate)	100 mcg. *
Green Tea Phytosome ( <i>Camellia sinensis</i> extract / Phosphatidylcholine complex)	50 mg. *
R-Lipoic Acid	50 mg. *
N-Acetyl-L-Cysteine	200 mg. *
MSM (Methyl Sulfonyl Methane)	100 mg. *
Silybin Phytosome (seed) ( <i>Silymarin marianum</i> extract / Phosphatidylcholine complex)	100 mg. *
Broccoli extract	50 mg. *
Dandelion (root) ( <i>Taraxacum officinale</i> )	10 mg. *
Curcumin Phytosome (root) ( <i>Curcuma longa</i> extract / Phosphatidylcholine complex)	100 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Hypromellose (derived from cellulose) capsule, Leucine,† Silicon Dioxide.†

Contains ingredients derived from soy (phytosomes).

†A hypoallergenic ingredient used to fill space.

360 Vegetarian Capsules

Code: VMD

Dosage: 3 to 4 capsules tid

## Medibulk®

### Supplement Facts

Serving Size: One Scoop Servings Per Container: 20

Each (11 g) Scoop Contains:	% DV
<b>Calories</b>	<b>37</b>
<b>Total Carbohydrates</b>	<b>8 g. 3%*</b>
Dietary Fiber	8 g. 37%*

A proprietary blend of:

- Psyllium powder (seed husk) (*Plantago asiatica*)
- Prune powder (fruit)
- Pectin (apple)

\* Percent Daily Values are based on a 2,000 calorie diet

This product contains no flavorings or sweeteners.

NET WT. 8 OZ. (227 G)

Code: SP621

Dosage: 1 to 2 scoops in 8 ounces of water  
qd - tid



## Liver Cleanse

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 60

Each Capsule Contains:	% DV
A Proprietary Blend of Herbs:	*
Celandine (aerial parts and roots) ( <i>Chelidonium majus</i> )	
Fringetree (bark) ( <i>Chionanthus virginicus</i> )	
Stinging Nettle (leaf) ( <i>Urtica dioica</i> )	
Bearberry (leaf) ( <i>Arctostaphylos uva-ursi</i> )	
Dandelion (root) ( <i>Taraxacum officinale</i> )	
Milk Thistle (seed) ( <i>Silybum marianum</i> )	
Burdock (root) ( <i>Arctium lappa</i> )	

\*Daily Value (DV) not established.

Other Ingredients: Hypromellose (derived from cellulose) capsule,

<sup>1</sup>A hypoallergenic ingredient used to fill space.

60 Vegetarian Capsules

Code: SF769

Dosage: 1 capsule qd - tid

## MediBulk®

### important soluble fiber for a healthy GI tract

Research has shown the average U.S. diet does not contain enough fiber, as most people do not eat the recommended daily amount of fruits and vegetables. Soluble fiber, such as that found in psyllium and pectin, is necessary for optimal intestinal transit, bowel health, and detoxification. It has also been demonstrated to lower blood cholesterol levels by binding to cholesterol in the gastrointestinal tract.

Colonic bacteria utilize soluble fiber and other undigested carbohydrates as food, and subsequently create short-chain fatty acids, which are used by colonic mucosal cells as fuel. The short-chain fatty acids liberated by these bacteria lower colonic pH and shorten the intestinal transit time, which can enhance detoxification and reduce the toxic burden on the liver. MediBulk contains psyllium, pectin, and prune powder as sources of soluble fiber.

Prior to embarking on a detoxification program, it is important to achieve optimal bowel function. MediBulk speeds transit time and binds toxins that have been released into the intestines from the liver, preventing their reabsorption.

Begin with ½ scoop in 8 oz. pure water or dilute fruit juice per night and slowly build up to 2-3 scoops. Follow with at least 8 oz. pure water.

## Liver Cleanse

### a synergistic blend of herbs to enhance bile flow and detoxification

Liver Cleanse is a potent combination of herbs that work synergistically to enhance the function of the liver, specifically during a comprehensive detoxification program. The herbs in this formula enhance production and flow of bile, which optimizes metabolism and excretion of substances detoxified by the liver. Several of the herbs also provide support for the kidneys.

As with all detoxification products, proper intestinal elimination is essential. Do not give to a constipated individual as toxins released into the bile may be reabsorbed. An individual should be having at least one healthy bowel movement daily. Vitamin C and MediBulk can be used in conjunction with Liver Cleanse to assist in bowel cleansing. The recommended starting dose is one capsule the night before beginning a cleansing protocol. If more liver cleansing is indicated, the dose can be gradually increased.

## Toxic Relief Booster

### for additional support during detoxification – now with plant phytosomes for superior absorption

Toxic Relief Booster provides nutrients and botanicals necessary for general detoxification support. It is designed for anyone undergoing a cleansing program. In addition, individuals on a weight-loss regimen, undergoing sauna therapy, or engaging in strenuous exercise can benefit from Toxic Relief Booster. This formula aids in metabolizing toxins previously stored in fat that have been released into the bloodstream due to these activities. This product can be used alone or in conjunction with Basic Detox Nutrients, MediBulk, Liver Cleanse, Hydrolyzed Whey Protein, and Ascorbic Acid. It can also be used in conjunction with products for clearance of specific toxins (see below).

Magnesium citrate is essential for hepatic phase I detoxification and is one of the most commonly deficient nutrients in the chemically toxic individual. Selenium is essential for glutathione activity and detoxification of many substances. One of the most researched herbs for the liver, milk thistle has proven its ability to increase liver glutathione levels and prevent liver cell damage from toxins. Siliphos contains the most potent flavonoid from milk thistle (silybin) bound to phosphatidylcholine for superior delivery to the liver. Curcumin is an important hepatoprotective antioxidant, and it has been shown to suppress the mutagenicity of several common chemical carcinogens, OPCs from grape seed provide additional potent antioxidant effects. Both curcumin and grape seed extracts are provided as phytosomes for superior absorption.



## Hydrolyzed Whey Protein

### enzymatically hydrolyzed for low allergenicity

Protein is the most important macronutrient for cleansing. Collectively, whey proteins have all the essential amino acids and in higher concentrations compared to various vegetable protein sources such as soy, corn, and wheat gluten. In addition to having a full spectrum of amino acids, the amino acids in whey are efficiently absorbed and utilized, relative to free amino acid solutions. Numerous studies have shown whey protein boosts glutathione levels, one of the most important molecules for detoxification. Furthermore, whey is high in cysteine and branched-chain amino acids (leucine, isoleucine, and valine) that can help prevent transport of metals across the blood-brain barrier into the brain.

Hydrolyzing whey protein breaks it into smaller, more absorbable, less antigenic peptides. Hydrolyzed Whey Protein should be considered for individuals undergoing a cleansing or detoxification program or those needing additional, high quality protein.

## Toxic Relief Booster

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 90

Each Capsule Contains:	% DV	
Magnesium (as Magnesium Citrate)	50 mg.	8%
Selenium (as Selenium Picolinate)	30 mcg.	43%
Curcumin Phytosome (root) ( <i>Curcuma longa</i> extract / Phosphatidylcholine complex)	100 mg.	*
Silybin Phytosome (seed) ( <i>Silymarin marianum</i> extract / Phosphatidylcholine complex)	100 mg.	*
Grape Seed Phytosome ( <i>Vitis vinifera</i> extract / Phosphatidylcholine complex)	50 mg.	*

\*Daily Value (DV) not established.

Other Ingredients: Hypromellose (derived from cellulose) capsule, Leucine,<sup>1</sup> Silicon Dioxide.<sup>1</sup>

Contains ingredients derived from soy (phytosomes).

<sup>1</sup>A hypoallergenic ingredient used to fill space.

90 Vegetarian Capsules  
Code: SF782  
Dosage: 1 capsule tid

## Hydrolyzed Whey Protein

### Supplement Facts

Serving Size: Two Scoops Servings Per Container: 17

Two (15 g) Scoops Contain:	% DV	
<b>Calories</b>	<b>117</b>	
Calories from Fat	18	
<b>Total Fat</b>	<b>2 g.</b>	<b>3%</b>
Saturated Fat	1 g.	5%
Trans Fat	0 g.	0%
Cholesterol	33 mg.	11%*
<b>Total Carbohydrate</b>	<b>2 g.</b>	<b>&lt;1%*</b>
Dietary Fiber	0 g.	
Sugars (as lactose)	2 g.	
<b>Protein</b>	<b>22.5 g.</b>	

\*Percent Daily Value based upon a 2,000 calorie diet. Daily Value (DV)

Other Ingredients: Hydrolyzed lactalbumin protein.

Contains ingredient derived from milk.

NET WT. 18 OZ. (510 G)  
Code: SP623  
Dosage: 1 to 2 scoops in 8 ounces of water  
qd - tid

## Cysteplus®

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 90

Each Capsule Contains:	% DV
N-Acetyl-L-Cysteine	500 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Hypromellose (derived from cellulose) capsule, Leucine,† Silicon Dioxide.†

†A hypoallergenic ingredient used to fill space.

90 Vegetarian Capsules  
Code: SA560  
Dosage: 1 capsule tid with meals



## Cysteplus®

### N-acetylcysteine for liver support, detoxification, and immune support

N-acetylcysteine (NAC) is the precursor of both the amino acid L-cysteine and reduced glutathione (GSH). Animal and human studies of NAC have shown it to be a powerful antioxidant and a therapeutic agent for heavy metal toxicity and other diseases characterized by free radical, oxidative damage. As a source of sulfhydryl groups, NAC stimulates glutathione synthesis, enhances glutathione-S-transferase activity, promotes liver detoxification by inhibiting xenobiotic biotransformation, and is a powerful nucleophile capable of scavenging free radicals. Historically the most prevalent and well-accepted use of NAC has been as an antidote for acetaminophen (Tylenol®) poisoning. The resultant liver toxicity is due to an acetaminophen metabolite that depletes the hepatocytes of glutathione and causes hepatocellular damage and possibly even death. NAC administered intravenously or orally within 24 hours of overdose is effective at preventing liver toxicity; however, improvement is most notable if treatment is initiated within 8-10 hours of acetaminophen overdose. NAC has also been effective for poisoning by carbon tetrachloride, acrylonitriles, halothane, paraquat, acetaldehyde, coumarin, and interferon. In addition to its dramatic effects in liver poisoning, NAC is effective in promoting normal liver detoxification.

## Siliphos®

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 90

Each Capsule Contains:	% DV
Silybin Phytosome (seed) ( <i>Silymarin marianum</i> extract /Phosphatidylcholine complex)	180 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Cellulose,† Hypromellose (derived from cellulose) capsule, Leucine,† Silicon Dioxide.†  
Contains ingredients derived from soy (phytosome).

†A hypoallergenic ingredient used to fill space.

90 Vegetarian Capsules  
Code: SF733  
Dosage: 1 to 3 capsules tid

Siliphos® (Silybin Phytosome) is a registered trademark of Indena S.p.A.

## Siliphos®

### a highly bioavailable silybin-phosphatidylcholine complex

Siliphos provides all the benefits of silymarin and phosphatidylcholine in one compound! Siliphos is a phytosome, which is a water soluble flavonoid (in this case silybin) that has been made lipid friendly by the addition of phosphatidylcholine. This allows for better incorporation of this hepatoprotective flavonoid into hepatic cell membranes. Of the three flavonoids comprising silymarin, silybin predominates and is the most potent. Clinical studies indicate the silybin-phosphatidylcholine complex in Siliphos provides superior bioavailability when compared to conventional silymarin products.

Phosphatidylcholine (PC) is not merely a passive “carrier” for the bioactive flavonoid silybin, but is itself a bioactive nutrient with documented clinical efficacy for liver disease, including alcoholic hepatic steatosis, drug-induced liver damage, and hepatitis. Silybin protects the liver by conserving glutathione in the parenchymal cells, while PC helps repair and replace cell membranes. These constituents likely offer the synergistic benefit of sparing liver cells from destruction.

## Ascorbic Acid One Gram necessary cofactor for phase I and phase II detoxification

Vitamin C is necessary for the action of cytochrome P450 enzymes of phase I detoxification. In addition, as an antioxidant, it can help quench free radical intermediates created during this first phase of detoxifying substances in the liver. Furthermore, vitamin C raises glutathione by increasing the rate of synthesis, thus enhancing phase II detoxification as well. Vitamin C can protect against the toxic effects of some heavy metals, including lead, aluminum, and cadmium.

## Detox Products for Specific Toxin Exposure

### Solvent Remover for individuals exposed to solvents

Chemical solvents can be detrimental to the nervous system. Solvent Remover contains amino acids needed to support the specific liver detoxification pathways involved in solvent elimination, as well as antioxidant nutrients to protect nerves from solvent damage. Individuals exposed to solvents who might benefit from this product include painters, dry cleaners, construction workers, printers, office workers, auto mechanics, manicurists, and beauticians. Other individuals who can benefit from Solvent Remover include those sensitive to paint, glue, and perfume, and persons with food intolerance, poor cholesterol metabolism, and/or fat-soluble vitamin depletion (signs of deficiencies in the acylation phase II pathway).

The nutrients in this product enhance acylation (amino acid conjugation), glucuronidation, and sulfation pathways – all involved in solvent detoxification. L-glycine is the primary amino acid necessary for acylation; L-glutamine is also needed for proper acylation. Taurine is needed for both acylation and sulfation pathways. N-acetylcysteine increases glutathione levels, an essential endogenous antioxidant for detoxification. Alpha-lipoic acid increases glutathione and is neuroprotective.

## Pure Ascorbic Acid One

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 250

Each Capsule Contains:	% DV
Vitamin C (as Ascorbic Acid)	1000 mg. 1667%
Daily Value (DV)	

Other Ingredients: Hypromellose (derived from cellulose) capsule.

250 Vegetarian Capsules

Code: C149

Dosage: 1 to 3 capsules bid



## Solvent Remover

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 90

Each Capsule Contains:	% DV
Glycine	150 mg. *
Glutamine	150 mg. *
Taurine	150 mg. *
N-Acetyl-L-Cysteine	50 mg. *
Alpha Lipoic Acid	50 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Hypromellose (derived from cellulose) capsule, Leucine,<sup>1</sup> Silicon Dioxide.<sup>1</sup>

<sup>1</sup>A hypoallergenic ingredient used to fill space.

90 Vegetarian Capsules

Code: SF796

Dosage: 1 to 2 capsules tid

## DHA

### Supplement Facts

Serving Size: One Gelcap Servings Per Container: 90

Each Gelcap Contains:	% DV	
<b>Calories</b>	<b>5</b>	
Calories from Fat	5	
<b>Total Fat</b>	<b>0.5 g.</b>	<b>&lt;1%*</b>
Saturated Fat	0 g.	0%*
DHA (docosahexaenoic acid from algae oil)	250 mg.	**

\* Percent Daily Values are based on a 2,000 calorie diet.

\*\* Daily Value (DV) not established.

Other Ingredients: Olive oil, Ascorbyl Palmitate (vitamin C) and d-Alpha Tocopherol (vitamin E) as antioxidants, in a gelatin capsule (gelatin, water, and glycerin).

90 Gelcaps  
Code: SP609  
Dosage: 1 gelcap tid



## Pesticide Protector™

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 90

Each Capsule Contains:	% DV	
Vitamin A (as Palmitate)	500 IU.	10%
Vitamin E (as d-Alpha Tocopheryl)	100 IU.	25%
Thiamine (as Thiamine HCl)	25 mg.	1667%
Alpha Lipoic Acid	100 mg.	*

\* Daily Value (DV) not established.

Other Ingredients: Magnesium Citrate,<sup>†</sup> Hypromellose (derived from cellulose) capsule, Leucine,<sup>†</sup> Silicon Dioxide.<sup>†</sup>

<sup>†</sup>A hypoallergenic ingredient used to fill space.

90 Vegetarian Capsules  
Code: SF794  
Dosage: 1 capsule tid

## DHA

### Omega-3 fatty acid from algae

Docosahexaenoic acid (DHA) is a naturally occurring omega-3 essential fatty acid found in fish and some algae. It is a downstream metabolite of eicosapentaenoic acid (EPA). Some interconversion exists between DHA and EPA, so if there is a deficit of one it can be made up if the other is present. DHA is essential for proper brain and retinal function. The inability to convert other essential fatty acids to DHA has been implicated in attention deficit disorder.

DHA crosses the blood-brain barrier, protecting cell membranes from toxin-induced oxidative damage particularly organophosphate and carbamate pesticides. Individuals who can benefit from DHA supplementation include those undergoing detoxification from pesticides, exposed to organophosphates, carbamate, or pyrethroid pesticides, or experiencing neurological problems secondary to chemical toxin exposure.

## Pesticide Protector

### for individuals with present or past exposure to pesticides

The presence of pesticides in human tissue samples is ubiquitous, with nearly all people tested in numerous studies registering measurable levels of some type of pesticide. Pesticide exposure results primarily in neurotoxicity, but can significantly affect the immune and endocrine systems as well. In fact, no organ system in the body is immune from the effects of pesticides. Pesticide Protector is specifically formulated to aid the body in detoxification of chlorinated pesticides, organophosphates, carbamates, and pyrethrins. Patients who may benefit from supplementation with Pesticide Protector include those with current exposure (from lawn and garden chemicals, spraying of buildings, travel through major agricultural areas), individuals with chronic health problems and a history of significant past exposure, and chemically sensitive individuals (they often have detectable pesticide residues in their serum).

Because pesticides are neurotoxins, alpha-lipoic acid is included as a potent neuroprotective antioxidant. Vitamin E helps prevent oxidative damage caused by organophosphates and carbamates. Both thiamine (B1) and vitamin A are depleted by chlorinated pesticides.

## Indole-3-Carbinol for improved estrogen metabolism

Indole-3-carbinol (I3C) is a compound found in high concentrations in Brassica family vegetables, including broccoli, cauliflower, Brussels sprouts, and cabbage. The majority of ingested I3C is absorbed in the small intestine as the dimer, diindolylmethane (DIM), which is thought to be the primary contributor to I3C's beneficial properties. DIM has been shown to selectively bind to estrogen receptors, and may act as an estrogen antagonist at physiological concentration.

I3C up-regulates phase I and II detoxification enzymes and increases the ratio of 2-hydroxy/16-hydroxy estrogens. The 2-hydroxy estrogens, less active than the 16-hydroxy estrogens, are more rapidly eliminated from the body. A high urinary level of 16-hydroxyestrone has been associated with increased risk for breast and other hormone-related cancers. Studies have shown urinary 2:16-hydroxyestrone ratios to be significantly lower in breast cancer cases compared to controls in both pre- and postmenopausal women.



## Calcium D-Glucarate aids in liver detoxification of hormones and xenobiotics

Calcium D-glucarate is the calcium salt of D-glucaric acid, a substance produced naturally in small amounts by humans. Glucuronidation – attaching a glucuronic acid molecule to a substance for detoxification and elimination – is a primary method of phase II detoxification in the liver. Steroid hormones and many xenobiotics are detoxified in this manner and subsequently eliminated in the bile or urine. Unfortunately, intestinal bacteria can deconjugate these already detoxified compounds via the enzyme beta-glucuronidase. Calcium D-glucarate inhibits beta-glucuronidase, preventing recycling of hormones and carcinogenic toxins. Elevated beta-glucuronidase activity is associated with an increased risk for various cancers, particularly hormone-dependent cancers such as breast, prostate, and colon cancers. Other potential clinical applications of oral calcium D-glucarate include regulation of estrogen metabolism and as a lipid-lowering agent.

## Indole-3-Carbinol

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 60

Each Capsule Contains:	% DV
Indole-3-carbinol	200 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Magnesium Citrate,<sup>†</sup> Hypromellose (derived from cellulose) capsule, Leucine,<sup>†</sup> Silicon Dioxide.<sup>†</sup>

<sup>†</sup>A hypoallergenic ingredient used to fill space.

60 Vegetarian Capsules  
Code: SF749  
Dosage: 1 capsule qd - bid



## Calcium D-Glucarate

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 90

Each Capsule Contains:	% DV
Calcium D-Glucarate	500 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Hypromellose (derived from cellulose) capsule.

90 Vegetarian Capsules  
Code: M280  
Dosage: 1 to 2 capsules tid

## Formaldehyde Relief

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 90

Each Capsule Contains:	% DV
Thiamine (as Thiamine HCl)	25 mg. 1667%
Pyridoxine (as Pyridoxal 5'- Phosphate)	50 mg. 67%
Selenium (as Selenium Picolinate)	50 mcg. 71.4%
Pantethine	100 mg. *
Bifidobacterium lactis (bifidum)	250 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Hypromellose (derived from cellulose capsule, Magnesium Citrate,<sup>†</sup> Leucine,<sup>†</sup> Silicon Dioxide.<sup>†</sup>

<sup>†</sup>A hypoallergenic ingredient used to fill space.

90 Vegetarian Capsules  
Code: SF793  
Dosage: 1 capsule tid

## B-Complex #1

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 60

Each Capsule Contains:	% DV
Thiamine (as Thiamine HCl)	200 mg. 13,334%
Riboflavin (from 25 mg Riboflavin and 5 mg Riboflavin 5'- Phosphate)	28.6 mg. 1682%
Niacin (as Niacinamide)	80 mg. 400%
Vitamin B6 (from 25 mg Pyridoxine HCl and 5 mg Pyridoxal 5'- Phosphate)	23.4 mg. 1170%
Folate (100 mcg as Calcium Folate and 100 mcg as 5-Methyl-tetrahydrofolate)	200 mcg. 50%
Vitamin B12 (50 mcg as Adenosylcobalamin and 50 mcg as Methylcobalamin)	100 mcg. 1667%
Biotin	80 mcg. 27%
Pantothenic Acid (as Calcium Pantothenate)	45 mg. 450%
Choline Citrate	40 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Magnesium Citrate Laurate,<sup>†</sup> Hypromellose (derived from cellulose) capsule, Silicon Dioxide.<sup>†</sup>

<sup>†</sup>A hypoallergenic ingredient used to fill space.

60 Vegetarian Capsules  
Code: B101  
Dosage: 1 to 3 capsules qd

## Formaldehyde Relief for detoxification from aldehyde compounds

Formaldehyde is a pervasive environmental toxin. Off-gassing from new carpet or furniture and exposure to particle/fiber board paneling – used in cabinetry and prefabricated homes – are common sources of exposure. Occupational exposure can occur in carpet installers, medical students, histology technicians, cabinet builders, and construction workers. Off-gassing of formaldehyde can continue for as long as 15 years. Candida toxin and alcohol metabolism are also sources of aldehyde compounds. Thus, Formaldehyde Relief should also be considered for individuals with Candida or a history of chronic alcohol consumption.

Thiamine (B1) deficiency is common in this population, particularly alcoholics, as aldehyde metabolism utilizes vitamin B1. Vitamin B6 is a cofactor for the sulfation and glucuronidation pathways necessary for aldehyde clearance. P5P, the active form of B6, spares activation in the liver and is better utilized by chemically toxic individuals. Selenium is a cofactor for glutathione metabolism; glutathione is essential for sulfation. *Bifidobacterium bifidum* has demonstrated effectiveness at clearing aldehydes from the system. Pantethine, the active form of vitamin B5, increases the activity of aldehyde dehydrogenase, the enzyme that metabolizes acetaldehyde.

## B Complex #1 higher levels of thiamine and active forms of folate and vitamin B12 in a complete B-complex

Thiamine (vitamin B1) is a water-soluble vitamin and necessary cofactor for oxidative carboxylation of pyruvate to acetate and acetyl coenzyme A, the primary substrate for the Krebs cycle. Carbohydrate, protein, and fat metabolism are all dependent on vitamin B1. Humans are dependent on dietary intake to fulfill their thiamine requirements. Because there is very little thiamine stored in the body, depletion can occur as quickly as within 14 days. Deficiency of thiamine can manifest as mental confusion, anorexia, muscle weakness, indigestion, constipation, tachycardia, neuropathies, and palpitations. Causes for deficiency include malnutrition, genetic polymorphisms, and excessive consumption of caffeine and alcohol.

Thorne's B-Complex #1 supplies 200 mg of thiamine HCl and bioactive forms of other B vitamins in each capsule to ensure your patients get the most bioavailable B complex available for immediate utilization.

While *Candida albicans* has long been acknowledged as a cause of vaginitis, it can also have significant negative effects in the gastrointestinal tract. GI *Candida* can result in gas, bloating, diarrhea, and rectal pruritis. It is also capable of translocation from the GI tract into systemic circulation, even in non-immunocompromised individuals, resulting in vague systemic symptoms such as fatigue and foggy-headedness. Patients who might be at increased risk for *Candida* include diabetics, alcoholics, individuals with HIV, cancer patients undergoing chemotherapy or radiation, and persons on immunosuppressive drugs, antibiotics, or estrogen therapy. GI *Candida* should be ruled out in women with recurrent vaginal infections and individuals with chronic fungal infections of the skin, nails, or mouth (thrush). Nutritional support can help eradicate *Candida* or prevent it in susceptible individuals. *Candida albicans* produces the aldehyde compound acetaldehyde in the process of fermenting carbohydrates. Therefore, in addition to using Formaldehyde Relief to help eliminate aldehyde compounds, it is essential to eradicate the source of these toxins with products listed below.

## Formula SF722

### undecylenic acid – the most potent antifungal fatty acid

Fatty acids have been used for centuries as antimicrobial agents, and in the last 50 years have demonstrated effectiveness as yeast and mold inhibitors in food, as well as utility as topical, intestinal, and systemic antifungals. Undecylenic acid (10-undecenoic acid) is an eleven-carbon, monounsaturated fatty acid occurring naturally in the body's perspiration.

Undecylenic acid has been shown to be approximately six times more effective as an antifungal than caprylic acid. A Thorne innovation, SF722 contains undecylenic acid in a base of pure olive oil. It aids in eradicating *Candida* and other yeast species, and has been one of our best-selling products for almost two decades.

## Lactobacillus Sporogenes

### stable probiotic resists destruction by heat or stomach acid

Probiotics can prevent overgrowth of harmful bacteria and fungi in the intestines, genitourinary tract, and skin. This is accomplished via competitive inhibition, lactic acid production (resulting in an acidic environment not conducive to bacterial or fungal growth), and production of substances with antimicrobial properties. *Lactobacillus sporogenes* is a lactic acid-producing, spore-forming bacillus, representing a significant breakthrough in *Lactobacillus* supplementation, with significant advantages over *L. acidophilus*. *L. sporogenes* is a safe, effective probiotic, that needs no special handling, survives in stomach acid, and is delivered to the small intestine without loss of viable organisms. In contrast, many other *Lactobacillus* products lose most or all of their potency before use, and do not survive well in stomach acid.

## Formula SF722

### Supplement Facts

Serving Size: One Gelcap Servings Per Container: 250

Each Gelcap Contains:	% DV
10-Undecenoic Acid (derived from castor bean oil)	50 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Extra virgin olive oil, gelatin (from tilapia and catfish) and glycerin (vegetable source) capsule.

Contains ingredient derived from fish (tilapia and catfish).

250 Fish Gelatin Gelcaps

Code: SF722

Dosage: 3 to 5 gelcaps tid

## Lactobacillus Sporogenes

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 60

Each Capsule Contains:	% DV
Lactobacillus sporogenes <sup>†</sup> (providing approximately 1.5 billion CFU's)	100 mg. *

\*Daily Value (DV) not established.

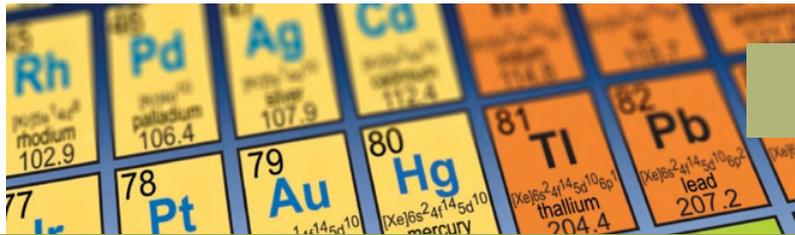
Other Ingredients: Magnesium Citrate,<sup>†</sup> Hypromellose (derived from cellulose) capsule, Leucine,<sup>†</sup> Silicon Dioxide.<sup>†</sup>

<sup>†</sup>A hypoallergenic ingredient used to fill space.

60 Vegetarian Capsules

Code: SF758

Dosage: 1 capsule bid - tid



## Detox Products for Heavy Metal Exposure

### Heavy Metal Support

#### Supplement Facts

Serving Size: Two Capsules Servings Per Container: 60

Two Capsules Contain:	% DV	
Magnesium (as Magnesium Citrate-Malate)	75 mg.	8%
Zinc (as Zinc Picolinate)	15 mg.	67%
Selenium (as Selenium Picolinate)	75 mcg.	71.4%
Copper (as Copper Picolinate)	1 mg.	50%
Manganese (as Manganese Picolinate)	15 mg.	500%
Molybdenum (as Molybdenum Picolinate)	15 mcg.	13.4%
Potassium (as Potassium Citrate)	75 mg.	<2%
Methionine	150 mg.	*
Alpha Lipoic Acid	75 mg.	*
Marshmallow (root) ( <i>Althea officinalis</i> )	75 mg.	*
Bearberry (5 to 1) extract (leaf) ( <i>Arctostaphylos uva ursi</i> )	200 mg.	*

\*Daily Value (DV) not established

Other Ingredients: Hypromellose (derived from cellulose) capsule, Leucine,<sup>†</sup> Silicon Dioxide.<sup>†</sup>

<sup>†</sup>A hypoallergenic ingredient used to fill space.

120 Vegetarian Capsules

Code: SF795

Dosage: 2 capsules tid

### Heavy Metal Support

#### replenishes nutrients depleted during chelation

Used as an adjunct to Captomer and Basic Detox Nutrients, Heavy Metal Support provides nutrients needed to assist in the safe movement of heavy metals out of the body and helps replenish nutrients made deficient by heavy metal toxicity and clearing. This, as well as other supplements containing minerals (such as Basic Detox Nutrients) should be used on the days that Captomer is not supplemented.

Magnesium is included in the product to replenish magnesium that is typically lost during the detoxification process. Because manganese, copper, and molybdenum can be chelated by DMSA, they are included in Heavy Metal Support to replace mineral losses. Zinc increases production of metallothionein, which helps protect the kidneys during metal clearing. Potassium citrate aids in mobilization of mercury from the body. Both selenium and alpha-lipoic acid increase glutathione levels; lipoic acid also has some mild metal chelating effects. Methionine moves cadmium from inside the cells for easier clearance. Uva ursi and marshmallow root are kidney protective botanicals; heavy metals bound to DMSA are primarily cleared by the kidneys.

### Protocol Testing for Heavy Metals

While there is no test that can show total body burden of heavy metals, provocative urine testing gives an indication of burden, and of the ability of the chelating agent to clear the metal from the body. Utilize the following protocol:

1. Run a non-provoked 24-hour urine heavy metal panel to get a baseline of the amount of metals being cleared by the body on a random day.
2. Run a creatinine clearance test to ensure adequate kidney function. DMSA clears metals through the kidneys, putting extra stress on the kidneys.
3. Give an oral dose of DMSA (Captomer) of 10 mg/kg body weight/day in divided doses between meals for three days. During the third day, while still dosing Captomer, do a 24-hour urine collection. Follow lab instructions for collection and transport.

#### Optional six-hour provocation:

1. Run a non-provoked urine test and creatinine clearance test as above.
2. Take a single oral dose of 20 mg/kg body weight/day on an empty stomach. Collect all urine for the next six hours. Follow lab instructions for collection and transport.

Heavy metals are common underlying factors in chemical overload, and in some persons comprise the primary toxic assault. Contamination of water, air, and food by chemicals and heavy metals is an unfortunate consequence of our industrialized, high-tech society. The resultant accumulation of heavy metals in the human body poses a significant health risk, leading to a wide array of symptoms and disease states. Although human lead toxicity has decreased in the United States since lead was eliminated from gasoline and lead-based paint, it continues to be a significant problem, particularly in urban areas and areas of lead mining and smelting. Mercury, cadmium, and arsenic toxicity from occupational and environmental exposure also continue to pose a significant threat to public health. For these reasons, diagnostic testing for heavy metals and subsequently decreasing the body's burden of these substances has become a necessity.

## Captomer® and Captomer-250® DMSA for heavy metal chelation

Meso-2, 3-dimercaptosuccinic acid (DMSA) is a sulfhydryl-containing, water-soluble, non-toxic, orally administered, metal chelator which has been in use as an antidote to heavy metal toxicity since the 1950s. More recent clinical use and research substantiates this compound's efficacy and safety, and establishes it as the premier metal chelation compound when compared to other available chelating substances. Captomer contains 100 mg DMSA per capsule, while Captomer-250 contains 250 mg DMSA per capsule.

Provocation testing using DMSA, followed by a 6- to 24-hour toxic metal urine analysis, is recommended to assess the amount of heavy metal present. Before initiating a heavy metal challenge with DMSA, the physician should be assured the patient has sufficient creatinine clearance to handle heavy metal excretion via the kidneys, as this is the primary route of elimination of heavy metals bound to DMSA. Check with your lab to establish their preferred protocol for the DMSA challenge. Some labs use a 24-hour urine collection, others a six-hour collection – which means a different pre-collection protocol.

Heavy metal detoxification should be accompanied by regular colonic irrigation – weekly is preferable but no less than one colonic per cycle of Captomer (on the last day of the Captomer dosing if possible). More frequent colonics will aid in elimination and reduce the body's toxic burden.

Metals chelated by DMSA include mercury, lead, arsenic, antimony, silver, bismuth, copper, cadmium, tin, nickel, zinc, thallium, and manganese.

## Captomer®

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 45

Each Capsule Contains:	% DV
Succinic Acid (from 100 mg DMSA <sup>**</sup> )	65 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Magnesium Citrate,<sup>†</sup> Hypromellose (derived from cellulose) capsule, Leucine,<sup>†</sup> Silicon Dioxide.<sup>†</sup>

<sup>†</sup>A hypoallergenic ingredient used to fill space.

45 Vegetarian Capsules

Code: SF740

Dosage: 10 mg. per kg body weight per day in three divided doses - between meals. Use on a two-week cycle, 3 days on 11 days off.

<sup>\*\*</sup>Meso-2,3-Dimercaptosuccinic Acid

## Captomer-250®

### Supplement Facts

Serving Size: One Capsule Servings Per Container: 45

Each Capsule Contains:	% DV
Succinic Acid (from 250 mg DMSA <sup>†</sup> )	162.5 mg. *

\*Daily Value (DV) not established.

Other Ingredients: Hypromellose (derived from cellulose) capsule.

45 Vegetarian Capsules

Code: SF735

Dosage: 10 mg. per kg body weight per day in three divided doses - between meals. Use on a two-week cycle, 3 days on 11 days off.

<sup>†</sup> Meso-2,3-Dimercaptosuccinic Acid

Warning: DMSA (Captomer) should not be used by pregnant or lactating women.



## HEAVY METAL DETOXIFICATION

### Protocol of Walter Crinnion, ND

**Step 1:** Perform a creatinine clearance test prior to clearing of heavy metals. DMSA (Captomer) clears metals primarily through the kidneys, which can cause an increased burden on the kidneys. If creatinine clearance is low, do not use Captomer. Perform a 24-hour urine challenge. (SEE PAGE 10)

Have patient take one capsule of Captomer before starting the program to ensure they don't have an immediate hypersensitivity to the sulfur.

**Step 2:** Captomer chelates heavy metals. Establish the total daily dose you will be prescribing. Dosage recommendation is 10 mg/kg body weight daily in three divided doses between meals. Since there are 2.2 pounds in a kg, divide the patient's weight in pounds by 2.2 to determine kg weight. Multiply kg weight by 10 to get the recommended daily dose in mgs. If you have a particularly sensitive patient or are not familiar with using Captomer, you may even begin with a lower dose. You can always increase the dose during the next cycle. All heavy metal detoxification should be accompanied by regular colonic irrigation - weekly is preferable but no less than one colonic per cycle of Captomer (on the last day of the Captomer dosing if possible). More frequent colonics will aid in elimination and reduce the body's toxic burden.

**Step 3:** Captomer is dosed in cycles, with the number of days on and off varying among physicians. Dr. Crinnion recommends 5 days on and 9 days off. Other physicians use a 3-day-on, 11-day-off cycle. Still others use a one-week cycle rather than a two-week cycle and have the patients use Captomer for 3 days with a 4-day break. The more sensitive or ill the patient, the longer the break you will want to take between dosing.

#### PRODUCT PROTOCOL FOR CHELATING PHASE (with Captomer)

- Captomer - dosage as outlined above
- Hydrolyzed Whey Protein (pure whey protein) - 1 - 2 scoops once or twice daily in water, juice, or milk (may make a smoothy with it); branched chain amino acids help block re-entry of mercury across blood brain barrier; provides amino acids which increase glutathione levels.
- MediBulk - 1/2 - 1 scoop in 8 oz. water before bed; assists in binding heavy metals in the colon and flushing them from the system.
- Toxic Relief Booster - 1 capsule three times daily; support the body's detoxification mechanisms.
- Vitamin C - 1-3 grams three times daily.
- Liver Cleanse - 1 capsule one to three times daily; enhances liver's detoxification mechanisms.

### PRODUCT PROTOCOL FOR REPLENISH PHASE (no Captomer)

- Basic Detox Nutrients - 6 capsules twice daily; multiple vitamin-mineral with additional detoxification nutrients.
- Heavy Metal Support - 2 capsules twice daily; replenishes minerals bound by Captomer and nutrients used up during the heavy metal detox process, and nourishes the kidneys.
- Hydrolyzed Whey Protein (pure whey protein) - 1-2 scoops once or twice daily; assists in moving mercury from the brain.
- MediBulk - 1/2 - 1 scoop in 8 oz. water before bed; assists in binding heavy metals in the colon and flushing them from the system.
- Vitamin C - 1-3 grams three times daily.
- Liver Cleanse - 1 capsule one to three times daily; enhances liver's detoxification mechanisms.
- Toxic Relief Booster - 1 capsule three times daily; use if patient needs additional detoxification support.

### OTHER SUPPORTIVE THERAPIES

To insure heavy metals are not getting recycled, colonic irrigation is recommended at the end of each week. Other supportive detoxification measures such as saunas and hydrotherapy are also recommended.

### POSSIBLE ADVERSE REACTIONS

The movement of heavy metals can lead to adverse symptoms in some individuals. This often occurs between the third and fourth cycle of Captomer, often on the third day of the cycle. Symptoms of mercury mobilization include fatigue and irritability. Symptoms of arsenic mobilization include fatigue, irritation of mucus membranes, and hive-like skin reactions.

As with any natural sulfur-containing substance, a certain percent of the population may be sensitive. If your patient is allergic to eggs, brassica family vegetables, onion, garlic, or supplements with sulfur (NAC, lipoic acid, glucosamine sulfate, MSM, etc.) do not use Captomer.

#### If adverse reactions occur:

1. Stop Captomer, at least for the remainder of the cycle.
2. Increase vitamin C intake (double it).
3. Do another colonic irrigation.

### FOLLOW-UP TESTING

At the beginning of the fifth Captomer cycle, perform another 24-hour urine test to check for clearing of metals. Begin urine collection on the morning of the third day of the Captomer cycle (unless your lab recommends a different protocol). As you clear the body of heavy metals, you should begin to see less clearing of heavy metals in the urine (when compared to the original 24-hour urine challenge).



**MediClear supports Phase I and Phase II detoxification**

**The MediClear Program promotes compliance and clinical efficacy**

**The MediClear Program is designed to be flexible**

**The MediClear Program is designed for patient compliance**

**The MediClear Program includes a step-by-step guide for your patient that is easily modifiable for each patient's special needs**



## **MediClear® rice protein and accessory nutrients support hepatic detoxification**

Our external environment has become increasingly more polluted in the last 50 years, causing a greater cumulative toxic burden in humans than ever before. Unavoidable exposure to tens of thousands of toxic chemicals in the environment has delivered up the daunting task of detoxifying and eliminating these substances from our bodies. Add to this the myriad endogenous substances (hormones, biochemical metabolites) the body must detoxify on a daily basis, and you see the serious challenge to our organs of elimination. In addition to this ever-increasing toxic load, the over-consumption of fats and sugars – and our reliance on nutrient-depleted vegetables, grains, fruits, and antibiotic- and hormone-laden meats – adds to the toxic load while providing inadequate nutrients for many metabolic processes, especially detoxification. These poor dietary habits also predispose to the overgrowth of pathogenic microorganisms, potentially resulting in dysbiosis and intestinal hyper-permeability. These conditions can subsequently lead to a number of maladies, including allergies, chronic fatigue, and autoimmune processes.

The liver carries the greatest share of the detoxification burden, as it is the liver's job to change potentially harmful substances into non-toxic, water-soluble compounds that can be eliminated by the kidneys or intestines. The liver and other tissues participating in the detoxification process must have available the proper nutrient cofactors to efficiently accomplish this task. In addition, specific botanicals are useful in assisting hepatic detoxification.

### **phase I and phase II hepatic detoxification**

In phase I of hepatic detoxification, polar, fat-soluble substances are converted to intermediate metabolites mainly by the cytochrome P450 family of enzymes. The intermediate metabolite is often more reactive and potentially more toxic than the original molecule.

Phase II detoxification involves the attachment, or conjugation, of other molecules onto the intermediate metabolite to make it non-toxic, water-soluble, and allow its elimination via the urine or bile.

### **liver support for detoxification**

Providing essential nutrient cofactors, while supplying an adequate amount of low-allergenicity protein, can be very beneficial to liver function. Health-care practitioners know many problems can arise if a patient's liver is not functioning as it should, including poor digestion, allergies, inflammation, hyperlipidemia, intestinal dysbiosis, chronic fatigue, even cancer. MediClear includes beneficial detoxification nutrient cofactors, as well as an array of extra nutrients and botanicals, in powder form that can be added to water, or fruit or vegetable juice.

## the MediClear program

The MediClear program is an easy-to-implement, affordable three-week protocol that emphasizes healthful, hypoallergenic dietary changes coupled with supplementation including MediClear. This approach delivers a nutrient-dense diet with extra cofactors that are necessary for optimal liver detoxification. The MediClear program is designed to be implemented incrementally, to gradually move your patients into and out of the program. (see MediClear patient guide for more information).

## why rice protein?

Rice protein is used in MediClear because of its low incidence of allergenicity or intolerance. Rarely is an individual allergic to rice protein; whereas, it is far more common for dairy or soy to initiate an allergic reaction. Utilizing rice protein allows the patient to eliminate allergenic proteins from the diet, yet maintain high-quality protein intake.

## detoxification cofactors

MediClear contains vitamins and minerals necessary for detoxification and hepatic support. These nutrients are provided in the most absorbable, best utilized forms; e.g., calcium and magnesium citrate-malate, pyridoxal 5'-phosphate (active vitamin B6), and folic acid (active folate).

## extra nutrients and botanicals

Catechins (from green tea extract) are included to promote proper hepatic phase I detoxification and as a potent antioxidant. Glutathione and N-acetylcysteine are added for their antioxidant activity and to support hepatic phase II detoxification. The amino acids glycine and taurine, and the amino acid derivative trimethylglycine, are also included for their supportive role in phase II detoxification, along with the sulfur-containing compound MSM. L-glutamine supports proper intestinal health. Quercetin chalcone is included for its antioxidant activity and mast cell-stabilizing action. Our stable probiotic, *Lactobacillus sporogenes*, helps balance the normal intestinal flora. See label copy for a complete listing of ingredients.

## the difference

MediClear is different than most similar beverage mixes. MediClear contains more protein, fewer carbohydrates, more accessory detox cofactors, special nutrients and a probiotic for gut health, and is more affordable than other detox formulas.

## Supplement Facts

Serving Size: Two Scoops (46 g) Servings Per Container: 20

Two (46 g) Scoops Contain:	% DV
<b>Calories</b>	<b>190</b>
Calories from Fat	25
<b>Total Fat</b>	<b>3.5 g. 5%*</b>
Saturated Fat	1.5 g. 8%*
<b>Cholesterol</b>	<b>0 mg. 0%*</b>
<b>Total Carbohydrate</b>	<b>12 g. 4%*</b>
Sugars	4 g. **
<b>Dietary Fiber</b>	<b>4 g. 16%</b>
<b>Protein</b>	<b>29 g.</b>
Vitamin A (from 3000 IU Mixed Carotenes and 2000 IU Palmitate)	
5000 IU.	100%
Vitamin C (as Ascorbic Acid)	
300 mg.	500%
Vitamin D (as Vitamin D3)	
400 IU.	100%
Vitamin E (as d-Alpha-Tocopherol from 100 mg Pure Mixed Tocopherols)	
50 IU.	166%
Thiamine (as Thiamine HCl)	
12 mg.	800%
Riboflavin (as Riboflavin 5'- Phosphate)	
5 mg.	294%
Niacin (from 8 mg Niacin and 30 mg Niacinamide)	
38 mg.	125%
Vitamin B6 (from Pyridoxal 5'- Phosphate)	
10 mg.	500%
Folate (from 150 mcg Calcium Folate and 150 mcg 5-Methyl-tetrahydrofolate)	
300 mcg.	75%
Vitamin B12 (from 25 mcg Cobamide and 25 mcg Methylcobalamin)	
50 mcg.	833%
Biotin	
150 mcg.	50%
Pantothenic Acid (as Calcium Pantothenate)	
50 mg.	500%
Calcium (as Calcium Citrate-Malate)	
300 mg.	30%
Magnesium (as Magnesium Citrate-Malate)	
150 mg.	37.5%
Zinc (as Zinc Picolinate)	
10 mg.	66.6%
Selenium (as Selenium Picolinate)	
70 mcg.	100%
Manganese (as Manganese Picolinate)	
1.5 mg.	75%
Chromium (as UltraChrome®)	
100 mcg.	83.3%
Molybdenum (as Molybdenum Picolinate)	
50 mcg.	66.6%
Potassium (as Potassium Citrate-Malate)	
300 mg.	8.5%
Phosphorus	
220 mg.	22%
Choline Citrate	
30 mg.	**
Boron (as Boron Picolinate)	
100 mcg.	**
Vanadium (as Vanadium Picolinate)	
50 mcg.	**
Lactobacillus sporogenes	
50 mg.	**
Quercetin chalcone	
250 mg.	**
Green Tea Extract (Catechin source)	
25 mg.	**
MSM (Methyl Sulfonyl Methane)	
100 mg.	**
Betaine (Trimethylglycine)	
50 mg.	**
Medium Chain Triglycerides (MCT's)	
1.5 g.	**
ADDED AMINO ACIDS	
L-Glutamine	
500 mg.	**
Glycine	
1.65 g.	**
Taurine	
110 mg.	**
Lysine	
500 mg.	**
Glutathione	
25 mg.	**
N-Acetylcysteine	
50 mg.	**

\* Percentage Daily Value based on a 2,000 calorie diet.

\*\* Daily Value (DV) not established.

Other Ingredients: Rice protein, pure cane molasses, rice bran, natural vanilla, SlimSweet® (Lo Han fruit extract), orange flavoring, silicon dioxide.

Net Wt 32.45 oz (920 g)

Code: SP640

Dosage: 1 to 2 scoops in 8 ounces of water  
bid - tid

Slimsweet® is a registered trademark of TriMedica International Inc.



Toxic Exposure	Primary Products	Primary Product Functions	Additional Support
General non-specific	Basic Detox Nutrients	General support; provides botanical and nutrient detox cofactors	Toxic Relief Booster; Liver Cleanse; MediClear; Siliphos
Heavy metals	Captomer* or Captomer-250*; Heavy Metal Support; Basic Detox Nutrients	Chelates heavy metals Replaces lost nutrients General support	Toxic Relief Booster; Hydrolyzed Whey; MediBulk; Ascorbic Acid
Pesticides	Pesticide Protector; DHA; Basic Detox Nutrients	Prevents pesticide damage and replaces nutrients depleted by pesticides Protects cell membranes from toxin-induced damage General support	Toxic Relief Booster; Liver Cleanse; MediBulk
Formaldehydes (new carpet, upholstery, medical students, histologists)	Formaldehyde Relief; Basic Detox Nutrients	Nutrients for formaldehyde clearing General support	Toxic Relief Booster; Liver Cleanse; MediBulk; Lactobacillus sporogenes; Cysteplus
Aldehydes from Candida or excessive alcohol consumption	Formaldehyde Relief; Basic Detox Nutrients; Formula SF722 (Candida); B-Complex #1 and Liver Cleanse	Clears aldehydes General support Clears Candida Clears aldehydes from alcohol consumption	Toxic Relief Booster; MediBulk
Solvents (painters, dry cleaners, construction workers, printers, beauticians, auto mechanics, individuals sensitive to perfumes)	Solvent Remover; Basic Detox Nutrients	Detoxifies solvents and protects from solvent damage General support	Toxic Relief Booster; Liver Cleanse; MediBulk; Siliphos
Over-exposure to estrogens and other steroid hormones; environmental toxins such as bovine growth hormone or DES	Calcium D-Glucarate; Indole-3-Carbinol; Basic Detox Nutrients	Enhances phase II liver clearance of hormones Enhances ratio of 2/16 hydroxy estrogen General support	Toxic Relief Booster; Liver Cleanse; MediBulk

\* Captomer contains 100 mg DMSA per capsule; Captomer-250 contains 250 mg DMSA per capsule. DMSA is known to chelate mercury, lead, cadmium, arsenic, antimony, bismuth, tin, nickel, thallium, manganese, copper, and zinc.

## RESOURCES

Accu-Chem Laboratories  
990 N. Bowser Road,  
Suite 800-880  
Richardson, TX 75081  
800-451-0116

Genova Diagnostics  
63 Zillicoa Street,  
Asheville, NC 28801  
800-522-4762  
[www.GDX.net](http://www.GDX.net)

National Medical Services  
3701 Welsh Road,  
Willow Grove, PA 19090  
800-522-6671

Doctor's Data  
3755 Illinois Avenue,  
St. Charles, IL 60174  
800-323-2784  
[www.doctorsdata.com](http://www.doctorsdata.com)

Metametrix Clinical Laboratory  
3425 Corporate Way,  
Duluth, GA 30096  
800-221-4640  
[www.metametrix.com](http://www.metametrix.com)

Pacific Toxicology Laboratories  
9348 De Soto Avenue,  
Chatsworth, CA 91311  
800-328-6942

Thorne Research has been manufacturing the finest nutritional supplement products and supplying them to doctors and pharmacies around the world for over 20 years. Only the purest raw materials are used in our product line.

For the health-care practitioner, Thorne offers an unparalleled regimen of products designed to optimize detoxification pathways and protect the body from toxin-induced damage. Thorne products offer safety, efficacy, and quality you can rely on, made with the highest level of manufacturing standards possible. This guide has been designed specifically to help you incorporate a complete detoxification program. For added support, Thorne Research has physicians on staff to answer any protocol questions, at 800-228-1966 or [info@thorne.com](mailto:info@thorne.com).



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