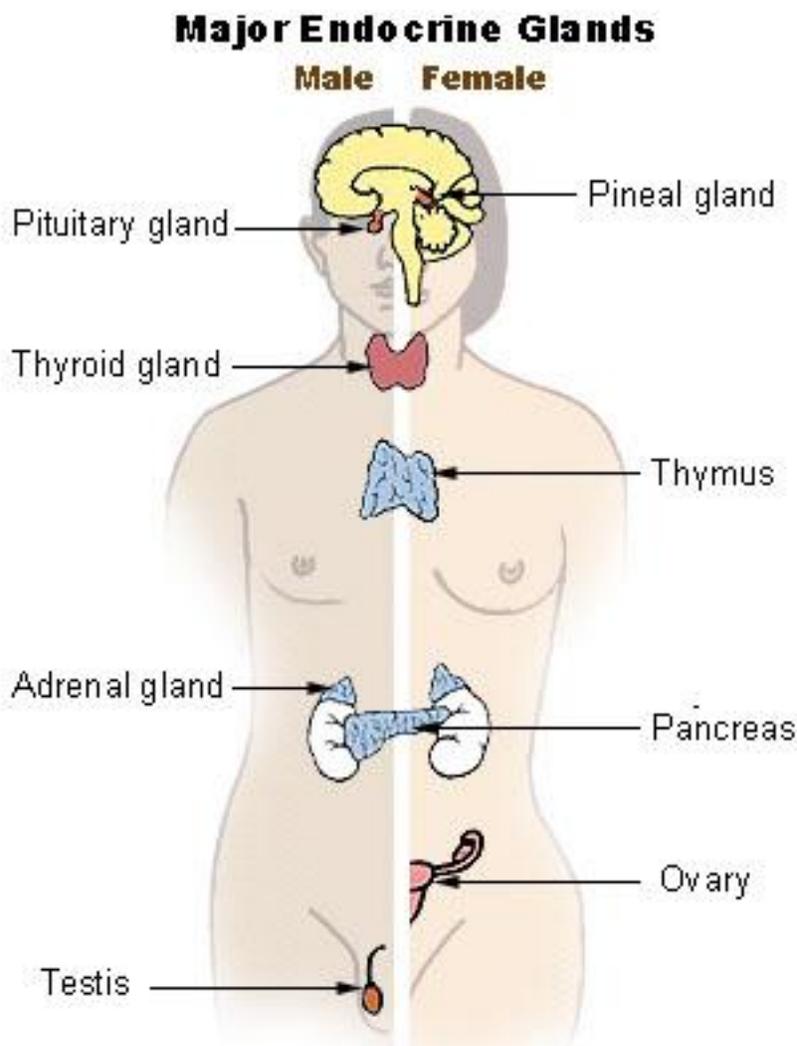


## CERTIFIED ADVANCED HERBALISM COURSE - SESSION 16: The Glandular System

The glandular and nervous systems work intimately together to maintain balance among all of the body systems.



Together, these systems regulate voluntary and involuntary actions within the body such as growth, metabolism, digestion, elimination, menstruation and sleep. These systems also serve as the body's means of communication between cells.

The glandular system communicates using chemical messengers called hormones, which stimulate reactions that may last from a few hours to several days.

Glandular system concerns include hormone imbalances, weak adrenal glands, thyroid imbalance, diabetes, hypoglycemia and hyperglycemia.

### Examining the Glandular System

While the glandular system communicates using hormones, the nervous system uses electrical impulses and chemicals called neurotransmitters to relay fast, short-lived messages. Some neurotransmitters, e.g., noradrenaline, also act as hormones and may be secreted in more than one place throughout the body. Both neurotransmitters and hormones bind to receptor cells to initiate responses.

The nervous and glandular systems are linked by the hypothalamus – the control center for the body's emotional and physical responses. The hypothalamus, part of the brain stem,

has been found to control hunger, thirst, blood pressure, pain, pleasure, water balance, temperature, sexual desire, hostility and many other emotions and responses. However, it is not the only area of the brain associated with emotions. Many structures, including the hypothalamus, make up the limbic system, an area of the brain that processes feelings and emotions.

The relationship between the hypothalamus and the pituitary gland provides the link between the nervous and glandular systems. The pituitary is a small gland located at the base of the brain. Many refer to it as the master gland because it regulates the release of hormones from most other glands, much like the maestro of a symphony directs all the musicians to play together to produce harmonious music. Divided into two lobes, the anterior and posterior, the pituitary is a double gland. Some hormones are produced in the hypothalamus and stored in the posterior lobe of the pituitary. The hypothalamus also manufactures hormones that stimulate the release of other hormones from the anterior pituitary. These are called releasing, or tropic hormones.

Many glands have a "feedback loop" that prevents the over-secretion of certain hormones. For instance, if the anterior pituitary secretes thyroid-stimulating hormone (TSH), the thyroid subsequently releases thyroxine and triiodothyronine, two hormones that trigger an increase in metabolism. These hormones inhibit the release of TSH so the thyroid will not be stimulated by the anterior pituitary.

The pituitary also produces hormones that it secretes directly into the bloodstream. One of these, growth hormone, is responsible for growth, development, protein synthesis, the breakdown of fats, and increases in blood sugar levels. Other hormones produced by the pituitary and secreted directly into the bloodstream

include prolactin, which stimulates milk secretion in females; follicle-stimulating hormone (FSH), which stimulates the growth of ovarian follicles in females and seminiferous tubules in males; and luteinizing hormone (LH), which initiates ovulation during the menstrual cycle.

The pineal gland is a small, pea-sized gland located in the center of the brain. It is associated with biological responses to light and regulation of the body's circadian rhythms such as sleep. Exposure to light inhibits the secretion of melatonin, a pineal hormone, and darkness stimulates it. Secretion of this natural antioxidant peaks around midnight and troughs in the morning. Melatonin production decreases with age.

The thymus gland is located behind the upper part of the breastbone and produces the hormone thymosin. Thymosin plays a role in immune response.

Just above the thymus, in the neck, is the thyroid gland. The thyroid secretes two different hormones; thyroxine and tri-iodothyronine (mentioned previously). Together, these two hormones regulate metabolism, growth and development. Calcitonin, another thyroid hormone, regulates blood levels of calcium, preventing excessive amounts from being released into the blood.

The parathyroid gland lies adjacent to the thyroid. Parathyroid hormone (PTH) acts as an antagonist to calcitonin to increase calcium levels in the blood by stimulating its release from the bones. At the same time, PTH causes the kidneys to excrete phosphate, which is also released from the breakdown of bone. The kidneys, intestines and bones all play a role in maintaining proper blood levels of calcium and phosphate.

The adrenal glands are located on top of the kidneys. Each gland is divided into two parts, the cortex and the medulla. The adrenal cortex (outer layer) produces "cortical" steroid hormones from cholesterol. Among the many cortical steroid hormones produced by the adrenal cortex are the sex hormones, DHEA, cortisone and aldosterone. The sex hormones signal development of secondary characteristics such as facial hair and a deeper voice. DHEA (dehydroepiandrosterone), an intermediate hormone, aids in the production of sex hormones. Cortisone and its derivatives (called the glucocorticoids) help maintain normal blood sugar levels by stimulating formation of carbohydrates from protein and fat through secretion of enzymes from the liver. These glucocorticoids also decrease inflammation, help repair damaged tissue and act as the body's buffer for stress.

Another cortical steroid hormone is aldosterone, which regulates mineral balance within the body by stimulating the absorption of sodium, chloride and water, and decreasing absorption of potassium by the kidneys. A careful balance of these minerals is vital for proper function of the sodium-potassium pump, which transports molecules into cells, and for conduction of nerve impulses.

Many plants produce hormones similar to the cortical steroid hormones; these are often called phytosteroids, and in the body they act similarly to the way the cortical steroid hormones function.

The medulla (or inner layer) of the adrenal gland produces adrenaline and noradrenaline. These hormones stimulate the sympathetic nervous system in fight-or-flight responses. When the body senses stress – whether it be emotional, physical or environmental – elevated blood pressure, increased blood sugar, accelerated heart rate and constricted blood vessels can result as the body redistributes its energy in order to deal with the stress. Simultaneously, functions that are less crucial to survival (like digestion and elimination) temporarily stop.

The ovaries are the female sex organs that produce estrogen and progesterone. Estrogen maintains and helps develop other female sex organs, stimulates secondary sexual characteristics and stimulates growth of the uterine lining during the first two weeks of the menstrual cycle. Progesterone has been called the pregnancy hormone because it prepares the uterus for the fertilized egg during the last two weeks of menstruation and helps maintain a healthy fetus during pregnancy.

The male hormone testosterone is produced in the testes, the main male reproductive organs. Testosterone stimulates development of sperm cells in men, maintains and develops male reproductive organs, and is responsible for male secondary sexual characteristics.

The pancreas is a digestive organ that also functions as a gland. It secretes glucagon, which converts glycogen into glucose, and insulin, which acts as an antagonist to glucagon to prevent excessive levels of blood glucose. Both of these conversions involve enzymes produced by the liver.

The digestive tract also contains hormones. Gastrin, secreted in the stomach, triggers secretion of gastric juices and enzymes in the pancreas. Stomach acidity causes the release of secretin in the small intestines, which in turn causes the pancreas to secrete its enzymes, and stops the secretion of acid. Cholecystokinin (CCK) stimulates the gallbladder to secrete bile.

Proper nutrition is crucial to the function of this complex system. Most glands need increased amounts of particular minerals to function as enzymes in their reactions. For example, the pancreas needs chromium, the prostate requires zinc, and the thyroid uses iodine. Many problems with the glandular system are associated with poor nutrition and low levels of these minerals in the diet.

#### Did You Know?

- The pituitary gland is about the size of a kidney bean.
- Giants and midgets are the result of too much or too little growth hormone.
- Diabetes mellitus, the most common glandular system disorder, affects between 10 and 20 million people in the United States.

#### Glandular System Analysis

If you have four or more of the following indications, you may consider nutritional aid to the glandular system.

- Lack of energy
- Regular consumption of alcohol
- Frequent mood swings
- Poor concentration or memory
- Stressful lifestyle
- Skin/complexion problems
- Cravings for sweets, salt or junk foods
- Too little sleep or restless sleep
- Hair loss
- Difficulty in maintaining ideal weight
- Lack of a balanced diet
- Slow recovery from illness
- Lack of appetite
- Unsettled, apprehensive, pressured
- More than 2 cups of caffeinated beverages/day
- Easily irritated or angered
- Don't get enough exercise

#### Glandular System Suggestions

- Eat regular meals at regular intervals.
- Eat vegetables, legumes and whole grains.
- Avoid simple sugars.
- Exercise.
- Avoid stress.

#### Glandular System Products - Metabolism

The following products are listed with ingredients only as not to sell any particular product line. These ingredients can be purchased at any store you wish. If you are interested in the actual combinations listed below, please contact JLS directly.

- **Master Gland Formula** – This general body tonic includes adaptogens like schizandra and Siberian ginseng, along with herbs historically used to strengthen all the glands: alfalfa for the pituitary, kelp for the thyroid, licorice for the adrenals, thyme for the thymus, dong quai and ginseng for the reproductive glands, and dandelion and uva ursi for the pancreas.
- **Hypoglycemia Combination** – A combination of licorice, dandelion, safflowers and horseradish, this formula was designed for hypoglycemics. Herbal properties of this formula include adaptogenic, glandular and stomachic. Licorice helps stabilize the adrenal glands, dandelion supports the liver, and safflowers and horseradish improve digestion.
- **Licorice Root** – Licorice has long been recognized for the natural sweetness of its deep-sinking roots. Next to ginseng, licorice is the most popular herb used in Chinese formulas.
- **Sugar Regulating Formula** – By combining banaba leaf, gymnema, bitter melon, fenugreek, nopal, chromium, and vanadium, this formula assists diabetics. This formula works naturally to keep blood sugar at levels in the healthy range while providing antioxidant and protective substances to guard against the damage that is often caused by diabetes.

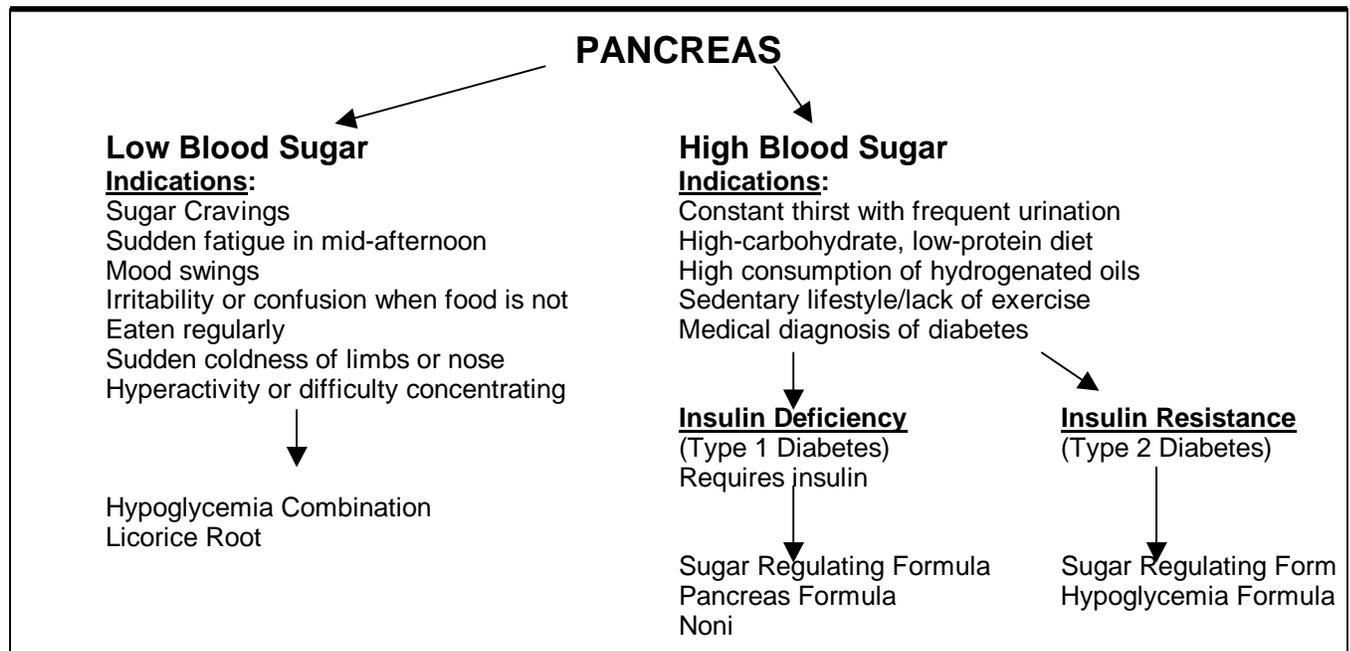
- **Pancreas Formula** – This mixture contains 14 herbs that help support the function of the pancreas gland. It helps balance blood sugar levels and improve digestive secretions from the pancreas. This formula also contains golden seal root, juniper berries, uva ursi leaves, cedar berries, mullein leaves, garlic bulb, yarrow flowers, slippery elm bark, capsicum fruit, dandelion root, marshmallow root, nettle herb, white oak bark and licorice root.
- **Hypoglycemia Formula** – This is a Chinese combination of 16 herbs that nutritionally support the glandular system and associated metabolic processes. The Chinese call this formula bu yin, which means to “supplement yin.” The herbs in this formula work to support the body as it attempts to reduce fire (fever) and strengthen water (support associated organs and normalize metabolic processes).
- **Recuperative Combination** – A blend of five herbs that support glandular health, this combination aids the body’s recuperative functions. Its adaptogenic ingredients – astragalus, ginkgo, gotu kola, Siberian ginseng, and suma – provide energy and emotional support.
- **Nerve Calming** – A combination of herbs and essential B-complex vitamins, which nourishes the nerves to help the body cope with stress. Contains generous amounts of vitamin C, B-complex vitamins, plus schizandra fruit, choline bitartrate, wheat germ, inositol, PABA, bee pollen, citrus bioflavonoids, hops flowers, passion flower and valerian root to help reduce tension, stress and insomnia.
- **Nervous Fatigue Formula** – This formula contains 18 Chinese herbs that offer adaptogenic, balancing and stimulating properties. It is excellent for those feeling “burnout” or stress.
- **Balanced B-Complex** – B-vitamins are particularly important for the nervous system and are also vital for good digestive function and enzyme reactions that control energy, circulation, hormones and overall health. Since the same amount of each B vitamin is not necessarily needed by the body, this formula is balanced to assist B12 absorption.
- **Thyroid Activator** – This combination was created by Dr. Christopher. It contains several sources of iodine and other nutrients that benefit the thyroid. Ingredients include Irish moss, kelp, black walnut hulls, parsley, watercress, sarsaparilla and Icelandic moss. This formula aids thyroid function and may help with fatigue. Do not use with an overactive thyroid.
- **Thyroid Normalizer** – This combination works to normalize an underactive thyroid. By supplying the body with organic sources of iodine, this product activates the thyroid to increase your metabolism to a healthy level of glandular operation.
- **7-KETO** – 7-Keto boosts the production of T3 hormone, which stimulates metabolism and helps lower the body’s pre-programmed weight “set point.” Clinical tests indicate that 100 mg of 7-Keto taken twice a day significantly lowered body fat over an eight-week period.

### **Glandular System Products - Reproductive**

The following products are listed with ingredients only as not to sell any particular product line. These ingredients can be purchased at any store you wish. If you are interested in the actual combinations listed below, please contact JLS directly.

- **Master Gland Formula** – This general body tonic includes adaptogens like schizandra and Siberian ginseng, along with herbs historically used to strengthen all the glands: alfalfa for the pituitary, kelp for the thyroid, licorice for the adrenals, thyme for the thymus, dong quai and ginseng for the reproductive glands, and dandelion and uva ursi for the pancreas.
- **Monthly Maintenance** – This formula provides women with nutritional support vital to promoting and maintaining optimum health throughout the month.
- **Yam Cream** – This cream provides the progesterone a woman’s body needs in a unique herbal base. Chamomile is included to help soothe the nerves and skin, and the addition of ginkgo strengthens nerves and improves circulation. Horsetail, yucca, Vitamins A and C and aloe vera are added to support the mature woman by promoting healthy hair, skin and nails, while enhancing the adrenal system and protecting body tissues.
- **Hot Flash Combination** – This potent, time-release combination of black cohosh and dong quai provides a natural defense against uncomfortable menopausal changes. Studies show that black cohosh acts like estrogen to help relieve hot flashes and depression.

- **Soy Combination** – Because they contain the isoflavonoid genistein, soybean products are in great demand today for major benefits to the immune, glandular and circulatory systems. This soy combination contains 48 times more isoflavonoids than comparable amounts of tofu, 25 times more than tempeh and 10 times more than roasted soybeans.
- **Prenatal Multivitamin and Mineral** – The perfect supplement for pregnant or lactating women, a prenatal vitamin and mineral that provides a balanced combination of vitamins and minerals, including Vitamins A, C, D, E, B1, B2, B6 and B12, as well as folic acid, biotin, pantothenic acid, iron, iodine, magnesium, zinc and copper to support the nutritional needs of both mother and baby. In addition, this combination provides ginger root to help soothe the stomach. It's free of artificial flavors, preservatives, sweeteners, guar, yeast, gluten, lactose, milk, soy and wheat.
- **Red Raspberry** – This herb is renowned for its nutritional support of the female reproductive system. Raspberry is known to nourish and strengthen the uterus. A common backyard fruit bush, Red Raspberry is an excellent herbal source of iron, manganese and niacin. It also contains quantities of vitamins C, A, D, E and B, as well as phosphorus and calcium.
- **Men's X-rated Formula** – This formula features muira puama stem and yohimbe bark. Muira puama, also called "potency wood," has aphrodisiac properties. Yohimbe bark supports and stimulates the nervous system. Also includes L-arginine, damiana leaves, oat straw leaves, saw palmetto berries and DHEA.
- **Woman's X-rated Formula** – This formula for Women contains seven herbs carefully selected for female reproductive needs: red raspberry leaves, slippery elm bark, Siberian ginseng, ginger root, oat straw concentrate, damiana leaves and kava kava concentrate.
- **Men's Formula** – This combination of saw palmetto, pygeum, lycopene, stinging nettle, gotu kola and zinc provides incredible nutrition and toning for the prostate gland. Lycopene is a powerful antioxidant. A seven-year study showed that the most lycopene-containing foods in your diet, the less risk you have of getting prostate cancer.



## ADRENALS

Spirulina

Spirulina

### Adrenal Stress (Hot)

#### Indications:

High blood pressure  
High blood sugar  
Poor wound healing  
Bone loss  
Lowered immune response  
Thinning hair  
Muscle wasting  
Development of abdominal fat  
Feelings of tension and stress  
Anxiety  
Shallow breathing  
Muscle tension



Recuperative Combination  
Nerve Calming  
Adrenal Glandular

### Adrenal Exhaustion (Cold)

#### Indications:

Low blood pressure  
Low blood sugar  
Tachycardia and palpitations  
Cravings for sweets and carbohydrates  
Poor memory and concentration  
Insomnia (restless sleep, disturbing dreams, waking frequently at night)  
Nervousness, irritability  
Mental confusion  
Fatigue  
Nightmares



Nervous Fatigue Formula  
Balanced B-Complex

## THYROID

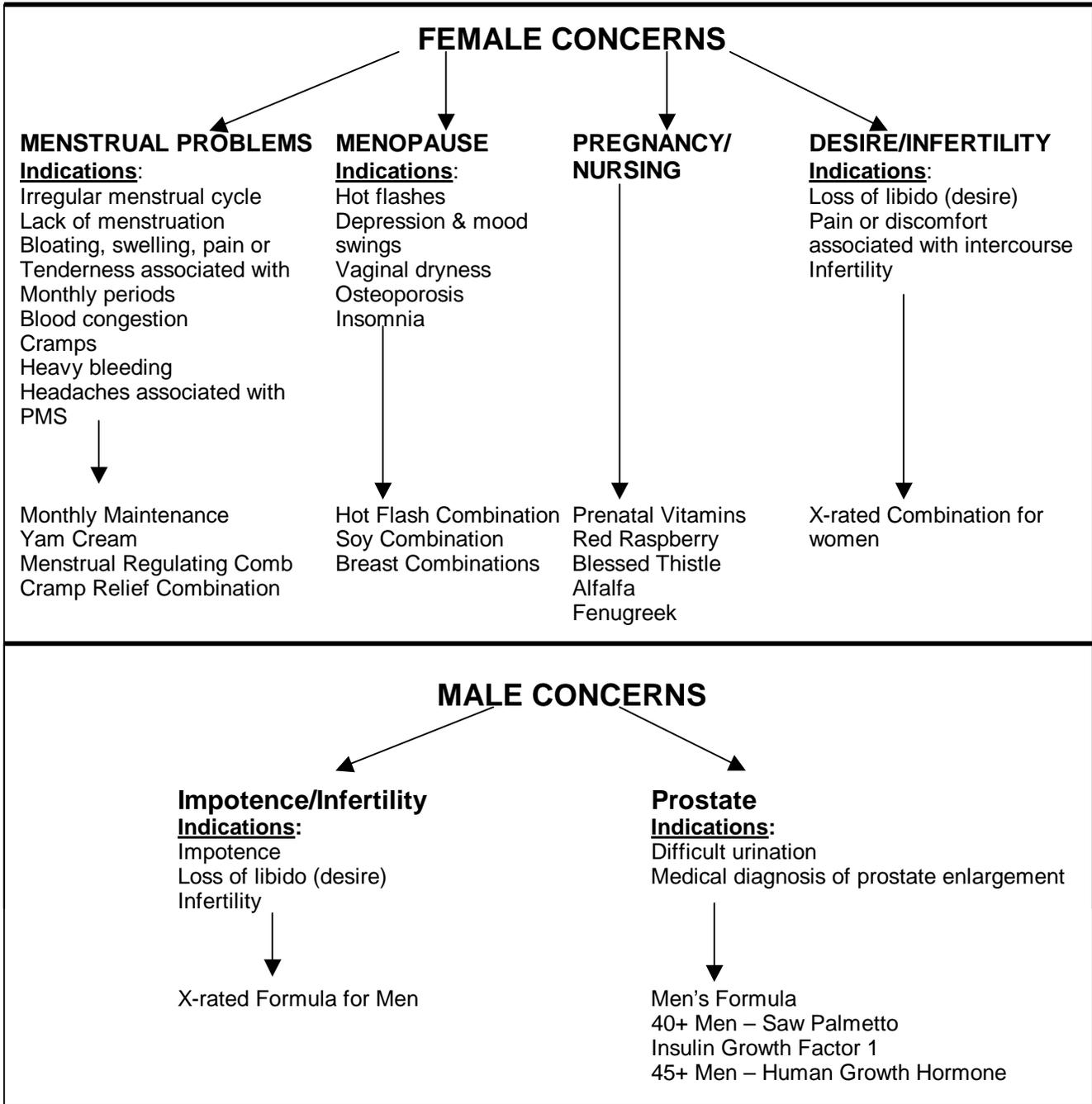
### Hypothyroidism (Cold)

#### Indications:

- Mental or physical slowing
  - Fatigue/lethargy
- Undue sensitivity to cold weather
  - Low body temperature
    - Hair loss
    - Weight gain
    - Coarse skin
- Low sex drive/infertility
  - Mild depression



Thyroid Activator  
Thyroid Normalizer  
7-Keto  
Thyroid Support  
Master Gland  
Iodine Patch  
Goiter use Liquid Dulse  
Myrrh



## CERTIFIED ADVANCED HERBALISM COURSE - SESSION 16 – QUESTION & ANSWERS

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE: \_\_\_\_\_

FAX: \_\_\_\_\_

E-MAIL: \_\_\_\_\_

Please be sure to fill out the information above, complete the test and e-mail or fax it back to us at 425-955-4639 (US) or at +353 1 647 5705 (EU) or e-mail it to us at [joyful@best.com](mailto:joyful@best.com) (US) or at [answers@med-herbs.com](mailto:answers@med-herbs.com) (EU). We will grade your question & answer session and will let you know if we have any questions or concerns.

1. The glandular system coordinates actions in the body by secreting \_\_\_\_\_ into the bloodstream.
  
2. The \_\_\_\_\_ is the main link between the nervous and glandular systems.
  
3. The \_\_\_\_\_ gland stimulates many other glands by secreting tropic (releasing) hormones.
  
4. What are some indications this system is weak and may need nutritional aid?
  
  
5. Who can I help? List five people who exhibit the above indications and who may benefit from nutritional aid to the glandular system.