

# ARTHRITIC OR TOXIC? – LIVER 14

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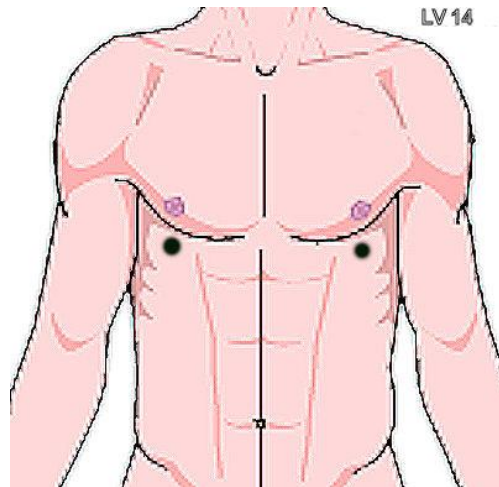


Figure 1: Liver 14

**Related Neurotransmitter:** Acetylcholine (high levels)

**Organ or System:** Liver / Detoxification

**Main Biomarkers:** Acetylcholine, Hormones, Food and Environmental Chemicals.

**Common Hormetic Nutrients:** Sulfur, Taurine, Iron, Niacin (B3), Magnesium, Milk Thistle, Phyllanthus Fraternus, Schisandra

Think of the liver as a homeschool mom. It cooks (assembles proteins), cleans (converts ammonia to urea), changes diapers (detoxifies), cares for the sick (aids the immune system), makes clothes (produces a variety of essential chemicals), is a counselor (manufactures hormones), takes the kids for a walk (regulates metabolism), monitors behavior (helps regulate blood pressure), saves for the future (stores glycogen and a host of other nutrients), and never sleeps. The liver is responsible for so many functions that it is easy to see why life is impossible without it (her).

The PEP Liver 14 is located on the front of the body just below the nipple. Green people will commonly need their liver supported (see the chapter, *What Color Are You?*), but so do many others. Young women with breast tenderness and cramping during their menstrual cycle are experiencing the effects of liver congestion as it tries unsuccessfully to detoxify the reproductive hormones. Acne is another ailment of adolescence related in part, to an over-worked liver. Liver congestion later in life is the main reason for arthritic pain.

The neurotransmitter imbalance associated with the PEP Liver 14 is elevated acetylcholine. The effect of too much acetylcholine is seen in the muscles of those with the degenerative disease Parkinson's.<sup>i</sup> Acetylcholine forces muscles to contract. As Parkinson's progresses the muscles become more and more rigid. A once normal stride becomes a shuffle and the upper extremities, unable to fully relax, are flexed and unbending.

In the brain, acetylcholine is critical for memory and learning.<sup>ii iii iv</sup> These desirable effects of acetylcholine would argue that keeping acetylcholine high is a good idea. After all, everyone wants a good memory. However, everything must be in balance. Even too much acetylcholine is not good. Symptoms of acetylcholine irregularities include:

- Decreased visual memory
- Decreased verbal memory
- Slower mental response
- Difficulty calculating numbers
- Changing opinions about oneself

A variety of nutritional compounds can aid the liver in the detoxification process and help lower acetylcholine including: pantothenic acid, thiamin, vitamin C and lithium.<sup>v vi vii</sup> Acetylcholine levels, when high, can be made worse with any additional liver stress and even with otherwise beneficial substances such as the amino acid L-carnitine.<sup>viii</sup>

## HOW DO I BECOME TOXIC?

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Today the world is exposed to more chemicals and pollutants than in any previous generation. According to the book, *An Alternative Medicine Definitive Guide to Cancer*, "70 million Americans live in areas that exceed smog standards; most municipal drinking water contains over 700 chemicals, including excessive levels of lead. Some 3,000 chemicals are added to the food supply and as many as 10,000 chemicals, in the form of solvents, emulsifiers, and preservatives, are used in food processing and storage, which can remain in the body for years."

The reason toxins are stored in the body is a matter of efficiency. The human body is a master detoxifier, but everything has its limits. The resources allocated for detoxification are numerous and redundant, but they are still finite. If more toxins come in to the body than can be processed at any given moment, then the body must store them. Storing toxins is much less harmful than allowing them to float freely in the blood. Fat and muscle are typically the storage tissues of choice. Eventually however, if toxin accumulation continues, the immune system suffers and the body then manifests the symptoms of toxicity. Any of the following are possible with toxicity:

Abnormal pregnancy  
Broad mood swings

Kidney dysfunction  
Learning disorders

Cancer	Memory loss
Chronic fatigue syndrome	Mineral imbalances
Contact dermatitis	Multiple chemical sensitivities
Fatigue	Panic attacks
Fertility problems	Parkinson's disease
Fibromyalgia	Reactions to medications or Supplements
Headaches	Sensitivity to strong smells
Immune system depression	Tinnitus

**Foods:**

- There are currently 400 different pesticide types available for use.
- 2.5 billion pounds of pesticides are used on croplands, forests, lawns, & fields.
- 24.6 million tons of antibiotics are fed to livestock.
- 750,000 dairy cows are injected with growth hormone.
- Over 80 million acres of genetically engineered crops are presently under cultivation. The long-term effects of these foods are as yet undetermined.
- The average American eats about 125 pounds of additives and 175 pounds of refined sugar per year.
- America leads the world in overall consumption of artificial sweeteners. 800 million pounds or 5.8 pounds of aspartame are consumed per person annually.<sup>ix</sup>

Foods with the Highest Concentration of Pesticides	
1. Celery	7. Bell Peppers
2. Peaches	8. Spinach
3. Strawberries	9. Cherries
4. Apples	10. Kale / Collard Greens
5. Blueberries	11. Potatoes
6. Nectarines	12. Grapes (imported)

These statistics have to do with what happens to food before it is prepared to eat. Food preparation - how it is cooked or processed - may also produce toxins. Likewise, food additives such as monosodium glutamate (msg) for some are toxic as well.

## Water

The Environmental Protection Agency monitors drinking water for safe levels of microorganisms, disinfectants, disinfectant by-products, inorganic chemicals, organic chemicals, and radionuclides.

- In 2002, approximately 260 million pounds of chemicals were released into surface waters. Since the EPA measures for safe levels and not merely for the presence of toxic substances, you know that the water you consume is already contaminated to some extent. Any water filter is a good idea.
- Many of the pesticides that are eventually dumped into our rivers have estrogenic effects.<sup>x</sup> This means that they act like estrogen hormones in your body, preventing proper hormonal function and production. They also affect the receptor sites where hormones bind,<sup>xi</sup> further altering function. It is believed that these estrogenic compounds are responsible in part for the current explosion in hormone cancers, increased hypothyroidism, early female puberty; low sperm counts in males and the loss of libido of both sexes.
- These estrogenic effects take their toll on animals as well. Lake Apopka in Florida, an intensely toxic lake full of pesticides, produced hermaphroditic fish and markedly demasculinized male alligators. The next generation of alligators born at the lake was 100% female.<sup>xii</sup>
- There are also other toxins that are ingested voluntarily such as medications, low quality supplements, birth control pills, recreational and illegal drugs. These too take their toll.

## THE LIVER & ARTHRITIS

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Arthritis simply means inflammation of the joints: more specifically, the soft tissues that make up the joints such as cartilage and ligaments. Non-autoimmune arthritis, like osteoarthritis, is nearly always associated with an overworked, toxic liver. How the liver becomes toxic is varied, however, food reactions are at the top of the list.

Any food may set off a cascade of chemical events which exaggerate inflammation and encourage the condition of arthritis. So can a host of food additives, preservatives, flavor enhancers and non-food-related substances. Which ones turn out to be trouble makers depends on the genetic and epigenetic variability of a given person.<sup>xiii xiv</sup> However, some foods are more suspicious than others.

The major inflammers from food are caffeine and its derivatives, gluten (a protein found in wheat and other grains), and solanine, a chemical found in the nightshade family of plants such as tomatoes, potatoes, and spicy peppers. Some people simply do not genetically possess the ability to breakdown certain food items such as alcohol, monosodium glutamate (MSG) and sulfites found in wine and some meats. MSG is a common food additive used as a flavor enhancer but is well known cause of headaches in most Green people (see: *What Color Are You, Red, Green or Blue?*).

Then there are the food toxins. Cheeses for instance, often contain molds. Mold toxins are called mycotoxins and have a direct link to poor DNA replication as well as being a significant stress on the liver. Other foods, like peanut butter, produce aflatoxins, a very poisonous substance believed by some researchers to have a direct link to cancer.<sup>xv xvi xvii</sup>

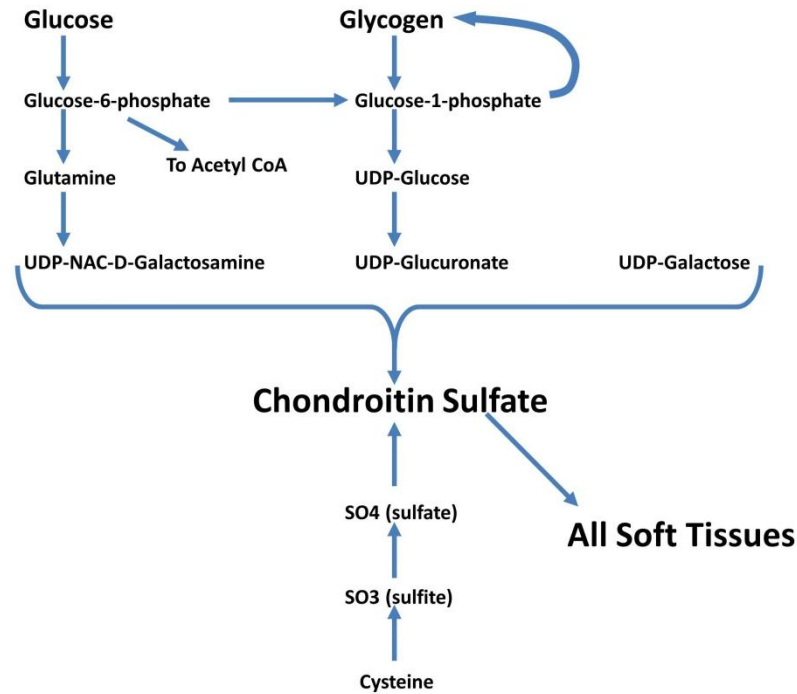
The wrong ratio of good fats and oils will cause inflammatory pain by disrupting eicosanoid balance (see chapter: *The Fountain of Youth?*). Overconsumption of grains or too much of any processed food for that matter, can make life painful as well since nearly all inflammatory reactions begin in the digestive tract.<sup>xviii xix</sup>

There are other potential initiators of arthritis including infections and allergies to food additives.<sup>xx</sup> Processed meats contain sulphites as do wines. A modest percentage of people have genetic errors preventing the detoxification of sulphites.<sup>xxi xxii</sup> For these people, synthetic versions of sulfur, such as sulfa drugs, can trigger significant - sometimes anaphylactic - reactions.

Sulfur is the reason why the liver is always involved in joint pain and arthritis. Sulfur is body glue. All soft tissues: joints, ligaments, cartilage, collagen, elastin, and fibrillin, would literally begin to fall apart without sulfur. At the same time, many detoxification pathways in the liver are entirely dependent upon adequate levels of this important nutrient. Ten of the fourteen pathways of phase II liver detoxification are sulfur dependent.

Those with allergies to sulfites or sulfa drugs still need sulfur but lack the ability to utilize all available forms. Sulfur used in detoxification can be free-form or as part of the structure of amino acids such as taurine and cysteine. The liver gets first bids. Whichever available type the liver can use is snatched up, leaving the soft tissue with insufficient amounts of sulfur with which to repair and rebuild.

Common joint nutrients available in the local drug store include glucosamine, chondroitin and MSM. These are all different forms of sulfur. But none of these work for everyone. Each body type has its own specific requirements. FBA can determine which one is best in seconds. Above is a review of the formation of chondroitin sulfate, a glycosaminoglycan (GAG) and critical component of many soft tissues. GAGs are like 2X4 studs - the primary building material for the body's soft tissue house.



An important thing to know about GAGs is that they are assembled from sugars (polysaccharides), which cling to an amino acid called serine. It can be seen from the figure above that  $SO_4$  or sulfate is one of three critical precursors to the metabolism of chondroitin (4 or 6) sulfate. The other two are glucose (blood sugar) and glycogen (stored glucose). Each polysaccharide or sugar molecule is derived from glucose via the sugar-using (glycolytic) pathway and connected together to make a GAG.

Just from knowing these three key components it can be theorized that if blood sugar management or liver detoxification were compromised, soft tissue formation and repair would suffer. Poor detoxification often results from a poor diet and is then compounded by a disrupted blood sugar system. The case for liver-based arthritis has now been built.

The pattern goes something like this: A prepubescent female eats the Standard American Diet (SAD) which is full of trans-fats, refined sugars, too many simple carbohydrates, not enough quality protein and a plethora of food additives and flavor enhancers. This diet and other lifestyle factors associated with living in the modern age, place a large strain on the regulation and utilization of both glucose and glycogen. Because the primary fuel for the brain is glucose, the body will do what it must in

order to first feed the brain. This means that the sympathetic fight-or-flight system gets turned on in order to generate glucose from muscle catabolism and never gets turned off.

As a result, other blood sugar dependent systems are sacrificed out of necessity as glucose is scavenged to feed the brain - like those that assemble chondroitin sulfate. At the same time, the entire endocrine and glucose system is further stressed by a woman's menstrual cycle. Excess progesterone, estrogen, luteinizing and follicle stimulating hormones require sulfur and a host of other nutrients to detoxify.

The sulfur and nutrient depleted liver is soon overburdened by the hormonal barrage, which results in the recognized symptoms of PMS. This process continues for decades leading to imbalanced hormones, dilapidated joints, scarceness of nutrients and much more.

### Chapter Highlights

- Liver disturbances will activate the PEP Liver 14. The neurotransmitter imbalance associated with this PEP is elevated acetylcholine.
- A congested liver means sluggish detoxification. In young women this could mean breast tenderness and cramping during her menstrual cycle. Whereas, liver congestion later in life is the main reason for arthritic pain.
- Tissue toxicity is the result of too much exposure to chemical compounds in the food, water or air supply; from the inability to eliminate toxins effectively, or both.
- Sulfur is both a primary liver detoxifier and a body "glue." All soft tissues: joints, ligaments, cartilage, collagen, elastin, and fibrillin, would literally begin to fall apart without sulfur.
- Continuous liver strain reduces the total level of tissue sulfur, which can then result in osteoarthritis and joint issues of all kinds.

The hormetic nutrients required most often to support an over-worked liver include: magnesium, sulfur, pantothenic acid, vitamin B12, folic acid, the components of glutathione and herbs like milk thistle and dandelion root.

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