

LOVE YOUR LIVER!

Guard it well, it's your life

Your handbook for survival in a toxic world

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Contents

Your liver is your best friend in this highly toxic world. Treat it kindly.

Detox factory	4
Phase 1 and Phase 2 detox.....	5
Detoxing Food	6
So, What Does Your Liver Do, Exactly?	6
Fatty Dumps.....	8

Symptoms Of Liver Dysfunction and Disease

Symptoms Associated With Liver Dysfunction	11
Gallbladder Symptoms.....	13
Gallstones.....	14

The Single Biggest Threat To Your Liver

What is nonalcoholic fatty liver disease (NAFLD)?	15
Alarming statistics about nonalcoholic fatty liver disease	16
Recognizing Fatty Liver	16
Other Liver Diseases	17
Hepatitis Review.....	17
Liver Disease Secondary to other Disease	18
Liver Cancer.....	19
Xenobiotic Liver Damage.....	19
Fast And Slow Metabolizers.....	20
Natural Hepatotoxins	20
Lipoic Acid, Milk Thistle And Toadstools.....	21
Herbal and alternative remedies	22
Drugs That Cause Liver Toxicity.....	23
Serum bilirubin.....	25
Serum Proteins.....	25
Ammonia and Urea	26
Blood work.....	26
Interpreting your blood test results.....	26
Imaging.....	28
Biopsy.....	29

Self Treatment Of Liver Disease

The Basic Rule 30

Second Rule 30

Weight Loss Will Save Your Life 31

Follow A “Liver Diet” 31

The “Gallbladder Flush” or “Liver Flush” Scam..... 33

AMINO ACIDS..... 34

Glutamine 34

Glutathione 34

Glycine..... 34

Taurine 34

ANTIOXIDANTS 35

VITAMINS..... 35

MISCELLANEOUS 38

Milk Thistle 41

Proprietary Formulas 41

Formulate Your Own Liver Herbal Tincture 41

Fiber..... 42

Hot Update: More On Alpha Lipoic Acid.....44

APPENDIX

The Traditional Chinese Medicine (TCM) View Of The Liver 45

Your liver is your best friend in this highly toxic world. Treat it kindly.

In Chinese medicine the liver was considered to “house the soul” and was responsible for the flow of life energy or ‘Chi’ (see appendix). It is believed that the name of the liver derives from the Anglo-Saxon verb meaning ‘to live’. That’s how important it is.

The liver is your chief “detox” organ. It eliminates environmental poisons. If your liver didn’t continually remove metabolic trash and toxins from your blood, you would be dead in a matter of days.

Think of the liver as a vast and complex chemical factory: that’s its job, to make biotransformations in blood-borne substances which pass through it. The liver is our largest organ and a huge flow of blood is processed and cleaned by it every living moment. Older folks talk about feeling “liverish”, meaning toxic and out of sorts. That’s when the liver is not doing its job as efficiently as it should, either because of disease or overload.

The liver is also the largest gland in the body. The liver is considered a gland because, among its various functions, it manufactures and secretes bile. Bile is needed for the absorption and digestion of fats in the gut. The bile is also used as an important excretion route, to rid the body of toxins. Heavy metals, notably mercury, are mainly removed this way.

The liver has many other functions, as we shall see, including the breakdown of spent red blood cells; storing all fat soluble vitamins including Vitamins A, E, D, K, plus B-12 and metabolizing all other vitamins; it deactivates and balances hormones such as estrogens and the corticosteroids; and manufactures the blood clotting chemicals prothrombin and fibrinogen.

Detox factory

Most of the enzyme transformation processes, such as the cytochrome P-450 system, take place in the liver. Don’t be put off by the big clumsy name: it’s just a family of over 60 detox enzymes that knock off over 90% of the poisonous and unwanted chemicals in your body. It’s supposed to eliminate drugs too but unfortunately many medications actually inhibit the cytochrome P-450 pathways. Detoxing and removing them becomes a vicious circle.

I was teaching in the 1980s that drugs interfere with drug elimination! This was the basis of many chemically sensitive patients. They were labeled neurotic or depressed by their physicians and put on antidepressant drugs, such as SSRIs, which blocked the P-450 process and made things much worse. It

was a nightmare for these “chemical victims”, a term invented by Dr. Richard Mackarness. They became trapped in a poisonous world that was making them ill and treatment held them prisoner!

There is actually a physiological state which has been identified in which the cells lack enough energy to expel the poisons within them. The poisoned cell really struggles to get rid of the toxins that are making it struggle!

Phase 1 and Phase 2 detox.

To understand this a little more but avoiding too much complex detail, detoxification of chemicals has 2 major processes which take place in the liver and also in cell mitochondria. One is called phase 1: it turns toxins into water soluble alcohols and aldehydes, which are easy to excrete via the kidneys. But if this process bottlenecks, which happens with zinc and magnesium deficiency for example, then phase 2 comes into play.

Phase 2 detox is an alternative pathway we call conjugation. It renders insoluble substances more soluble by sticking them with molecular add-ons like methyl, acetyl- and sulphonyl- groups. This needs glutathione, which is why this compound is so powerful an antioxidant and detoxer. Phase 2 metabolites (the end products) are often dumped into the bile, which goes to the gut and so are excreted. However in situations of extreme chemical overload, much glutathione is lost this way and needs substantial replacement as a nutritional supplement.

Cysteine and certain other amino acids also help with phase 2 detox, because of their ability to supply methyl groups and sulfur. This is why I am teaching these days that we have a new sub-specialty of nutrition, geared solely towards assisting our overworked liver and detox pathways.

When you hear totally dumb doctors saying “we can get all the nutrition we need from a balanced diet”, realize you are listening to idiots—dangerous idiots at that. Even if it was once true we can get what we need from our diet (doubtful, bearing in mind the miserable life expectancy of centuries ago), it certainly cannot be today.

We live in a world which is a thousand times more toxic than the one in which we evolved. We need extra chemical helpers (supplements) to get us through this blizzard of chemicals. Glutathione is one of the most important liver protectors and we need lots of it in order to destroy toxic chemicals, before they destroy us. Unfortunately, we cannot simply swallow glutathione. It gets broken down in the stomach. We have to take what are called precursors: substances which precede glutathione and we take lashings of those! Lipoic acid, SAME and N-acetyl-cysteine are examples of glutathione precursors. They all work better with vitamin C present and so on...

We’ll cover liver nutrients later.

Detoxing Food

Just to remind you: blood from the gut, once absorbed and full of foodstuffs, goes straight to the liver. It does not go into the general circulation until it has been processed by the liver. This means the liver is a kind of gateway or portal (from the Latin porta, meaning gate). In fact the veins which drain blood from the gut to the liver are called the hepatic portal system.

That alone should caution you to be careful what you eat. Liver-toxic foods and drinks, such as high-fructose-corn-syrup, which are very damaging to the liver, should never be in your diet. If you remember the movie Super Size Me by Milton Spurlock, he was taken off the fast food program because his physician was worried at the appearance of signs of liver damage, after just 30 days of soda and burgers (HFCS is the sweetener used in sodas, not sugar).

If pollutants and junk food continue for long enough, the liver damage which results leads to a condition called "fatty liver". This isn't quite the same as cirrhosis. Fatty liver is somewhat reversible, whereas cirrhosis is not. Instead of the fibrosis we see in cirrhosis, fatty liver is characterized by fat deposits. This causes liver enlargement and loss of function. Fatty liver may progress, in time, to cirrhosis and permanent damage.

50% of the population of the USA now have fatty liver enlargement, undoubtedly due to HFCS and other junk food ingredients. Almost as common as bad food, alcohol abuse also causes fatty liver, leading finally to destructive cirrhosis. Other causative factors include drugs such as Amiodarone, methotrexate, steroids and tamoxifen. Also inflammatory bowel disease, HIV, and specific environmental liver toxins. Remember, certain herbs may damage the liver, notably Black Cohosh.

So, What Does Your Liver Do, Exactly?

A lot!

The liver filters nearly 100 gallons of blood every day, processing raw materials, manufacturing the building blocks of the body, recycling the old to make new, and detoxifying the body's waste.

The liver is involved in a huge array of biochemical pathways to make our bodies function and, as a result of this complicated inter-relationship, liver disease can affect just about any other part of the body. Thus the symptoms of liver disease are typically unpredictable and not necessarily specific.

Moreover, because the liver acts as a "biochemical cross roads" for the body, it is affected by a wide range of diseases, including viral, parasitic and bacterial infections, degenerative and cancerous disease, and toxins.

WARNING: The liver has a double edged nature which, while being life preserving, makes diagnoses and treatment of liver disease extremely

difficult. The liver has a tremendous reserve capacity, which means that it can easily perform its duties with up to 70 to 80 per cent of the liver mass affected by disease. While it certainly is a benefit that our liver can keep us alive despite an overwhelming infection or a massive tumor, it also means that the disease is well advanced and possibly untreatable before any symptoms are noted.

The liver also manufactures a full quart of bile daily to break down fat. Bile is the yellowish-green fluid that's produced in your liver and stored in your gallbladder. Bile also plays an essential role in emulsifying – or breaking down – the fats you eat. Think of bile as a detergent that gets rid of grease from your dishes.

This remarkable organ produces more than 13,000 crucial chemicals and hormones including cholesterol, testosterone, and estrogen. Plus, your liver manages over 50,000 enzymes to maintain a healthy body.

Practically all the vitamins consumed in our diets are either directly involved in liver function or require liver aided transformation to be used in the body. This includes Vitamin C, the B vitamins, Vitamins A, D, E and K. Vitamin K is important to maintain blood clotting and requires hepatic transformation from the inactive form to the active form.

Carbohydrates

It regulates your blood sugar and carbohydrate metabolism. Sugars, or carbohydrates are the basic fuel of the body. The liver is the primary centre for processing of the sugars into the form immediately required. The liver is also responsible for the destruction of insulin, the hormone directly involved with the cellular absorption of blood sugars. Alterations in liver function often do not affect blood sugar levels until much of the liver has been destroyed.

It can store some nutrients (not all), allowing them back into circulation when needed. These include vitamins A, D, K, and B12 – to help keep your bones from crumbling.

Lipids

Fat or lipid metabolism is extremely complex due to the vast number of functions fat carries out in the body. The liver sits at the centre of those many functions. The liver directly regulates the proportions of HDL and LDL cholesterol and also dangerous triglycerides. However disorders of blood lipids are not to be seen merely as liver dysfunction. They are whole body problems. Cholesterol is probably the most common fat based substance in the body, being the major component in cell walls; the basis for the steroid hormones, such as estrogen and testosterone; used the manufacture of bile pigments; and the precursor of vitamin D.

Proteins and amino acids

The building blocks of proteins are the amino acids. The liver is primarily involved in processing of dietary amino acids to modify them into required or useful forms. The liver synthesizes many of the proteins involved in the body functions, notably albumin and globulins. When liver function is seriously impaired, these critical blood proteins fall dramatically; nutrition suffers and the blood becomes "watery", allowing fluid to escape, where it collects in the abdomen as a pond called "ascites" (from the Greek).

Fatty Dumps

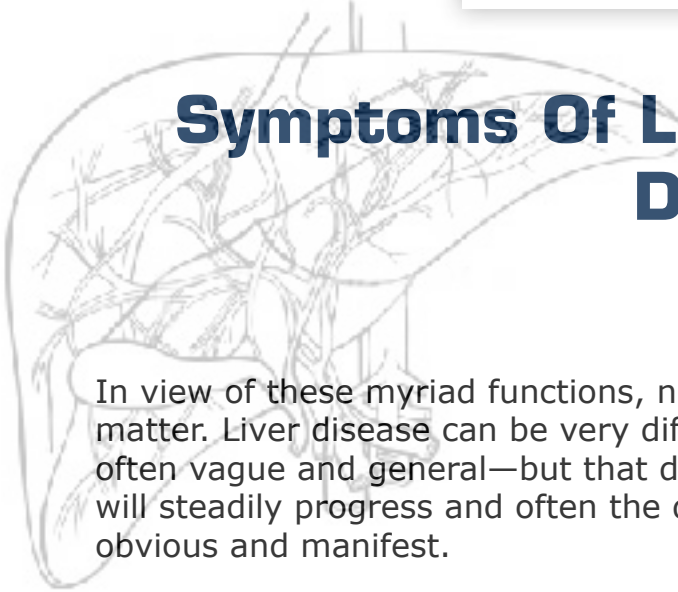
When your liver is not working properly, or it is overwhelmed by the amount of toxins and drugs it encounters in the blood stream, things start to go wrong. To create somewhere to get rid of excess waste, your liver will create balls of fat that collect in the liver itself. (This is the start of a "fatty liver.") Those fats will also spill into your blood in the form of triglycerides, which boost the risk of a heart attack.

Your liver will also move those toxins to different places in your body, including your skin. In fact, many skin conditions like dandruff and psoriasis are tell-tale signs of a sick liver.

Also, don't forget that the brain is a major fatty organ; all the nerve cell "insulation" or myelin sheaths are basically lipids. That means your brain too will become part of the toxin trash bin. That's the last thing you want.

That's why poor liver function is often signaled by a lack of vitality and strength: many vague conditions, like chronic fatigue, high blood pressure, autoimmune disorders, and sexual dysfunction can often be traced to a sluggish or sick liver.

Symptoms Of Liver Dysfunction and Disease



In view of these myriad functions, not surprisingly, liver disease is a very complex matter. Liver disease can be very difficult to diagnose in the early stages. It is often vague and general—but that doesn't mean it's safe to ignore. Liver disease will steadily progress and often the damage is extensive before it becomes obvious and manifest.

- Common symptoms would include
- feeling heavily hung over in the morning, even when you've not been drinking
- slow getting started in the morning
- feeling unduly tired or drained
- having a very low tolerance of alcohol.

Liver function is reflected externally in the condition of finger and toenails and by the eyes and vision. Blurry vision may be the result of liver malfunction rather than an eye problem, per se. Skin spots may denote liver problems. Note that the usual brownish "age spots", often mistakenly called liver spots, are not reflective of liver function.

The real "liver spot" is a tiny red spider-like lesion that is called a spider naevus. These were first described in 1869 by the English physician Erasmus Wilson who noted them on the skin of a publican. They are described as "spiders" due to their appearance, the central patch resembling the body of a spider, with the finer radiating vessels looking like the legs. Spider naevi may be an indication of underlying disease, but can also occur in healthy individuals or in response to pharmacological agents. If you can find more than 2 or 3, get some liver function tests done.

It seems likely that spiders and reddened palms we sometimes see in patients with liver disease are a manifestation of disturbed circulating sex hormone activity (estrogen and free testosterone).

Here is a table of symptoms that may help raise your index of suspicion of liver disorder. Like most such lists, the majority of symptoms could have many other causes. Even jaundice may have other causes than liver disease; hemolytic anemia, for example.

There is no order of priority in this list:

1. Lethargy and fatigue, unusual weariness.
2. Brain fog or “wooly brain syndrome”
3. Intermittent recurrent abdominal or gastrointestinal upsets, including loss of appetite, nausea, vomiting, diarrhea, constipation.
4. Abdominal bloating
5. Pain over the liver (from stretching of the liver capsule when it is inflamed).
6. Stool changes. Since chemically broken down bile is the origin of the brown color of feces, lack of adequate bile is often signaled by pale stools. Bile is the emulsifier of fats and fat cannot be digested without enough bile. Undigested fat will cause stools to stick to the toilet pan and to float on the water surface (fat is lighter than water).
7. Dark urine. This is actually the other side of 4. Bile which is not excreted into the gut, as it should be, will appear in the blood instead. The kidneys will filter it out and that makes the urine very dark orange-yellow (this is like the fecal color appearing in the urine instead).
8. Jaundice. This in turn is the extreme of 7. If the bile cannot get out into the gut and there is too much for the kidneys to filter, the yellow color will appear in the skin and the whites of the eyes. We call this condition jaundice, from the French word jaune, meaning yellow. Doctors sometimes use the Latin word: icterus. It means the same thing.

[The yellow color comes from a pigment called bilirubin, a product of the breakdown of hemoglobin in red blood cells. The normal total level of bilirubin in blood serum is between 0.2 mg/dL and 1.2 mg/dL. When it rises to 3 mg/dL or higher, the person’s skin and the whites of the eyes become noticeably yellow.]
9. Hormone metabolism. The liver is both the target organ for many of the body’s hormones and the recycling centre for most of the hormones. Some of the symptoms stemming from liver failure may mimic a major hormonal imbalance.
10. Skin rashes (eczema etc.) is well known in alternative medicine to be a sign of “hot” or “angry” liver. That’s a troubled organ but also often denotes a troubled psyche too.

Symptoms Associated With Liver Dysfunction

Here's an extended list from Dr. Sandra Cabot, The "Liver Doctor". I should point out that these are symptoms associated with liver dysfunction and far from a list of symptoms *caused* by liver problems. Moreover, the vast majority of symptoms may come from other causes, not liver disease at all.

Abnormal metabolism of fats

- Abnormalities in the level of fats in the blood stream. For example; elevated LDL cholesterol and reduced HDL cholesterol and elevated triglycerides.
- Arteries blocked with fat, leading to high blood pressure, heart attacks and strokes.
- Build up of fat in other body organs (fatty degeneration of organs).
- Lumps of fat in the skin (lipomas and other fatty tumors).
- Excessive weight gain, which may lead to obesity.
- Inability to lose weight even while dieting.
- Sluggish metabolism.
- Protuberant abdomen (pot belly).
- Cellulite.
- Fatty liver.
- Roll of fat around the upper abdomen - (liver roll).

Digestive problems

- Indigestion.
- Reflux.
- Haemorrhoids.
- Gall stones and gall bladder disease.
- Intolerance to fatty foods.
- Intolerance to alcohol.
- Nausea and vomiting attacks.
- Abdominal bloating.

- Constipation.
- Irritable bowel syndrome.
- Pain over the liver - (upper right corner of abdomen & lower right rib cage).

Blood sugar problems

- Craving for sugar.
- Hypoglycaemia and unstable blood sugar levels.
- Mature onset diabetes (Type 2) is common in those with a fatty liver.

Nervous system

- Depression.
- Mood changes such as anger and irritability.
- Metaphysically the liver is known as the "seat of anger".
- Poor concentration and "foggy brain".
- Overheating of the body, especially the face and torso.
- Recurrent headaches (including migraine) associated with nausea.

Immune dysfunction

- Allergies - sinusitis, hay fever, asthma, dermatitis, hives, etc.
- Multiple food and chemical sensitivities.
- Skin rashes and inflammations.
- Increased risk of autoimmune diseases.
- Chronic Fatigue Syndrome.
- Fibromyalgia.
- Increase in recurrent viral, bacterial and parasitic infections.

External signs

- Coated tongue.
- Bad breath.
- Skin rashes.
- Itchy skin (pruritus).
- Excessive sweating.
- Offensive body odour.
- Dark circles under the eyes.
- Yellow discoloration of the eyes.
- Red, swollen, itchy eyes (allergic eyes).
- Acne rosacea - (red pimples around the nose, cheeks and chin).
- Red palms and soles which may also be itchy and inflamed.
- Flushed facial appearance or excessive facial blood vessels (capillaries/ veins).

Hormonal Imbalance

- Intolerance to hormone replacement therapy or the contraceptive pill (eg. side effects)
- Menopausal symptoms such as hot flushes may be more severe.
- Premenstrual syndrome may be more severe.

You should get Dr Cabot's book. It'll take you up to black belt standard in liverology. You can get a copy at www.TheLiverDoctor.com

Gallbladder Symptoms

The gallbladder is an intimate part of the liver/biliary system. It stores bile, which can then be released after a fatty meal. The healthy functioning gallbladder reacts to the fatty stimulus from the gut, by contracting and sending bile down the common bile duct, where it joins to digestive juices flowing from the pancreas and the resultant mixture is secreted into the duodenum (the upper part of the small intestine).

Unfortunately, there are not so many healthy gallbladders around! This is due to faulty diet. We are hunter-gatherers by nature and this would mean intermittent

meals very high in fat (meat, seal blubber, whatever). The gallbladder likes to be challenged frequently, otherwise the bile stagnates and that may result in gallstone formation, due to salts precipitating out of solution.

Gallstones can create a miserably painful condition called biliary colic. More about stones in a moment.

Our diets today are rich in carbohydrate and low in fat. We are even told not to eat fat, which is stupid and dangerous. We need quite a lot of fat in our diet—only the healthy kind, of course; cell walls are made of a type of fat; certain vitamins are only absorbed through fat; and the brain is substantially made up of fat. Without sufficient fat in meals to trigger a secretory response, the gallbladder does not discharge, then stagnation of bile is inevitable.

Gallstones

Gallstones are a sign of poor bile secretion and a faulty diet. They may lie dormant for years, even decades, without making their presence felt, except maybe vague discomfort, which is put down to “indigestion” or something of the sort.

But if the stones begin to move and pass down the bile duct, the resultant pain can be a miserable agony called “biliary colic”. It is one of the most severe of all pains; the patient often curls up crying or may end up on her hands and knees, banging her head against the wall to distract from it. (I have used a woman as the example, since they more frequently suffer with gall stones; the classic patient is said to be a woman who is “fair, fat and forty”). Surely, you don’t need me to tell you it’s not exclusively women; or fair-haired; and gallstones can start causing trouble as early as a person’s third decade(20s).

Gallstones are also often accompanied by an infection of the gallbladder, which is a condition called “cholecystitis”. Cystitis means bladder inflammation, as most people know; adding the chole- is the Greek prefix for bile.

The Single Biggest Threat To Your Liver

It's not alcohol! In fact the biggest damage factor for your liver is overweight and obesity. Evidence suggests that alcohol contributes to only 6% of liver damage. But obesity alone contributes to 52% of liver disease

If you're overweight, you have double the risk of liver damage. If you're obese (body mass index over 30), you're four times more likely to develop liver damage than a normal-weight individual. [Obesity is the Cause of Most U.S. Liver Damage: Risk of Disease Fourfold Higher in Obese. Mitchel L. Zoler. Family Practice News. July 1, 2004].

Obviously, if you put both together, it's really bad news: when an overweight person drinks, the chances of liver damage increase dramatically. An obese person drinking 2 or more drinks per day has a 5.9-fold increase in risk of liver damage. That's almost a 600 percent increase in risk of getting liver disease.

Obesity is a major health problem worldwide. In the United States alone, roughly 300,000 deaths per year are directly related to obesity. It leads to several chronic diseases such as type II diabetes, insulin resistance, coronary heart disease (responsible for heart attacks), cerebrovascular disease (responsible for strokes), high blood pressure, gout, gallstones, colon cancer, sleep apnea, and a form of liver disease called non-alcoholic fatty liver disease (NAFLD).

Obesity is best defined by the body-mass index (BMI). The BMI is weight in kilograms, divided by height in metres squared (wt/ht²).

In adults, normal weight is defined as a BMI between 20 and 25 BMI units, overweight from 25 to 30, obesity from 30 to 35, significant obesity from 35 to 40, morbid obesity from 40 to 45, super obesity from 45 to 50, and super-morbid obesity greater than 50. Eighty percent of deaths related to obesity occurs in obese individuals with a BMI greater than 30.

You can find out your BMI by measuring your weight and height and then Googling dozens of websites that will turn that into BMI for you. For example, refer to the [Body Mass Index \(BMI\) Table for Adults](#), and the [Body Mass Index \(BMI\) Index Table for Teens](#).

What is nonalcoholic fatty liver disease (NAFLD)?

Nonalcoholic fatty liver disease (NAFLD) actually refers to a spectrum of liver diseases ranging from the most common, fatty liver (accumulation of fat in the liver, also known as steatosis), through nonalcoholic steatohepatitis (NASH, fat in the liver causing liver inflammation), all the way to cirrhosis (irreversible, advanced scarring of the liver as a result of chronic inflammation of the liver). All

of these conditions can come about without any alcohol history at all (my father died of liver failure, due to reckless medications from his doctors; he hardly ever drank from one month to the next).

Hence the technical term: non-alcoholic fatty liver. The changes in liver function are just the same as in those who consume too much alcohol.

We often just call the early stages of this spectrum just "fatty liver". It is fully reversible but not if it goes on too long.

All of the stages of Nonalcoholic fatty liver disease are now believed to be due to insulin resistance, a condition closely associated with obesity. In fact, the BMI correlates with the degree of liver damage, that is, the greater the BMI the greater the liver damage.

Alarming statistics about nonalcoholic fatty liver disease

As expected, nonalcoholic fatty liver disease is observed principally in developed countries. In these societies, a sedentary lifestyle and high calorie, sugar, and fat intake lead to a high prevalence of obesity, insulin resistance, and diabetes.

Nonalcoholic fatty liver disease is currently the most common liver disease worldwide, affecting estimated 10-24% of the world's population. In the US alone, the Centers for Disease Control reports that currently, approximately one half of the U.S. adult population is overweight (BMI>25) and one quarter of the U.S. adult population is obese (BMI>30). That means upwards of 29 million Americans have nonalcoholic fatty liver disease, while 6.4 million of these persons have the more severe nonalcoholic steatohepatitis (NASH).

Even more alarming than these statistics, nonalcoholic fatty liver disease is occurring among children in the U.S. As kids guzzle more and more sweet foods and sodas, they are wrecking their livers. High fructose corn syrup, used as a sweetener, has emerged as a great liver toxin. Manufacturers fight the science and try to suppress this but the science is certain enough to say nobody should ever swallow that stuff.

Recognizing Fatty Liver

In most patients nonalcoholic fatty liver disease causes no symptoms. Nonalcoholic fatty liver disease often is discovered when routine blood tests show slightly elevated levels of liver enzymes in the blood (see below).

Once it has progressed as far as true cirrhosis, then real pathology supervenes. The development of cirrhosis can lead to failure of the liver, swelling of the legs (edema), accumulation of fluid in the abdomen (ascites), bleeding from veins in the esophagus, and mental confusion (hepatic encephalopathy).

Patients with cirrhosis caused by nonalcoholic fatty liver disease also may be at risk of developing primary liver cancer

The most common cause of liver failure (and thus a common reason for transplantation of the liver) is cryptogenic cirrhosis (cryptogenic meaning that the cause of the cirrhosis is unknown). Alcohol isn't the culprit.

Doctors now believe that a large number of patients with cryptogenic cirrhosis are actually patients in the late stages of nonalcoholic fatty liver disease. Doctors and public health officials project that obesity related liver diseases (cryptogenic cirrhosis and liver cancer) will become the leading cause of liver failure and liver transplantation in the not too distant future.

So you had better listen up. We don't want that to happen to you.

Other Liver Diseases

There are numerous specific diseases of the liver. Many pathogens will attack it: viruses, bacteria, fungus and parasites.

I shalln't be doing unusual liver diseases here, such as Wilson's disease, Leptospirosis and hemochromatosis. These are too rare to be for general consumption.

However everyone understands the concept of hepatitis.

We call inflammation of the liver "hepatitis". There are acute and chronic forms of hepatitis. Viral hepatitis is divided into five main strains: A - E. Each has very different effects.

Hepatitis Review

Hepatitis A is caused by eating food and drinking water infected with a Hep A virus. It can also be caused by unhygienic sex practices (anal-oral contact). While it can cause swelling and inflammation in the liver, it doesn't lead to chronic, or life long, disease. Almost everyone who gets hepatitis A has a full recovery, even though it may be slow.

Hepatitis B is caused by the Hep B virus and is very dangerous, often fatal. It is a chronic disease that's hard to cure. It may lead to liver cancer.

It is spread by contact with an infected person's blood, semen, or other body fluid. And, it is a sexually transmitted disease (STD). Infections can follow unprotected sex with an infected partner, use of contaminated needles and drug equipment, body piercing and tattoos with unsterile equipment and blood transfusions. Health workers are sometimes infected by accidentally pricking themselves on a used syringe and a mother can pass it to her baby

in the womb.

Hepatitis C is caused by yet another Hep virus. It is spread the same way as hepatitis B, through contact with an infected person's blood, semen, or body fluid (see above). Like hepatitis B, hepatitis C causes swelling of the liver and can cause liver damage that can lead to cancer. Most people who have hepatitis C develop a chronic infection. This may lead to cirrhosis.

Hepatitis D is caused by the Hep D virus. You can only get hepatitis D if you are already infected with hepatitis B. It is spread through contact with infected blood, dirty needles that have HDV on them, and unprotected sex (not using a condom) with a person infected with HDV. Hepatitis D causes swelling of the liver.

Hepatitis E is caused by the virus HEV. You get hepatitis E by drinking water infected with the virus. This type of hepatitis doesn't often occur in the U.S. It causes swelling of the liver, but no long-term damage. It can also be spread through oral-anal contact.

The diagnosis, treatment and management of infectious hepatitis is complex and best left to medical professionals to diagnose, since they have the laboratory fire power.

However their modes of treatment leave much to be desired. We'll scan that quickly in a later section and then get on to the good stuff: self-help liver protection and health.

Liver Disease Secondary to other Disease

There are also liver diseases which arise secondary to other pathology.

Acute pancreatitis: the close proximity of the pancreas to the liver and the bile ducts results in some degree of hepatitis whenever there is a case of pancreatic inflammation. Treat the pancreatitis and the liver disease will regress.

Chronic inflammation of the bowel allows portal absorption of toxic intestinal products and bacteria. Treat the colitis. The most common causes are infections, parasites and food intolerance.

Shock, anemia, and congestive heart failure. All these result in severe loss of blood circulation to the liver and lack of oxygen. The liver disease is rarely of primary concern as the primary causes of the problem are most likely going to kill the animal prior to liver failure.

Again, these need not delay us on a general review.

Liver Cancer

Liver cancer will ultimately lead to liver damage and death. But it's somewhat different to disease of the liver. It won't affect function until very late. Diagnosis of liver cancer comes from recognition of potential symptoms and scans or biopsy.

Liver cancer falls into two categories: primary, that is cancer arising in the liver; or secondary, that is originating in some other part of the body and spreading to the liver by metastasis (blood borne spread).

Both are very serious. Liver cancer progresses rapidly and liver secondaries are a sure sign that the primary cancer (elsewhere) has already metastasized (stage IV).

Secondary cancers may stem from any part of the body, but the liver is a favorite destination for metastatic cancer because of its centralized function in the body and the micro- capillary network which makes up the circulation passing through the liver.

Primary liver cancer is usually quite advanced prior to diagnoses and tends to metastasize to the rest of the body very early in the course of the disease. The prognosis is poor, on the whole, but of course depends on many factors and some people resist much longer than others.

Keep in mind the liver can function with less than one third of its volume still operating, therefore liver cancer can be very advanced before any symptoms are noted.

Individual cancer treatments cannot be discussed here. But if you haven't already got it, make sure you read my "Cancer Confidential" report into all the many safe, natural alternative treatment options. Don't just go with the scary hyperbole and brou-ha-ha from the oncologists. Think for yourself!

Xenobiotic Liver Damage

Because of its unique role in detoxing chemical poisons, the liver is very susceptible from damage by all xenobiotics. Drugs and pesticides are xenobiotics. Anything man-made is, essentially, a xenobiotic.

Pesticides, herbicides, solvents, degreasers, plastics and many other chemical groups, including arsenic, carbon tetrachloride, vinyl chloride and thousands of others, have known and unknown toxicity. Many hurt the liver while it tries to remove them.

An example is the weedkiller Paraquat. It is one of the most widely used herbicides in the world. It is quick-acting, non-selective, and kills green plant tissue on contact. But it is also deadly for the liver. There are no specific antidotes. However, fuller's earth or activated charcoal is an effective treatment, if taken in time. Death may occur up to 30 days after ingestion. In the European Union, paraquat has been forbidden since July 11, 2007.

Fast And Slow Metabolizers

People vary in their ability to deal with and remove these substances from the blood. Those who don't handle xenobiotic chemicals very well we can call 'slow metabolizers'.

A simple test called the sulphoxidation reaction test can detect the amount of sulphoxide in the urine following a loading dose of a suitable test substrate. Slow metabolizers will produce less metabolite output to the urine. Preliminary results show that as many as 4% of Black populations; 11% of the Caucasian population, and up to 21% of Oriental populations are slow metabolizers.

A genetically-determined ability to metabolize in this way could be an important factor in a person's response to toxic environmental chemicals and could determine whether he or she will ultimately contract cancer or other diseases. It is now held likely that poor metabolizers are the people who suffer from chemical intolerance and are those most likely to become universal reactors or to develop 'twentieth-century allergies'.

Even something as simple as caffeine can become dangerous to slow-metabolizers. For instance, a study Research on more than 4,000 people in Costa Rica found that about half had the trait and were considered "slow caffeine metabolizers." The other half had the opposite trait, which caused their bodies to rapidly break down or metabolize caffeine, and coffee-drinking in this group appeared to reduce heart attack risks.

Among slow-metabolizers, those who drank two or more cups of coffee daily were at least 36% more likely to have a heart attack than those who drank little or no coffee. Even higher risks were found for younger slow metabolizers – those under 50. They were up to four times more likely to have a heart attack than slow metabolizers in their age group who drank little or no coffee.

Natural Hepatotoxins

Not all hepatotoxins are synthetic. Many natural plant substances, even foods, contain hepatotoxins. Microcystins and a number of herbal remedies can also induce hepatotoxicity.

Pyrrrolizidine alkaloids are notorious offenders. These chemical compounds (which are quite widespread) can produce liver damage with single dose (Schoental, R. & Magee, P. N. (1957) J. Path. Bact., 74, 305 and Schoental, R. & Magee, P. N. (1959) J. Path. Bact., 78,471)

Pyrrrolizidine alkaloids are found in many plants in the borage family, the Compositae (lettuce, cooking oils and crucifers) and the legumes (peas and beans).

Probably the most widely known liver toxins in nature are the fungi, notably the infamous amanita mushrooms (particularly the destroying angels), and aflatoxins, the poison from *Aspergillus flavus*, a fungus which taints peanuts.

Lipoic Acid, Milk Thistle And Toadstools

You hear a lot about alpha-lipoic acid from me; it's a major precursor of glutathione, our most active detox enzyme. It's also a great chelator; it's water and fat soluble, so it can move around like few other molecules; it lowers blood pressure; helps lower cholesterol; protects the lens and retina in your eyes from degeneration; and it helps vitamins C and E work better. You probably knew.

But you may not have known Lipoic acid was first used in clinical medicine to treat people with Amanita mushroom poisoning. This deadly fungus can destroy the liver in a matter of days.

Amanita muscaria or fly agaric, is your classic "fairy toadstool" (red cap with white spots) But it also happens to be deadly poisonous. It looks pretty but don't even touch it! The deathcap (Amanita phalloides) is well-named. And the deadliest of all, the Destroying Angel (Amanita bisporigera). The latter two are common everywhere and account for the vast majority of mushroom poisonings, worldwide.

Generally only 10-50 % of people with amanita mushroom poisoning survive.

As little as half a cap can prove fatal, if action is not taken swiftly enough. Unfortunately, victims often don't feel ill for several hours afterwards and, by the time they do, extensive and irreversible liver and kidney damage may have occurred.

But with lipoic acid, one group of 75 patients had almost 90% survival (67 patients). That's pretty darned good.

Another group of 60 cases were treated with milk thistle (Silybum marianum), a well-known liver herb and all survived. Even better.

These mushrooms are all white, stalks, caps and gills. Don't touch them.

Herbal and alternative remedies

Many plant compounds and natural herbs are naively thought to be harmless.

In fact many are serious liver toxins and their use is hardly to be recommended. Certainly, dosing by a skilled herbalist may be advisable.

Examples include Ackee fruit, Bajiaolian, Camphor, Copaltra, Cycasin, Kava, ragwort, Horse chestnut leaf, Valerian and Comfrey (often used in herbal tea).

Women in pursuit of bioidentical hormones should know that Black Cohosh (*Cimicifuga racemosa*), a herb often touted for that use, is thought to be liver toxic.

Chinese herbs are a particular problem because, let's face it, quality control and safety of materials from China are suspect at best; fraudulent at worst. According to Acupuncture.com:

...Modern patents have moved away from the traditional formulations, and we have begun to see problems as a result. Reports from the USA in 1993 and 1994 drew attention to toxicity problems with the patent medicine Jin Bu Huan Anodyne Tablets, made by Kwangsi Pai Se Pharmaceutical/Bose Drug Manufactory, Kwangsi, China^{8, 9}.

Seven adults developed symptoms of hepatitis after taking Jin Bu Huan for between 7 and 52 weeks. Symptoms and signs included fever, fatigue, nausea, pruritus, abdominal pain, jaundice and hepatomegaly. Liver function tests and liver biopsy results confirmed acute hepatitis and were consistent with a drug reaction. Two patients later recommenced the use of Jin Bu Huan and both experienced a rapid return of the symptoms of hepatitis. All seven patients made gradual but complete recoveries on ceasing the use of the patent medicine.

Beware also many weight loss formulas. Dietary supplements represent an increasingly common source of drug-induced liver injury. The infamous Hydroxycut is a popular weight loss supplement which has previously been linked to hepatotoxicity. Hydroxycut contains several different herbs, including: Garcinia Cambogia extract, chromium polynicotinate, Gymnema sylvestre extract and Camellia Sinensis (*C. Sinensis*).

Drugs That Cause Liver Toxicity

There are LOTS of these.

More than 900 drugs have been implicated in causing liver injury and it is the most common reason for a drug to be withdrawn from the market. Chemicals often cause subclinical injury to liver which manifests only as abnormal liver enzyme tests. Drug induced liver injury is responsible for 5% of all hospital admissions and 50% of all acute liver failures.

Acetaminophen (paracetamol), surprisingly, is the most common cause of drug induced liver disease and acute liver failure worldwide [Keeffe, Emmet B; Friedman, Lawrence M. (2004). *Handbook of liver diseases*. Edinburgh: Churchill Livingstone. pp. 104–123. ISBN 0-443-06633-7.]

Drug induced liver injury (DILI) is usually considered in 3 main physiological categories:

Hepatocellular (destruction of liver cells, leading to jaundice)

This can be serious and lead rapidly to dangerous high levels of bilirubin (50% fatal).

The chance of spontaneous recovery is low and a transplant may be needed.

Cholestatic. As the name suggests this is a condition in which bile stagnates. It can be due to inflammation of liver cells or the small ducts which mark the start of the bile pathways. Either way, bile does not flow. Jaundice is prominent and ALP runs high.

Mixed. Both pictures show and blood tests show neither aminotransferase nor alkaline phosphatase elevations are clearly predominant. Symptoms may also be mixed.

Anticonvulsant drugs, such as phenobarbital, primidone and phenytoin can do this.

I see little point in listing lots of drugs. HepCnet has a large listing if you are interested: <http://www.hepcnet.net/drugsandliverdamage.html>



Testing Liver Function (LFTs)

Not surprising, since the liver is such a complex organ, testing for dysfunction is also quite a comprehensive matter. Liver performance is examined in a number of ways. Measuring enzymes that show damage to liver cells is one of the most common.

But also testing hormone function, blood fats, carbohydrate control and a host of other measures are also, directly or indirectly, tests of liver function.

Two enzymes to take note of are ALT (alanine aminotransferase) also called SGPT, and AST (aspartate aminotransferase) also known as SGOT.

ALT is very liver-specific. The normal range of serum ALT levels is 5- 60 IU (International Units) per Liter.

AST is found in many other organs and raised levels may denote heart damage, for example. The normal range of AST is 0 to 45 U/L

Alkaline Phosphatase ALP. This enzyme is present in many tissues, therefore it is not very specific in liver disease, but it appears very early in the progress of liver disease, therefore it is considered quite sensitive. The normal range of ALP is 30 to 120 U/L

Gamma Glutamyltransferase GGT. This enzyme is most concentrated in the kidneys and pancreas, but it is also found in the liver and other organs. The major proportion of GGT in the serum seems to come from the liver. Large elevations of GGT are more commonly associated with pancreatitis and bile duct obstruction. The normal range of GGT is 0-45 U/L.

The precise levels of these enzymes do not correlate well with the extent of liver damage or the prognosis (outlook). Thus, the exact levels of AST (SGOT) and ALT (SGPT) cannot be used to determine the degree of liver disease or predict the future. For example, patients with acute viral hepatitis A may develop very high AST and ALT levels (sometimes in the thousands of units/liter range). But most patients with acute viral hepatitis A recover fully without residual liver disease. For a contrasting example, patients with chronic hepatitis C infection typically have only a little elevation in their AST and ALT levels. Some of these patients may have quietly developed chronic liver disease such as chronic hepatitis and cirrhosis (advanced scarring of the liver).

It should be said that these liver enzymes do not give any real indication of the function of the liver. So although we call them "liver function tests" or LFTs, they are not. They merely put the finger on the liver.

The highest levels of AST and ALT are found with disorders that cause the death of numerous liver cells (extensive hepatic necrosis). This occurs in such conditions as:

- acute viral hepatitis A or B,
- pronounced liver damage inflicted by toxins as from an overdose of acetaminophen (brand-name Tylenol), and
- prolonged collapse of the circulatory system (shock) when the liver is deprived of fresh blood bringing oxygen and nutrients.

AST and ALT serum levels in these situations can range anywhere from ten times the upper limits of normal to thousands of units/liter.

Mild to moderate elevations of the liver enzymes are commonplace. They are often unexpectedly encountered on routine blood screening tests in otherwise healthy individuals.

By far the commonest cause of moderate damage is prescribed medication.

With drug-induced liver enzyme abnormalities, the enzymes usually normalize weeks to months after stopping the medications.

Serum bilirubin

This is tested in two forms: conjugated and non-conjugated. The latter shows serum levels before reaching the liver. It is therefore chiefly a measure of red blood cell damage when raised.

The liver conjugates bilirubin and excretes in the bile. Therefore this form, when raised, is a reliable measure of obstruction to bile flow (gall stones etc.)

The normal range for total bilirubin is 0 to 20 $\mu\text{mol/L}$ or 0.174 to 1.04 mg/dL .

Serum Proteins

Total protein: Normal range is 60 to 80 g/L or 6 to 8 g/dL

Serum albumin: Normal range is 38 to 55 g/L or 3.8 to 5.5 g/dL Serum albumin is a good guide to the severity of chronic liver disease. A healthy liver manufactures plenty of albumin and falling levels of blood albumin show deteriorating liver function.

Globulin protein: Normal range is 20 to 32 g/L or 2 to 3.2 g/dL . Blood levels of globulin may be abnormal in chronic liver disease. Elevated levels of globulin proteins in the blood usually mean excessive inflammation in the liver and/or immune system. Very high levels may be seen in some types of cancers.

Ammonia and Urea

Ammonia is a by product of digestion of protein in food and the catabolism of nitrogen based organic materials in the body. Eighty per cent of ammonia is delivered to the liver and converted to urea. In patients with liver insufficiency the ammonia is not detoxified to urea, but enters the circulation to act as a central nervous system depressant.

In patients with a severely reduced liver function we may see a true intolerance of ammonia and thus neurological signs after a heavy protein meal or we may see substantially reduced urea levels. This is a late sign in liver disease, only seen after 60 to 70 per cent of the liver function is gone.

Blood work

Thorough testing will, of course, include a blood work up.

- * A complete blood count to check for anemia and blood cell abnormalities.
- * A complete chemistry screen, including ALT, ALP, AST, bilirubin, glucose, urea, electrolyte levels, albumin, globulin and bile acid levels.
- * A complete urine analysis. Check urobilinogen levels, bilirubin levels, glucose levels, protein levels.

Interpreting your blood test results

Dr Sandra Cabot gives a great section on interpreting results on her website. You should get her book. As I said, it will take you to black belt standard in liver health.

Doctors generally look first at the level of the liver enzyme GGT. Generally speaking in "normal liver function tests" the level of GGT is not greater than 45.

If your GGT is greater than 100, the doctor will look at the levels of the other liver enzymes to try and work out possible causes of liver damage. Let's take a look at some possible combinations of abnormally high liver enzymes and what that could mean.

For example:

- If your GGT is above 100, and your ALT is less than 80 and your ALP is less than 200
- This could mean that:
- You are drinking too much alcohol
- You are taking recreational drugs such as ICE or heroin
- You have diabetes
- You have a fatty liver
- You have very high levels of the blood fat called triglycerides
- You are taking certain prescribed drugs that have stimulated your liver to make more enzymes for example – barbiturates, benzodiazepines, anticonvulsants, warfarin, tricyclic antidepressants, paracetamol, pain killers or immunosuppressants.

Note: in some people it is normal for GGT levels to be as high as 120, with no liver problems being found.

If your GGT is above 100, and your ALT is less than 80 and your ALP is above 200

This could mean that:

- The flow of bile is being slowed down or obstructed and this could be from a gall stone in the bile ducts, very inflamed bile ducts or a tumour inside the liver or a tumour outside the liver which is pressing on the bile ducts.
- Excess drugs or alcohol can slow the flow of bile
- Scarring of the liver (known as cirrhosis) can distort the bile ducts and cause slowing/obstruction to the flow of bile.
- You have liver disease plus bone disease, as the enzyme ALP can also be elevated by some bone diseases

Note: when the flow of bile is obstructed or slowed, the level of bile (bilirubin) becomes elevated in the blood to above 20 and the patient may turn yellow (jaundiced).

If your GGT is above 100, and your ALT is above 80 and your ALP is less than 200

This could mean that:

- The liver cells are inflamed by certain viruses such as the Hepatitis A, B or C

viruses or the glandular fever virus (Epstein Barr Virus).

- You are taking liver toxic drugs or drinking excess alcohol
- You have a fatty liver

If your GGT is above 100, and your ALT is above 80 and your ALP is above 200

This could mean that the liver cells are damaged plus there is slowing or obstruction to the flow of bile and this can occur in the following liver diseases:

- Acute hepatitis from viral infections or drug or alcohol toxicity
- Chronic (long term) hepatitis from viral infections, alcohol excess or autoimmune diseases
- Tumours inside or near the liver which obstruct the flow of bile
- Scarring of the liver (cirrhosis)

Note: in alcoholic liver disease the level of the other liver enzyme AST is often elevated to high levels as well, and is usually higher than the level of ALT.

Imaging

Other tests include imaging the liver, such as X-rays and MRI scans.

- Radiograph the abdomen. X rays can show increased liver size, decreased liver size liver abscesses, abnormal mineralization , and circulatory abnormalities (using special dyes)
- Ultrasound the liver. Perfect technique for visualizing the circulation of the liver, the bile duct system, the density of the liver tissue, the size of the liver. Contrary to the nonsensical un-scientific tripe written by Hulda Reger Clark, gallstones show up very well and bile duct obstruction is easy to see [“When the gallbladder is scanned or X-rayed nothing is seen. Typically, they are not in the gallbladder. Not only that, most are too small and not calcified, a prerequisite for visibility on an X-ray,” she says]. But then writing meaningless nonsense was how Clark made all her money.
- Images of an enlarged liver obtained by an ultrasound test, CT (computed tomography) scan, or MRI (magnetic resonance imaging) may suggest the presence of a fatty liver. To be certain of the diagnosis requires a liver biopsy, in which a small sample of liver tissue is obtained through the skin and analyzed under the microscope. It’s an unpleasant procedure and I recommend you avoid it, by looking after your liver!

Biopsy

Trust me, you don't one of these! It's uncomfortable.

While this is a surgical technique, it is the ultimate for diagnoses, since it allows us to directly examine and test liver tissue, give an absolute diagnoses and hopefully a final treatment regime. Biopsies can be taken by full laparotomy, where the surgeon actually looks at the liver and removes a small piece, or they can be done by a biopsy needle guided by ultrasound through the body wall. The liver will regenerate any piece removed, therefore liver biopsy is usually a low risk procedure in capable hands.

Self Treatment Of Liver Disease

We are really looking at two things here: helping yourself if you have one of the liver diseases I've mentioned; or prevention—just taking care, looking after your liver especially, and staying healthy.

The Basic Rule

First, let me re-state my **basic rule of all healing** in this context: any good health measure is a liver support measure. Get it?

Second Rule

Nature will heal pretty much anything, if you set the stage. It was once taught that liver could not repair itself and replace cells. We now know that's the usual "scientific" nonsense; it's just not true. The liver can do a remarkable job of healing itself. But there have to be some viable cells present, which can then multiply and replenish themselves.

To help your liver heal you must reduce the destructive burdens it faces and they are many, as we have seen. Lowering the body burden is crucial.

What to Do:

- a. If you have any liver symptoms from the table above
 1. If you are overweight, start losing NOW.
 2. If you drink too much cut down or get on the wagon NOW.
 3. Get rid of drugs. Stop street drugs NOW. Talk to your doctor about reducing or eliminating unnecessary medical drugs.
 4. If you are aware of toxins, parasites or any other agents, get rid of them.
 5. Clear out chemical clutter in your home (that includes chemical cleaning agents, solvents, plastics, cosmetics, detergents etc.)

Weight Loss Will Save Your Life

Losing excess weight is the cornerstone of treatment of nonalcoholic fatty liver disease. If you have the problem you **MUST** take this step seriously.

The good news is that sometimes that's all it takes to get your liver healing itself!

One retrospective study (that is, a study that looks back in time) found that among obese individuals with elevated transaminases, a 10% loss of weight leads to a significant decrease in the levels of the enzymes, and the enzymes even may become normal. The decrease in enzymes occurred at the rate of 8% per 1% loss of body weight.

Similarly, in studies of patients undergoing stomach reduction operations for morbid obesity, substantial weight loss is accompanied by a marked reduction in transaminases and a regression (improvement) of non alcoholic fatty liver disease.

This book will not go into details of any weight loss program. But you should certainly be familiar with the Fat Release System and my sugar-free designer chocolates are also helping a lot of people lose weight, without adding to the toxic burden. Chocolate is one of the richest sources of natural health-protective antioxidants known. Xylitol (the sweetener) can cause liver damage in dogs when given in absurdly large amounts. I'm just leveling with you here. Xylitol has no known toxicity in humans.

Follow A "Liver Diet"

Certain foods would be good to avoid, if your liver is distressed, at least until some healing has taken place.

You would be best to avoid or eat very little of:

Meat, poultry and eggs

Refined cereals (flour, bread, cakes, muffins, biscuits etc)

Sugar and sweeteners, especially corn-based sweeteners, such as HFCS

All dairy products: milk, cream, cheese, yoghurt, etc. (cow's and goat's)

Tomatoes, citrus fruits, avocados and all over-ripe fruits

Nuts, except almonds

Coffee, cocoa and tea (except herb teas)

Chocolate

Fried food

Alcohol

Basically, you can eat:

Whole grains

Tofu

Fish (white, fresh)

All vegetables

Most fruits in moderation (careful, there's fructose in all of it)

Almonds and seeds

Carob instead of chocolate

Coffee substitute

Olive, coconut and sunflower oils

Herbs

A suggested daily menu, modified from Dr. Andrew Lockie, the homeopath, is as follows:

Uncooked breakfast: granola or whole grain breakfast cereal with soy milk or fruit juice. Wholegrain toast with dairy-free spread.

Cooked breakfast: mushrooms of toast or white fish, grilled. Oatmeal porridge and soy milk (or no milk at all).

Main meal: white fish dish or pulses or textured vegetable protein (TVP). Wholegrain pasta or brown rice. Fresh vegetables and raw salad.

Desserts: fruits, with or without wholegrain pastry or crumble. Brown rice pudding with soya milk.

Snacks: wholegrain bread sandwiches. Salads. Sprouted seeds or beans. Homemade soups from allowed ingredients.

Of course, you all know my story on this (I hope); we should all work to establish our own perfect eating diet and ANY set or standard foods can react unpleasantly, resulting in, among other things, liver and pancreatic stress. The ideal diet lies within you; how to set it free is given in my book "Diet Wise"

The “Gallbladder Flush” or “Liver Flush” Scam

All over the Internet and among 90% of ignorant holistic therapists, you will come across one of the most comical (and stupid) absurdities of the alternative healing “industry” (I use that pejorative term deliberately): the so-called gallbladder flush.

The therapist will prescribe a horrendous regime, much like this one:

Take a couple of cups of plain old olive oil, mix in an equal volume of grapefruit or lemon juice, throw in a spoonful of Epsom salts and drink. By the time you get up the next morning, you’ll have passed a few irregularly-shaped stones and cleansed your gallbladder.

Why is this a scam? Because these “stones” are not stones at all but a saponified form of the olive oil used in the flush. These “stones” actually float in the pan; stones do not float. Moreover if you warm them gently, they soften and even melt, because they are, essentially, just fats and soaps.

Soap is, after all, just a salt made up of some kind of fatty acid mixed with some kind of alkaline. The olive oil provided the fatty acid and the lemon juice provided the potassium. Mix in a little bile from the gallbladder—because bile is, remember, an emulsifier—and you have soap. Not a very good soap, but soap nonetheless.

But don’t try and dazzle a born-again holistic “therapist” with mere facts. They still cling to this procedure, despite the evidence. The Internet forums still ring with “testimonies” from people who passed handfuls of “real” gallstones.

The fact is that, taking large doses of fatty substance (the olive oil) may trigger the passage of a real gallstone or two. That’s rare but the victim would be under no illusion: I have already described the appalling pain suffered when a gallstone is passed. Women who have borne children say that it is worse than labor pains.

The shower of painless “stones” after a liver flush at once tells you it’s not real.

A piece in the journal *The Lancet* featured this topic, in 2005 [Sies, C., Brooker, J. (2005). Could these be gallstones? *The Lancet*.]

Good Stuff To Consider Taking

A number of nutritional substances can help support a weakened liver and get it on the path to recovery. Remember, a great deal of liver damage is still reversible.

AMINO ACIDS

Specific amino acids are essential for the liver to breakdown toxins and drugs and also for efficient metabolism in the liver.

Glutamine

This amino acid is required for phase two detoxification in the liver and is required in increased amounts by those who consume excessive alcohol. It is said to reduce the craving for alcohol. Glutamine is converted in the body into glutamic acid, which, along with the amino acids cysteine and glycine, is converted into the powerful liver protector glutathione. Glutathione is essential for liver phase two conjugation reactions used during detoxification of drugs and toxic chemicals.

Glutathione

Glutathione is a potent antioxidant and key de-tox molecule that is produced in the healthy liver. Glutathione is a component of the antioxidant enzyme glutathione-S-transferase, which is a widely acting liver-detoxifying enzyme. Large amounts of glutathione are stored in the liver, where it detoxifies harmful compounds so they can then be excreted via the bile. Glutathione helps to reduce damage from cigarette smoke, alcohol, radiation, heavy metals, drugs and chemotherapy. Glutathione plays a vital role in preventing liver cancer.

Unfortunately, glutathione levels decline with age, and it is used up as toxic molecules are removed. So we need plenty.

Oral glutathione doesn't work. Our only option is to take sulfur-containing precursors, such as alpha lipoic acid, glycine, glutamine, N-acetyl-cysteine and SAMe.

Glycine

This amino acid performs more biochemical functions. It is required for the synthesis of bile salts, and is used by the liver to detoxify chemicals in the phase-two detoxification pathways.

Taurine

Inadequate levels of taurine are common in those patients with chemical sensitivities, allergies and poor diets. Taurine is the major amino acid required by the liver for the removal of toxic chemicals and metabolites the liver to detoxify pollutant environmental chemicals. Recent findings are demonstrating that taurine

is one of the major nutrients involved in the body's detoxification of harmful substances and drugs, and should be considered in the treatment of all chemically sensitive patients.

Taurine is helpful for fatty liver, high blood cholesterol and gall bladder problems and is required for the healthy production of bile.

Vegans don't get any taurine and vegetarians don't get enough.

ANTIOXIDANTS

Antioxidants destroy free radicals and so help to detoxify and protect the cells of the body, including the liver cells, from toxins. We all need lashings of antioxidants, to preserve us in this toxic chemical world. Lots of brightly colored foods help (fresh, of course).

VITAMINS

Vitamin C

Vitamin C is the most powerful antioxidant vitamin for the liver and reduces toxic damage to the liver cells from chemical overload. It neutralizes free radicals generated during the phase 1 detoxification pathway in the liver. Toxic chemicals are far less dangerous if there is plenty of vitamin C in the liver. It helps the liver to regulate cholesterol levels and improves immunity.

Vitamin E

Natural vitamin E is actually a family of variants. Most "studies" test only alpha-tocopherol, which is a synthetic form and virtually useless on its own. This is also the form you are likely to obtain at the pharmacy.

Vitamin E protects delicate fatty (phosphor-lipid) cell membranes from rancid changes.

Vitamin E has an important role to play in those with NAFLD.

A recently published study in the New England Journal of Medicine suggests that high-dose vitamin E might be one answer.

In this well-designed, two-year study, researchers randomized 247 non-diabetic adults with NAFLD to receive one of three treatments: pioglitazone (an expensive drug used to reduce insulin resistance); vitamin E, 800 units per day; or a placebo. Liver tissue was examined at the beginning and end of the study to look for changes in inflammation and scarring.

The scientists found that both vitamin E and pioglitazone reduced fatty changes and inflammation in the liver, but vitamin E seemed to work better than pioglitazone, and only vitamin E produced significant improvements in scarring. In fact, 43 percent of the patients getting the vitamin E showed benefit. In addition, those people taking the pioglitazone gained weight during this study.

There are no good treatments for NAFLD other than weight loss; based on this study, some researchers believe that everyone with NAFLD should be treated with vitamin E. Vitamin E in high doses like this is probably safe, though there have been some studies suggesting that it may increase the risk of bleeding.

[N Engl J Med 2010 May 6 362(18):1675-85]

Vitamin E also reduces scarring, something found to be helpful in reduce scar tissue in the liver which can lead to cirrhosis.

Thiamine (Vitamin B 1)

This B vitamin has antioxidant properties and is helpful in reducing the toxic effects of alcohol, smoking and lead. Thiamine protects against many of the metabolic imbalances caused by alcohol. Deficiency of thiamine is common in those who consume excessive alcohol and this will often lead to poor mental function. Conversely, those with low transketolase enzyme activity (deficiency of B1) will have trouble tolerating alcohol.

[<http://en.wikipedia.org/wiki/Transketolase>]

Riboflavin (Vitamin B 2)

This B vitamin is required during phase one detoxification in the liver and is crucial in the production of body energy. Riboflavin deficiency is common in those who consume excessive alcohol and should be supplemented in such cases.

Nicotinamide (Vitamin B 3)

This is also known as Niacinamide, and is required by the liver's phase one detoxification system. It is needed for the metabolism of fats and helps to keep cholesterol levels under control.

Calcium Pantothenate (Vitamin B 5)

Several studies have found that pantothenate can lower cholesterol (by an average of 15%), and triglycerides (by an average of 30%) in those with elevated

levels of these blood fats. A study showed that pantothenate speeds up liver detoxification of acetaldehyde after alcohol consumption. This is very important for those who consume excessive alcohol because acetaldehyde appears to be a major chemical in the toxic process that accompanies long term alcohol use. Pantothenate is required in increased amounts in liver disease and in those who use alcohol excessively.

Pyridoxine (Vitamin B 6)

Vitamin B 6 is required for effective phase one liver detoxification. Vitamin B 6 inhibits the formation of a toxic chemical called homocysteine, which accelerates cardiovascular disease.

Cyanocobalamin (Vitamin B 12)

Supplements of this powerful vitamin are essential for those who are strict vegetarians or those with nervous complaints. It is a great energizer of the nervous system and can reduce depression and fatigue. It is required for phase one detoxification of chemicals in the liver, and can help people who are allergic to sulphites, which are common food and wine preservatives. A study showed that vitamin B 12 can effectively block most of the adverse reactions to sulphites such as hay fever, sinusitis, headache and wheezing. B 12 is required for the liver to perform methylation, which inactivates the hormone estrogen and enhances the flow of bile. B 12 is required in increased amounts by those who use alcohol excessively, or in liver disease.

Folic Acid

Is required for the phase one detoxification pathway in the liver and for cell repair and division. Studies have shown that folic acid exerts an anti-cancer effect and is vital for pregnant women.

Biotin

Biotin is one of the B vitamins and is produced in the intestines by friendly bacteria. It is found in foods such as nuts, whole grain foods, vegetables and brewer's yeast, and in supplement form. Liver cells that lack biotin will be deprived of the energy they need to detoxify chemicals and drugs. Deficiency of this vitamin is not rare and can cause hair loss, dry flaky skin, rashes and fatigue. Those with a poor diet, alcoholism or long term antibiotic use are at risk of deficiency.

Inositol

This vitamin is important in fat metabolism, and helps to remove fats from the liver. Deficiency of inositol can increase hardening of the arteries, increase blood cholesterol levels and lead to hair loss, constipation and mood swings. Excessive consumption of caffeine can reduce the level of inositol in the body.

Lecithin

Lecithin contains healthy fats, which are required for the functional and structural integrity of cell membranes. Lecithin is composed of the B vitamin choline, along with linoleic acid and inositol. A choline deficiency promotes liver damage (as does methionine deficiency) and can be corrected with lecithin supplements. Choline has shown a protective effect against cirrhosis in animal studies. Lecithin is vital for fat metabolism and allows cholesterol to disperse in watery solutions so that it can be transported around the body to where it is needed, or removed from the body. This reduces the risk of fatty degeneration in arteries and vital organs. It can help those with the condition of fatty liver caused by incorrect diet or alcoholism.

MISCELLANEOUS

Zinc

The mineral zinc has antioxidant properties and is part of the powerful antioxidant enzyme called superoxide dismutase (SOD). Zinc is vital for the efficient functioning of the cellular immune system needed to fight infections from viruses, parasites and fungal micro-organisms.

Cruciferous vegetables

Cruciferous vegetables such as broccoli, cauliflower, cabbage, Brussels sprouts, kale, bok choy, mustard greens and radish, contain important substances such as indoles, thiols and sulphur compounds, which enhance the liver's phase one and two detoxification pathways. Broccoli has a particularly good effect and enhances glutathione conjugation of toxins. There is evidence that cruciferous vegetables are able to reduce the risk of cancer, and the American Cancer Society has been placing large advertisements in magazines with pictures of these vegetables.

Psyllium

Those with sluggish liver function often have difficulty metabolising fats and may have high LDL cholesterol levels. Psyllium can help in such cases. The largest trial ever conducted into the effects of psyllium fiber carried out at the University of Newcastle in Sydney has proven that it is probably the best cholesterol-lowering fiber available. Psyllium is proving a more consistent cholesterol-lowering agent than oat fiber. Psyllium is a plentiful source of soluble fiber, and it is well accepted that soluble fiber has a significant role in the prevention and treatment of elevated cholesterol levels.

Dandelion

Dandelion is known by herbalists as *Taraxacum Officinale* and its root has been used for liver and biliary complaints for centuries. Extensive records of its medicinal use exist from the 10th and 11th centuries when it was promoted by famous Arabian doctors.

The therapeutic properties of dandelion are due in part to its bitter substances taraxacin and inulin (a bitter glycoside). Other substances in dandelion are taraxanthin, sesquiterpenes, flavonoids, levulin, pectin, fatty acids, minerals and vitamins.

Bitters, such as those in dandelion, stimulate the digestive glands and the liver and activate the flow of bile. Although dandelion's specific action is on the liver, it also acts as a general body tonic. It acts as a laxative, diuretic, anti-inflammatory, bitter tonic and cholagogue. Its cholagogue effect is useful for liver and gall bladder inflammation and congestion, as well as jaundiced states. It is of use in the early stages of cirrhosis of the liver such as alcoholic cirrhosis.

The Australian journal *Medical Herbalism* Vol 3 (4), 1991, refers to two studies, which demonstrate the liver healing properties of dandelion. They found that dandelion is helpful for hepatitis, liver swelling, jaundice and indigestion in those with inadequate bile secretion.

Globe Artichoke

Globe artichoke, also known as *Cynara scolymus* is a bitter tonic with liver-protective and liver-restorative actions. It has also been used as a "blood purifier". During the 1930s clinical studies established its value in lowering blood cholesterol, urea and nitrogen waste products of metabolism. [Reference Rocchietta S: *Minerva Med* 50,612 (1959)].

It is of use as a liver restorative, in cases of liver insufficiency and damage, liver diseases, poor digestion, gall stones and chronic constipation. In overweight patients it can be used to lower elevated cholesterol and triglycerides. It can be used as a cleanser in cases of skin diseases and excessive body odour.

Licorice (Glycyrrhizin)

Licorice extract contains glycyrrhetic acid, the active component that has been shown to protect the liver from damage, enhance the immune system, potentiate the effect of the immune-enhancing agent interferon, and to aid the liver in detoxification reactions. Clinical studies with a glycyrrhetic acid product in Japan have shown excellent results in supporting individuals with both acute and chronic hepatitis.

[Arase Y, et al. The long term efficacy of glycyrrhizin in chronic hepatitis C patients. *Cancer* 1997; 79: 1494-1500 and van Rossum TG, et al. Glycyrrhizin as a potential treatment for chronic hepatitis C. *Aliment Pharmacol Ther* 12(3):199-205, 1998.]

Grapefruit

Grapefruits may inspire a new treatment for hepatitis C, one of the trickiest forms of liver disease.

Naringenin, a compound found in grapefruit and other citrus fruits, may curb the spread of the hepatitis C virus by 80%. That would give healthy cells a chance to regenerate and stem the tide of hepatitis C's spread. Remember, these days, we know that liver cells can re-grow from a handful of surviving healthy cells.

It's good news because the expensive hi-tech treatments are toxic and don't always work.

It's an interesting model. We suspect that the hepatitis C virus may "hitch a ride" on cholesterol, which is mainly produced by the liver. Naringenin counters very low density lipoprotein cholesterol (vLDL), or "very bad" cholesterol.

But you might not be able to eat enough grapefruit to get that benefit. The gut doesn't absorb naringenin very well. So, guess what? Yes, they want to develop a drug form of naringenin.

All about profits again and not common sense.

Grapefruit may affect certain types of medications, so a grapefruit-based approach might not be right for all patients.

[SOURCE: Nahmias, Y. *Hepatology*, May 2008; vol 47: pp 1437-1445.]

Milk Thistle

Silybum marianum or Milk Thistle is a famous liver-protective, liver-regenerative, anti-inflammatory and antioxidant.

The ancient Romans knew its merits well and would take milk thistle to counter the liver-damaging effects of excessive and repeated intoxication.

The American Journal of Gastroenterology published a clinical review of Milk Thistle and found that this herb may be effective hepatitis induced by viruses, toxins, drugs and alcohol.

The active or therapeutic component of Milk Thistle is a bioflavonoid compound called Silymarin. Silymarin is rapidly absorbed from the gut and produces peak blood levels of Silymarin after about 2 hours.

In the bile maximum levels of Silymarin are found within 2 to 9 hours after ingestion.

Silymarin is able to speed up the regeneration of healthy liver cells (hepatocytes) after different types of liver damage. The regenerative effect of Silymarin has been confirmed in several clinical trials. Thirty-six patients with alcohol-induced liver disease were treated with 420mg of silymarin for 6 months in a double-blind clinical trial. This treatment produced improvement in liver function and histology compared to placebo.

Proprietary Formulas

You can also consider liver support remedies. HEEL (www.heelusa.com) do a great compound called Hepar compositum, which we would all probably benefit from.

Formulate Your Own Liver Herbal Tincture

David G. Young, N.D. (www.Naturopathic-Physician.com) gives the following liver detox recipe, which is given originally I think in *Phytosynergistic Prescribing*, First Edition, 1994, by Kerry Bone, a regular contributor to the Townsend Letter for health practitioners (a tincture is an herb in liquid form, usually with 35 to 50% alcohol base.)

Recipe:

5 parts: *Silybum Marianum* (Milk Thistle)

2 parts: *Taraxacum officinale* (Dandelion Root)

Taraxacum is a bitter, containing taraxacin. It is widely regarded as the

supreme liver tonic. Taraxacum also has gentle laxative properties.

2 parts: Cynara Scolymus (Globe Artichoke)

Cynara is the Brazilian name for the globe artichoke. Cynara has similar liver protective and regenerating properties to Silybum. Animal studies have shown an ability to increase the flow of bile by 60 % to 400 % in a twelve-hour period.

1 part: Chionanthus Virginicus (Fringe Tree)

Chionanthus is used in a variety of hepatic and biliary complaints including cholecystitis, cholelithiasis, jaundice, enlarged spleen, portal hypertension, etc.

1 part: Chelidonium majus (Greater Celandine)

Celandine is a plant with specific actions on the gall bladder and bile ducts. It has a normalizing action on the gall bladder and is indicated in most conditions involving gall bladder and bile ducts. Remember, as I said above, bile is a major excretion route used by the liver.

Recommended dose: 1 tsp with 4 tsp water or juice, three times per day. Children under 12 should be given half quantity. For best results the formula should be taken 10 – 20 minutes before meals and sipped slowly.

Caution: Large amounts of Chelidonium majus are toxic due to its alkaloid content and may cause nausea, vomiting, and diarrhea. Excessive amounts may also cause abortion. It is therefore contraindicated in pregnancy or even when planning to become pregnant.

WARNING: Of course you know I have to state that this herbal information is for educational purposes only. The remarks above have not been evaluated by the US Food and Drug Administration.

Fiber

Fiber is very important to health. It acts as a matrix for friendly probiotics bacteria to grow, so we call it a pre-biotic.

But there is another terrifically important role that fiber plays in the gut. It absorbs toxic heavy metals to itself.

The presence of toxic heavy metals causes inflammation of the gut. This leads to “leaky gut” which, ironically, allows re-absorption of toxic heavy metals that the liver has been trying to get rid of in the bile. It becomes a vicious circle.

The liver is exposed to the same toxins over and over. So you need to get that

gut in order. Eat a proper diet (and that means a "Diet Wise" book, proper diet). Include only whole foods and no manufactured items. Include plenty of fiber foods.

But also take pre-biotics. These include the following:

- Jerusalem artichoke (* the star)
- Jicama
- Chicory root
- Psyllium
- Raw oats
- Soy also works as a pre-biotic but we don't look on soy as being as healthy as we once thought.

One significant study I found showed that fiber alone was very helpful at reducing or eliminating fatty liver and stimulating liver regeneration. The study was on rats but I think very informative.

The rats were fed a high fat diet for 4 weeks. That was sufficient to create fatty livers in the test animals. The rats were then randomly assigned to 3 groups that received a high-fat diet, a normal diet, or a high-fiber diet for another 4 weeks.

Then partial hepatectomy (around 70%) was performed, to force liver regeneration.

The researchers drew the following significant conclusions:

1. a high-fat diet for 4 weeks can markedly induce fatty liver
2. apoptosis (cell suicide) of hepatocytes is greater in fatty liver than in normal liver 6 hours after partial hepatectomy
3. the capacity of liver regeneration decreases significantly in fatty liver 24 hours after partial hepatectomy
4. a normal diet can partially reverse the effects of fatty liver
5. a high-fiber diet can significantly reverse the effects of fatty liver

Conclusions: A high-fiber diet is good at reversing the negative effects of fatty liver on apoptosis and regenerative capacity after partial hepatectomy.

Hot Update: More on Alpha Lipoic Acid

You'll already recognize alpha lipoic acid as a great liver protector and healer.

Now a new study has shown that in combination with vitamin E it helps with NAFLD. The results were presented at the American College of Gastroenterology 2011 Annual Scientific Meeting and Postgraduate Course.

Patients were excluded from the study if they had diabetes, hepatitis B, hepatitis C, hypothyroidism, or syndromes with known insulin resistance; consumed more than 30 g of alcohol per day; or took any other medications, including herbs and supplements.

The patients followed 1 of 4 daily regimens for 6 months: 300 mg ALA; 700 IU vitamin E; 300 mg ALA + 700 IU vitamin E; or placebo.

Compared with placebo, combination therapy resulted in a 70% difference in change in tumor necrosis factors-alpha levels from baseline. On their own, neither compound scored so high; ALA alone revealed a 47% difference and vitamin E alone a 49% difference from placebo.

This is significant. P. Patrick Basu, MD, MRCP, AGAF, FACP, assistant clinical professor of medicine at Columbia University College of Physicians & Surgeons in New York City, clinical professor at Hofstra University Medical School, and division chief of the Department of Gastroenterology and Gastrointestinal Endoscopy at North Shore University Hospital in Hempstead, New York, recommends that ALA and vitamin E should be considered as therapy in patients with nonalcoholic fatty liver disease and nonalcoholic steatohepatitis to reduce inflammation and to block the damaging fibrosis effect on the liver that characterizes cirrhosis proper.

ALA and vitamin E combined also reduced the likelihood of hepatocellular cancer.

"...no matter what you do, how you squeeze the data," says Dr Basu, "This trial is statistically significant, and this is [using] over-the-counter, very inexpensive drugs. The regimen should have no adverse effects."

In other words, you can do it for yourself!

If you drink a lot, you had BETTER do this!

APPENDIX

The Traditional Chinese Medicine (TCM) View Of The Liver

You may know that TCM does not view organs in the way that Western medicine does. To them, liver is not a structure, it's an energy concept; a humoral function.

The liver is one of the most important of all organs in TCM. It is believed to house the Hun or non-corporeal soul. Because the non-corporeal soul is the seat of human kindness and benevolence, it is sensitive to the boundaries that make the recognition of self and others. Too much liver and you arrogant and inconsiderate; not enough liver and you are self-effacing and self-doubting.

Liver is a yin organ; that is, the feminine side. In TCM it is most intimately connected with the blood and even "stores" the blood.

According to the *Yellow Emperor's Nei Jing*, the first great classic book of acupuncture and TCM, the liver is known as "the general of an army", its functions are so crucial to attack (detox) and defense (balance).

The liver is seen as the organ which calms and soothes; it flows; it is "the wanderer". Liver smoothes the Ch'i energy. It fosters a relaxed, easygoing internal environment—an even disposition.

Not surprising then, when the liver is "hot" and Ch'i energy runs too violently through it, discord results. This may be felt as abdominal pain, nausea, belching, intestinal rumbling, or diarrhea. In alternative medicine we also see skin problems, such as eczema, as often being a manifestation of a hot liver. Thus a Chinese herbalist may give a yin liver remedy, to calm the liver, and thus the skin problem goes away.

Emotionally, the overstrong liver leads to a temperament that can easily turn angry, belligerent and stubborn or "fly off the handle".

Interestingly, the liver is said to rule the tendons. Tendons is a bit broader than the Western anatomical version; it includes ligaments and, to a certain extent, muscles too. The liver is also manifest in the nails

Finally, the liver is connected to the eyes (all the *yin* and *yang* organs contribute the purest part of their energy to the eyes). But the liver is most strongly associated with the eyes. The *Nei Jing* says "When the liver is harmonized, the eyes can distinguish the five colors" and "When the liver receives blood, the eyes can see". Therefore many eye disorders are taken to be liver-related.

(valuable notes from Ted Kaptchuck's wonderful, scholarly book *The Web That Has No Weaver*).