Introduction to the Liver and Gall Bladder

The liver and gall bladder can be considered “auxiliary” organs to the digestive system, in the sense that they are extremely important for optimal digestive health, yet they exist outside the digestive tract themselves. The liver in particular holds many other physiological functions separate from the digestive system alone and can submit to various functional and structural diseases. The liver is an extremely complex organ with a multitude of physiological and biochemical functions. Here we will undergo an examination of the liver and gall bladder and how to maintain their optimal health and functioning.

The Physical System

- **Anatomy and Physiology**

**Liver:**
The liver is the largest organ in the human body weighing more than 3 lbs. It is located in the upper right quadrant of the torso, underneath the lower part of the ribcage. It is much higher up than many people typically imagine, being relatively close to the heart. As stated above, the liver has an extremely broad spectrum of physiological functions, which span from detoxification of metabolic and other waste products and toxins, to the production of bile, recycling of hormones and blood cells, etc. In short, it can be broken down into 5 basic physiological functions: detoxification, regulation of internal food supply, bile production, storage of nutrients/hormones, and the manufacturing and release of blood proteins. The best way to think of the liver is that it is at the root of our metabolism- which is essentially the process of breaking down and building up the various materials of the body. The 2 aspects of metabolism are anabolism (building up) and catabolism (breaking down).

The liver receives all of the nutrient rich fluids from the portal vein via the small intestine from the process of digestion and assimilation. Once it reaches the liver it goes through “preparatory metabolism,” whereby those nutrients and substances are transformed from one state to another, organized and “flagged” to be distributed to the various areas of the body to nourish the cells. It can be thought of as a big packaging warehouse, which receives bulk materials which are unpacked, organized, rearranged, and then shipped out to their proper destinations. In this way, the liver prepares every substance that enters our bodies to be utilized by the rest of the body. It also has the task of processing much of the waste products from cellular metabolism, detoxifying them and preparing them for expulsion from the body via the kidneys and urinary tract, or removal through the GI via bile.

It’s helpful to think of the various channels that move into and out of the liver. First and foremost is the portal vein, which brings nutrients and toxins from the digestive tract into the liver. There is also the hepatic artery which brings fresh oxygenated blood to the liver so it can continue its detoxification processes. Then there is the bile ducts which drain bile to the gall bladder for fat/oil metabolism. Lastly there is the hepatic vein which carries the waste products from the liver into the overall venous system of circulation. The liver also has rich lymphatic tissues which can also bring metabolic waste products to it for detoxification and processing. Because so much of the blood coming into and out of the liver is venous blood, it does not have it’s own pumping mechanism. Because of it’s location next to the lungs and diaphragm, it is our breathing that helps to move the blood through the liver.
When we eat very rich meals, or imbibe a certain level of toxins that overload the liver, the portal vein can become congested and sluggish, which leads to the hepatic artery being wide open to keep a fresh supply of blood to the area. This can lead to cloudy thinking and hangover symptoms as a majority of the body's blood is in the liver.

Central to understanding liver physiology (like the rest of the digestive system) is that it is strongly influenced by the autonomic nervous system, and is thus strongly influenced by our levels of stress, hyperadrenalism, and excessive nervous stimulation. This neural innervation governs how much blood flows into and out of the liver at certain times, primarily based on consumption of food and activation of the parasympathetic nervous system. When we eat during sympathetic stimulation, the liver does not receive as much fresh oxygenated blood as it needs and gets flooded with nutrients and toxins from the GI which can damage the hepatic cells. Oxidation can occur, along with overall stagnation in the liver. During sympathetic activation, all the sphincters in the circulatory aspect of the liver are closed, and during parasympathetic they are open. This is why 1-3 am is the liver time in Chinese Medicine and when the liver is bathed in fresh blood and restores itself.

The liver also produces and stores some vitally important compounds for the body. Among these is cholesterol, bile, glycogen (stored blood sugar), vitamins, hormones, minerals, and triglycerides. These help it to regulate the bodies "internal food supply," by maintaining healthy blood sugar levels between meals, it does this in concert with the pancreas. This is done via 2 hormones: insulin and glucagon.

Insulin signals the liver to store excess glucose into glycogen for later use, until it gets full, at which point it stores the excess sugar as triglycerides. Because the liver doesn’t want all of that fat, it gets attached to cholesterol to form LDL (low density lipoproteins) which it sends out into the bloodstream where it stores in various parts of the body and can accumulate on the vessel walls (atherosclerosis).

Glucagon however is used in between meals when blood sugar levels dip. This signals the liver to snip up glycogen into glucose and send it out into circulation to nourish the cells and raise blood sugar. This process is enhanced by secretions of cortisol from the adrenal glands, which enhances the livers acceptance of glucagon. Thus it is in the liver where we see the central point of focus between the stress response, the nervous system, endocrine function, and blood sugar regulation, among other things.

A good thing to keep in mind in regards to liver physiology is that the liver is intimately linked to the spleen and the small intestine, which are all linked by the portal venous system. Thus when the portal system is stagnant it effects the spleen-liver-small intestine triad.

There is a diurnal rhythm of the liver. During the daytime it is primarily a digestive organ and a detoxification organ at night time. This is strongly governed by the circulation and autonomic nerve functions.
Gall Bladder:
The hepatocytes of the liver manufacture bile from cholesterol, old blood, and bile salts, which are secreted into tiny ducts which all come together in the common bile duct, which also received enzymes secreted by the pancreas. These all come together in the gall bladder, whose job it is to take this water substance and “cook it down” into a concentrated thick substance. This job of bile is the emulsification of fats and oils from the diet. At the moment of the stomach emptying into the small intestine, a signal tells the gall bladder to secrete bile into the duodenum (upper part of the small intestine) through relaxing the sphincter of Odi. While we typically think of the gall bladder as being the storage sac, it is beneficial to think of it as this entire system of channels and ducts from the liver to the small intestine.

The function of bile is much broader than simply emulsifying fats. It also serves as the bodies natural laxative, helping to moisten and lubricate the GI and stimulate peristalsis. It also serves as a detoxifying pathway from the liver to relieve the body of fat soluble toxins that are unable to be made water soluble and be excreted in the kidneys. An important facet of bile physiology is that much of it is reabsorbed in the large intestine and recycled for future use. We can decipher much of the health of the gall bladder and bile through simple observation of the stool: copious, watery, yellow stool indicates an excess of bile, dry, pale colored stool indicates a bile deficiency.

Like the liver and the rest of the GI, the gall bladder is intimately innervated by the autonomic branch of the nervous system and is active during parasympathetic neural activity. Thus it is “off” during the sympathetic state and here we have another testimony as to how excess stress and hyperadrenalism/hyperthyroid have an adverse impact upon the digestive function as a whole. When the sympathetic nervous system is over active, there is a reflex tension that ripples through the entire hepatic system, including the liver and gall bladder, as well as the gastrointestinal tract.

**Pathological Patterns and Tissue States**

Because the liver is so important to our overall digestive and metabolic functioning of the body it holds an important seat for governing our health and vitality. A concept in various traditional systems of medicine is the “bad blood” syndrome, whereby the liver’s metabolic fire is diminished, leading to poor breakdown of waste products and nutrients, accumulation of metabolic byproducts (toxins), and an ultimate accumulation within the blood, lymph, spleen, kidneys, digestion and skin. This has variously been called bad blood, toxic blood, stagnant liver, or humors in the blood. In Ayurveda this is called “ama” or toxin accumulation due to low agni, or digestive fire. This is the pattern which requires a class of medicines call “alteratives.”

I like to think of this as analogous to the burning in a wood stove. If we have good dry, seasoned wood, our stove burned hot and clean. If we have green damp wood, the fire burns low, slow, and accumulates soot within the stovepipes, clogging it. If we think of this occurring in the body, we see that various channels in the system get “clogged” with waste products which can in fact “catch on fire” within the body, leading to inflammation, and oxidation of tissues. This is often called the “damp/heat” pattern in Chinese Medicine. These accumulations stagnate the channels of elimination: skin, lungs, kidneys, and intestines, which
is where we often see symptoms, especially the skin, like eczema and psoriasis. These symptoms can also commonly appear in hypothyroidism, which will be explored in a later lesson on the endocrine system.

Modern medicine primarily recognizes structural changes to the liver, such as cirrhosis or hepatitis, but in traditional models there is a much deeper understanding into liver pathology based on underlying energetics and whole system interactions. If we think of the liver as the central organ responsible for cellular nutrition and detoxification for the organism as a whole, we start to get a picture as to its importance in the maintenance of our health, as well as it's potential pathologies.

In regards to the gall bladder, symptoms typically boil down to improper management of the bile: over-secretion, under-secretion, or improperly timed secretion. We can see many digestive imbalances due to poor gall bladder function, such as indigestion (especially with rich, fatty or oily foods), diarrhea (over-secretion), and constipation (under-secretion).

- **6 Tissue States**
  - **Heat/Excitation:** With the gall bladder and liver, this is marked by an overstimulation and overproduction of bile. The sac and ducts become hot, inflamed, and tend towards cramping and spasm due to an increased sensitivity. There may be a tendency to cook down bile and concentrate it too much. The liver can express heat/excitation due to a widening of the hepatic artery, bringing too much oxygen and blood to the liver, leading to quicker breakdown of enzymes. Eating an excessive diet that is too rich, fatty and oily would lead to this artery opening wider, as the parasympathetic is overactive and relaxes the hepatic artery. Hormonal excess can lead to excitation of the liver, as it is overstimulated to process and break them down (think of menopause or puberty). As heat rises, this produces a symptomatic picture in Chinese Medicine called “liver fire rising,” which can produce systemic heat signs, redness, sweating, fever, anger, and frustration. There is often sensitivities to light, sound and touch. Here we want to use cooling, bitter, sedative remedies like Yarrow (*Achillea millefolium*) or Burdock (*Arctium lappa*). For the gall bladder Wild Bergamont or Sweet Leaf is a specific (*Monarda fistulosa*). In it’s most intense state, heat/excitation/irritation in the liver manifests as hepatitis.

  - **Cold/Depression:** When we think depression, we want to think that the overall function of the organ is not operating well- it is weakened. Thus, when the liver becomes depressed, it is unable to metabolize nutrients/poisons effectively which allows them to seep into the bloodstream and have a systemic effect. We can also see that the cells of the body may not receive optimal nutrition and become deficient and weak, and there may be low production of bile. This tissue state may show as dark brown to black spots on the tongue and will generally reveal as coldness in the constitution. We may see psychological tendencies towards despair depression, discouragement and an inability to be “fired up.” Pungent, oily, warming remedies are indicated here, like Turmeric (*Curcuma longa*), Angelica (*Angelica spp.*), Sage (*Salvia spp.*), Oregano (*Origanum vulgare*), Rosemary (*Rosmarinus officinalis*), and Thyme (*Thymus vulgaris*), as well as some of our
stronger liver stimulant remedies, such as Blue Flag (*Iris versicolor*), Greater Celandine (*Chelidonium majus*), and Fringe Tree (*Chionanthus virginicus*).

- **Dry/Atrophy:** In the gall bladder we will see stone formation due to bile retention and “over cooking.” There will be general weakness in the gall ducts and smooth muscle responses to release the bile. If the liver is functioning low, it will then atrophy the gall bladder for it is not receiving the stimulation it needs with adequate bile flow. We can often see this accompanied by low will power, personal power and vital reserve. When the liver becomes deficient in its functioning, the entire body suffers from malnutrition and low metabolism. There will oftentimes be dry and pale skin, constipation and dry light colored stool, dry tongue, and often a vata type constitution. The most intense form of liver atrophy is cirrhosis. Our classic dry liver remedy is Burdock (*Arctium lappa*), but we can also use the demulcents like Marshmallow (*Althea officinalis*) and Licorice (*Glycyrrhiza glabra*). Milk Thistle (*Silybum marianum*) is of course our classic remedy for atrophy in the liver. For foods, Beets are great to eat, as they are sweet and moistening.

- **Damp/Stagnation:** Anatomically the liver is prone towards stagnation due to the venous circulation being much more prominent that arterial circulation, as well as the fact that the blood needs to flow upwards against gravity (venous blood from GI). Remember this tissue state is also called “toxic” and thus has a profound impact upon the liver. After a meal, it is standard for the liver to become slightly congested, as it is full of nutrients, toxins and fresh oxygenated blood... there’s a lot going on there! But with overconsumption of foods, drugs, alcohol, and other things that stress the liver, it can become chronically congested. There is an accumulation of waste products in the liver and portal circulation, which leads to toxicity in the bloodstream, lymph, kidneys, and ultimately the skin- hence chronic skin conditions are common. There is often an acidic pH in the body, and the tissues become weak, atrophied, full of stagnant fluids and generally congested. There is typically mental dullness, depression, weakness, and difficulty rising upon waking (as well as more energy at night that keeps them up). Here we will see a thick heavy coating on the tongue. This tissue state finds some of our classic liver alterative remedies like Dandelion (*Taraxacum officinale*), Goldenseal (*Hydrastis canadensis*), and Oregon Grape (*Mahonia aquifolium*). Stagnation in the liver can also be successfully worked over with St. John’s Wort (*Hypericum perforatum*), especially accompanied by depression.

- **Damp/Relaxation:** The old doctors called this “passive congestion” of the liver and is oftentimes associated with the venous side of circulation. Essentially there is a lack of tone to the circulation causing a general stagnation of blood in the portal vein. There can be abdominal distention due to water retention, psychological depression and dullness, headaches and sallow complexion. This can be accompanied by overall venous relaxation/stagnation such as hemorrhoids, varicose veins, and edema, or prolapsed organs. Laxity in the gall bladder will allow it to fill to the brim with bile, and won’t be able to contract to squeeze it’s contents into the duodenum. Classic herbs here are Horse Chestnut (*Aesculus hippocastanum*), Oak (*Quercus alba*), Red Root (*Ceanothus americanus*), and Sage (*Salvia spp.*). Note these are all astringent remedies.
• **Wind/Tension:** The liver is strongly influenced by the nervous system due to its contracting/dilating effect on arterial circulation (which directly feeds the liver). So while not “directly” affecting the liver, tension in the circulation still has a powerful impact upon the liver. This is where we see intermittent fever, or alternating chills and fever affecting the liver, as well as general malaise, headache, night sweats, and tenderness in the liver area. Matthew Wood states, “the gall bladder is the flagship of the parasympathetic branch of the autonomic nervous system. Whenever there is a problems switching to the parasympathetic there will be symptoms in the gall bladder.” Here we see gall bladder colic and spasm, usually associated with stones. Excess wind in these organs generally comes alongside psychological tension. Remedies specific for this tissue state in the liver are Boneset (**Eupatorium perfoliatum**), Agrimony (**Agrimonia eupatoria**), Wild Yam (**Dioscorea villosa**), Chamomile (**Matricaria recutita**), Blessed Thistle (**Cnicus benedictus**), Hops (**Humulus lupulus**), and Blue Vervain (**Verbena hastata**). Think bitter nervines!

Of primary importance in determining the tissue state of the liver is to decipher whether it is overactive (excess/excitation/heat) or stagnant (deficient/cold/damp).

• **Other Patterns:**

  **Damp/Heat:** This is a major pattern to consider in regards to liver energetics and it’s systemic effects upon our entire physiology. This pattern is said to arise through imperfect digestion of foods, which then enter the system not fully processed, congeal and lodge themselves within the tissues and initiate an inflammatory or heat response. This is what is called *ama* in Ayurvedic Medicine and is formed through low *agni* or digestive fire (which includes not just the digestive system and liver, but also the metabolic flame of each cell in the body). Signs of this will be: fluid retention, they will look puffy, feel stuck and heavy in their body, sluggish metabolism and energy, have headaches, constipation, poor digestion, and thick coating on the tongue (white if cold, yellow if heat) with obscure pulse.

As the digestive system becomes depleted and deficient, we see this dampness begin to accumulate within the system. This can begin with mild digestive complaints, progress to heavy, sluggish energy and clouded thinking, to joint pain and muscle aches, into gall stones and eventually tumors and growths. Thus at the root is correcting the digestive system, primarily through the elimination of potential food intolerances, and then using herbs to relieve the dampness by building the digestive fire. In Chinese Medicine this is about treating the spleen (note Chinese spleen, not the physical spleen). In Ayurveda this is working with *agni* or digestive fire, and in traditional western herbalism it is removing canker and restoring the “fountain of life.”

Essentially what we are seeing is an accumulation of metabolic waste products within the extracellular fluids, which is the state of dampness. This initiates an immune response in order to purge the area of the toxins which creates heat. Classically these states were initiated more in the wintertime months when fresh food was sparse and they ate preserved foods and meats, with little fresh plants. It was generally a relatively acidic kind of diet. Hence the development of “spring tonics” to help clean out the dampness, cool down any excess heat.
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**Stuck Liver Chi:** This is essentially tension and an overall sense of stuckness in one's life. It accompanies anger, depression, and frustration, stiff neck, and tension headaches. If we think of the liver as having a certain amount of vital force within it, and there's tension constricting that flow of vitality then it's going to back up in some way and divert into other directions to express itself. We can think of this as the Chinese reflection of wind/tension.

**Liver Fire Rising:** Typically this goes along with stuck liver chi. There will be an excess amount of heat in the abdomen area which can reflex into the head, showing as excess blood flow to the head (fire rising), leading to headaches, acne, allergies, burning pain, burping, acid reflux etc.

**False Cold:** Sometimes you can see people who have heat signs all over, yet they still have cold hands and feet.

The above patterns often are completely eliminated with the removal of a food allergen or because of the introduction of exogenous hormones (estrogen, birth control etc.)

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**Evaluation Criteria**

Primary signs and symptoms of minor liver/gall bladder malfunctioning are:

- Indigestion with a sensation of fullness in the upper part of the GI and chest. To the point where it can be hard to breathe.
- Nausea and the overall sensation of queasiness
- Intolerance of fats and oils, alcohol and caffeine
- Bad gas and bloating after meals
- Oil slicks and fat droplets in bowel movements (low bile)
- Lethargy in the morning, difficulty rising, foggy headed. The nighttime phase of the liver didn't work properly.
- PMS and erratic menstrual flow (alternating heavy/slow)
- Frustration, anger, stagnant depression (more vitality underneath it), worrying about the future, boundary issues, indecision.
- Constant sighing
- **Headaches,** migraines. Especially when accompanied with heat signs and fullness
- **Skin conditions:** rashes, eczema, psoriasis
- Paradoxical signs of hot and cold. False cold in TCM (cold hands and feet but everything else is hot). Stuck liver chi.
- Pain in the right upper quadrant of the torso
- Pelvic and portal congestion and hemorrhoids.
- Changes in vision, dryness and wetness, over sensitivity to light
- Itchiness (called “pruritis”) can indicate liver/gb stuff.
- According to Margi Flint, an excess of ear wax indicates gall bladder stuff.
**Tongue:** The location for the liver and gall bladder on the tongue is in the middle 3rd along the sides. Look to see if there are any signs of redness, yellow-brown-orange coloration which will indicate heat signs. Streamers may indicate relaxation and fluid leakage. Dryness = atrophy. Heavy thick white coat indicates cold/depression and damp/stagnation. Remember this is all along the sides of the tongue, specifically in the middle 3rd.

**Face:** A central vertical line above the nose and in between the eyes is a liver line. The gall bladder has a line next to it on the right that moves to the edge of the eye (if you are looking at someone’s face- close to the clients left eye). We also want to observe the temples and notice if it is particularly dry or oily, and especially if there are any pimples there. This indicates the quality of oil/fat metabolism in the body. Roughness may indicate gall stones. Another sign for gall bladder issues is dandruff, which sticks to the hair, especially three fingers of the hairline from the forehead. For gall bladder look for yellow coloration of the skin, eyes and tongue.

**Pulse:** The pulse position for the liver is the middle position on the left wrist, deep, the gall bladder is the same except the superficial level.

**Other:** The bottoms of the fingernails may appear blue in color with liver chi stagnation.

**The Energetic System**

The liver is a truly “alchemical” organ, in the sense that it’s sole purpose is separating, purifying and recombining the various biochemical elements of the body. As the hottest organ of the body, it can be likened to as the “alchemical furnace” of the solar plexus, or the crucible of transformation. It is an aspect of agni (or digestive fire), to use Ayurvedic terminology, but the liver focuses it more inwardly, whereas the agni of the stomach proper radiates heat out to the periphery. If the metabolic fire of the liver is deficient, it burns too low and foodstuffs are not properly metabolized and processed, creating stagnation and depression of this all important organ. This in turn impacts the blood, lymph, spleen, digestion, skin and pretty much every other part of the body.

In many traditional models of medicine, the liver holds the emotional patterns of anger, frustration, tension and depression. This holds true to the Chinese and Greek traditions. Because the liver is such a hot organ (as a seat of Fire) and because it is so intimately connected to the autonomic nervous system, it naturally produces “hot” emotions like anger. When the autonomic nerve function is out of whack, the balance of toxic portal blood draining from the GI, and fresh oxygenated blood from the hepatic artery is out of balance. Excessive oxygenated blood makes the liver hot (anger, frustration) and excessive portal blood makes the liver depressed/cold (depression). Thus there is a strong emotional component to the health of the liver which can be key diagnostic criteria into assessing its underlying energetics.

We can think of this in relationship again to the neural component of these organs. With sympathetic excess, the liver and gall bladder become tense and constricted, which then reflects up into our psychology. In Chinese Medicine the gall bladder is associated with unexpressed anger whereas the liver is “unchecked” anger.
Let’s quickly take a look at the astrological perspective on these organs. The planetary ruler of the liver is Jupiter and it’s Sign association is Virgo. Jupiter is the Planet of expansion, radiance, good luck and joy. Naturally when the liver is congested we are not feeling that way, but rather are contracted, angry and frustrated. In the Qabalah, Jupiter is related to Chesed, the sphere which gathers the celestial energies and organizes them into an archetypal blueprint which holds the seed for physical matter. The liver does this in a way, as it receives all of the nutrients and toxins from the GI and organizes and distributes them throughout the system for metabolism. Virgo, the Sign of purification naturally relates to the liver especially in the way she likes organization and structure.

The gall bladder is associated with Mars, as it is the seat of our willpower, personal strength and determination. It’s relationship to Saturn is primarily through it’s Sign rulership of Capricorn, also in the sense that a primary health problem with the gall bladder is the formation of stones, which are ruled by both Saturn and Capricorn. Interestingly enough, in gall bladder issues there may be issues with the outside area of the front of the knees. The knees in general are ruled by Capricorn. Capricorn also relates to “iron clad will” that is determined to make it to the top of the mountain, to push through struggles and challenges and achieve ones destiny... they are willing to put the hard work into it and don’t sit idly dreaming.

**Primary Herbal Actions**

- **Bitter Tonic:** This is a relatively general term which refers to the plant not only having a bitter taste, but also a general action upon the GI tract by increasing secretions. This can be HCl in the stomach, pancreatic enzymes, and bile product and release from the liver and gall bladder. *Anything* that tastes bitter has an impact on the liver. Oftentimes they are cooling and draining, though some remedies are not and can actually be used in dry conditions, such as Oregon Grape (*Mahonia aquifolium*).

- **Alteratives:** These are our traditional detoxifying remedies which open the channels of elimination and purge excess dampness from the body and cool excessive heat (damp/heat). William Cook’s definition of an alterative is: “Herbs which normalize the metabolism by supporting nutrition, or by promoting the bodies natural mechanisms of detoxification, and which act slowly, steadily, and moderately in improving the quality of the circulating fluids.”

This is a very broad term which includes within it many sub-actions, such as lymphagogue, diuretic, expectorant and laxative. The channels of elimination in the body are the skin, lungs, bowels, and kidneys, with different alteratives having different organ and system affinities. These are generally discussed here in regards to the liver because *many* alteratives are bitter in
nature and have an impact upon the liver. People that need alterative remedies typically need warming digestive stimulants that will rekindle the digestive fire. It’s worth noting here that many times alterative herbs are excellent for use in hypothyroidism.

We can see a very broad spectrum of remedies under this category, such as Dandelion (Taraxacum officinale), Red Clover (Trifolium pratense), Echinacea (Echinacea angustifolia), Nettle (Urtica dioica), and Kelp (Fucus vesiculosus).

Generally speaking, we can think of our alteratives within a handful of categories: immunological effects (Echinacea, Garlic, Elder), nutritive tonics (Nettle, Red Clover, Alfalfa), lymphagogues (Blue Flag, Red Root, Red Clover, Cleavers), hepatic alteratives (Yellow Dock, Oregon Grape, Dandelion, Calendula, Burdock), kidney diuretics (Cleavers, Burdock, Blue Flag, Dandelion, Nettles)

Because this is such a broad spectrum category, alteratives are oftentimes given in formulas to lend the broadest spectrum of action to effect the entire ecological system of the client.

- **Cholagogue:** This action denotes the specific secretion of bile from the gall bladder at the point of emptying the contents of food from the stomach into the small intestine. Many cholagogue remedies are strong bitters, and some have relaxant or anti-spasmodic effects. It can easily be confused with the next action, choleretic- my little trick for remembering the difference between them is that the word **cholagogue** has the letter “g” in it like the gall bladder.

- **Choleretic:** Increases the production and flow of bile from the liver into the gall ducts and gall bladder. We can think of it being like a “diuretic for the liver.” So whereas a cholagogue focuses on expulsion of the bile from the gall bladder specific, choleretics specifically increase production of bile in the liver. Many times these actions are used interchangeably and oftentimes a remedy with one property will have the other.

- **Bitter Nervine:** The bitter nervines are a branch of the nervine category which have a specific energetic property to them which combined the bitterness. These are especially useful here in treatment of the liver and gall bladder because as we have seen, the autonomic nervous system is intimately linked to the digestive system as a whole, and the flow of blood into the liver. These remedies can help to relax the central nervous system and hyperadrenalism, and move stagnant liver energy. Good examples of bitter nervines are Hops (Humulus lupulus), Skullcap (Scutellaria lateriflora), Blue Vervain (Verbena hastata), Motherwort (Leonurus cardinalis), and Valerian (Valeriana officinalis)- though Valerian is bitter it is also pungent, aromatic and carminative, whereas the other 4 are truly bitter.

- **Relaxant/Anti-Spasmodic:** This can be a useful action especially in cases of tension afflicting the liver or gall bladder, especially in cases of stones in the gall ducts. Our 2 primary ones here are Lobelia (Lobelia inflata) and Wild Yam ( Dioscorea villosa).

- **Anti-lithic:** This action denotes a plant that will facilitate in the removal of stones from the gall ducts. A classic physiomedicalist remedy here is Fringe Tree (Chionanthus virginicus).
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- **Circulatory Stimulant:** Circulatory stimulants can be highly beneficial especially during a state of sympathetic excess when the liver is deficient in oxygen rich blood, making it prone to stagnation. Those with high amounts of oils will be good here as they will have a great liver/gall bladder affinity, such as Thyme (*Thymus vulgaris*), Oregano (*Origanum vulgare*), and Sage (*Salvia spp.*).

- **Anti-Inflammatory**

- **Hepatoprotective:** Protects the liver from oxidative damage or injury. This can be beneficial with multiple tissue states afflicting the liver, but we see oxidative damage being primarily associated with inflammation and thus heat/excitation. Classic remedies here are Milk Thistle (*Silybum marianum*), Licorice (*Glycyrrhiza glabra*), Reishi (*Ganoderma lucidum*) and Schizandra (*Schisandra chinensis*).

- **Hepatotrophorestorative:** This action restores the function of an atrophied liver. This is primarily used in extreme conditions such as cirrhosis where the liver is full of scar tissue from chronic inflammation and loss of liver function. Again we see Milk Thistle (*Silybum marianum*) and Schizandra (*Schisandra chinensis*) being primary remedies in this category.

- **Common Symptoms and Some Materia Medica**
  
  An important factor to consider in the symptomatic picture of liver pathology is to remember that anatomically it is located much higher than most people think. Often liver pathologies will have symptoms of fullness in the chest or what some people may even mistake as a heart sensation.

  **“Toxic Liver”/Bad Blood:** Some standard symptoms associated with overall stagnation in the liver are: general indigestion, headaches, constipation, hyperactive sensitivities (foods, environmental factors etc.), depression, chronic skin conditions (eczema, psoriasis, acne), hormonal imbalances, fatigue, hemorrhoids, and joint pain. That’s a lot of symptoms!! Signs and symptoms can progress from superficial levels to deeper levels of expression- from swollen glands and acne to chronic infections to tumors. In this way understanding the liver can be really important for assessing the overall health of someone.

  In traditional systems of medicine, from Ayurveda and Chinese Medicine, to Greek Humoral Medicine and Physiomedicalism, there is a concept of systemic toxicity- essentially an excess of dampness accumulation within the organism, often accompanied by heat (damp/heat). The body is unable to rid itself of normal metabolic waste products. Note this is very different from our modern interpretation of “molecular toxicity” such as Mercury poisoning and pesticides. This is a major issue in modern herbalism, especially in the products industry, whereby traditional detoxifying herbs for damp/heat (alteratives) are given to people trying to get rid of pesticides from their liver- completely ignoring the constitutional effects of these plants. Maintain an ecological perspective of medicines.

  An important point in regards to the “blood” here is that we are not just discussing the red blood flowing through the circulatory system, but rather the extracellular fluid which
nourishes every cell, tissue, and organ in the body in the form of oxygen and nutrients. This extracellular fluid can be thought of as the inner ocean. The extracellular fluid is of the highest importance to the vitalist practitioner because it is what determines the health of the cells. When this extracellular fluid becomes stagnant, toxic or its composition is in some way “deranged” it was traditionally called “bad blood.” Typically this manifests as skin conditions and was treated with alterative herbs. Bad blood can be generated through stagnation of the lymphatic fluids, chronic infections, poor liver metabolism, nutrient deficiencies, sluggish circulation, chronic dehydration, and general low metabolism causing inadequate detoxification of standard metabolic waste products.

It’s helpful to think of this system as the blood in the vessels, which moves into the extracellular fluid via the capillaries, and then the lymphatic fluids which clean the area. This all feeds into the liver for final metabolism, the immune system which is present in the extracellular and lymphatic fluids, and the kidneys and bowels for excretion. I know we’re talking about things outside of the realm of the liver, but it is important to discuss as it all ties into liver health (it’s really hard to separate a part of the body from the whole!).

Thus we can see that when we say “bad blood” we are really talking about our metabolism as a whole. Conversely, when someone says “toxic liver,” they are not just referring to the organ itself, but to the entire portal circulation, the gall bladder, and the state of the colon itself. The state of intestinal health primarily determines the health of the liver.

**Constipation and Diarrhea:** These symptoms can arise due to hepatic and gall bladder insufficiency, their treatment is discussed under the digestive system. Though it is worth mentioning here that if constipation is due to liver/gall bladder issues, then it is primarily treated with bitters (for constipation). Diarrhea due to excessive gall bladder secretions may be corrected with nervines to reset the autonomic response.

**Jaundice:** Jaundice is technically a symptom not necessarily a disease unto itself. It is marked by a yellow discoloration of the skin and the sclerae of the eyes due to an accumulation of bilirubin throughout the circulatory system. This occurs because of an underlying blockage in the gall ducts, causing bile to congest, stagnate, and enter the bloodstream where it deposits into the tissues, giving it a yellow hue. There if often portal venous congestion, hepatic swelling, poor digestion of fats and oils, and dry pale stools. Congestion of the gall ducts in this way can occur due to the formation of a gall stone, with accompanying spasm and extreme pain.

Jaundice is relatively rare these days, but people with severe liver/gall bladder disorders may present with this picture. Any yellow discoloration of the skin and the eyes indicates this. It is often treated by the use of strong bitter cholagogue remedies, as well as liver relaxants to ease the tension. Some plants here show indications through their signature of yellow coloration such as Dandelion root (flowers are yellow), Oregon Grape (*Mahonia aquifolium*), Greater Celandine (*Chelidonium majus*), and Turmeric (*Curcuma longa*). Blue Vervain is also a traditional specific used for jaundice, as it combines a strong bitter tonic and hepatic action, combined with a relaxant nervous effect to kickstart the parasympathetic response. Alterative and lymphatic remedies should also be considered to help with general detoxification.
Cholelithiasis (gallstones): My first client ever had gall stones and it was rather shocking to see how excruciatingly painful it was! Just as the name implies, gall stones are small gravel-like substances that get lodged in the ducts of the gall bladder, causing first poor secretions into the small intestine, and second initiating a strong spastic response in the smooth muscles of the ducts as the vital force of the body attempts to throw off the stone. Think of squeezing down on 3D shards of glass... ouch.

This typically occurs when the bile sits in the gall bladder for too long, cooking it down and concentrating it to the point that the salts precipitate out, but it can also be to poor evacuation of the bile (leaving too much behind), overall fluid accumulation and stagnation in the tissues, or excessive heat and inflammation. Gall stones can vary in size, from multiple grains of sand, to even as large as a golf ball! High cholesterol, low fiber, and a generally poor diet are often major contributing factors to formation of stones. Often times there is referred pain going up the right shoulder blade alongside a crushing headache.

Another major issue with gall stones is that when they block the sphincter of Odi, which is where the common bile duct joins the duodenum, pancreatic enzymes essentially have no where to go. Remember, pancreatic enzymes digest proteins, fats, and starches among other things. These enzymes can then flow back into the pancreas creating pancreatitis (which can kill you rather quickly), and flow up into the gall bladder to begin dissolving the walls of the gall bladder. This is very serious and why doing a “gall bladder flush” can be extremely dangerous unless you really know what you are doing.

Treatment of gall stones involves the use primarily of ant-spasmodic remedies to reduce the spasms associated with it. A few specifics here are Wild Yam (Dioscorea villosa), Lobelia (Lobelia inflata) and Crampbark (Viburnum opulus). It can also be useful to use nervines to relax the nervous tension associated with gall stones, and liver/gall bladder relaxants such as Fringe Tree (Chionanthus virginicus) and Agrimony (Agrimonia eupatoria).

Cholecystitis: Remember anything ending with “itis” indicates inflammation. Thus here we have inflammation of the gall bladder, which oftentimes accompanies the presence of a stone. There may be nausea and vomiting accompanying cholecystitis, and typically right upper quadrant pain radiating up the shoulder blade and producing headaches. Here we want to reach for some simple anti-inflammatory remedies such as Turmeric (Curcuma longa), Yarrow (Achillea millefolium) and Chamomile (Matricaria recutita), as well as hepatic relaxants like Fringe Tree (Chionanthus virginicus), Agrimony (Agrimonia eupatoria), and Wild Yam (Dioscorea villosa). Gentle bitters like Dandelion root (Taraxacum officinale) can also be beneficial. The old Eclectic physicians also used Goldenseal (Hydrastis canadensis) and Lobelia (Lobelia inflata) in their formulations.

Biliousness: This is a term used by the old doctors which denotes indigestion associated with disordered functioning of the gall bladder. Traditionally it was associated with a certain “short circuiting” of the nervous system, where the autonomic functions is stuck in the sympathetic state. This was common in the old days due to malarial fever, which you’ll see in old books called “intermittent fever,” that is, one characterized by strong alternating chills and fever.
This state caused the nervous system to get “stuck.” Symptoms would often be characterized by alternating diarrhea and constipation, bile regurgitation and reflux, poor digestion in general (cramping, bloating, gas etc.), headaches, poor vision, and yellow discoloration of the skin.

**Hepatitis:** This is one of our most serious liver diseases and is marked by elevated liver enzymes and high levels of inflammation in the liver. It ultimately ends with necrosis (tissue death) and deterioration. There are different forms of hepatitis, from alcohol induced to viral infections. In general, Milk Thistle (*Silybum marianum*) is a highly supportive remedy here, as is Dandelion root (*Taraxacum officinale*), Fringe Tree (*Chionanthus virginicus*), Licorice (*Glycyrrhiza glabra*), and Turmeric (*Curcuma longa*). It’s important to note that this is a serious liver disease and should probably be treated and overseen by an experienced practitioner.

**Cirrhosis:** This is our other major liver disease, characterized by depressed function of the liver, tissue atrophy, fibrosis, and necrosis. It is typically associated with excessive consumption of alcohol. Again Milk Thistle is a primary remedy, along with some standard gentle bitter tonics like Dandelion and Artichoke.

**Healing Strategies**

The “oil change”
B Vitamins
Coenzyme Q-10
Vitamins A and C
Magnesium
Gut restoration protocol- heal leaky gut.
Reduce toxic load on the liver: heal leaky gut, reduce bowel toxicity (address chronic constipation), eat clean diet

**Lifestyle Factors**

Stress management
Diurnal rhythm- going to bed early and rising early. Being asleep before midnight at the latest!

**Materia Medica**

A good way of thinking through our liver materia medica is by the varying level of intensity of the effect of the herbs on the liver. Some are quite strong and stimulating, others more mild in their effects. I once heard the liver referred to as like a sleeping dog, you don’t want to startle it as it might get angry. Rather it’s more beneficial to take a gentle approach. Again it’s very important to take into consideration whether the liver is in a stuck, deficient, cold, stagnant state, or if it is in an excessive, excitation, hot, and tense state. If you give the wrong herb for the wrong person, it may likely make them feel worse!

Aromatic Bitters (more warming than true bitters)
Calamus (*Acorus calamus*)
Angelica (*Angelica spp.*)
Wormwood (*Artemesia absinthium*)
Mugwort (*Artemesia vulgaris*)
Chamomile (*Matricaria recutita*)
Yarrow (*Achillea millefolium*)

**True Bitters** (typically cooling and drying)
Gentian (*Gentiana lutea*)
Dandelion (*Taraxacum officinale*)
Oregon Grape (*Mahonia aquifolium*)
Goldenseal (*Hydrastis canadensis*)

**Bitter Nervines**
Hops (*Humulus lupulus*)
Blue Vervain (*Verbena hastata*)
Motherwort (*Leonurus cardiaca*)
Chamomile (*Matricaria recutita*)

**Mild Liver Stimulants**
St. John’s Wort (*Hypericum perforatum*) - specific for liver stagnant depression
Rosemary (*Rosmarinus officinalis*)
Burdock (*Arctium lappa*)
Turmeric (*Curcuma longa*)
Calendula (*Calendula officinalis*)
Yellow Dock (*Rumex crispus*)
Dandelion (*Taraxacum officinale*)
Red Root (*Ceanothus spp.*)
Oregon Grape (*Mahonia aquifolium*)
Lemon juice and olive oil

* According to both Paul Bergner and David Winston, both Calendula and St. John’s Wort can be used in both excess and deficient liver conditions.

**Stronger Liver Stimulants** (use in lower doses and with more caution, esp. in inflammation)
Blue Flag (*Iris versicolor*)
Greater Celandine (*Chelidonium majus*)
Fringe Tree (*Chionanthus virginicus*)
Wormwood (*Artemesia absinthium*)
Goldenseal (*Hydrastis canadensis*)
Boneset (*Eupatorium perfoliatum*) this is I would say is in the middle, not as strong as Iris, Celandine or Fringe Tree

**Liver Relaxants**
Rosemary (*Rosmarinus officinalis*)
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Peony (Paeonia officinalis)
Lavender (Lavandula angustifolia)
Skullcap (Scutellaria lateriflora)
Wild Yam (Dioscorea villosa)
Valerian (Valeriana officinalis)
Agrimony (Agrimonia eupatoria)

Liver/Portal Venous Tonics
Goldenseal (Hydrastis canadensis)
Witch Hazel (Hamamelis virginiana)
Stoneroot (Collinsonia canadensis)
Horse Chestnut (Aesculus hippocastanum)
Yarrow (Achillea millefolium)
Red Root (Ceanothus americanus)

Cholagogues/Choleretics (these are typically liver stimulants)
Fringe Tree (Chionanthus virginicus)
Goldenseal (Hydrastis canadensis)
Gentian (Gentiana lutea)
Dandelion (Taraxacum officinale)
Oregon Grape (Mahonia aquifolium)
Gravelroot (Eupatorium perfoliatum)

Simple Formulations
For a comprehensive liver formula we want to take into consideration again the fact that it is intimately linked with the spleen, intestinal tract and portal circulation. We want to thus take all of these factors into consideration for a liver formula, as well as the underlying energetics—are we treating a stagnant deficient damp liver, or are we treating an excessive inflamed excited liver? We typically want to include a circulatory stimulant, a bitter cholagogue and choleretic, perhaps an anti-inflammatory, and a hepatoprotective remedy. Because so many bitters are cooling, and liver issues come alongside digestive upset, putting some nice warming carminatives can be highly beneficial. If you can choose bitters and carminatives which also relax the autonomic nervous system the better.

We also want to think about using tonic remedies to astringe any lax tissues in the portal system, as well as anything that might relax any tension in the system- which is a bit of an anomaly, to have a relaxant and a tonic at the same time. A good example of this is Agrimony (Agrimonia eupatoria), and Rosemary (Rosmarinus officinalis).

Gentle Liver Bitter
Dandelion root (Taraxacum officinale)
Oregon Grape (Mahonia aquifolium)
This is a great foundation for a liver formula... it is really archetypal. It is not just acting upon the liver, but the kidneys and urinary tract, the skin, the lymphatic system, and the portal circulation.

**Stronger Liver Stimulant**
Greater Celandine (*Chelidonium majus*)
Fringe Tree (*Chionanthus virginicus*)

*Note: this is a strong pair and should typically not be used often.... gentle does it.

**Hepatoprotective Formula**
Milk Thistle (*Silybum marianum*)
Schizandra (*Schisandra chinensis*)

**Liver Inflammation Compound**
Turmeric (*Curcuma longa*)
Licorice (*Glycyrrhiza glabra*)

**Liver Relaxant Compound**
Lavender (*Lavandula angustifolia*)
Skullcap (*Scutellaria lateriflora*)
Blue Vervain (*Verbena bastata*)
Rosemary (*Rosmarinus officinalis*)

**Portal Vein Decongestant/Tonic**
Horse Chestnut (*Aesculus hippocastanum*)
Red Root (*Ceanothus americanus*)

**Bitter Nervine Relaxant**
Blue Vervain (*Verbena bastata*)
Motherwort (*Leonurus cardiaca*)

This is just a simple example of some pairs for various dynamics around the liver and the gall bladder. Of course a client typically presents more complex symptomatic pictures that requires a few more herbs that can be added to modify, alter or enhance the formula in different directions and to focus on different symptoms.

**General Alterative Formula**
Echinacea (*Echinacea angustifolia*) immune stimulant, lymphagogue, circulatory stimulant
Dandelion (*Taraxacum officinalis*) liver stimulant, bitter tonic, diuretic
Burdock (*Arctium lappa*) alterative, blood purifier for skin, lymphagogue, diuretic
Yellow Dock (*Rumex crispus*) liver stimulant, bitter tonic
Red Clover (*Trifolium pratense*) lymphagogue
Nettle (*Urtica dioica*) diuretic, nutritive tonic
Sassafras (*Sassafras albidum*)  
circulatory stimulant