



## Featured Article | Natural Guide to a Healthy Liver

by Judy Phillips

### Introductions

Despite the escalating health awareness in our culture, it is unbelievable how very little consideration is given to the liver and its vitality in our considerations about health and disease.

This article offers fascinating facts about the significant role of the liver, and explains why a well functioning liver is imperative for our overall health. Numerous chronic physical and mental disorders are the direct result of an overloaded liver filled with toxic food fragments, synthetic drugs, fat, and environmental toxins.

The liver is the largest organ in the body, and weighs about 3 to 5 pounds. It demands about 12% of all your body's energy to perform over 500 different tasks in regulating your metabolism every single day. The liver is almost certainly the most important detoxifier of all the organs, as it takes poisons, neutralizes them, and what it cannot make harmless, it stores. liver health

These are just a few of the jobs it performs:

- The liver converts the thyroid hormone thyroxine into triiodothyronine, without which energy-depleting hypothyroidism results.
- The liver metabolizes the food we eat—breaking it down to useful parts.
- The liver is a detoxifier that breaks down and protects us from transforming substances such as ammonia, metabolic waste, drugs, alcohol and chemicals, so that they can be excreted. These are called “xenobiotic” chemicals.
- The liver creates Glucose Tolerance Factor (GTF) from glutathione and chromium, essential for insulin to maintain proper blood sugar levels.
- The liver has impressive restorative capabilities, and is the only organ that will regenerate itself, when part of it is damaged.
- The liver breaks down hormones for elimination from the body after they have been used (insulin, estrogen, aldosterone, and adrenaline).
- The liver filters your blood. Approximately 2 quarts of blood pass through the liver every minute to be detoxified.
- The liver manufactures bile salts that dissolve toxins before they are secreted into the intestine and break down fats and fat-soluble vitamins (A, D, E and K) for absorption into the digestive tract. Bile is stored in the gallbladder. The liver generates 1-1.5 quarts of bile in one day!
- The liver is full of tubes (biliary tubing) that deliver the bile to one large tube (the common bile duct).
- The liver is also a major immune system organ. Its filter is called the sinusoidal system and it has special “Kupffer” cells that remove a wide range of microorganisms such as bacteria, fungi, viruses and parasites from the blood stream.
- The liver also stores Iron and various vitamins such as D, A and B-12.
- Please keep in mind that ONLY the liver can cleanse the blood stream and we only have one liver!

### Toxins and Your Liver

Detoxification has become synonymous with colon cleansing, but doing it effectively also involves liver cleansing. Your liver is essentially the filter of your bloodstream, and like any filter, it can become clogged with waste material. When the liver is affected, its ability to secrete bile, filter waste, store vitamins and nutrients, remove pathogens, resist infections, and make important life-giving substances such as cholesterol, glucose, and albumin is compromised. Keeping this lifeline flowing is imperative!

Detoxification is a fundamental part of the human body's metabolism, and the liver functions as a key player in this process. Our liver is constantly being barraged with toxic chemicals (internal and external origin). Nutritional deficiencies and imbalances add to the manufacture of toxins, as do prescription drugs and alcohol, which add to the stress on the liver by requiring a tough detoxification capacity.

The biggest contributor of toxins to our liver is our external environment. The load on the liver today is profoundly more than ever before in history. Toxic chemicals are present in the water we drink, the food we eat and the air (both indoors and outdoors) we breathe. Chemicals such as tetrachloroethylene, p-xylene, ethylbenzene and benzene are recorded as being “everywhere” in the air by the Environmental Protection Agency. How about aspartame example, which is used as an artificial sweetener? Originally, it was developed as a drug by G.D. Searle, a subsidiary of Monsanto. This chemical that is widely used in the food industry breaks down in the body like this:

- 50% Phenylalanine - can be neurotoxic - in some people susceptible (those with a genetic disorder called phenylketonuria) it will cause seizures.
  - 40% Aspartic acid, which is an ant sting poison that may cause brain damage in the developing brain
  - 10% methanol, which is a wood alcohol that turns into formaldehyde (an embalming fluid).
- environmental toxins

Other chemicals listed as “often present” were chloroform, carbon tetrachloride, styrene, and p-dichlorobenzene. Just a visit to your local dry cleaner or gas station will elevate your breath levels of toxins.

Starting in about 1930, the release of manmade chemicals into the environment has rapidly developed to over 160 billion kilograms per year. Two surveys have tracked this progression over the years. One is called the National Human Adipose Tissue Survey (NHATS) and the other is the FDA’s Total Diet Survey (TDS). The FDA has found the level of chlorinated pesticides in food to be alarming. DDE was found in 63% or more of the 42 food samples, although DDT and DDE have been banned for use in this country since 1972. Sadly, toxic chemicals that are used all over the world travel easily around the globe with the winds.

There is sufficient evidence today of a relationship between chemical exposure and chronic health problems to realize that our herbicides, pesticides, household chemicals, and food additives are creating a tremendous health epidemic.

What you need to know is that the liver is the gateway to the body, and in this chemical day and age, its detoxification systems are easily overloaded. Come on—thousands of chemicals are added to food and over 700 have been identified in drinking water. Our food is genetically engineered and processed, our animals are injected with potent hormones and antibiotics and our plants are sprayed with toxic chemicals. You think for one minute that the liver is able to cope with every toxic chemical in our environment, not to mention the damaged fats that are present in all the fried foods we eat?

### **The Big Question?**

toxic overload The big question is—what happens when the liver’s detoxification system is overloaded? When the liver cannot do its work, the toxins that we are subjected to accumulate in the body and make us ill in an assortment of ways. They have damaging effects on many body functions, particularly the immune system. An overworked and undernourished liver is recognized to be the root cause of many chronic diseases.

One of the liver’s primary responsibilities is the production of bile, which is its waste product, and also a great digestive system aid, among other things. When the liver gets sick, it gets constipated, and the bile, instead of getting released, backs up in the body. What do you think happens when the liver backs up with bile, which contains bilirubin, an orange-red pigment from the old hemoglobin that the liver eats?

You guessed it—jaundice.

Here are but just a few of the symptoms associated with Liver Dysfunction:

#### **• HORMONAL IMBALANCES**

Premenstrual syndrome may be more acute. You may have intolerance to hormone therapy or the contraceptive pill.

#### **• DIGESTIVE PROBLEMS**

Acid Reflux, hemorrhoids, indigestion, intolerance to fatty foods, abdominal bloating, gall stones and gall bladder disease, nausea and vomiting attacks, constipation, irritable bowel syndrome, intolerance to alcohol, and pain over the liver (located at the upper right corner of the abdomen and lower right rib cage).

#### **• EXTERNAL SIGNS**

Brownish spots and blemishes on the skin (pruritus), excessive sweating, skin rashes, red palms and soles (which may also be itchy and inflamed), coated tongue, bad breath, acne rosacea, dark circles under the eyes, offensive body odor, red swollen itchy eyes, and flushed facial appearance or excessive facial blood vessels.

#### **• ABNORMAL METABOLISM OF FATS**

Roll of fat around the upper abdomen (liver roll), cellulite, abnormalities in the level of fats in the blood stream (elevated LDL cholesterol and reduced HDL cholesterol and elevated triglycerides, protuberant abdomen (pot belly), arteries blocked with fat, excessive weight gain (which may lead to obesity), inability to lose weight even when dieting, sluggish metabolism, high blood pressure, heart attacks and strokes, lumps of fat in the skin (lipomas and other fatty tumors) and fatty degeneration of organs.

#### • **BLOOD SUGAR PROBLEMS**

Mature onset diabetes (Type II), craving for sugar, hypoglycemia and unstable blood sugar levels.

#### • **IMMUNE DYSFUNCTION**

Increased in persistent viral, bacterial and parasitic infections, allergies, Fibromyalgia, hay fever, chronic fatigue syndrome, dermatitis, increased risk of autoimmune diseases, multiple food and chemical sensitivities, skin rashes and inflammation, asthma, and hives.

#### • **NERVOUS SYSTEM**

Recurrent headaches (including migraines) associated with nausea, depression, mood swings (anger and irritability), poor concentration (foggy brain), and overheating of the body (especially face and torso).

Note: The above symptoms are customary manifestations of a dysfunctional liver. They can, however, be due to other causes of a more ominous nature. If the symptoms persist, it is vital to see your doctor.

#### **Whose Is At Risk**

- If you work at a gas station, either as an attendant or auto mechanic and are exposed to diesel fuel, gasoline, motor oil and degreasing chemicals. These are inhaled or absorbed through the skin and end up putting you at risk.
- “Junk Food” consumers who regularly eat things like doughnuts, chips, French fries, and food cooked in fat or oil. These are items that are a primary source of lipid peroxides or rancid fats, which are highly toxic to the liver.
- Industrialized and service fields where the person is regularly exposed to heavy metals such as lead, mercury and cadmium. In addition, they are also exposed to such things as radioactive chemicals, solvents (carbon tetrachloride and TCE), spray paints, and chemicals in hair salons.
- Continual use of alcohol. The liver changes alcohol into toxic acetaldehyde.
- People who work on farms and handle produce and are exposed to pesticides, DDT, Chlordane, Lindane, Aldrin, 2-4-5-T and Dioxin which all tend to accumulate in body fat.
- Women who take birth control pills. When the liver breaks down estrogen, the byproduct, estradiol, is manufactured and can be toxic for persons who are deficient in B-vitamins and protein.
- Long-term prescription drug users
- Recreational drug users who make use of cocaine, tobacco and MDMA also risk liver damage.
- Candida patients who suffer with yeast problems should be aware that yeast fermentation of dietary sugar, which turns into the liver-toxic acetaldehyde makes liver-harmful ammonia in the gut as well. Matter from dead yeast also overworks the liver’s immune cells.
- Chronic users of Tylenol and aspirin for such diseases as arthritis and Fibromyalgia. These supposedly “safe” drugs can damage the liver with prolonged, high dosage use.

#### **Get Your Liver Checked**

If you think that your liver is not functioning properly or may be unhealthy, you need to have it checked. There are several assorted techniques that are available.

- **Ultrasound scan-** Is done by a radiologist and a scan of the upper abdomen will show the size and shape of the liver, gallbladder, spleen and pancreas. It is important to know that one of the most common causes of liver inflammation is fatty liver, which is also known as NASH (Non-Alcoholic Steatorrheic Hepatosis). This is not unusual for someone who has had a long term diet consisting of fried foods, processed foods, sugar, saturated fats and dairy products. Normally, an ultrasound of the abdominal area would be the only sure way of picking this up.  
get your liver checked

- **CAT scan**- Also done by a radiologist and is used to check for cancer or tumors of the liver.
- **Blood tests**- This can check the levels of serum bilirubin and bile acids, which may be elevated in certain types of liver and gallbladder disease. If the bilirubin is too high, you may also detect that your bowel actions are very pale and that urine is a darker color because bilirubin is redirected from the bowels to the urine.
- **Heavy Metal/Chemical Testing**- Metals and chemicals break down the immune system, wreak havoc on the liver, block the absorption of vitamins and minerals in the body, create an unhealthy environment in the body which attracts parasites, bacteria, fungus, viruses and eventually leads us to all kinds of disease. How does a person know that they have toxic chemicals and heavy metals in their body? There are many ways of finding out through laboratory testing and in this day and age of advanced technology, through various instruments::
- **Great Smokies Diagnostic Laboratories** - The Toxic Element Exposure Profile assesses levels of 20 potentially damaging elements using a hair sample. A substantial body of scientific literature supports hair analysis as an accurate, reliable gauge of long-term toxic exposure. Because hair follicles are exposed to the blood supply during growth, element concentrations in hair reflect concentration in other body tissues. Should levels be elevated, a variety of clinical and lifestyle interventions can be implemented to reduce toxic burden; follow-up hair testing provides a good indication of long-term treatment effectiveness (after 3-4 months).

*Note: Please don't use the Morocco Method Zen Hair Detox prior to sending in a hair sample. We found out through experience that if you do, you will compromise the heavy metal test, and will have to wait at least 3 months before you can send in your hair sample.*

- **Heavy Metal "Home Screen Test"**- This is new and has just been introduced to the United States. It is called the "Environmental Toxin Screen Kit." This is a scientific documented test from Europe that is fast, easy and can be an early warning system (not meant for diagnostic purposes) for environmental hazards that can affect YOUR health. This is a urine test for mercury, cadmium, zinc, copper and normal range.

### **Actions Of The Liver To Detoxify**

1. Remember the "Kupffer" cells that remove a wide range of microorganisms such as bacteria, fungi, viruses and parasites from the blood stream? Well, these cells have to be persuaded to seize and digest the above toxins. In order to do this, sufficient amounts of vitamins and trace minerals should be taken before and during the detoxification process. In addition, superior proteins, carbohydrates, and fats are needed to assure optimal results.
2. The manufacture and flow of bile is very important. By doing so, "liver congestion" is prevented, the toxin and cholesterol excretion is increased, and there is a noted decrease in fatty deposits. A first-rate fiber supplement is needed which will guarantee that bile acids and toxins are bound and purged thus prevents their re-absorption and the forming of cancer producing compounds.
3. Lastly, we have the main liver cells, which are called hepatocytes. They need to be shielded from damage caused by inflammation and must be encouraged to regenerate and multiply, thus functioning at optimum.

### **Therapeutic Recommendations: Nutrients**

**Phosphatidylcholine (PC)**- a phospholipid, which is a kind of a fat that is found throughout the body. It is the main component of lecithin and is an integral part of cell membranes, essential for their structure and functional integrity. Cell membranes perform like gatekeepers, permitting nutrients into the cells but blocking damaging toxins from gaining entrance. Supplemental phosphatidylcholine in the form of polyunsaturated phospholipids extract from soybeans (PPC) has been shown to improve this function. It is one of the most crucial support nutrients for the liver. The majority of the liver's metabolism occurs on cell membranes, which occupy about 33,000 square meters in the human.

Over 2 decades of clinical trials reveal that PC protects the liver against damage from alcoholism, pharmaceuticals, pollutant substances, viruses and other toxic influences, which operate by damaging cell membranes. PC is safe and is fully compatible with pharmaceuticals and with other nutrients.

A unique type of PC called polyenylphosphatidylcholine has been shown to prevent the early changes in the damaged liver from occurring before the actual development of cirrhosis (Navender 1997). This is a primary liver nutrient!  
polyenylphosphatidylcholine

*Suggested dosage:* 2 capsules per day

*Recommendation:* Life Extension Foundation - Hepato Pro

**B-Complex-** These are a group of B vitamins (B1/thiamine, B2/riboflavin, B3/niacin, B5/pantothenic acid, B6/pyridoxine, and B12/cyanocobalamin, which vary from each other in configuration and the effect they have on the body. B vitamins perform a crucial role in numerous essential activities including enzyme activities (thiamine, riboflavin, niacin, pantothenic acid, pyridoxine). These enzyme actions also have numerous roles and are involved in the metabolism of carbohydrates and fats; performing of the nervous and digestive systems; and the manufacture of red blood cells. The B vitamins have a synergistic effect with each other.

B-vitamins are found in vast amounts in the human liver as well as in numerous food and yeast. Folic acid, which is an important part of the B-complex family is used by the liver to assist healthy methylation patterns that are critical components of enzymatic detoxification. Choline is another B-complex member and is crucial for the use of fats in the body. Studies show it stops the fats from being dumped into the liver and helps move fats into the cells. If you suffer a deficiency of choline, it can lead to degenerative diseases such as cirrhosis. The B vitamins are necessary for healthy metabolic performance. Working individually and together, they make possible energy release and the production of new cells.

*Suggested dosage:* Start with B-complex, 3 capsules per day, divided with meals

*Note:* B3/Niacin should be avoided by people with liver disease, as it disrupts healthy methylation patterns.

*Recommendation:* Life Extension Foundation - Complete B Complex

**Zinc-** Cirrhotic livers are normally deficient in zinc. Zinc plays a critical role in the immune system, which may explain why it is helpful in protecting against infections. It has antioxidant properties so it helps protect cells in the body from the potential damage by free radicals. Next to iron, zinc is the most abundant trace mineral in the body and is stored in red and white blood cells, the retina of the eye, bones, skin, kidneys, liver, the prostate gland and the pancreas. Lastly, zinc acts as a chelator and helps to remove copper from your system.

*Suggested dosage:* 30mg, twice daily

*Caution:* Supplemental zinc can inhibit the absorption and availability of copper. If more than 50 mg of supplemental zinc is taken daily, 2 mg of supplemental copper should also be taken to prevent deficiency. Chronic ingestion of more than 100 mg of zinc daily may be toxic.

*Recommendation:* Life Extension Foundation - Optizinc

**Mycoceutics Medicinal Mushrooms** - This is a ten mushroom formula that is specifically designed for individuals wanting to enhance their immune system functions. It is also beneficial for promoting heart and artery wellness by regulating blood pressure. Some components enhance the immune response to foreign invaders such as toxins, mutagens and free radicals by enhancing the liver's detoxification cycles. This is important for recovering addicts as their liver has been severely compromised by substance abuse. Grown on a bed of organic brown rice under careful conditions, these premium quality mushrooms never come in contact with heavy metals, pollutants or contaminants sometimes found in mushrooms from other sources. Exceptional cultivation creates a safe, high-quality supply, without damaging sensitive ecological areas, which can occur with wild crafted mushrooms.

*Suggested Dosage:* 2 capsules twice daily

**S-adenosylmethionine (SAME)-** SAM-e was discovered about 5 decades ago in Italy. Unfortunately, there were no oral preparations at that time, so the early studies used intravenous and intramuscular distribution. It was first introduced into the United States in 1999 as a dietary supplement for the treatment of depression. What is not widely known is that SAM-e is the liver's natural antioxidant. Research has revealed that subjects with liver disorders and additionally alcoholic liver disease can benefit by using SAM-e because it produces the extremely powerful antioxidant—glutathione. Glutathione is extremely powerful and enhances the liver's ability to clear out toxins. A study done by the University of California in 1999 examined how SAM-e worked for liver damaged by alcohol. The study was published in the Journal of Hepatology and concluded that there was a 30% decrease in deaths and liver transplants, compared with a group of subjects who were not given the supplement.

*Suggested Dosage:* 2-3 per day, taken in divided doses, morning, midday, and late afternoon. Should be taken with food to avoid gastrointestinal disturbances. Refrigeration is recommended.

*Caution:* Those supplementing with SAME should also take folic acid, vitamin B12, vitamin B6 and TMG (trimethylglycine, betaine). SAME should not be used by those with bipolar disorder (manic depressive psychosis) or those with suicidal thoughts or feelings.

*Recommendation:* Life Extension Foundation - SAME

**Acetyl-L-carnitine-** Long-term excessive consumption of alcohol can cause fat to build up in the liver. L-carnitine protects the liver

from the harmful breakdown products of everyday fat metabolism and improves blood flow through the liver. In addition, it helps detoxify lactic acidosis and ammonia, both of which are extraordinarily toxic to the liver. When an abundance of carbohydrates are stored as fat, L-carnitine assists in the burning of these fats for energy by making it possible for the long chain acids it transports to enter the cell. If the fatty acids cannot reach the mitochondria where they are converted to cellular energy, it stands to reason they are going to be dumped in places where your body will suffer from their presence, as happens in “fatty liver” disease, fatty build-up in the heart, and your plain old everyday obesity.

*Suggested dosage:* 2-4 capsules per day on an empty stomach with water or juice, in divided dosages 45 minutes before breakfast and lunch.

*Caution:* For some people, L-carnitine, especially acetyl-L-carnitine, may have a stimulating effect. Therefore, it may be unwise to take it in the evening.

*Recommendation:* Life Extension Foundation - Acetyl-L-carnitine

**Vitamin C-** Vitamin C is the most powerful antioxidant vitamin for the liver and cuts down toxic damage to the liver cells from chemical overload. It counteracts free radicals produced during the phase I detoxification pathway in the liver. Studies done at the University Michigan Medical School have shown that even doses as low as 500 milligrams daily of vitamin C have helped prevent fatty build-up and cirrhosis of the liver. In addition, doses of 5,000 mg per day have been known to actually flush fats from the liver. A study was done on patients who had been admitted into a hospital with acute alcohol poisoning and were tested with unbelievably high levels of oxidant stress. After using 2,500 mg of vitamin C for ten days, biochemical markers of oxidant stress were decreased by approximately 50%. The method by which you determine proper doses of vitamin C for the treatment of disease is by your bowel tolerance, so if you find that it is causing diarrhea, cut back until you find the right dose.

*Suggested dosage:* 1000-4000 milligrams spread throughout the day with a meal.

*Note:* Medications for diabetes such as chlorpropamide (Diabinese) and sulfa drugs may not be as effectual if taken with vitamin C. In addition, taking high doses of vitamin C may produce a false-negative reading in tests for blood in the stool.

*Caution:* If you consume aspirin and standard vitamin C (ascorbic acid) together in large doses, you may experience stomach irritation—possibly leading to ulcers. So, if you have to take aspirin regularly, please use an esterified form of vitamin C, and take it separately from the aspirin. Pregnant mothers are advised not to take more than 5,000 mg of vitamin C daily. A growing fetus may become dependent on this supplement and acquire scurvy when deprived of the accustomed megadoses after birth.

*Recommendation:* Any esterified vitamin C is our first suggestion as we feel that it is a remarkable form of C. It is created by having the vitamin C react with a necessary mineral, such as calcium, magnesium, potassium, sodium, or zinc. This produces a vitamin C that is non-acidic and includes metabolites identical to those produced by the body. Esterified vitamin C comes into the bloodstream and tissue four times faster than standard forms of vitamin C because it moves into the blood cells more effectively and also remains in the body tissue longer. The concentration of vitamin C in white blood cells achieved by using esterified vitamin C are four times higher than those attained with standard vitamin C. Furthermore, and a very important fact; only one-third is lost during excretion in the urine.

**Cell Food-** An ionic formula that contains 78 ionic minerals, 34 enzymes, 17 amino acids, electrolytes and dissolved oxygen—and utilizes a unique water-splitting technology. Cellfood is created by a proprietary nine month process in which all-natural nutrient-rich plant substances are held in a negatively-charged suspension of deuterium (an isotope of hydrogen). The result is a remarkable formulation which—by utilizing the same technology used decades ago to split the atom—actually ‘dissociates’ (splits) water molecules within the body by weakening the bonding electrons, and gives birth to cascades of vital, life-giving oxygen.

This newly-born oxygen, combined with an array of vital nutrients, is carried to every cell in the body—cleaning, toning and building the cells and tissues hour after hour, day after day. Since our bodies are over two-thirds water, this oxygen and hydrogen source is virtually unlimited.

*Suggested dosage:* 8-10 drops in a glass of purified water, 3 times a day. Or you can put the whole days supply in your stainless steel drinking bottle and drink during the day. Best if taken separate from meals.

*Recommendation:* Cellfood

**Carotenoids-** Nature supplies us with an abundance of carotenoids in the form of vegetables and fruits with bright colors. Of more than 700 naturally occurring carotenoids, it has been determined that as many as 50 may be absorbed and metabolized by the human body. Beta-carotene is one of the most commonly found carotenoids in fruits and vegetables and is significant for human health. It is important to remember that natural sources of beta-carotene and carotenoids are the ones you should be using. Beta-carotene, for instance, is converted to vitamin A in your body and you can take large amounts without worrying about the toxic side effects. For the most efficient absorption, utilize a juicer, and remember to use organic produce as much as possible.

*Suggested dosage:* Try and juice at least once a day for optimal intake

*Recommendation:* For busy individuals try JuicePlus+ to increase your carotenoid intake!

**Glutathione-** This is an extremely powerful antioxidant that is manufactured in the liver. It actually neutralizes oxygen molecules before they can damage cells. Vast amounts of glutathione are amassed in the liver, where it detoxifies harmful compounds so they can then be expelled via the bile. Glutathione helps to reduce the harm brought about by alcohol, cigarette smoke, radiation, heavy metals, drugs and chemotherapy. As we age, the levels of glutathione decline and might even accelerate the aging process. One would think that after reading the above, supplementing with glutathione would help, but unfortunately, it is not worth taking glutathione supplements. They are too expensive and usually poorly absorbed. The more effective way is to give the liver the raw material to make its own glutathione—namely, the amino acids: glycine, glutamine and cysteine.

*Suggested dosage:* Follow dosage instructions on bottle.

*Recommendation:* Any quality freeform supplement of L-glycine, L-glutamine, and L-cysteine

**Taurine-** Current findings are showing that taurine is one of the major nutrients involved in the bodies detoxification of harmful substances and drugs and should be taken into account in the treatment of all chemically sensitive people. It plays an important role in the liver via the formation of bile acids and detoxification. In other words, once conjugated, chemical toxins are removed from the body as a component of bile and also through water soluble acetates in the urine. Taurine is the body's central antioxidant defense against the making of excess hypochlorite ion and if this is not managed, it will lead to severe aggravation of chemical sensitivity. Impaired body synthesis of taurine will reduce the ability of the liver to detoxify environmental chemicals such as chlorine, chlorite (bleach), aldehydes (produced by excess alcohol), alcohols, petroleum solvents and ammonia. When you are deficient in taurine, you are likely to have impaired mineral transport across the cell membrane producing imbalances in electrolytes and reduced ability of the liver to eradicate pollutants via the excretory course of the bowel and kidneys.

*Suggested dosage:* 1-4 grams daily

*Caution:* Taurine is a sulphur giving amino acid that is free of side effects, but do not take it on an empty stomach if you have a stomach ulcer.

*Recommendation:* Life Extension Foundation - Taurine Capsules

**Branched-Chain Amino Acids-** The liver's purpose includes storage and filtration of blood, secretion of bile, detoxification of assorted substances, and conversion of sugars into glycogen, which it stores. The liver is also accountable for processing numerous vitamins and nutrients into a form that can be used by the body, and processing many toxic chemicals for eradication. Current living styles expose us daily to substances that are toxic to our bodies, which inflict a heavy load on the liver. The branched chain amino acids, L-valine, L-leucine, and L-isoleucine improve protein synthesis in liver cells and muscle cells. In addition, because they can be oxidized in the cell's mitochondria, the branched chain amino acids may also provide energy.

Research has shown that patients with liver diseases that lead to coma—called hepatic encephalopathy—have low concentrations of branch-chain amino acids and excess levels of certain other amino acids. Initial research suggested that people with this condition might be helped by branch-chain amino acids. Therapeutic effects of branch-chain amino acids have also been shown in adults with cirrhosis of the liver. The suggested dose is 2-4 capsules daily between meals with fruit juice or before eating. Each capsule should contain 300 mg of leucine, 150 mg of isoleucine, and 150 mg of valine.

*Suggested dosage:* Four capsules daily, on an empty stomach, after exercise or before bedtime.

*Caution:* To be used only by adults who are fully grown. Should not be used by anyone afflicted with the disease pellagra.

*Recommendation:* Life Extension Foundation - BCAA's

### **Therapeutic Recommendations: Herbal**

**Milk Thistle (Silybum mariannum)** - This is a major player in the treatment of liver disease. It helps lower enzyme levels and facilitates the liver in its process of detoxifying the body. European research has shown that it is effective in treating cirrhosis, chronic hepatitis and alcohol induced fatty liver. It also helps protect the liver for those individuals that are taking prescription medications known to elevate liver enzymes.

*Dosage:* A normal dose would be 6-9 dropperfulls in a cup of warm water per day. You might want to start with 2-3 dropperfulls to begin with, as it has a natural cleansing effect. For chronic cases: You may increase your dosage over time to 12-14 dropperfulls per

day in warm water. Divide it up into 6-7 dropperfulls in the AM and the other half in the PM.

*Caution:* If you have large gallstones, please consult your physician. Milk thistle will increase the flow of bile into the intestines and may promote the movement of stones. Elimination through a severely clogged gall bladder may present a health risk.

*Recommendation:* Skye Herbals Physician's Grade Herbal Extracts

**Artichoke-** The artichoke is a member of the milk thistle family and first came to the attention of researchers in 1966 (in a study that supported its effect on liver regeneration in rats). Artichoke leaf extracts have demonstrated great benefits and potential as an antioxidant and hepatoprotective. The extracts have also exhibited immense advantages in regard to the gallbladder with the ability to stimulate the secretion of bile in the liver.

Akin to milk thistle, artichoke extract is also able to stimulate regeneration of damaged liver tissue. The value of artichoke for preventing or reducing buildup of fat in the liver from chronic alcohol consumption is significant. Cynarin, which is a caffeoylquinic acid and a chief constituent of the extract, was discovered to be responsible for the main cell-protective action. The investigations of hepatoprotective action in the U.S. have been done only in animals, as the normal procedure involves exposure to toxins. The central research method for this type of investigation is to administer the test substance (in this case the artichoke leaf extract) to the animal just before or simultaneously with administration of a toxic substance and observe the results. A study done in 1987 by Adzet used carbon tetrachloride as the toxin. The use of artichoke leaf extract clearly indicated an apparent reduction of liver injury.

Recognizing the significance of adequate bile flow for health, German researchers set out to verify the earlier findings of bile promoting effects of the artichoke plant in a controlled double-blind study on healthy volunteers. The participants were provided a one-time dose of artichoke extract or a placebo, and their bile discharge was measured over the course of several hours. The bile secretion was found to be sizably higher in the group that received the artichoke extract. An additional open label study was done on 417 volunteers with liver or bile duct disease. The majority of these participants had longstanding symptoms, some for countless years. They were all given artichoke leaf extract for approximately four weeks. Following a one week period, 70% of the patients experienced improvement of their symptoms, and the percentage went up to 85% three weeks later. Artichoke leaf extract has demonstrated to be a safe and natural way to preserve and improve general health due to its numerous applications to essential physiological functions. In addition, as a nutritional supplement and antioxidant, it can safely be used.

As a rule, the majority of the research on artichoke has been done with a German extract that contains 3% caffeoylquinic acids. A recent and even more potent extract of 15% caffeoylquinic acids-calculated as chlorogenic acid is now available on the American market. Researchers all over the world are investigating it for applications in areas such as diabetes, cancer and HIV. Artichoke leaf extract has demonstrated to be a safe and natural method to help your liver and can be used harmlessly as an addition to conventional therapies.

*Dosage:* 1 capsule, 3 times a day.

*Caution:* If you have gallstones or a biliary tract obstruction, or if you are allergic to artichoke, do not use this product.

*Recommendation:* Life Extension Foundation - Artichoke Leaf Extract (15% chlorogenic acid)

**Turmeric-** Nowadays, curcumin is on a border between ancient food customs and cutting- edge medicine. In Asia the root and powder are used in cooking, home cures and medicine, as a preservative for festive dishes and in drinks, ointments and poultices to treat sore throat, inflammation, wounds, and sprains. In the laboratories, scientists and researchers are treating rats with curcumin to determine its effects on cancer. Turmeric or curcumin also holds a high place in Ayurvedic medicine as a “body cleanser” and today research is finding a mounting list of diseased conditions which turmeric’s active ingredient heals. Your liver spends a lifetime keeping your blood clean.

The question is—what keeps your liver clean? One answer would be turmeric and its team of antioxidants. Turmeric shares similar liver protectant compounds that milk thistle and artichoke leaves contain. Studies have shown that it can shrink engorged hepatic ducts, so it would be beneficial in treating liver conditions such as hepatitis, cirrhosis and jaundice. To be successfully assimilated into the bloodstream, curcumin should be combined with small amounts of piperine (a component of black pepper). It seems piperine enhances the body’s natural absorption function. Some of the studies done with turmeric can be accessed below by using the links:

*Dosage:* 1-3 capsules a day with meals.

*Caution:* Do not take more than 15 mg per day of Bioperine®. If you are taking any medication, use only under physician supervision. Bioperine® may increase the absorption rate of certain drugs, so take Bioperine®-containing products at a different time of the day than when you take prescription drugs. Do not take if you have a biliary tract obstruction, or during pregnancy or lactation. High doses of curcumin on an empty stomach may cause stomach ulcers. Do not take with anticancer drugs.

*Recommendation:* Life Extension Foundation - Super Curcumin w/ Bioperine® (piperine)

**Green Tea-** This study was released in the March 2005 issue of Liver Transplantation, the official journal of the American Association for the Study of Liver Diseases (AASLD) and the International Liver Transplantation Society (ILTS). Roughly one-fifth of U.S. residents are afflicted with hepatic steatosis due to a mounting incidence of obesity. Since fatty livers are more sensitive than lean livers to ischemia/reperfusion injury and are associated with an intensified risk of disease and death, this has resulted in fewer usable donors for liver transplants. As a matter of fact, virtually one-third of all donated livers are afflicted with fatty changes, but longer waiting lists are forcing doctors to contemplate using these organs. A prior study found that rinsing livers with a solution containing green tea extract prevented failures in transplants using fatty livers. The existing study observed whether the major flavonoids component in green tea shielded fatty livers from damage after ischemia/reperfusion injury.

Green tea has been in frequent use among Chinese people for thousands of years. In the course of the last decades, it has become widely used in Europe for the treatment of hepatic disease. Its hepato-protective effect has been related to its properties as a powerful free radical scavenger and antioxidant as well as its anti-endotoxin effect and its ability to stabilize membranes.

An international workshop in 1981 on the use of catechin in diseases of the liver deduced that the flavonoids have much potential for the treatment of many types of hepatic disease, particularly acute and chronic viral hepatitis. For the majority of people, drinking green tea daily appears to be one of the most practical and readily available means for preventing chronic toxicity. It is assessed that two to four cups of green tea corresponds to the preventative dose used in the study. The dosages used for hepatic diseases in clinical studies have typically been one gram three times a day.

*Suggested dosage:* 1-3 capsules a day with a meal.

*Note:* Even though these are “lightly caffeinated” capsules, the high volume of green tea extract contained in each capsule might cause over-agitation in people who are sensitive to caffeine.

*Recommendation:* Life Extension Foundation - Mega Green Tea Extract

**Chlorella-** For any of you who have ever had their teeth filled with mercury laden amalgams, been vaccinated, eaten mercury laden seafood, used pharmaceutical drugs or been exposed to dioxins and PCBs that are found in our food and environment—you will want to use chlorella. Not only will your liver thank you, but your whole body will benefit from the long list of attributes this food has to its name. We call it a food because it is a complete food that provides sustenance to each and every cell in your body. It includes all eight essential amino acids and is rich in vitamin B12, beta carotene, minerals, anti-oxidants, DNA/RNA, enzymes, fiber, essential fatty acids, chlorophyll and chlorella growth factor (CGF). Chlorella has been the topic of thousands of medical and scientific studies.

There has been no other food source that has been investigated to such a degree and today we are finally beginning to understand that chlorella contains more value than ever before. In close proximity to a perfect food, chlorella has an impressive list of benefits that go well beyond what most foods can do:

- Clear the body of heavy metals, pesticides and dioxins
- Build the immune system
- Detoxify the blood, liver and bowels
- Enhance digestion
- Manage blood sugar levels
- Increase energy
- Balance pH levels

The human body is adept at resisting disease, repairing itself and becoming accustomed to its ever-changing environment. When the body is furnished with the correct vitamins, minerals, enzymes and other essential dietary needs, our bodies are almost assured to respond with good health. Whereas numerous plants can provide the body with essential nutrients, very few foods have such a diverse, life-enhancing and remarkable nutrient profile as chlorella. When choosing a chlorella source, it is very, very important to make sure that:

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- It has been grown outdoors in natural sunlight, in clean, mineral rich water.
- It has no fillers, binder or other unnatural additives
- The cell wall has been broken down by milling or jet-spraying to enhance digestibility.

*Suggested dosage:* A maintenance dose would be 2-3 grams per day, and a therapeutic dose would be 5-10 grams a day. You can take it anytime of day, but taking it right before a meal helps with digestion.

*Recommendation:* Yaeyama Chlorella, which comes in 200 mg tablets and powder form.

**Picrorhiza Kurroa**-This is a small perennial herb from the Scrophulariaceae family. It protects the liver against hepatotoxins, has hepatoprotective properties, potent antioxidant activity, modulates liver enzyme levels and anti-inflammatory actions. Various studies, mainly on rats, have established that the active constituents of Picrorhiza kurroa are valuable at preventing liver toxicity and the ensuing biochemical changes caused by numerous toxic agents. The hepatoprotective achievement of this herb is not fully understood but may be characteristic of Picrorhiza's ability to hinder the generation of oxygen anions and to scavenge free radicals. Similar to milk thistle, Picrorhiza has been shown to encourage liver regeneration in rats, possibly via stimulation of nucleic acid and protein synthesis.

*Suggested dosage:* Between 400-1,500 milligrams of the powdered, encapsulated herb is recommended. This would be the equivalent to the use of 1-2 ml of fluid extract twice per day. It is a very, very bitter herb.

*Caution:* Please check with your health practitioner prior to using this herb if you are pregnant or breastfeeding.

*Recommendation:* This was very difficult to locate as a solitary herb, so the only location we could establish for the time being is here.

**Fringe Tree (Chionanthus)** - Bark from this tree has comparable properties to dilute and increase the flow of bile. When you have adequate bile flow, fatty foods stop generating digestive problems and fat-soluble vitamins and other nutrients are completely absorbed. The liver is no longer congested with by cholesterol and neither is the blood's circulation blocked by it. Chionanthus has been safely used in all liver ailments, but in particular when it has developed into jaundice. Through its action of releasing bile, it acts as a gentle and effective laxative.

*Suggested dosage:* 30-40 drop in a little warm water, 2-3 times per day.

*Recommendation:* Herb Pharm Fringe Tree Extract

### **Therapeutic Recommendations: Diet**

The primary phase to a healthy liver and body is your diet. There is no replacement for eating correctly and securing most of your daily nutritional requirements from whole foods, rather than junk. You must eat a diet that is high in fiber, low in saturated fat and real low in refined sugar. Try and avoid processed foods, such as lunchmeats, fried foods, colas and sodas, white sugar products, salty foods, ice cream and alcohol. If you plan on going on a liver cleanse, the first week you should attempt to stay on a vegan diet, which means without animal products. If you have to have a cup of coffee, please try and keep it to one cup per day.

Fifty percent of your intake should consist of salads, sprouts, fresh fruit, veggies, fruit and vegetables juices made fresh, whole grains and legumes. Please try and secure organic produce at all times to avoid pesticides and lighten your body's toxic load. At least eight, 8 ounce glasses of clean water (water filters with sub-micron, solid carbon block filters are able to remove parasites and many toxic chemicals) daily is imperative as it will help dilute the toxins, and then the fiber from your fruits and veggies will escort them out of the body. In addition, try not to use plastic bottles to drink your water out of. Plastic has a tendency to leach chemicals into your water and your liver does not need that. Try swapping out that plastic water bottle for a wonderful stainless steel personal water bottle.

Here are some of the best fresh juices to make at home for the liver:

- **Beets**- This vegetable has always been known to cleanse and support the liver. You can have from three to eight ounces of beet juice a day, and it is best taken in the morning. Beets are a very strong tasting juice and some people don't like it straight, so you may add a milder tasting juice such as carrot, celery or apple to tone it down.
- **Green Drink**- Try and juice up a handful of greens in the late afternoon or early evening. Parsley, spinach, kale, sprouts, cucumber with skin and it should equal about 8-10 ounces all together. This will help clean and nourish not only your liver but your kidneys as well.
- **Broccoli**- This is part of the cruciferous family and scientists have recently isolated the phytochemical, sulphoraphane, which augments the phase-two detoxification pathway in the liver.

**Hot Water, Organic Lemon Juice and Cayenne**- This combo is a great liver cleanser and can be used upon rising in the morning to start your day. Squeeze the juice of one lemon into a cup of hot water, add a dash or two of cayenne and stir.

After the first week, slowly start adding a wide range of proteins from grains, raw nuts, seeds, legumes, organic eggs, clean seafood and even free-range chicken without the skin. Keep the fresh organic veggies, fruits and juices on the menu and don't forget to keep drinking your water at all times. If you need to use a sweetener, try using brown rice syrup, real maple syrup, or honey.

## Therapeutic Recommendations: Physical

**Castor Oil Packs-** (Liver cleanser) supplies that you will need: cold-pressed Castor Oil, wool flannel, plastic wrap and heating pad.

Fold the flannel into three or four layers. Soak it with castor oil. Put the flannel in glass corning baking dish, or baking pan that stainless steel (not aluminum), and heat it slowly in the oven until hot (make sure that it is not scalding as you don't want to burn your stomach. Rub castor oil on your stomach, lie down, and place the hot flannel on top of your stomach. Seal off the flannel with plastic wrap. Cover with the heating pad for one hour, keeping the flannel hot but not uncomfortable.

During the detox period, use the castor oil pack once a day for three days, take three days off, and then use it for another three days. You can safely use this regimen throughout the next two months.

**Liver/Gallbladder Flush-** This is something we recommend you try on days that you can stay home and take the time to really follow the regime. If you do, you will be helping your liver and gallbladder immensely. The methods and recipes for flushing your liver are quite long, as some are a bit more intense than others, and the recipes vary somewhat depending on who wrote it. We highly recommend taking the time to read all the information possible before attempting a liver flush, including FAQ's, different recipes, as well as the experiences of others. All of the information regarding liver and gallbladder flushing is available here.

**Infrared Sauna-** Far infrared ray energy, which is also called radiant heat, is a component of the natural light spectrum of sunlight, without the skin damaging ultraviolet rays. Saunas operate mainly by encouraging detoxification through the skin. Sweat formed in conventional saunas is 95 to 97 percent water. On the other hand, with an infrared sauna only 80 to 85 percent of the sweat is made up of water and the outstanding 15 to 20 percent is made up of cholesterol, fat-soluble toxins, toxic heavy metals, sulfuric acid, sodium, ammonia and uric acid.

Infrared saunas enhance circulation and oxygenate the tissues. They also detoxify your body and liver by eliminating the accumulation of heavy metals, alcohol, nicotine, sodium, environmental toxins, and cholesterol. All of this is good news for your liver and is a daily habit that pays big dividends.

Infrared saunas offer two features that are crucial for good health and your liver: cellular detoxification and excellent circulation. The health of the entire system depends on the passage of blood and energy throughout. An average infrared sauna session instigates a fleeting 1-3 degree increase in body temperature. Fever is your body's (including your liver) protection against bacteria, microbes and subsequent infection. This valuable side effect activates the production of white blood cells (leukocytes) via your bone marrow and killer T cells via your thymus—end result is the strengthening of your immune system.

The healing power of heat from your infrared sauna imparts a safe, natural form of detoxification. This equates to diminishing toxic liver burdens of heavy metals, volatile hydrocarbons, PCB's, non-metallic toxins, solvent residues, pesticides, herbicide residues and other synthetic chemicals. This is important to you and your liver because researchers and studies have now confirmed that diet and environmental chemicals cause 95% of debilitating diseases.  
infrared sauna therapy

*Dosage:* Saunas are safe for the majority of the population as long as you abide by a couple of simple rules. Stay inside your sauna for no more than 30 minutes at a time. Relax for about 10-15 minutes afterwards. This permits time to eradicate dead cells and other debris. Please drink mineralized clean water prior to and after your session. If you have a persistent condition, please use supervision. If you are very ill or very heat-sensitive, your first session should be shorter than normal. People who suffer from MS, hyperthyroidism, hypertension or serious heart conditions should consult their health professional. Be sure and shower off when finished with cool water to wash away the toxins.

**LL's Magnetic Clays-**What is one of the most exceptional ways to clean toxins out of your system that is easy on the body and less invasive—LL Magnetic Clay! It is imperative that you keep the liver clean of toxins, chemicals, poisons and cholesterol. Why? Your liver cleans your blood. It cleans your blood 24 hours a day, 7 days a week, 365 days a year, every second of every day. If you detox the blood with a clogged liver, where do the toxins go? Right back where they came from.

“Clay has been used for thousands of years, and yet no one has been able to pin down what makes it a healer,” observes Michael Abehera, author of *Amazing Cures From the Earth Itself—the Healing Clay*. Most users, he notes, seem content with the amazing results. “Raymond Dextreit, the French naturopath who popularized clay cures in his own country, believes bentonite's powers transcend its purely three-dimensional physical properties. “From a thermodynamic point of view”, he writes, “clay cannot be the sole source of energy of the phenomenon it produces. Clay is a dynamic presence, a catalyst rather than an agent itself. This is possible because clay is alive. Most of the poisons in the body, Dextreit notes, are positively charged, whereas clay has a negative electrical charge. Thus, he writes, “These toxins cannot resist being drawn toward the clay.”

LL Magnetic Clay Formulas have their ingredients synergistically tested with each of the other ingredients for the “blending” and maximizing effect of the specific detox bath. The ingredients also have been tested for the amounts so that they will have the greatest impact for its purpose. This is an easy and very cost effective way to pull the metal and chemicals out of your body to enable your liver to operate more efficiently.

*Environmental Detox:* This bath is for pollutants, insecticides, pesticides, vaccination poisons, industrial pollution, chemical warfare, and almost all chemicals including food additives, chlorine, etc. Also used for nickel and other metals not covered by the other formulas. Very helpful in radiation and lead detoxification.

*Dental/Mercury Detox:* This kit is for assisting the clearing of dental/mercury poison from amalgams, fish and vaccinations.

*Smokers/Drug Detox:* This formula assists in removing toxins found in cigarette smoke (cadmium), tobacco, drugs, and medical drugs or recreational drugs, smoke inhalation, etc. It is effective to release toxic substances found in tobacco such as tar, hexavalent chromium, hydrogen cyanide, nicotine, lead and arsenic.

*Arsenic Detox:* A formula that assists in removing toxins found in pesticides, industrial pollution, water supplies, and also addresses chemical wastes, assists in removing arsenic and arsenic of lead, etc.

*Aluminum Detox:* This kit helps remove toxic aluminum found in aluminum cans (cola drinks), cookware, aluminum foil, antacids, automotive exhaust, American cheese, milk products, table salt, toothpaste & deodorants. Also assists in releasing chemical residues.

*Tox-Away Detox:* This kit is a general detox bath to help remove metals.

*Clear Out Detox:* This is our newest formula and the spices and herbs in this are known for various situations that are present with metal and chemical poisons, such as digestive problems, parasites in the body, depression, etc. This bath also addresses the following metals: lead (lead poisoning), arsenic, mercury and aluminum poisoning. A great bath for a general detoxification.

Many people like to see the results of the bath of the toxins being pulled into the clay from their own body. These can be seen with Clear-Out, Smoker's/Drug Detox and Dental/Mercury Detox. The Tox-Away, Arsenic, Aluminum and Environmental formulas all have activated charcoal (black powder) and one cannot see the results in those formulas but many FEEL the results.

LL's Magnetic Clays are designed to be used under professional supervision as there are many factors surrounding the correct application of the baths. Not sure if you have heavy metals built up in you? Order a personal heavy metal screen test to find out today.

Please be sure to visit the LL Magnetic Clay product page for more information.

**Massage-** Did you know that you can go to your masseuse and ask them for a liver and intestinal massage? It is one of the best things you can do if you are cleansing your liver. The liver supplies us with a real benefit over the other organs because we can get to it. Physical manipulation of the liver is one of the optimal ways to support detoxification as it mechanically stimulates the organ. An excellent masseur/masseuse can manipulate and pump the liver like a baker kneads bread. Be careful, however, to release only what you can tolerate. Have your masseuse start slowly and gently. Alert them as to how you feel. If a massage is used in conjunction with a cleansing program, it can more than double the accomplishment.

**Exercise-** This should be a critical part of your health program, and is particularly important if you are on a liver cleanse. Aerobic exercises are those that require significant increases in respiration and are the most important. These would include:

- Swimming
  - Biking
  - Yoga
  - Walking (fast or uphill)
  - Trampoline
  - Dancing
  - Running & Jogging are aerobic as well, but a tad too strenuous while you are on a liver cleanse or fast.
- exercising

Exercise requires energy, thus the only exercises that you should do are those that assist elimination without creating extra stress. Swimming and walking fast are two of the paramount exercises in that respect. The lungs amplify their activity oxygenating cells and ejecting gaseous wastes. Trampolining is an additional excellent exercise as it agitates the lymphatic system, aids in removing fluid wastes and does not jar the skeletal system. Running, however, does crash against the ankles and the knees and causes stress on the heart muscle. Don't get us wrong, running and jogging are great forms of exercise with numerous benefits, but not at this particular time.

Another great practice during a liver cleanse is yoga. We know it is not aerobic, but there are particular yoga positions that invigorate and massage the colon, small intestine, thyroid, liver, kidneys, adrenals and lower back. Yoga can compress toxins out of muscles

and joints. Keep focused on why you are exercising. When you are on a cleanse, your body is half slumbering and it is important that the exercises you choose be those that do not stress your body. You are not trying to build strength but to support detoxification. Lastly, do not exercise to the point of fatigue—just stimulation!

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