



## Study Guide with Test Questions

**Herbal ABC's: The Foundation of Herbal Medicine**  
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**CLASS: G350A – Part I (Digestive System thru Respiratory System)**

### Digestive System Herbs

- \_\_\_ Which organ is not part of the ancillary digestive system?
  - Liver
  - Gallbladder
  - Stomach
  - Pancreas
- \_\_\_ True or False: Alcohol can be absorbed directly from the stomach.
- \_\_\_ What type of herbs contain fiber and nutrients that nourish our good gut bacteria?
  - Alterative
  - Mucilaginous
  - Bitter
  - Vulnerary
- \_\_\_ True or False: Bitter receptors exist only on the tongue.

Mucilaginous herbs provide good gut bacteria the type of fiber they need to thrive. “It is very common to refer to plant heteropolysaccharides in general as ‘mucilages’ as long as they form gels or viscous solutions with water. For example, *Plantago* leaf mucilage contains several different neutral and acidic heteropolysaccharides which can also be classified as gums, pectins, arabinogalactans, arabinoxylans, and/or glucomannans – in other words, in practical usage and among herbalists, mucilage is a sort of catch-all term for any slippery heteropolysaccharide mixture. Mucilages are very polar, so polar that many are soluble in cold water and low-EtOH solutions”. - Lisa Ganora

The stomach plays a critical role in food digestion and secretes a mixture of compounds, primarily, mucus, intrinsic factor, hydrochloric acid, and pepsin. Intrinsic factor is a glycoprotein that binds to the vitamin **B<sub>12</sub>** in the stomach and allows the vitamin to be absorbed in the small intestine. The secretion of mucus protects the stomach lining from the very acid (low pH) of hydrochloric acid. Hydrochloric acid **protects the body from infections** by killing the bacteria, parasites, and other microorganisms naturally found in food.

Hydrochloric acid plays a crucial role in protein digestion by converting pepsinogen into pepsin. Pepsinogen is a substance secreted by cells in the stomach wall and is converted into the enzyme pepsin by gastric acid. **The activation of pepsin requires an acidic environment** (pH at approximately 1.5 to 2). The enzyme pepsin breaks proteins down into amino acids. When the food and gastric juice mixture (chyme) enters the small intestine, the protein digestion continues with the assistance of pancreatic enzymes such as trypsin, chymotrypsin, and elastase. Both trypsin and pepsin are proteolytic enzymes secreted by the digestive system in order to digest proteins.” - AAT Bioquest

5. \_\_\_When working with an individual who has a severely irritated digestive system, it's important to consider how to supply the necessary herbs without contributing to further gastrointestinal irritation. For an individual whose gut is acutely inflamed, which of the following herbs might be a good, healing choice:
- |             |               |
|-------------|---------------|
| a. Parsley  | c. Cranesbill |
| b. Licorice | d. Poke Root  |
6. \_\_\_True or False: Gentian root contains two bitter constituents, amarogentin and gentiamarin. Amarogentin is the mildest/weakest bitter constituent among the bitter plants.
7. \_\_\_Due to its expectorating effect, what herb makes a nice addition to an herbal formula when an individual with a respiratory infection needs both an expectorant and a bitter – a combination of symptoms often seen in the elderly?
- |              |              |
|--------------|--------------|
| a. Chamomile | c. Sage      |
| b. Caraway   | d. Horehound |

*Marrubium vulgare* is often used in cough syrup formulas and is known for easing spasms and loosening mucus for productive coughs. Harvey Wickes Felter, M.D. (1922), author of *Eclectic Materia Medica*, wrote “White Horehound is a stimulating expectorant and tonic, and is adapted to both acute and chronic irritation of the larynx and bronchial tract, and gives added power to respiration. In small doses it is a gastric tonic of considerable value, but given too freely it will act as an emetic and cathartic. A hot infusion is diaphoretic; a cold infusion, diuretic.”

8. \_\_\_\_\_ True or False: When employing carminative herbs, it's important to use a preparation that retains the volatile oil content.



Carminatives are herbs that help promote digestion, relieve bloating and flatulence/gas and usually contain volatile oils/essential oils. “The precise mechanism of carminatives is unknown, but the essential oils have an irritant effect on mucous membranes causing capillaries to dilate and increase blood flow. In addition, these oils normalize peristalsis (the rhythmic movement of the intestines) and relax sphincters, thereby facilitating the passage of food and also make it easier to expel gas” - Matt Gowan, ND).

Carminatives contain essential oils which need to be “captured” or “retained”. When using carminative herbs as a hot tea, cover the cup or container while the herbs are steeping. Preparing herbs as a decoction is not appropriate if you want to retain the essential oil content. Essential oils are volatile (can evaporate) – which is why we are able to smell them.

9. \_\_\_When using stimulant laxatives, which one of the following herbal preparations is not as effective as the other three?
- |              |             |
|--------------|-------------|
| a. Tinctures | c. Teas     |
| b. Tablets   | d. Capsules |

10. \_\_\_ Which herb contains berberine and promotes elimination of metabolic waste?

- a. Alfalfa
- b. Oregon Grape
- c. Ginger
- d. Milk Thistle

“The genus *Mahonia* comprises of several species that contain berberine. Within them, *M. aquifolium* has been traditionally used for various skin conditions. Due to its main alkaloid (berberine), *Mahonia* is known to be used in Asian medicine for its antimicrobial activity. *Coptidis rhizoma* (rhizomes of *Coptis chinensis*), another plant which contains berberine, is a famous herb very frequently used in traditional Chinese medicine for the elimination of toxins, “damp-heat syndromes”, “purge fire”, and to “clear heat in the liver”. - [www.ncbi.nlm.nih.gov/pmc/articles/PMC6111450/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC6111450/).

Generally, **Berberis** includes spiny shrubs with simple, deciduous leaves, while **Mahonia** includes evergreen plants and shrubs with pinnate leaves consisting of 5 to 15 leaflets with spines along the edges. For several centuries there has been disagreement among botanists about whether there are two distinct genera, *Berberis* and *Mahonia*, or just one, *Berberis*. In 1753 Linnaeus created the *Berberis* genus; in 1818 Thomas Nuttall created the *Mahonia* genus. **You will often see a mixture of names: *Mahonia repens*. Synonym: *Berberis repens*. (Oregon Grape); Berberidaceae (Barberry Family)**

11. \_\_\_\_\_ What herbal constituent has been shown to triple bile secretion for up to 90 minutes?

- a. Camphor
- b. Glycyrrhizin
- c. Limonene
- d. Berberine

12. \_\_\_ True or False: Anthraquinone glycosides are activated by intestinal flora.

Anthraquinones are distinctively reddish-orange compounds that have the undisputed physiological effect of stimulating peristalsis in the bowels. Anthraquinones are found in classic ‘laxative’ herbs such as Senna (the sennosides), Cascara (the cascariosides), Aloe (aloe-emodin), and the **milder** Yellow Dock (emodin, chrysophanol, and rhein). - Lisa Ganora

13. \_\_\_ True or False: When using a vermifuge herb to address intestinal parasites, a laxative herb should be used to help expel the parasites in a timely manner. Do not use laxative herbs when a person has loose stools or diarrhea.

14. \_\_\_ Which of the following is an antiparasitic herb that works on parasites both directly in the intestinal tract and also outside the intestinal tract?

- a. Marshmallow
- b. *Artemisia*
- c. *Cascara sagrada*
- d. Plantain

15. \_\_\_ True or False: Astringent herbs are most effective when used long-term.

Astringent herbs are used to treat damaged and inflamed tissues (wounds and bleeding, ulcers, diarrhea, intestinal inflammation, etc.). Compounds called tannins are responsible for the astringent effect. Tannins bind to proteins forming cross-linking that tightens and thickens tissues. Tannins are divided into condensed tannins and hydrolyzable tannins (naturally more astringent). Long-term use of herbs rich in hydrolyzable tannins is not recommended because they can interfere with digestion and nutrient absorption. Hydrolyzable tannins are synthesized by a variety of plants and trees and most commonly found in the wood, bark, leaves, and galls.

16. \_\_\_ True or False: All vulnerary herbs are also demulcent herbs.
17. \_\_\_ True or False: Mucilage containing plants have many healing constituents but, the mucilage itself does not have chemical properties known to act in a medicinal way. However, mucilage acts as a prebiotic providing food for the intestinal flora in the large intestine.

### Liver Herbs

18. \_\_\_ The hepatic portal system carries blood to the liver from which system?
- a. Respiratory System
  - b. Digestive System
  - c. Endocrine System
  - d. Urinary System
19. \_\_\_ When working properly, the liver is capable of clearing what percentage of toxins from the blood?
- a. 99%
  - b. 75%
  - c. 50%
  - d. 29%
20. \_\_\_ True or False: When the flow of bile is increased, toxins are forced to stay in the liver where they cause damage.
21. \_\_\_ The most common cause of impaired liver function is:
- a. Gallstones
  - b. High Blood Pressure
  - c. Parasites
  - d. Alcohol ingestion
22. \_\_\_ The main mechanism for moving conjugated toxins out of the liver is through:
- a. The Hepatic Portal Vein
  - b. The Bile
  - c. The Lungs
  - d. The Skin

Digestion of dietary lipids is a multi-step process. When partially digested food enters the duodenum, both bile and pancreatic “juice” are secreted and mixed in the duodenum. This provides large amounts of conjugated **bile salts** with strong emulsification properties, **digestive enzymes**, especially lipases and phospholipases, and a high concentration of **bicarbonates** that raise the pH (acidic gastric juices from stomach need to be less acidic or it will damage the intestinal walls). The breakdown and absorption of fatty acids and fat-soluble vitamins depend on the emulsification of the bile acids and actions of lipase and phospholipase. When the gallbladder is removed many natural health professionals recommend a digestive supplement containing **ox bile salts and lipase**. Bile salts also help dissolve gallstones that have formed in the gallbladder.

23. \_\_\_\_\_ The most common phase I enzymes, known as the cytochrome P450 enzymes, are essential for biotransformation of chemical toxins and the production of:
- a. Hydrochloric Acid
  - b. Cholesterol
  - c. Steroids
  - d. Both B & C
24. \_\_\_ A significant side effect of phase I detoxification is the production of:
- a. Free Radicals
  - b. Glutathione
  - c. Fat-Soluble Toxins
  - d. Enzymes
25. \_\_\_\_\_ True or False: Stimulation of phase I detoxification is contraindicated if an individual's phase II system is underactive.
26. \_\_\_ What compound has been shown to inhibit phase I detoxification while also stimulating phase II detoxification, making it very useful in preventing certain types of cancer?
- a. Quercetin
  - b. Naringenin
  - c. Capsaicin
  - d. Curcumin
27. \_\_\_\_\_ True or False: The best way to elevate an individual's glutathione level is to identify their specific needs for co-factors and amino acids.
28. \_\_\_ True or False: In healthy individuals, a daily dose of 500mg of vitamin C can be sufficient to elevate and maintain glutathione levels.
29. \_\_\_ True or False: Raw fresh fruits and vegetables are better at raising glutathione levels than cooked foods.
30. \_\_\_ Individuals with low bile (hypochlorhydria) who do not respond to cholagogue/ choloretic herbs are often in need of what two amino acids?
- a. Glycine & Taurine
  - b. Glycine & Arginine
  - c. Taurine & Glutamine
  - d. Glutamine & Cysteine

Sufficient concentrations of amino acids and their metabolites (e.g., nitric oxide, polyamines, glutathione, taurine, thyroid hormones, and serotonin) are required for body functions. However, elevated levels of amino acids and their products (e.g., ammonia, homocysteine) are pathogenic factors for neurological disorders, oxidative stress, and cardiovascular disease. **“Thus, an optimal balance among amino acids in the diet and circulation is crucial for whole body homeostasis.** There is growing recognition that besides their role as building blocks of proteins and polypeptides, some amino acids regulate key metabolic pathways that are necessary for maintenance, growth, reproduction, and immunity”. - <https://pubmed.ncbi.nlm.nih.gov/19301095/>

31. \_\_\_\_\_ Which specific Phase II conjugation pathway is significantly burdened by the ingestion of large amounts of acetaminophen?
- |                |                    |
|----------------|--------------------|
| a. Methylation | c. Acetylation     |
| b. Sulfation   | d. Glucuronidation |
32. \_\_\_ Individuals who struggle with poor acetylation pathways may have problems with:
- |                      |              |
|----------------------|--------------|
| a. Digesting protein | c. Hair loss |
| b. Sleep             | d. Headache  |
33. \_\_\_\_\_ Silymarin, the most well-studied, active ingredient in Milk Thistle, has been shown to increase levels of the master antioxidant, glutathione, by up to:
- |        |        |
|--------|--------|
| a. 45% | c. 25% |
| b. 75% | d. 35% |
34. \_\_\_\_\_ True or False: Liver dysfunction is associated with metabolic syndrome.
35. \_\_\_ True or False: Herbs that stimulate the production of bile are called direct cholagogues or choloretic in Western herbal medicine.

**What is metabolic syndrome?** Medscape defines metabolic syndrome (syndrome X, insulin resistance) as “a multifactorial disease with multiple risk factors that arises from insulin resistance accompanying abnormal adipose deposition and function. It comprises a combination of risk factors for coronary heart disease, as well as for diabetes, fatty liver, and several cancers”. Metabolic syndrome greatly increases an individual's probability for developing chronic kidney disease.

Prof Hannele Yki-Järvinen in *The Lancet*, expands on the basic definition by stating that “non-alcoholic fatty liver disease (NAFLD) is defined as a disorder with excess fat in the liver due to non-alcoholic causes. Two key components of metabolic syndrome, glucose and triglycerides, are overproduced by the fatty liver. **The liver is therefore a key determinant of metabolic abnormalities.** The prevalence of both metabolic syndrome and NAFLD increases with obesity. Other acquired causes for both disorders include excessive intake of simple sugars and physical inactivity.”

NAFLD has become the second leading cause of liver transplantation in the United States. Nonalcoholic fatty liver disease (NAFLD) is the most common liver disease since its prevalence is estimated to be 20-30% in general population of Western countries.

### Immune System Herbs

35. \_\_\_\_\_ True or False: Any foreign substance in the body is called an antigen.
36. \_\_\_\_\_ True or False: The primary role of Immunoglobulin A is to protect against invading pathogens by attaching to them and penetrating their defenses.

37. \_\_\_\_What two types of immune cells are known for attacking foreign invaders using a process called “phagocytosis”?
- a. Macrophages & neutrophils  
b. Eosinophils & basophils  
c. Mast cells & epithelial cells  
d. Neutrophils & basophils
38. \_\_\_\_The adaptive immune system consists of two branches, both mediated by cells that are initially manufactured in the:
- a. Thymus  
b. Bone marrow  
c. Spleen  
d. Liver
39. \_\_\_\_Nearly 80% of the immune system resides in the:
- a. Bone marrow  
b. Spleen  
c. Intestines  
d. Respiratory tract
40. \_\_\_\_What herb could be indicated for an individual with deficiencies in immune response, exhaustive states, and lymphatic congestion?
- a. Echinacea  
b. Yarrow  
c. Poke root  
d. Indigo
41. \_\_\_\_True or False: Garlic exerts strong antimicrobial and anti-parasitic effects when used in its dried form.
42. \_\_\_\_If an individual presents with metabolic syndrome and is prone to fungal infections, which herb might be a good choice to use?
- a. Catnip  
b. Fennel  
c. Cinnamon  
d. Yarrow
43. \_\_\_\_True or False: Antiviral herbs act directly on a virus only if in direct contact with the virus.



*Uncaria tomentosa* (Cat's Claw/Uña de Gato) is immunomodulatory but not immune-stimulatory. This effect makes the extract suitable for conditions where the immune response is excessive (active autoimmune). Studies reveal that the inhibition of viral attachment in the host cells was the main mechanism of antiviral activity. A second mechanism was found with the xindole alkaloids from cat's claw which induced apoptosis (cell death), favoring elimination of virus infected cells. Antiviral activity of cat's claw has focused mainly on dengue fever virus, vesicular stomatitis virus, and rhinovirus type 1B infection in HeLa cells. Topically, cat's claw cream is antiherpetic for both herpes simplex virus type 1 and type 2.

44. \_\_\_It has been found that stimulating the\_\_\_\_\_ cools down inflammatory cytokines, decreasing inflammation in the body.

- a. Brain
- b. Vagus Nerve
- c. Immune System
- d. Heart

Over 100 different cytokine molecules are involved in the regulation of local and systemic inflammation, cellular proliferation, metabolism, tissue repair, and the development, differentiation and regulation of immune cells. The term “cytokine storm” is not a medical term, it refers to cytokine release syndrome (CRS), a complex set of actions resulting in uncontrolled inflammation throughout the body (systemic). Cytokine release syndrome is typically a consequence of a hyper-activated immune response against an infection or the result of immunotherapy drugs. Research articles suggest that vitamins A, B6, B12, C, D, E, and folate, as well as the trace minerals zinc, iron, selenium, magnesium, and copper may play a key role in the management of “cytokine storms”.

### Respiratory System Herbs

45. \_\_\_\_\_Deficiency in which fat-soluble vitamin is associated with an accelerated decline in lung function?

- a. Vitamin B
- b. Vitamin D
- c. Vitamin C
- d. Vitamin K

46. \_\_\_Diaphoretic herbs are often most helpful when administered as a:

- a. Tincture
- b. Capsule
- c. Poultice
- d. Hot tea

47. \_\_\_True or False: Because mucus is a necessary body defense, mucus secretion should not be stopped unless it is chronically in excess or the cause cannot be addressed.

48. \_\_\_True or False: Adequate hydration is key when using astringent and/or antitarrhal herbs.

49. \_\_\_True or False: Antispasmodic herbs that support the respiratory system will often decrease spasms in the gut as well.

**N-acetylcysteine (NAC)** reduces phlegm and cough, thins mucus, and eases expectoration, and may decrease the deterioration of lung function. “There is no recommended daily allowance for NAC, because unlike vitamins, it’s not an essential nutrient. The dosage used to prevent radio contrast dye damage is 600 mg to 1200 mg every 12 hours for 48 hours. Oral doses above 1200 mg per day can result in headache, nausea, abdominal pain, vomiting, constipation, and diarrhea. People who take nitroglycerine should not take NAC unless supervised by a physician.” - pharmacytimes.com

**Low vitamin D** levels increase inflammatory cytokines and the risk of pneumonia and viral infections.

**Zinc** deficiency increases susceptibility to inflammatory and infectious diseases (pneumonia, influenza, etc.).



**Elecampane** (*Inula helenium*) is a versatile herb that is demulcent/soothing for sore throats and dry coughs; a stimulating expectorant to help the body dispel mucus from the lungs and yet can relax tissues and decrease inflammation. There are many synergistic constituents. However, do not use as a decoction, as some of the action comes from the volatile oils. Widely used for viral coughs, bronchitis, asthma, whooping cough, and pleurisy.

**Yarrow** (*Achillea millefolium*) is a versatile herb with relaxing diaphoretic, anti-catarrhal, astringent, de-congestive, expectorant, and diaphoretic properties. It will thin thick mucus and relieve head congestion; reduce excess fluid; stimulate a cough to clear the excess mucus from lungs; and disperse heat or induce sweating to regulate a fever. A valuable herb that tones mucus membranes in the digestive tract & respiratory track.

**Mullein** (*Verbascum thapsus*) has an affinity for the respiratory system and the ability to calm inflamed nerves to relieve pain and soothe and tone the bowels; it is a soothing anti-inflammatory that stimulates fluid/thins mucus for easier expectoration (productive coughs). Widely used for spasmodic coughs, chronic bronchitis, pleurisy, asthma, and dry hot coughs.

~ End of Test ~