



**The Clinician's Handbook of Natural Medicine,**  
3rd Edition by J.E. Pizzorno, M. Murray, H. Joiner-Bey

**G550-B**  
**Test Questions Part Two**

1. **True or False?** The term *erythema multiforme* (EM) is not accepted worldwide; various clinical categories have overlapping features. Potassium iodide and topical zinc sulfate are therapeutic agents but identifying the initiating factor (food allergy, medications, environmental exposures, underlying infection) is needed to tailor natural interventions.

“Apart from viral infections, drugs are the second most frequent cause of pediatric EM. The culprit medications were mostly, antibiotics which is in concurrence with the literature. Post-vaccination EM is a rare condition but has been reported with most vaccines used in pediatric practice. Our study showed that only 3.9% of all pediatric EM cases were triggered by vaccines, diphtheria-tetanus-pertussis vaccine being the most frequent cause, followed by the recombinant hepatitis B vaccine. **However, vaccines were the trigger of 47.3% of EM cases in infants. A causal link is hard to establish due to the rarity of the disease, but similar to infections, the immune activation induced by vaccination could be the culprit.**” - <https://www.sciencedirect.com/science/article/pii/S0190962219303512>

“Potassium iodide has been successfully used for the treatment of erythema multiforme, even when associated with infection with herpes simplex; granuloma annulare, including reports of good response to widespread cases of the disease; Erythema annulare centrifugum; and Wegener's granulomatosis.” - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3754371/>

**NOTE: Microgram (mcg or µg); Milligram (mg); Gram (g)**

There are 1000 micrograms (mcg or µg) in one milligram (mg)

There are 1000 milligrams (mg) in one gram (g)

2. Fibrocystic breast disease is a very common (20-40% of premenopausal woman) and describes the presence of multiple cysts of varying sizes giving breasts a nodular consistency. **The following should be considered for clients with fibrocystic breast tissue:**
- (A) Limit dietary methylxanthines (coffee, tea, cola, chocolate, caffeinated medicines), consider supplementing evening primrose oil (gamma-linolenic acid, vitamin E, choline and B vitamins, vitamin A (25,000 IU only if not pregnant and for 30-60 days), and iodine. Vitex agnus-castus (chasteberry) is an excellent herbal choice. Increasing fiber (vegetables and fruits) and addressing liver and bowel function or toxicity.
  - (B) Avoid exogenous estrogen sources: eliminate oral contraceptives, HRT and estrogen augmented animal products. Elemental iodine is preferred form for breast metabolism and dose should be 70 to 90 mcg/kg body weight. (1 kilogram is approximately 2.2 pounds).
  - (C) Both A & B
3. **True or False:** The most common symptoms of fibromyalgia syndrome (FMS) are fatigue, stiffness, headache, sleep disturbance, irritable bowel, depression, cognitive dysfunction, anxiety, coldness, paresthesias, sicca (Sjögren's) symptoms, exercise intolerance, and dysmenorrhea.
4. **True or False:** Fibromyalgia syndrome (FMS) is rarely associated with thyroid disease. Some antidepressants (commonly prescribed for FMS) and decongestants can cause tachycardia when used concurrently with exogenous thyroid hormone.

"IBS (irritable bowel syndrome) has been linked to the occurrence of **small intestine bacterial overgrowth (SIBO)**, a condition in which the normal colonic flora overgrow into the small intestine to varying extents, causing disruption of normal intestinal bacterial patterns... It is thought that endotoxins produced by overgrown bacteria are responsible for the hyperalgesia by increasing pain perception in the body. Another mechanism of pain production is **bacterial translocation, which is common in SIBO**. This results in the production of **endotoxins** which provoke the production of the tumor necrosis factor, leading to systemic effects." - [https://www.news-medical.net/health/Fibromyalgia-and-Small-Intestinal-Bacterial-Overgrowth-\(SIBO\).aspx](https://www.news-medical.net/health/Fibromyalgia-and-Small-Intestinal-Bacterial-Overgrowth-(SIBO).aspx)

"Despite the fact that FM etiology and pathogenesis remain unclear, there is data that FM pain has a **neuropathic nature and disease manifestation can follow after a specific trigger. A trigger could be a viral infection**, such as **hepatitis C, parvovirus B19**, human immunodeficiency virus (HIV), and **Epstein-Barr virus**....After the primary infection, viruses establish a state of life-long, subclinical persistence, or latency and can be reactivated in cases of immunosuppression. Other human herpesviruses such as **HSV-1 and HSV-2 have been described in the involvement in chronic pain, but have been connected to central nervous system involvement**....There was a higher detection frequency of persistent HHV-6 and HHV-7 infection in FM patients than in control group individuals. **A higher HHV-6 and HHV-7** load and infection in active phase was detected only in patients with FM. - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6505518/>

5. **True or False?** Cholagogues stimulate gallbladder contraction, whereas cholaretics increase bile secretion by liver. Cholaretics appropriate for gallstones include *Taraxacum officinale* (dandelion root), silymarin from *Silybum marianum* (milk thistle), *Cynara scolymus* (artichoke), *Curcuma longa* (turmeric), and *Peumus boldus* (alkaloid boldine helps treat gallstones).

Cholagogues promote the flow of bile from the liver and gall bladder into the intestines. Cholaretics increase bile production. Many plants have been confirmed to have cholagogic and cholaretic properties in both animal experiments and clinical studies. The most common include:

- Chamomile (*Chamomilla recutita*)
- Elecampain (*Inula helenium*)
- Dandelion (*Taraxacum officinalis*)
- St. John's wort (*Hypericum perforatum*)
- Artemisia species
- Yarrow (*Achillea millefolium*)
- Rosemary (*Rosmarinus officinalis*)
- Greater Celandine (*Chelidonium majus*)
- Licorice (*Glycyrrhizae uralensis*) contains the flavonoid liquiritigenin which increases both the secretion of bile and the activity of hepatic detoxication enzymes.
- Milk Thistle (*Silybum marianum*) contains a mixture of flavonolignans called silymarin. Silibinin is an antioxidant hepatoprotective that increases bile acid production and promotes "more hydrophilic and less toxic bile acid species, thus alleviating the metabolic strain on hepatocytes". [www.longdom.org/open-access/mechanisms-of-action-of-herbal-cholagogues-2167-0412.1000107.pdf](http://www.longdom.org/open-access/mechanisms-of-action-of-herbal-cholagogues-2167-0412.1000107.pdf)
- Essential oils with cholaretic properties include: Peppermint (*Mentha piperita*), *Rosaceae* species, *Anethum graveolens*, *Perovskia abrotanoids*, *Salvia rhytidea*, *Ziziphro afghanica* and *Origanum glaucum*

6. Increased intra-ocular pressure (IOP) may be improved by:
- (A) Achieving collagen integrity with ascorbic acid and flavonoids like anthocyanosides (blue-red pigments in berries). Testing for and removing allergens, and supplementing with cod liver oil and chromium.
  - (B) Achieving collagen integrity with corticosteroids and anthocyanosides (blue-red pigments in berries). Testing for and removing allergens, and supplementing with cod liver oil and chromium.
7. Gout is a common arthritis condition caused by increased uric acid in biologic fluid. Uric acid crystals (monosodium urate) deposit in joints, tendons, kidneys, and other tissues, causing inflammation and damage. **Diet changes should include:**
- (A) Increase refined carbohydrates and saturated fats. Eliminate alcohol and optimize protein (0.8 g/kg body weight). Drink liberal quantities of fluid (purified water) and eat liberal amounts (250 to 500 g q.d.) cherries, blueberries, other anthocyanoside-rich red and blue berries.
  - (B) Decrease refined carbohydrates and saturated fats. Eliminate alcohol and optimize protein (0.8 g/kg body weight). Drink liberal quantities of fluid (purified water) and eat liberal amounts (250 to 500 g q.d.) cherries, blueberries, other anthocyanoside-rich red and blue berries.

8. The most common causes of hair loss in women include: androgenic excess, drug side effects, nutritional deficiencies, hypothyroidism, and antigliadin antibodies. Which herbal supplement is recommended for androgenic excess?
- (A) Saw palmetto      (B) *Serenoa repens*      (C) Both A & B

**Skin diseases like alopecia areata, psoriasis, contact dermatitis/urticaria, skin tumors, acne, and atopic dermatitis may have at least one common root cause - the hypothalamic pituitary adrenal axis.** Alopecia areata is a non-scarring **inflammatory** hair loss considered to be a T-cell dependent autoimmune disease. Chronically activated hypothalamic pituitary adrenal axis (HPA) aggravates inflammation. Current research suggests that the release of stress induced corticotropin-releasing hormone (CRH) alters the hypothalamic pituitary adrenal axis (HPA) **as well as the hair follicle. The HPA axis hormones are expressed in the skin.** Corticotrophin-releasing hormone (CRH) affects proliferation, differentiation, and apoptosis of skin cells.

Corticotrophin-releasing hormone (CRH) is a hormone and a neurotransmitter secreted by the **hypothalamus** during the stress response. It is a major regulator of the hypothalamic pituitary adrenal (HPA) axis response. CRH stimulates the release of adrenocorticotrophic hormone from the **pituitary gland**. The released adrenocorticotrophic hormone travels in the bloodstream to the **adrenal glands** and stimulates the release of the stress hormone cortisol. Cortisol, epinephrine, and norepinephrine are glucocorticoids that may enhance **cutaneous immune responses at low concentrations and suppress immune responses at high concentrations.** - <https://www.medicaljournals.se/acta/content/html/10.2340/00015555-1557>

“...**human hair follicles** can synthesize cortisol and that cortisol synthesis is regulated by endogenous feedback controls. Thus, **the skin apparently has a peripheral equivalent of the HPA axis** that is fully functional. The peripheral skin HPA axis may coordinate or fine tune peripheral stress responses with the central HPA axis. In addition to expressing components of the HPA axis, skin also produces a number of other neuroendocrine signals including prolactin, melatonin, and catecholamines.” - <https://www.hindawi.com/journals/drj/2012/403908/>

9. **True or False?** Typically, the more severely ill and jaundiced a person is during the acute phase of viral hepatitis, the better the chances of not progressing to chronic hepatitis.
10. Which two herbs are considered hepatotoxic and contraindicated in those with hepatitis?
- (A) *Silybum marianum* & *Glycyrrhiza glabra*  
(B) *Phyllanthus amarus* & *Symphytum officinale*  
(C) *Symphytum officinale* & *Piper methysticum*
11. **True or False:** HSV-1(herpes simplex virus -1) has replaced HSV-2 (herpes simplex virus -2 ) as the primary cause of genital lesions.

“L-lysine supplementation appears to be **ineffective** for prophylaxis or treatment of herpes simplex lesions **with doses of less than 1 g/d without low-arginine diets.** Doses in excess of 3 g/d appear to improve patients’ subjective experience of the disease...Arginine deficiency may occur with kidney or small bowel pathology, sepsis, sickle cell disease, burns, trauma, or surgery. It is essential for growth, wound healing, endothelial function, and nitric oxide production. **Lysine should, therefore, be used with caution in patients with cardiovascular disease, impotence, gallstones, asthma, or immune dysfunction.**” - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6419779/>

12. **True or False:** *Silybum marianum* (milk thistle; 300 mg standardized extract away from highly active antiretroviral therapy [HAART]) is indicated for all patients on HAART to improve liver function, decrease liver damage, and increase the antioxidant activity of blood cells.

**Interesting:** “In summary, the GI tract is a site of massive CD4 T-cell depletion and viral infection, enterocyte apoptosis, disruption of tight epithelial junctions, and lymphoid tissue fibrosis. **Hence HIV infection could quite reasonably be considered a disease of the GI tract.** Our new understandings in this regard have pointed to new therapeutic directions: the aim would be to prevent or reduce the propagation of HIV at mucosal surfaces and to restore the immunological and epithelial integrity of the mucosal barrier.” - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2777614/>

13. The National Heart, Lung, and Blood Institute studied the efficacy of a system of dietary recommendations for hypertension (high blood pressure)—a diet rich in fruits and vegetables; low in dairy, saturated and total fat, and cholesterol; high in fiber, K, Ca, and Mg; and moderately high in protein. The DASH diet includes:
- (A) Recommends 7-8 servings of whole grains
  - (B) Recommends 3-4 servings of whole grains

**Note:** I can not support the DASH diet recommended in this book for high blood pressure. Cereal, rice, pasta, fruit juice, and low-fat dairy sounds like a perfect storm to create diabetes/metabolic disorders. Recommending 7 to 8 servings of grains and 4 to 5 servings of fruit but only 4 to 5 servings of vegetables is better than the Standard American Diet so of course improvements will be noticed with the short-term medical tests. Long-term results will most likely result in metabolic disorders.

14. Prehypertension is 120 to 139/80 to 89 mm Hg; Stage 1 hypertension is 140 to 159/90 to 99 mm Hg; Stage 2 hypertension is 160 and higher/100 and higher mm Hg. **What causes hypertension?**
- (A) more than 90% of cases are classified as insulin resistant hypertension
  - (B) more than 90% of cases are classified as essential hypertension - no discernible cause
  - (C) more than 90% of cases are classified as salt-sensitive hypertension

## Hyperthyroidism

15. **True or False:** Diffuse, non-painful **goiter** with hyperthyroidism is the most common presentation of Graves' disease. When a population's **intake of iodine suddenly increases**, even to appropriate levels, many persons lapse into hyperthyroid states.
16. **True or False:** TSH receptor antibodies in Graves' disease share a similar structure with antibodies against **several pathogenic organisms in the gut**. Cases of Graves' have started during or shortly after acute infection with *Yersinia enterocolitica* and *Borrelia burgdorferi* (Lyme disease).
17. **True or False:** The most common causes of hyperthyroidism in the elderly are high iodine intake and low use/doses of amiodarone (an antihypertensive drug).
18. Graves' disease is the most common diagnosis of hyperthyroidism. The second most common is toxic nodular goiter. **Which statement is true?**
- (A) Excess iodine can trigger hypothyroidism in euthyroid person
  - (B) Excess iodine can trigger an overactive thyroid to return to normal
19. **True or False:** The action of iodine is very predictable. Using high amounts of iodine (1,000 mcg/1 gram) instead of a low end of normal therapeutic range of 150 to 250 mcg/day for adults is recommended for hyperthyroidism.
20. **True or False?** Fluoride, as sodium fluoride, is a natural compound with antithyroid properties suitable as an alternative to conventional antithyroid drugs (ATD) or in conjunction with ATDs for lower doses.

**Note:** High Thyroid Stimulating Hormone (TSH) means that the pituitary is sending TSH into the blood but the thyroid is not responding by making enough thyroid hormone. The pituitary will keep sending additional TSH into the bloodstream until the blood contains the appropriate amount of thyroid hormones.

"In other words, cases tend to have higher TSH values (greater impairment of thyroid function) with higher fluoride concentrations in the water. Controls, with normal thyroid function, also have higher TSH values with higher fluoride concentrations, **even though their TSH values are still within the normal range**. TSH values are higher (in both cases and controls) with higher levels of water consumption. This is consistent with an association between increased fluoride intake (due to increased water consumption) and increased TSH. It was found that F impacts human thyroid hormones, especially TSH and T3 even in the standard concentration of less than 0.5 mg/L." - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5805681/>

"Iodine deficiency early in life impairs cognition and growth, but iodine status is also a key determinant of thyroid disorders in adults. **Severe iodine deficiency causes goitre and hypothyroidism** because, despite an increase in thyroid activity to maximize iodine uptake and recycling in this setting, iodine concentrations are still too low to enable production of thyroid hormone. In mild-to-moderate iodine deficiency, increased thyroid activity can compensate for low iodine intake and maintain euthyroidism in most individuals, **but at a price: chronic thyroid stimulation results in an increase in the prevalence of toxic nodular goitre and hyperthyroidism in populations.** This high prevalence of nodular autonomy usually results in a further increase in the prevalence of hyperthyroidism if iodine intake is subsequently increased by salt iodization. **However, this increase is transient because iodine sufficiency normalizes thyroid activity which, in the long term, reduces nodular autonomy.**" - <https://www.ncbi.nlm.nih.gov/pubmed/25591468>

## 21. Which statements are true about hypoglycemia?

- (A) Hypoglycemia causes brain dysfunction and is involved in various psychological disorders. Use dietary therapy to stabilize blood sugar. Reactive hypoglycemia is not a disease, but a complex set of symptoms caused by faulty carbohydrate metabolism induced by inappropriate diet.
- (B) Depressed individuals show high percentage of abnormal GTT and G-ITT, but rarely is hypoglycemia considered and dietary therapy prescribed. Reactive hypoglycemia is common in psychiatric patients and habitually violent and impulsive criminals.
- (C) Both A & B

**Note:** "The liver is key to glucose homeostasis. Any disruption of its metabolism, structural integrity, or intracellular dynamics may alter the liver's ability to maintain normal glucose homeostasis. When such disruption affects hepatic glucose output, hypoglycemia may eventuate. Multiple drugs including alcohol may alter the intra-hepatic pathways that are vital for normal glucose production by the liver. Spontaneous hypoglycemia always warrants an evaluation of hepatic function and a careful scrutiny of medications that affect hepatic structural or biochemical integrity." - [www.ncbi.nlm.nih.gov/pubmed/2645130](http://www.ncbi.nlm.nih.gov/pubmed/2645130)

22. **True or False?** Complex hormonal fluxes are largely the result of ingesting too many refined carbohydrates. Syndrome X is a cluster of abnormalities caused by a high intake of refined carbohydrates, leading to hypoglycemia, hyperinsulinemia, and glucose intolerance followed by diminished insulin sensitivity, further leading to hypertension, high cholesterol and, obesity.

23. 95% percent of all cases of overt **hypothyroidism** are \_\_\_\_\_. Iodine deficiency leads to hypothyroidism and/or enlarged thyroid gland (goiter). Goiters affect 200 million people worldwide. All but 4% are caused by iodine deficiency.
- (A) Primary (low thyroid hormones T3 and T4 with **high** TSH)
  - (B) Primary (low thyroid hormone T3 and T4 and **low** TSH)

**Note:** The statement "Iodine deficiency is rare in industrialized countries because of iodized table salt." is a common belief but, does it hold up under scrutiny? Iodized salt in the U.S. contains 45 micrograms of iodine per gram of salt. You would need almost 3/4 teaspoon of salt every day to get the minimum recommendation of 150 mcg. Processed food does not contain iodized salt so it must be added to your food at home.

**Note:** This book states that: "The only function of iodine in the body is thyroid synthesis.' Is this a true statement? I would say it a very limited view of an important mineral. "Previous studies from our laboratory and others have shown that **I<sub>2</sub> exerts antiproliferative and apoptotic effects in different models of cancer.** Specifically, in mammary cell lines it has been demonstrated that cancerous (MCF-7, MDA-MB134, MDA-MB157 and MDA-MB436) and normal (MCF-10, MCF-12F) lines exhibit different sensitivity to **I<sub>2</sub>, but they all have a lower rate of proliferation when iodine is present.**" - <https://www.spandidos-publications.com/or/38/5/2867>

TSH secretion increases thyroidal uptake of iodine and stimulates the synthesis and release of T3 and T4. In the absence of sufficient iodine, TSH levels remain elevated, leading to goiter, an enlargement of the thyroid gland that reflects the body's attempt to trap more iodine from the circulation and produce thyroid hormones. Iodine may have other physiological functions in the body as well. For example, it appears to play a role in immune response and might have a beneficial effect on **mammary dysplasia and fibrocystic breast disease.** <https://ods.od.nih.gov/factsheets/Iodine-HealthProfessional>

“Congenital hypothyroidism affects **1 in 1,500-3,000 newborns** in the U.S. each year. The condition most often occurs for no known reason, but 10-20% of the time it is inherited. **The disorder can result from insufficient maternal iodine consumption during pregnancy, but this is rare in the U.S., where dietary iodine is generally adequate** (iodine is added to table salt and is present in seafood and milk)...Acquired hypothyroidism develops after birth, typically during late childhood or adolescence. The condition is **very common, affecting 1 in 1,250 children**. About 4.6% of the U.S. population age 12 and older has hypothyroidism, according to the National Health and Nutrition Examination Survey (NHANES III).” - <https://www.endocrineweb.com/conditions/hypothyroidism/hypothyroidism-children>

24. Hashimoto's Thyroiditis is a disorder that involves antibodies that bind to thyroid peroxidase enzyme, thyroglobulin, and TSH receptors and inhibit hormone synthesis. Antibodies may also bind to adrenal glands, pancreas, and acid-producing cells (parietal cells) of the stomach. Chemicals that correlate with Hashimoto's thyroiditis include:

- (A) perchlorate, fluoride, lithium, mercury, bisphenol A (BPA), Teflon, excessive iodine
- (B) excessive iodine or when intake increases significantly
- (C) Both A & B

**Note:** Iodine is needed for thyroid function but, start with a daily dose of approximately 150 mcg and gradually increase if tolerated. “In patients with a pre-disposition to autoimmune disorders, **iodine excess can accelerate** or exacerbate autoimmune thyroiditis and **iodine deficiency can attenuate the disorder.**” - Autoimmune Thyroiditis and Iodine Therapy. Flechas, Jorge. Journal of Restorative Medicine, Volume 2, Number 1, October 2013, pp. 54-59

25. **True or False:** A clear correlation exists among autoimmunity, intestinal permeability, and food allergy. Roughly 2% of patients with celiac disease have overt autoimmune thyroid disease.

**Serologic autoantibody markers become undetectable 6 months after a gluten-free diet is started.** Use an elimination diet and/or detoxification regimen to decrease antigen load, strengthen gut integrity, and normalize autoantibody activity in autoimmune thyroid patients.

**Note:** Finding a sole root cause of any autoimmune disorder is usually in vain. However, we are given many “rabbit trails” in research papers. When searching for information, look into viruses, bacteria, parasites, mycoplasmas, and chemicals. Which ones are likely opportunists? Which ones can we systematically approach with diet, herbal combinations, homeopathics, and supplements? If you are able to help your client stop or reverse an autoimmune process you may not know exactly what worked or if it was a combination of approaches. Only the outcome is important because the next client may have a different cause - same symptoms with a different cause is why natural health professionals have an advantage in healing. Doctors are limited to the one cause and one protocol approach to disease.

**Example one:** “Our data indicate that TSH binds specifically and with high affinity to **mycoplasma**. Further studies are required to investigate the potential role of bacterial TSH binding proteins in the modulation of autoimmune thyroid disease.” - Pediatric Research 20(11) November 1986

**Example two:** “This study suggests a possible relation between Grave's disease, thyroid lymphocytic infiltration and **parvovirus** infection. Further study are needed to confirm these results.” - [www.endocrine-abstracts.org](http://www.endocrine-abstracts.org)

**Example three:** “With acute exposure, **mercury** has high affinity for thyroid tissue causing atrophic changes in thyroid gland. Inhibition of coupling, antagonism of deiodinases and induction of autoimmune reactions are the three fundamental pathophysiological mechanisms that have been documented as it relates to mercury's effect on thyroid.” - Carpenter D.O, Zehra R, Fatmi S S (2018) Pathophysiological Mechanisms of Mercury's Effect on Thyroid Gland. Int J Thyro Disord Ther 1(1): 1-6.

26. Thyroxine-binding globulin (TBG) from the \_\_\_\_\_ transports thyroid hormones, including 75% of circulating T4. Factors increasing TBG include excess estrogens (as in pregnancy, oral estrogens of birth control pills and hormone replacement therapy), tamoxifen for breast cancer, and liver diseases. Depending on clinical picture, consider moderating estrogen excess by decreasing intake of oral estrogens or using non-oral regimens to bypass the liver first pass and/or helping liver metabolism of estrogens.

- (A) Thyroid
- (B) Pituitary
- (C) Liver

27. **True or False:** Zinc, vitamin E, and vitamin A function together to manufacture thyroid hormone. A deficiency of any of these reduces the amount of active hormone produced.
28. **True or False:** Naturopathic physicians prefer Levothyroxine, complete with all thyroid hormones—T4, T3, T2, amino acids, and micronutrients (0.2% iodine per tablet). Normal tissue levels of T4 and T3 are achieved only with infusion of T4 and T3, not by T4 alone. Many patients treated with desiccated thyroid tend to feel better.

### Infectious Diarrhea

29. In healthy adults, clinical manifestation is acute, self-limited gastroenteritis. Twenty-five different types of bacteria and protozoa can cause an identical clinical syndrome; more than 75% of diarrhea-associated cases of gastroenteritis are caused by viruses. **Rotavirus transmission is person to person through:**
- (A) the fecal-oral route
  - (B) not washing hands after using the bathroom
  - (C) not washing hands after changing diapers
  - (D) all of the above

**Note:** Researches have identified the transmission routes of more than 400 parasites. Of these, **45%** can be transmitted by the **fecal–oral route**. Adults and children need to wash their hands every time they go to the bathroom, change a diaper, handle raw fruits and vegetables (wash the produce before eating). Toys and other surfaces, if touched by someone with the virus on their hands, will also be contaminated. Washing means the use of **soap and water**. Hand “sanitizer” does not remove or kill most organisms.

30. **True or False:** *Yersinia enterocolitica* is considered be the most frequent cause of bacterial enterocolitis in North America. Transmission is by fecally contaminated food or water and contaminated blood products. Symptoms are watery to bloody diarrhea. *Yersinia* is unable to invade lymphoid tissues and does not cause any cases of acute appendicitis.

“Reactive arthritis is a non-purulent joint inflammation that can be triggered by bacterial infections in the urogenital tract or gut and genetic factors...*Yersinia enterocolitica* is a **well-established trigger** of reactive arthritis...” - [www.ncbi.nlm.nih.gov/pmc/articles/PMC5491824](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5491824)

“Over a period of four years 18 children seen in our clinic have been diagnosed as suffering from *Yersinia enterocolitica* reactive arthritis: this group constitutes one third of the total reactive arthritides seen by us...*Yersinia* has been described as the most frequent agent causing reactive arthritis, **a common complication in an otherwise benign infection in children.**” (<https://www.ncbi.nlm.nih.gov/pubmed/7895406>)

“After identification of 4 children in a day-nursery in Belgium with enteritis due to *Yersinia enterocolitica* O3, further investigation revealed that 17 others were infected by the organism but were either **asymptomatic or may have had at most 1 or 2 loose stools** during previous days. One nurse was also infected. The cause of the outbreak could not be determined.” - D.W. FitzSimons

31. Diarrheal diseases caused by parasites (protozoa, helminths) are the greatest single worldwide cause of illness and death. Poor sanitation in undeveloped nations, worldwide travel, and migration to the United States are the most common cause of spread. **Which organism is considered the most frequent cause of parasitic enteritis in the United States?**

(A) *Entamoeba histolytica* (B) *Giardia lamblia* (C) *Giardia intestinalis*

32. Some pharmaceuticals increase susceptibility to infectious diarrhea: Which drug inhibits the production of stomach acid which allows pathogens and undigested food to reach intestines without proper processing.
- (A) Proton pump inhibitors (B) Anti-folate drugs (C) Antibiotics

33. Berberine's action against some pathogens is stronger than that of common antibiotics [This statement is specific to the bowels/intestines]. Berberine prevents overgrowth of yeast. Berberine has remarkable antidiarrheal activity in even severe cases of cholera, amebiasis, giardiasis, *E. coli*, *Shigella*, *Salmonella*, *Klebsiella*, and chronic candidiasis. The following group(s) of plants/herbs contain the alkaloid berberine?
- (A) *Hydrastis canadensis*, *Berberis vulgaris*, *Berberis aquifolium*, and *Coptis chinensis*
  - (B) *Hydrastis canadensis*, *Achillea millefolium*, *Berberis aquifolium*, and *Urtica dioica*
  - (C) Goldenseal, Barberry, Oregon Grape, and Goldthread
  - (D) Both A & C

**Note:** The statement, "Future studies should evaluate potential benefits and toxicities of these antiparasitic herbs: *Artemisia absinthium* (wormwood), *Dysphania ambrosioides* (wormseed), *Curcuma longa* (turmeric), *Phytolacca decandra* (pokeweed, pokeroot), *Juglans* species (black and white walnut), and *Tanacetum vulgare* (tansy)." is unfortunate. These herbs have been part of many herbal combinations that have been used to effectively eliminate the overgrowth of parasites, bacteria, and fungus for hundreds of years..

34. Nutrient and toxic element screening for infertility in female: It is widely accepted that excessive exposure to heavy metals has detrimental effects on fertility and must therefore be assessed and remedied during the \_\_\_\_\_ period. Also consider environmental assessments that check for porphyrins, polychlorinated biphenyls (PCBs), chlorinated pesticides, volatile solvents, phthalates, parabens, and other toxins. Consider them because they have deranging effects on reproductive function, endocrinology, gamete development, and thus embryologic potential.
- (A) post-conception
  - (B) preconception
  - (C) ovulation
35. *Vitex agnus-castus* (chaste tree): beneficial for anovulatory cycles, hyperprolactinemia, hypothalamic dysfunction, hypothalamicpituitary- ovarian (HPO) axis modulation, and promotion of a regular and normal menstrual cycle. It is beneficial in PMS. It alleviates symptoms of latent hyperprolactinemia, with lower-than-normal \_\_\_\_\_ secretion and normal to mildly elevated prolactin.
- (A) progesterone
  - (B) estrogen
  - (C) prolactin
36. **True or False:** Most male infertility reflects abnormal sperm count (oligospermia) or quality. Anything the male experiences during spermatogenesis can affect mature sperm regardless of his health at time of examination. Factors include illness, toxicity, trauma, nutritional status.
37. The "virtual sea of estrogens" in the environment increases exposure to estrogens during fetal development and reproductive years. This is a major cause of increased disorders of development and function of the male sexual system. **Avoid the following:**
- (A) Tap water, estrogenic xenobiotics, and a low-fiber diet
  - (B) Purified water, , and a high-fiber diet
38. **True or False:** Cell phones decrease sperm count, motility, viability, and normal morphology, with decline worsening as cell phone use increases. Use of cell phones more than 4 hours daily causes a 25% drop in sperm count and only 20% of remaining sperm are normal.

**Ionized calcium is often over-looked as a needed supplement for men. I would recommend 30% RDA calcium lactate (along with the other minerals and vitamins) for 3-6 months.** "Human semen contains several trace elements such as Calcium (Ca), copper (Cu), manganese (Mn), magnesium (Mg), zinc (Zn), and selenium (Se) that are necessary for metabolic processes, normal spermatogenesis, sperm maturation, motility and capacitation, as well as sperm normal function. Therefore reduced level of these trace elements can be considered as one of the significant factors for impaired spermatogenesis, poor semen quality and male fertility. ...It is well-known that Ca, as an intracellular and universal second messenger, is crucial for maximum motility of sperm cells, capacitation, hyperactivation, acrosome reaction, chemotaxis and fertilization processes. Human spermatozoa are unable to fertilize an oocyte before their maturation through the female reproductive tract. The process of fertilization



and maturation is tightly modulated by some signaling cascades and Ca, which plays a critical dynamic role in this process as an intracellular second messenger. Therefore, there may be a close relationship between Ca, and human sperm function and fertility outcome.” - [www.ncbi.nlm.nih.gov/pmc/articles/PMC6186280/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC6186280/)

39. Inflammatory bowel disease (IBD) is a general term for a group of chronic inflammatory disorders of the bowel. The two major categories are Crohn's disease (CD) and ulcerative colitis (UC). Infection as a cause is debated but the following organisms deserve consideration as a cause(s):
- (A) *Yersinia*, *Candida*, *Aeromonas*, pseudomonas-like organisms, and viruses
  - (B) *Candida albicans*, *Lactobacillus acidophilus*, *Bifidobacterium infantis*, and viruses
40. **True or False:** CD has spread like an epidemic. Wherever antibiotics are used early and in large quantities, the incidence of CD is now quite high.
41. **True or False:** The formation of inflammatory compounds is decreased when the following foods are increased: corn, meat, and dairy. It is also recommended that omega-3 fatty acids are decreased.
42. Extraintestinal Manifestations: More than 100 disorders are systemic complications of IBD. The most common extraintestinal lesion (EIL) in adults is arthritis (25% of patients). Skin manifestations/lesions include erythema nodosum, pyoderma gangrenosum, and aphthous ulcerations. Skin manifestations are seen in at least \_\_\_\_\_% of patients.
- (A) 3-7%
  - (B) 10%
  - (C) 15%
43. **True or False:** Nutritional complications of IBD have a great influence on morbidity (and mortality).
44. **True or False:** Bastyr's formula (modified Robert's formula) includes Comfrey (*Symphytum officinale*) and Poke Root (*Phytolacca americana*).
45. Obstructive Sleep Apnea is caused by excess fatty tissue that has accumulated in airway, causing it to be narrowed, leading to heavy snoring, periods of \_\_\_\_\_, and frequent arousals (causing abrupt changes from deep sleep to light sleep).
- (A) deep sleep
  - (B) no breathing
  - (C) restless legs
46. **True or False:** Central Sleep Apnea refers to the loss of perfect control over breathing by the brain. In both obstructive and central sleep apnea, obesity is the major risk factor and weight loss is the most important aspect of long-term management.
47. Psychological factors account for 50% of insomnia cases evaluated in sleep laboratories and are closely associated with affective disorders. *Valeriana officinalis* root improves sleep quality and sleep latency. Which herbs, vitamins/minerals may help with insomnia?
- (A) B6, Magnesium, Caffeine, Passionflower, *Scutellaria lateriflora*, Chamomile, Tryptophan, and 5-Hydroxytryptophan (5-HTP)
  - (B) *Passiflora incarnata*, *Humulus lupulus*, *Scutellaria lateriflora*, *Matricaria chamomilla*, B6, Magnesium, Tryptophan, and 5-Hydroxytryptophan (5-HTP)
48. The association between intestinal protozoa and chronic fatigue **without prominent digestive complaints** is \_\_\_\_\_; 80% of patients with diagnosis of chronic fatigue immune dysfunction syndrome infected with protozoan *Blastocystis hominis* showed improved fatigue after treatment that cleared protozoa from stool specimens. Infestation with *B. hominis* also shows several patterns of skin rashes/urticaria: acute, chronic, and pressure induced.
- (A) common
  - (B) unusual
  - (C) rare

49. Chronic *Entamoeba histolytica* infection is linked to autoimmune phenomena (e.g., antibodies to colonic epithelial cells and ulcerative colitis after cure of amebic colitis). Reactions may also include antiphospholipid antibody syndrome with deep vein thrombosis and pulmonary embolism and symmetrical polyarthritis mimicking rheumatoid arthritis. **Choose the best set of herbs to eliminate protozoa and amoeba:**

- (A) Equal amounts of Mullein, Phytolacca (poke root), *A. sativum* (garlic), and Turmeric
- (B) Equal amounts of Black Walnut, *Artemisia absinthium* or *A. annua*, Oregon grape, and *Coptis chinensis*

**Note:** *Artemisia annua* (Sweet Annie, Sweet Wormwood), is a wonderful herb for digestion and immune support. My understanding is that it takes very large doses to be effectively used for parasites.

*Artemisia absinthium* (Wormwood) is well known for expelling parasitic worms and for treating protozoa and amoeba.

### Irritable Bowel Syndrome - What is irritating the bowels?

Treatments to consider when a client has irritated bowels:

(1) increasing dietary fiber, (2) eliminating allergic or intolerable foods, (3) controlling psychological components, and (4) peppermint oil for spastic colon. Additional considerations: (5) acupuncture for pain modulation and motility regulation; (6) melatonin as stress adaptogen and mood stabilizer and for promotion of restful sleep; (7) possible silent triggers of IBS—small intestinal bacterial overgrowth (SIBO), intestinal dysbiosis, and food allergies; (8) dietary FODMAPs (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols), which may promote IBS and should be limited.

**Note:** Melatonin as a stress adaptogen? We have many excellent adaptogenic herbs and herbal combinations that offer direct support for the HPA axis. I would recommend an herbal approach to support the endocrine system when a client is facing mental and/or emotional problems.

50. **True of False:** The type of food sensitivity most significant in IBS is nonimmunologic—food intolerance rather than food allergy. Two thirds of patients with IBS have food intolerances. Foods rich in carbohydrates and fats, coffee, alcohol, and hot spices are problematic. The most common allergens are dairy (40% to 44%) and grains (40% to 60%).

51. **True of False:** Laboratory tests are able to determine food sensitivities as well as food allergies. Elimination diets are not necessary if the lab tests confirmed that the client is not allergic to dairy, grains, and other common food intolerances.

52. **True of False:** Almost all patients with IBS, including children, also report mental and/or emotions problems. Anxiety [constant worry, worst-case scenario, living or working in a hostile environment, real or imagined fears, etc], depressive symptoms [fatigue, no ambition, over-sleeping, avoiding activities they used to enjoy, etc.] anger issues, and sleep issues.

53. FODMAPs are short-chain carbohydrates that are fermentable by intestinal bacteria yielding gases that cause abdominal bloating. FODMAPs include oligosaccharides (e.g., fructans, chains of fructose with one glucose molecule on the end). Foods rich in fructans are wheat, onions, and artichokes; less-problematic fructan foods are asparagus, leeks, garlic, and chicory roots. Galactans are chains of fructose with one galactose molecule on the end. The main foods rich in galactans are legumes (soy, beans, chickpeas, lentils), cabbage, and Brussels sprouts. **How many patients responded well to restriction of FODMAP intake?**

- (A) 25% (B) 35% (C) 65% (D) 75% of patients

**Small intestinal bacterial overgrowth (SIBO):** “Herbal therapies are at least as effective as rifaximin for resolution of SIBO and also appear to be as effective as triple antibiotic therapy for SIBO rescue therapy for rifaximin non-responders. In the current study, we chose a combination of herbal preparations to provide broad-spectrum coverage against enteric coliforms. **The study included: Oil of oregano (*Origanum vulgare*)** that directly kills or strongly inhibits the growth of intestinal microbes. **Berberine extracts** and ***Thymus vulgaris*** for their broad antibacterial activities. **Wormwood (*Artemisia absinthium*)** has substantial antimicrobial and anti-inflammatory

properties and has been used to successfully induce remission of Crohn's Disease. **Coptis root** has growth-inhibitory effects on human bacteria. **Red thyme essential oil** inhibits the growth of *E. coli* and *Staphylococcus aureus*. Indian Barberry root (***Berberis aristata***) contains berberine and has antimicrobial, anti-inflammatory, and antidiarrheal properties. ***Equisetum arvense L. (Horsetail)*** possesses a broad spectrum of a very strong antimicrobial activity against *Staphylococcus aureus*, *E. coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and *Salmonella enteritidis* and the fungi *Aspergillus niger* and *Candida albicans*. ***Thymus vulgaris*** has potent antimicrobial and anti-inflammatory actions. ***Olea europaea*** inhibits the growth of a number of staphylococcal species including *S aureus*." -<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4030608/>

## Kidney Stones

Human urine is supersaturated with calcium (Ca) oxalate, uric acid, and phosphates. They remain in solution because of **pH control** and **secretion of inhibitors** of crystal growth.

54. Ca-containing stones are Ca oxalate, Ca oxalate mixed with Ca phosphate, or (very rarely) Ca phosphate alone. **High incidence of Ca stones in affluent societies is linked to a diet:**
- (A) high in fiber and low in refined carbohydrates, alcohol, animal protein, fat, low-Ca food, vitamin D-enriched food, soft drinks, and fructose.
  - (B) low in fiber and high in refined carbohydrates, alcohol, animal protein, fat, high-Ca food, vitamin D-enriched food, soft drinks, and fructose.
  - (C) a diet low fiber and high refined carbohydrates and soft drinks do not lead to health issues if the person is taking digestive enzymes and the best food-based multivitamins
55. **True or False:** Dietary factors induce hyperuricemia, hypercalciuria, and stone formation, building a cumulative effect.

**Hyperuricemia is an excess of uric acid in the blood.** Uric acid passes through the liver, and enters your bloodstream. Most of it is excreted in the urine, or passes through the intestines to regulate normal levels.

**Hypercalciuria is an excess calcium in the urine.** It may be secondary (a side-effect of some other condition causing high levels of calcium in the **bloodstream**) or it may be "idiopathic" (cause unknown with normal blood calcium levels).

56. Cranberry juice \_\_\_\_\_ urine pH and \_\_\_\_\_ oxalic acid excretion and relative supersaturation for uric acid. Cranberry juice \_\_\_\_\_ urine and may treat brushite and struvite stones and urinary tract infections.
- (A) decreases urine pH (acidifies urine), increases oxalic acid excretion
  - (B) increases urine pH (alkalizes urine), decreases oxalic acid excretion
  - (C) has no effect on urine pH, decreases oxalic acid excretions
57. **True of False:** Blackcurrant juice increases urine pH, excretion of citric acid, and oxalic acid loss. Blackcurrant juice may treat or prevent uric acid stones by alkalizing urine.
58. **True or False:** Grapefruit juice is recommended to inhibit the growth of calcium oxalate stones and calcium phosphate crystals. Women should drink at least 8 oz. daily.
59. **True or False:** Mg increases solubility of Ca oxalate and inhibits precipitation of Ca phosphate and Ca oxalate. Low urinary Mg/Ca ratio is an independent risk factor in stone formation. Supplemental Mg alone prevents recurrences. Use of Mg plus vitamin B6 has even greater effect.
60. **True of False:** Potassium (K) and sodium (NA) citrate for recurrent Ca oxalate are quite effective; they cease stone formation in 90% of patients. Magnesium (Mg) citrate is of no benefit and should not be used.

**Note:** The book states that supplementing with calcium (300 to 1000 mg per day) may be preventive. However, postmenopausal women with no KS history have exhibited a 17% increased risk of stones after consuming **1000 mg of Calcium carbonate plus 400 IU of vitamin D** daily. Postmenopausal women may respond differently to Ca carbonate compared with younger women and men **for unknown reasons**. This study contradicts others indicating that vitamin D can be taken by postmenopausal women who are not stone formers and who are vitamin D insufficient without fear of an increased risk of KS.

**The following information is from an article, *How much calcium do you really need?*, Harvard Health Publishing, Harvard Medical School ([health.harvard.edu](http://health.harvard.edu))**

Dr. Walter Willett, chair of the Department of Nutrition at Harvard T.H. Chan School of Public Health, thinks you're likely to do just as well on half as much calcium.

"Essentially, I think that adults do not need 1,200 mg of calcium a day. The World Health Organization's recommendation of **500 mg is probably about right**. The United Kingdom sets the goal at 700 mg, which is fine, too. It allows for a little leeway," he says.

In 1997 an Institute of Medicine panel raised the recommendation for calcium intake from 800 mg to 1,200 mg a day for women over 50. **That wasn't a sound decision**, Dr. Willett says: "The recommendation was based on calcium balance studies that lasted just a few weeks. In fact, calcium balance is determined over the course of years." Moreover, there wasn't any evidence that consuming that much calcium actually prevented fractures. **Nonetheless, the recommendation has been carried forward since then.**

**The downside of high levels of calcium supplementation (but not to calcium through diet):**

- **An increased risk of kidney stones.** In the Woman's Health Initiative, women taking the calcium–vitamin D combination had a higher risk of developing kidney stones than those who got the placebo. Although high levels of dietary calcium are thought to offer some protection against kidney stones, high doses of calcium from supplements may promote stone formation by increasing the amount of calcium that is eliminated in the urine.
- **An increased risk of heart attack.** In a randomized study of 1,471 postmenopausal women conducted in New Zealand, 21 of 732 women who took 1,000 mg of calcium a day had heart attacks, compared with 10 of 736 who received a placebo. A 2010 analysis of 15 randomized controlled trials also linked calcium supplementation with an increased risk of heart attack.

**One thing the studies have taught us is that both calcium and vitamin D are essential in building bone. The question is how much of each:**

- Dr. Willett recommends going lower on calcium and higher on vitamin D than the guidelines suggest—**500 to 700 mg a day of calcium and 800 to 1,000 IU of vitamin D**. At that rate, you can probably get all or most of your calcium from food, especially if you have a serving or two of dairy products daily.
- **If you can't tolerate dairy, you should still be able to get 300 mg a day in your diet and can take a low-dose calcium supplement to make up the rest.** By keeping your supplement consumption to 500 mg or less a day, you should avoid the possible risk of heart disease and kidney stones suggested by the studies.

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While the debate over calcium will continue for years to come, I have always recommended 30-50% of the RDA for calcium and 1,000 IU of vitamin D. Using higher amounts, short-term only, may be necessary when a person is very deficient but several months to several years comes with negative consequences. Calcium, like all supplements, should be taken with food. Choose calcium as a lactate, citrate, malate... never carbonate or di-calcium phosphate. It is also necessary to increase all trace minerals from food and/or herbs, omega-3 fatty acids, all fat-soluble vitamins, and use a B-complex (chose based on the amount of B6 that is likely needed).

\_\_\_\_\_ **End of Part Two of Three Tests**