An Herbalist's View
The Liver

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A Few Proceeding Notes

The liver is the heaviest of all glands (approximately 3 lbs.) and is the largest organ after the skin. The size of the liver reflects the amount of work it performs and the diversity of functions that it carries out in the body. One of the more interesting aspects of the liver is its regenerative ability, that is, its capacity to re-grow its cell population after injury or surgery. This faculty is important, as the liver, a major detoxification organ, bears the brunt of clearing the body of toxins and other waste material. Hence it can initiate self-repair after it has been damaged by these substances.

Categories

1. Aromatic bitters
2. Cholagogues
3. Constitutional tonics
4. General liver tonics
5. Liver purgatives

The Role of Bitters

Bitters have been historically used to treat a wide range of liver ailments, especially as they pertain to its digestive functions. Bitter plants are still one of the main categories of liver remedies, For both acute and chronic hepatic ailments. The bitter flavor stimulates secretions, notably bile, and increases the breakdown and absorption of fats. Bitter plants may be categorized depending on their action. Probably all bitters increase some hepatocyte (and other GI tract) stimulation, though depending on the chemical nature of the bitter it may have weaker or more potent effects.

It is important to note that bitters are not for everyone. As they increase secretions, they can be drying and increase a deficiency of fluids for those body types prone to dryness. They can also overstimulate the digestive process.

Also, some of these herbs can stimulate liver function, something you may not want to for some forms of liver disease such as a hepatitis flare-up.

Aromatic bitters-these bitters are considered warming and stimulating and are useful for gastric pain and to stimulate digestion. They are found in most commercial aromatic bitters.

Angelica
Calamus
Citrus peel
Galangal
Ginger

Cholagogues-are bitter and stimulate the release of bile from the liver and gall bladder. They increase intestinal digestion of fats and also increase the livers' eliminative processes.

Artichoke	Curly dock	Goldenseal	Vervain
Barberry	Dandelion	Greater celandine	Wahoo
Blue vervain	Figwort	Oregon graperoot	Yellow dock
Bogbean	Fringe tree	Toadflax	
Buttonbush	Gentian	Turtlehead	

General liver tonics-these remedies are generally used as long-term tonics to help restore liver function after damage and toxicity. They are antiinflammatory and may be helpful for various types of liver disorders. These may with the liver's detoxifying function.

Artichoke	Milk thistle
Chicory	Tumeric
Dandelion	

Constitutional tonics-where hepatocyte stimulation is indicated. Generally these bitter herbs are given in small regular doses. Use these carefully depending on the individual and their hepatic health issues.

Blackroot	Fringe tree
Buttonbush	Toadflax
Figwort	

Liver purgatives-this is the strongest class of liver remedies. They are used when there is sluggish liver function. Use with caution, as they are potentially toxic.

Iris	Poke

Symptoms of Liver Ailments

- Acne
- Anorexia
- Ascites
- Dry eyes
- Dry skin
- Enlarged liver
- Steatorrhea
- Fatigue & lethargy
- General sluggishness
- Headaches
- Hemorrhoids
- Jaundice
- Low appetite
- Nausea
- Pain on right side below the ribs
- Skin tone
- Portal hypertension
- Tired after eating
- Weight loss

Plant list

Alder–Alnus spp.
Angelica–Angelica spp.
Artichoke–Cynara scolymus
Ash–Fraxinus spp.
Barberry–Berberis spp.
Blackroot–Veronicastrum virginiana
Bloodroot–Sanguinaria canadense
Blue vervain–Verbena hastata
Bogbean–Menyanthes trifoliolata
Burdock–Arctium spp.
Buttonbush–Cephalanthus occidentalis
Calamus–Acorus calamus

Chaparral–Larrea spp.
Chicory–Cichorium intybus
Cleavers–Galium aparine
Curly dock–Rumex obtusifolius
Dandelion–Taraxacum officinale
Figwort–Scrophularia spp.
Fringe tree–Chionanthus virginicus
Galangal–Alpinia galanga
Gentian–Gentiana spp.
Ginger–Zingiber officinale
Goldenseal–Hydrastis canadensis
Greater celandine–Chelidonium majus
Greenbrier–Smilax spp.
Iris–Iris spp.
Milk thistle–Silybum marianum
Moonseed–Menispermum canadense
Oregon graperoot–Berberis spp.
Poke–Phytolacca americana
Red root–Ceanothus americanus
Stillingia–Stillingia sylvatica
Toadflax–Linaria vulgaris
Turmeric–Curcuma longa
Turtlehead–Chelone spp.
Vervain–Verbena officinale
Wahoo–Euonymus spp.
Wild yam–Dioscorea villosa
Yarrow–Achillea millefolium
Yellow dock–Rumex crispus

Primary functions of Liver

1. Detoxification and excretory functions
2. Endocrine functions
3. Clotting functions
4. Plasma protein functions
5. Digestive functions
6. Metabolic function
7. Cholesterol functions
8. Storage function

Detoxification and excretory functions-the liver breaks down and helps eliminate many endogenous and exogenous compounds. With damage to the liver's detoxification pathways these substances can accumulate in the bloodstream and cause illness. These substances are eliminated in the bile.

1. Various exogenous drugs such as antibiotics
2. Endogenous hormones including thyroxine and steroid hormones such as estrogen, and aldosterone

Endocrine functions The liver performs several endocrine functions.

- Activation of vitamin D
- Secreting angiotensinogen
- Metabolizing hormones
- Forming triiodothyronine (T3) from thyroxine (T4)

Clotting functions-the liver produces plasma-clotting factors that assist in blood coagulation. Vitamin K is required for the formation of some of these; hence a lack of Vitamin K dramatically decreases blood clotting.

1. Prothrombin
2. Fibrinogen
3. Factors V, VII, IX, X, XI, XII

Plasma protein functions-the liver synthesizes and secretes a number of plasma proteins.

1. Albumen
2. Acute phase proteins
3. Binding proteins for steroid hormones
4. Lipoproteins
5. Clotting proteins

Digestive functions-the liver assists in digestion and the breakdown of food particles.

1. The liver synthesizes bile (also storing and concentrating it in the gall bladder) and secretes it into the small intestine to help break up fats and aid in their absorption.
2. The liver is the first organ to process absorbed substances after they leave the digestive tract (aside from fats which are transported via the lymph and general circulation before reaching the liver) through portal circulation. This process insures that most of the bacteria from the gastrointestinal tract can be destroyed by the immune cells lining the liver before entering general circulation.

Metabolic functions-the liver converts, stores and releases many substances. These functions are essential as they allow an uptake and storage of many necessary molecules and later allow these substances to be released back into the bloodstream as they become in demand.

1. **Carbohydrate metabolism**- storage, conversion and release of sugars to maintain blood glucose levels. The liver can convert triglycerides and amino acids into glucose
2. **Fat metabolism**-storage and conversion of fats. Conversion of carbohydrates and proteins into fats.
3. **Protein metabolism**-breakdown and conversion of amino acids. Breakdown of ammonia to urea.

Cholesterol functions

1. Synthesizes cholesterol from fats and released into the blood
2. Cholesterol is converted into bile salts and secreted into the bile
3. Synthesizes lipoproteins to transport various types of cholesterol

Storage functions- the liver stores the following;

1. **Vitamins**-including A, D, B12, K
2. **Minerals**-including iron, copper
3. **Blood**-up to 500 ml (1 pint)

Liver Pathologies

Jaundice-this condition causes a yellowish tint in tissues due to high blood concentrations of bilirubin in the bloodstream. Jaundice may be caused by a number

of conditions, including; hepatitis, obstruction of bile ducts and excess production of bilirubin.

Cirrhosis - a condition where the liver lobules are scarred, destroyed and replaced by non-functional connective tissue. This leads to numerous complications due to the liver's diverse functions in the body. Causes include chronic alcohol use, biliary obstruction, viral hepatitis and liver damaging chemicals.

Hepatitis-an inflammatory liver condition. Three common forms of hepatitis are viral. These are hepatitis A, B, and C. Hepatitis A virus (HAV) is generally contracted by direct exposure, often through fecal contamination of food or water. HAV is typically followed by complete recovery. HBV is contracted through contact with infected blood as with contaminated needles. This infection may be long-term and can lead to liver cancer. HCV is also contracted through contact with contaminated blood. Over time, it can lead to liver failure.