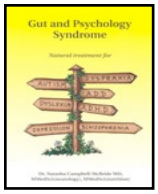

G110 TEST QUESTIONS & STUDY GUIDE

Gut & Psychology Syndrome (2010 revised edition)
by Dr. Natasha Campbell-McBride

Part One: Chapter 1

1. GAPS children and adults have _____ problems, sometimes quite severe. Colic, bloating, flatulence, diarrhea, constipation, feeding difficulties and malnourishment, all to various degrees, are a _____ part of autism, schizophrenia and other GAPS conditions.
    A. Attitude, rare
    B. Digestive, rare
    C. Digestive, typical

2. The main issue is: autistic children have enlarged and inflamed lymph nodes in their _____ wall, which is a clear sign of a fight with some _____ going on there.
    A. Cell, virus
    B. Intestinal, infection
    C. Intestinal, healing

Mesenteric lymphadenitis (also known as mesenteric adenitis) is inflammation of the lymph nodes in the membrane that attaches the intestine to the abdominal wall. Mesenteric lymph node enlargement can occur with localized or systemic inflammation reactions which include acute appendicitis, pancreatitis, bowel disorders, connective tissue disorders, and cancer. Mesenteric lymph enlargement is also caused by various pathogens, including *Yersinia enterocolitica*, *Yersinia pseudotuberculosis*, *Bartonella henselae*, *Salmonella, Nocardia*, *Ascaris lumbricoides*, *Cryptococcus*, *Mycobacterium* species, and norovirus. “Rarely, mesenteric lymphadenitis has also been associated with enteric fever and Epstein-Barr virus, *Toxoplasma gondii,* or *Bartonella henselae* infection.” (Helbling R, Conficconi E, Wyttenbach M, et al. Acute Nonspecific Mesenteric Lymphadenitis: More Than "No Need for Surgery". *Biomed Res Int*. 2017;2017:9784565. doi:10.1155/2017/9784565)

Nocardia is a genus of rod-shaped bacteria that form beaded branching filaments (acting like fungi). *Nocardia* bacteria are found in soil and water and can affect the lungs, brain, and skin.

There are ten common foodborne pathogens associated with both irritable bowels and joint pain: *Campylobacter*, *Salmonella*, *Escherichia coli*, *Listeria*, *Shigella*, *Cryptosporidium*, *Cyclospora*, *Giardia*, *Yersinia*, and norovirus.

“Emerging evidence now indicates that autism and many congenital and acquired gastrointestinal tract abnormalities and their intensity, including Hirschsprung’s disease, may be due to prenatal and/or postnatal damage of the enteric nervous system associated mainly with peroral infection with *Toxoplasma gondii* (intracellular parasitic protozoan)…Lactoferrin, a component of the breast milk, plays an important role in the host defense against *T. gondii* infection and dissemination, therefore it should be included into therapeutic assets used for treatment of GI tract disturbances caused by the parasite both in young and adult patients.” (Prandota J (2012) Gastrointestinal Tract Abnormalities in Autism, Inflammatory Bowel Disease and Many Other Clinical Entities May Be Due To *T. gondii* infection. 1: 256. doi:10.4172/scientificreports.256)

Part One: Chapter 2

3. Symbiotic relationships are ones where neither party can live without the other. We humans, cannot _____ without these tiny micro-organisms, which we carry on and in our bodies everywhere.
    A. Die
    B. Reproduce
    C. Live

4. Gut micro-flora can be divided into three groups: (select all that apply)

    A. Essential flora
    B. Aberrant flora
    C. Opportunistic flora
    D. Inflammatory flora
    E. Transitional flora

5. Without protection the gut wall is open to invasion by anything that comes along: a virus from vaccination or the _____, a ubiquitous fungus such as *Candida albicans*, various bacteria and _____ and toxic substances, all of which are very capable of damaging our digestive system and causing a chronic inflammation in its walls.
    A. Air, cysts
    B. Carpet, mold
    C. Environment, parasites

6. It is the _____ action on the dietary fiber that allows it to fulfill all those good functions in the body.
    A. Enzymatic
    B. Amino acid
    C. Bacterial

Damage to intestinal mucosa or the epithelium layers is like having an open wound on the skin. “Normal” gut microbiota are not harmful within the intestines but they can become pathogenic if they enter tissues within the body. If microbes are able to escape through a break in the intestinal barrier it is logical that other organisms and substances are also able to migrate from the intestines. Bacterial translocation is defined as “the migration of bacteria or bacterial products from the intestinal lumen to mesenteric lymph nodes or other extraintestinal organs and sites.” (Compare D1, Coccoli P, Rocco A, Nardone OM, De Maria S, Cartenì M, Nardone G. Gut-liver axis: the impact of gut microbiota on non alcoholic fatty liver disease. Nutr Metab Cardiovasc Dis. 2012 Jun;22(6):471-6. doi:10.1016))

Several types of *E. coli* exist as part of the normal flora of the human gut and have many beneficial functions, such as the production of vitamin K2. They also prevent harmful (pathogenic) bacteria, from establishing themselves in the intestine. Most *E. coli* strains pose no harm to human health but, serotype O157:H7, which is normal flora in bovine intestines, causes bloody diarrhea and can sometimes cause kidney failure and even death. *E. coli* O157:H7 is called a Shiga toxin-producing *E. coli* (STEC). There are other types of STEC that can make you just as sick as *E. coli* O157:H7.

7. Apart from digesting _____, physiological strains of *E. coli* produce vitamin K2, vitamins B1, B2, B6, B12, produce antibiotic-like substances, called _____, and control other members of their own family which can cause disease.
    A. Dairy, bactericides
    B. Lactose, colicins
    C. Protein, vitamins

8. People with abnormal gut flora have multiple _____ deficiencies due to all the factors described above.
    A. Nutritional
    B. Anti-nutrient
    C. Yeast

Intestinal microbiota is also called intestinal flora, natural flora, gut micro-flora, good bacteria, and friendly bacteria. An imbalance of the microbiota, commonly called gut dysbiosis, has been associated with various diseases in recent years. While Crohn's disease, ulcerative colitis, irritable bowel syndrome (IBS), and *Clostridium difficile* colitis are not surprising, an imbalance of the microbiota or an increase of specific bacterial strains has also been associated with type 2 diabetes, metabolic syndrome, obesity, asthma, allergies, non-alcoholic fatty liver disease, colorectal cancer, autoimmune disorders, and psychiatric disorders.

"In the human gut the most commonly found species of *Bifidobacterium* genus include *B. adolescentis*, *B. angulatum, B. bifidum, B. breve*, *B. catenulatum, B. dentium*, *B. longum, B. pseudocatenulatum*, and *B. pseudolongum*, whereas *B. animalis* subsp. *lactis* is the species most often included in functional foods and food supplements. Bifidobacteria is a dominant microbial group in healthy breastfed babies… During the last few years, it has been shown that a few probiotic strains have a potential role in reducing the symptoms of asthma and other allergic respiratory troubles. For instance, a hydrolyzed formula with *B. breve* and a galacto/fructo-oligosaccharide mixture (prebiotics) was able to prevent asthma-like symptoms in infants with atopic dermatitis. However, one of the more promising applications of probiotic bacteria in respiratory diseases is the use of some *Lactobacillus* and *Bifidobacterium* strains in the treatment of allergic rhinitis". (Tojo R, Suárez A, Clemente MG, et al. Intestinal microbiota in health and disease: role of bifidobacteria in gut homeostasis. *World J Gastroenterol*. 2014;20(41):15163-15176. doi:10.3748/wjg.v20.i41.15163)

Part One: Chapter 3

9. In GAPS people, due to the abnormalities in their gut flora, viruses from the vaccines or the environment have a good chance to _____ and _____. A good example is the measles virus found in the gut wall and spinal fluid of autistic children.
    A. Survive, persist
    B. Decrease, poison
    C. Die off, decrease

10. It has been estimated that around 80-85% of our _____ is located in the gut wall.
    A. Bacteria
    B. Immunity
    C. Digestion

The gut-associated lymphoid tissue (GALT) has the largest concentration of lymphoid tissue in the body. In addition, the mucosal epithelium of the intestines are host to several immune cells such as B cells, T cells, macrophages, antigen-presenting cells, dendritic cells, and mast cells. Individual nutrient status directly affects how our immune cells function. The function and number of NK cells are regulated in part by vitamin A, while vitamins B6, B12, C and E, folate and the mineral zinc maintain and enhance cell cytotoxic activity. Zinc influences the activity of many enzymes involved in activation, replication and programmed death of lymphocytes. Macrophages contain significant amounts of iron and like monocytes, dendritic cells, and the thymus, they have vitamin D receptors.

Part One: Chapter 4

11. Farm animals and poultry are routinely given _____ so all the products we get from them (meat, milk, eggs) will provide us with a constant supply of antibiotics and antibiotic-resistant bacteria, which these animals develop in their bodies as well as all the toxins which these bacteria produce.
    A. Soy
    B. Vaccinations
    C. Antibiotics

12. (True or False) Antibiotics change bacteria, viruses, and fungi from benign to pathogenic, giving them the ability to invade tissues and cause disease.
    A. True
    B. False

Andreas Wack, Ph.D and his research team used a group of mice with healthy gut bacteria at baseline. Over 4 weeks, they gave these mice a mix of antibiotics through their drinking water before infecting them with the flu virus. They also infected some mice that they had not treated with the antibiotic mix as the control group. Approximately 80% of the untreated mice with healthy gut bacteria survived the infection with the flu virus. Only one-third of mice given the antibiotic mix survived the viral infection.“Inappropriate use [of antibiotics] not only promotes antibiotic resistance and kills helpful gut bacteria, but may also leave us more vulnerable to viruses,” says Wack.

13. Which particular group of antibiotics allow bacteria normally found only in the bowel to move up to the intestines, which predisposes the person to development of IBS (Irritable Bowel Syndrome) and other digestive disorders?
    A. Minocyclines
    B. Penicillins
    C. Tetracyclines

14. Tetracyclines are routinely prescribed to teenagers for _____. It starts an _____ reaction in the body against its own gut.
    A. Strep throat, acute
    B. Ear infections, emotional
    C. Acne, autoimmune

Tetracycline, doxycycline and minocycline easily cross the blood–brain barrier which can lower neuroinflammation but they can also disrupt brain development in children. Other side effects include pseudotumor cerebri, headaches and dizziness. Dizziness/light headedness is commonly seen with minocycline, but not the others. This is caused by vestibular or central nervous system toxicity and is of such severity and frequency that CDC has changed recommendations on its non-essential use.

15. Aminoglycosides (the -mycins like Erythromycin) have a particular devastating effect on colonies of beneficial bacteria in the gut such as physiological *E. coli* and _____.
    - *A. Enterococci*
    - *B. C. diphtheriae*
    - *C. C. jejuni*

16. Nystatin is an _____ antibiotic which leads to selective stimulation of growth of the *Proteus* family and lactose-negative *E. coli* species, capable of causing _____ disease.
    - A. Anti-fungal, serious
    - B. Antibacterial, serious
    - C. Antiviral, serious

Proteus mirabilis causes up to10% of all urinary tract infections but is often isolated from the gastrointestinal tract. It is not known for sure if it is a commensal, a pathogen, or a transient organism but it is well-known for its flagella-mediated motility which allows swimming and swarming on surfaces. *Proteus* is a member of the same bacterial family (*Enterobacteriaceae*) as *E. coli*.

17. Processed and sugary carbohydrates (white bread, cakes, biscuits, pastries and pasta) also promote population of the gut with _____ and other _____.
    - A. Biofilms, parasites
    - B. Worms, parasites
    - C. Flora, parasites

Part One: Chapter 5

18. There are around _____ different species of opportunistic flora in the human gut.
    - A. 125
    - B. 250
    - C. 500

19. (True or False) *Candida* can cause “leaky” guts, food allergies, and food intolerances.
    - A. True
    - B. False

20. Opportunistic flora constantly produces _____, which are the by-products of their metabolism.
    - A. Candida
    - B. Toxic substances
    - C. Probiotics

There are several defense mechanisms to prevent bacterial overgrowth in the small intestine: peristalsis prevents attachment of ingested micro-organisms; gastric acid and bile destroy many microorganisms coming in with food; proteolytic enzymes helps destroy bacteria in the small intestine; the ileocecal valve inhibits translocation of bacteria from the colon to the small intestine; and the immune system.

Small intestinal bacterial overgrowth (SIBO) can result in bloating, flatulence, abdominal pain, diarrhea, and constipation. In severe cases, there are signs of malabsorption, skin disorders, joint pain, and deficiency syndromes (anemia and polyneuropathy from B12 deficiency, hypocalcemia from vitamin D deficiency, metabolic bone diseases like osteoporosis or rickets, impaired gut barrier, etc.).

"Bacteria produce various toxic agents with systemic effects. These agents are ammonia, D-lactate, endogenous bacterial peptidoglycans and others. SIBO is regularly associated with increased serum endotoxin and bacterial compounds stimulating production of (pro)inflammatory cytokines. SIBO might be associated with endogenous production of ethanol (probably synthesised by *Candida albicans* and *Saccharomyces cerevisiae*). Serum ethanol disappears after successful treatment of SIBO." (Bures J, Cyrany J, Kohoutova D, et al. Small intestinal bacterial overgrowth syndrome. *World J Gastroenterol*. 2010;16(24):2978-2990. doi:10.3748/wjg.v16.i24.2978)

21. An excess of histamine in the body is called. _____.
    A. Allergy
    B. Histadilia
    C. Arachnophobia

22. *Clostridium difficile* causes a potentially _____ pseudo-membranous colitis.
    A. Inflammatory
    B. Beneficial
    C. Fatal

23. Sulphates are needed in the body for many functions, some of which are detoxification and normal metabolism of brain _____.
    A. Neurotransmitters
    B. Cells
    C. Synapses

Sulfates/Sulfation (or Sulphation) - nap.edu

- There are various forms of sulfur in food and liquids but they need to be converted into inorganic sulfate before they can be used in sulphation. Inorganic sulfate reacts with ATP (energy) to form "activated sulfate" known as PAPS, and PAPS is used for sulfation.
- Inorganic sulfate (SO_4^{2-}) is required for the synthesis of 3′-phosphoadenosine-5′-phosphosulfate (PAPS). PAPS is required for synthesis of many important sulfur-containing compounds, such as chondroitin sulfate and cerebroside sulfate.
- Sulfation is needed for many important processes including phase two liver detoxification and the synthesis of macromolecules such as glycosaminoglycans and digestive secretions. Glycosamino-glycans are carbohydrate chains that have roles in cell structure and cell to cell communication
- There are hundreds of sulfur-containing molecules found in the human body, including biotin, pantothenine (vitamin B5), thiamine (vitamin B1), Acetyl CoA + CoA, methionine, SAMe, homocysteine, cysteine, N-acetyl cysteine (NAC), metallothionein, taurine, alpha lipoic acid, and glutathione. Sulfur, in some form, is found in every human cell and is involved in a vast range of

physiological functions.The body synthesizes all of the sulfur-containing molecules, except vitamins thiamine and biotin, by using sulfate and the amino acids methionine and cysteine.

- Sulfate and undigested sulfur compounds have been implicated in the etiology of ulcerative colitis. The specific agent is hydrogen sulfide, which is produced in the colon from sulfate by sulfate-reducing bacteria. Sulfate-reducing bacteria use either sulfate or sulfite as a terminal electron acceptor, releasing sulfide into the lumen where it is converted to hydrogen sulfide gas (H2S).
- Diets high in fat and animal protein while low in vegetables and fruits are associated with the growth of sulfate-reducing bacteria. Vegetables that are high in glucosinolates (sulfur-containing compounds found in cruciferous vegetables) inhibit the overgrowth of sulfate-reducing bacteria. Adequate cysteine (an amino acid) is required for using the sulfur provided by the food.
- High cystine foods include beef, chicken, fish, lentils, oatmeal, eggs, yogurt, and cheese. The recommended daily intake of cystine is 4.1mg per kilogram of body weight or 1.9mg per pound. A person weighing 70kg (~154 pounds) should consume 287mg of cystine per day.

Part One: Chapter 6

One only sees what one looks for, one only looks for what one knows. - Goethe

24. Alcohol and acetaldehyde render a lot of essential nutrients useless in the body. For example, binding to proteins, acetaldehyde causes functional deficiency of vitamin _____, which is a co-factor in production of neurotransmitters, fatty acid metabolism and many other functions in the body.
    A. B8
    B. B6
    C. B10

25. The thyroid gland may be producing plenty of _____, but their working sites are occupied by acetaldehyde and other toxins.
    A. TSH
    B. Cortisol
    C. Hormones

Several studies have demonstrated that fluorine, bromine, and chlorine reduce the thyroid hormones T4 and T3. They have anti-thyroid effects primarily by competing for the same receptors that help to take up iodine for thyroid hormone production. Bromine exposures come from bromine-fortified foods and beverages (potassium bromate, brominated vegetable oils…), sanitizers, and flame proofing agents. Pesticides contain methyl bromide, and can be found on commonly sprayed fruits.

26. _____ is a protein present in grains, mainly wheat, rye, oats and barley.
    A. Gluten
    B. Casein
    C. Lactose

27. _____ is a milk protein, present in cow, goat, sheep, human and all other milk and milk products.
    A. Collagen
    B. Keratin
    C. Casein

28. _____ is essential for protein digestion, as it provides normal conditions for pepsin to do its work of breaking down proteins into shorter peptide chains.
    A. Bile
    B. Stomach acid
    C. Salivary amylase

29. The important point is that GAPS children and adults are very toxic people. This toxicity comes from their _____ system. So it is the person's digestive system we have to concentrate on _____ and foremost in order to treat the condition.
    A. Digestive, first
    B. Blood, first
    C. Lymphatic, first

Part One: Chapter 7

30. The _____ pill has the same damaging influence on vaginal flora as antibiotics. Steroids in the pill have an ability to suppress the immune system and change the composition of bodily flora.
    A. Contraceptive
    B. Probiotic
    C. Placebo

31. In our modern society we have _____ of women, whose health has been compromised by our modern life styles.
    A. Fewer groups
    B. A lack
    C. Generations

32. For years we believed that the _____ in a pregnant woman protects the fetus from any toxins which the woman might have in her body. Recent studies show that we were wrong. The foetus/fetus accumulates most toxins which the mother is exposed to.
    A. Placenta
    B. Liver
    C. Lymph nodes

33. On the whole, having met many families with GAPS children, I usually find that the whole _____ needs treatment.
    A. Neighborhood
    B. School
    C. Family

Part One: Chapter 8

34. However, if the child's immune system is severely compromised, then the child will get ill even if _____ are completely avoided.
    A. Vaccinations
    B. Processed foods
    C. Sugars

35. (True or False) Concerning our current standard vaccination protocol there is a strong argument to administer single vaccines only rather than combined vaccines, like MMR and DPT. In a natural situation a child would never be exposed to measles, mumps, and rubella at the same time.
    A. True
    B. False

www.govinfo.gov/content/pkg/CHRG-108hhrg98046/html/CHRG-108hhrg98046.htm

"Good afternoon, Mr. Chairman and members of the committee and guests. My name is Rich Fischer, I'm a dentist.

Dental amalgam or silver mercury fillings contain 50 percent mercury, which is more toxic than lead, cadmium or even arsenic. These dental fillings contribute more mercury to body burden in humans than all other sources combined. In fact, the amount of mercury contained in one average size filling exceeds the U.S. EPA standard for human exposure for over 100 years.

Mercury vapor which escapes from these fillings is readily absorbed into the body, accumulates within all body tissues and has been shown to cause pathophysiology. In the case of pregnant women with mercury fillings, the mercury readily passes from her fillings into her lungs through her bloodstream through the placental barrier and into the developing child, whose central nervous system and immune system are especially vulnerable to this poison. The fetus developing in the average American mother will be born into this world with more mercury from its mother's dental fillings alone than it will receive from all the vaccinations it receives during its first 5 years of childhood. And I would add, those vaccines, without the trace, that was with the full load of thimerosal.

Scientists around the world have come to realize that even minute amounts of mercury can cause permanent neurological harm to young children and developing fetuses. The EPA recently announced that 630,000 babies are born each year with too much mercury in their bodies, and that one woman of childbearing age in 12 has enough mercury in her system to put her at risk to giving birth to a retarded child. In response, the FDA has issued advisories to pregnant women and women of childbearing age to reduce their dietary intake of those fish which are known to contain elevated levels of mercury, such as tuna, swordfish and shark. But according to leading toxicologists, including the World Health Organization, only 20 percent of mercury body burden in adults is derived from diet. In contrast, 80 percent is derived from dental fillings.

As of today, the FDA has yet to advise these same women whom they warned against eating fish to avoid having mercury fillings placed in their mouth. If 20 percent is a problem, why isn't 80 percent a bigger problem?"

Part One: Chapter 9

36. (True or False) The only treatment modern psychiatry can offer schizophrenic patients is anti-psychotic drugs.
    A. True
    B. False

37. There is a certain group of schizophrenics who may not be schizophrenic at all but _____. Pellagra is a deficiency of vitamin B3 (niacin or niacinamide).
    A. Next-of-kins
    B. Pellagrines
    C. Mannequins

October 29, 2014. University of Pennsylvania, *Parasite-schizophrenia connection: One-fifth of schizophrenia cases may involve the parasite T. gondii*
*"*Many factors, both genetic and environmental, have been blamed for increasing the risk of a diagnosis of schizophrenia. Some, such as a family history of schizophrenia, are widely accepted. Others, such as infection with Toxoplasma gondii, a parasite transmitted by soil, undercooked meat and cat feces, are still viewed with skepticism. A new study used epidemiological modeling methods to determine the proportion of schizophrenia cases that may be attributable to T. gondii infection. The work suggests that about one-fifth of cases may involve the parasite….Though the medical community has long believed that most healthy people suffer no adverse effects from a T. gondii infection, recent studies have found evidence of worrisome impacts, including an association with schizophrenia because the parasite is found in in the brain as well as in muscles. Other work has shown that some antipsychotic drugs can stop the parasite from reproducing. In addition, field and laboratory studies in mice, rats and people have shown that infection with T. gondii triggers changes in behavior and personality".

Part One: Chapter 10

38. Define idiopathic:
    A. Commonly caused
    B. Medically-induced
    C. No known cause

39. How do the diets work? In my opinion, what unites all these diets is the low _____ content.
    A. Carbohydrate
    B. Fat
    C. Protein

40. According to the author, the majority of epileptic seizures are the result of:
    1. damaged _____ and 2. nutritional _____.
    A. Liver, inadequacies
    B. Gut wall, deficiencies
    C. Adrenals, excesses

Part Two: Chapter 1 (Questions begin at page 99.)

41. The most common carbohydrates are _____, _____ and _____.
    A. Glucose, fructose, galactose
    B. Pizza, soda, wings
    C. Potatoes, beans, bread

42. _____ is found in soured milk products, like yogurt.
    A. Fructose
    B. Maltose
    C. Galactose

Galactose is present in lactose, the sugar found in all animal milks. Usually, when a person eats or drinks a product containing lactose, such as milk or cheese, the body breaks the lactose down into two sugars, glucose and galactose which are absorbed into the bloodstream through the intestinal lining. Glucose is used by the body for energy, while galactose is converted into more glucose. **Lactose intolerance** occurs when your small intestine doesn't produce enough of an enzyme (lactase) to digest milk sugar (lactose).

43. All grains and some root vegetables are very rich in _____.
    A. Starch
    B. Vitamin A
    C. Fatty acids

44. To allow enterocytes to recover and to stop feeding abnormal gut flora, starch has to be cut out of the diet for GAPS children and adults. It means _____ grains or _____ made out of them and no _____ vegetables.
    A. Lots of, foods, orange
    B. Some, pastas, green
    C. No, anything, starchy

45. The best sources of easy-to-digest and very nourishing proteins are _____, _____, and fish.
    A. Eggs, gluten
    B. Eggs, meat
    C. Beans, chicken

46. To be absorbed fats require _____.
    A. Vitamin B6
    B. Selenium
    C. Bile

47. Impaired absorption of fats also causes deficiencies in _____ and the vitamins: A, D, E, and K.
    A. Bile
    B. Minerals
    D. Enzymes

Riboflavin (vitamin B2) is involved in the process of glucose oxidation and the breakdown and synthesis of bile acids. It is also important in the transformation of retinol to retinoic acid and participates in the proper functioning of the circulatory, nervous, and immune systems. Chronic inflammation and bacterial infection in the intestinal mucosa increases the level of pro-inflammatory cytokines and reduces the absorption of vitamin B2 from food. Riboflavin can be synthesized by the intestinal microflora, lactic acid bacteria. Rich sources of riboflavin are baker's yeast, milk and dairy products, meat, and eggs.

Hopkins Medical Group, The Gallbladder's Role in Your Health, January 14, 2020
"The gallbladder is best known for storing bile and releasing it into the small intestine when we eat to help break down fats and digest food. And good absorption of fats is essential for health. When the gallbladder does its job well, we absorb those anti-inflammatory omega 3 and 6 fatty acids that most everyone needs more of, as well as fat-soluble vitamins A, D, E, and K. A well-functioning gallbladder also assists in the maintenance of healthy cholesterol levels.

Yet, despite its integral role in maintaining health, removal of the gallbladder has become increasingly common in children and young adults. One study showed that from 1998 through 2010 the rate of gallbladder removal surgery almost quadrupled among young people aged 18-24. A second study completed in England in 2014, showed a 3-fold increase in cholecystectomy in children under age 16 since 1997. So, what's really going on? Unsurprisingly, the research alludes to the role of poor diet and increased rates of obesity in young people contributing to the increase in gallbladder removal procedures.

But how can you address the health of your gallbladder? Start by cutting back on the high-sugar, high-carbohydrate foods that are so prevalent in the standard American diet. These refined carbs have been shown to increase the chances of gallstones, among other health implications. Reduce unhealthy fats – choose olive oil and avocados over French fries and pizza. Other observational evidence also implicates the role of estrogen and estrogen therapies, such as oral contraceptives which are increasingly being used by teenagers to manage heavy periods. Estrogen can increase the concentration of cholesterol in the bile making it thick and contributing to the formation of gallstones."

No Gallbladder? After explaining to my clients why their gallbladder was important in health, I recommended a "gallbladder replacement pill" - Ox Bile Salts. Something they would need for the rest of their life! For the majority of clients, one capsule with their largest meal of the day was sufficient.

No processed foods, please!

48. Processed carbohydrates get absorbed very quickly, producing an unnaturally rapid increase in blood glucose. A rapid increase in blood glucose, called _____, puts the body into a state of shock, prompting it to pump out lots of insulin very quickly to deal with the excessive glucose.
    A. Insulinemia
    B. Hypoglycemia
    C. Hyperglycemia

49. As a result of this over-production of insulin, about an hour later the person has a low level of blood glucose, called _____.
    A. Insulinemia
    B. Hypoglycemia
    C. Hyperglycemia

50. The fiber in breakfast cereals is full of _____ - substances that bind essential minerals and take them out of the system, contributing to a patient's mineral deficiencies.
    A. Glyphosate
    B. Phytates
    C. Sugar

51. Trans-fatty acids: What they do in the body is to replace the vital omega-3 and omega-6 fatty acids in cellular structure, making the cells _____.
    A. Over-active
    B. Stronger
    C. Dysfunctional

52. Being a staple in the Western world, _____ is also a number one cause of food allergies and intolerances.
    A. Wheat
    B. Butter
    C. Peanuts

53. Sugar added to food was once called "_____". It deserves 100% of this title.
    A. Necessary
    B. White Christmas
    C. White Death

54. Fruit juices are full of _____ fruit sugars and molds.
    A. Beneficial
    B. Processed
    C. Synthetic

"At present in the United States the largest single contributor to dietary methanol is aspartame. Aspartame is a weak methyl ester which quickly releases 11% of its weight as methanol in the gut after consumption. Its dietary burden has been steadily increasing as it is now being used as a low cost replacement for sugar. Aspartame was first introduced into the American food supply in 1981. Is autism a result of the exquisite human sensitivity to methanol? Methanol is a rare component of the human diet but changes in food choices and the introduction of aspartame have increased the average consumption gradually over the last 40 years, mirroring the increase in incidence in autism over the same time period. Methanol, with only a handful of significant dietary sources, is reliably found in just one of the major food groups, fruits and vegetables, where it is chemically locked safely to pectin, which

can pass digestion without absorption by the gut. However, when fruit, vegetable or other juices are heat processed and packaged for distribution, methanol is released over time from pectin's strong methyl ester bond and the free methanol is trapped in the container, readily available for quick absorption upon consumption. Ready to serve juice drinks have become very popular since being introduced by traditional carbonated beverage companies in the late 1970s as a "healthy" alternative in vending machines to an increasingly health conscious public. These juice drinks would, by now, have been considered the major source of methanol in the American diet if it were not for the extraordinarily rapid and massive introduction of aspartame, which reliably releases 10% of its weight as methanol within minutes of consumption. This study suggests that women who have given birth to an autistic child are likely to have had higher intake of dietary sources of methanol than women who have not. Further investigation of a possible link of dietary methanol to autism is clearly warranted."(https://doi.org/10.1016/j.mehy.2015.06.025 - excellent article!)

55. Soy is a natural _____. It has the ability to impair _____ absorption and reduce thyroid function.
    A. Goitrogen, iodine
    B. Pepsinogen, selenium
    C. Estrogen, testosterone

Supplementation for Children and Adults with GAP Syndrome (Page 245)

56. The most important fats for GAPS patients, which should be consumed daily and which should constitute the bulk of all fat consumption, are _____ fats: fats in fresh meats, fats rendered from meats, dairy fats (butter, cream and ghee) and fats in eggs yolks.
    A. Vegetable
    B. Animal
    C. Unsaturated

57. (True or False) The saturated fat in coconut oil is healthy.
    A. True
    B. False

58. The simplistic idea that eating fat makes you fat is completely _____. Consuming processed carbohydrates causes obesity. Dietary fats go into the structure of your body: your brain, bones, muscle, immune system, etc. - every cell in the body is made out of fats to a large degree.
    A. True
    B. Scientific
    C. Wrong

59. Every cell of every organ in our bodies has _____ as a part of its structure.
    A. Cholesterol
    B. ATP
    C. Potassium

60. The human brain is particularly rich in cholesterol: around _____ of all body cholesterol is taken by the brain.
    A. 15%
    B. 25%
    C. 35%

61. After the brain the organs hungriest for cholesterol are our _____ glands: adrenals and sex glands. They produce steroid hormones. Steroid hormones in the body are made from cholesterol: testosterone, progesterone, pregnenolone, androsterone, estrone, estradiol, corticosterone, aldosterone and others.
    A. Lymphatic
    B. Endocrine
    C. Mammary

Cell membranes contain cholesterol, glycolipids, and phospholipids. In the body lipids are a group of of molecules that include fats, waxes, sterols, glycerides, fat-soluble vitamins, phospholipids and many other molecules. Phospholipids are made from fatty acids like omega-6 and omega-3 polyunsaturated fatty acids (PUFAs). The lipids contained in the cell membranes determine the flexibility and permeability of the cell. Flexibility and permeability protect the interior of the cell by allowing certain substances into the cell while keeping other substances out.

62. There are two fatty acids that are essential for life but our body does not make them. We must get them from food. These are _____ and _____ fatty acids.
    A. Omega 3
    B. Omega 6
    C. Omega 9

63. EPA and _____ are absolutely vital for normal brain and eye development.
    A. HOA
    B. NRA
    C. DHA

64. (True or False) Supplementing with flax oil is sufficient for GAPS patients.
    A. True
    B. False

65. _____ is a good source of DHA and EPA and one of the oldest ways of supplementing these essential fats.
    A. Canola oil
    B. Vegetable oil
    C. Cod liver oil

66. Arachidonic Acid (AA) is found in _____, _____, and _____ products.
    A. Meat, eggs, dairy
    B. Vegetables, fish, butter
    C. Meat, green vegetables, eggs

The most common omega-6 fat is linoleic acid (LA). The body converts linoleic acid to Gammalinolenic acid (GLA) and then to arachidonic acid (AA/ARA). Cell membranes store AA until it is needed as a precursor for the synthesis of eicosanoids. Eicosanoids are are fast-acting, locally-produced hormones which include the the prostaglandins, thromboxanes, and leukotrienes.

Alpha-linolenic acid (ALA) is not incorporated into the phospholipids of cell membranes and is mainly used by the body for energy. This fatty acid can be converted in the body into EPA and then to DHA but the process is not very efficient. The request for DHA be considered at least “conditionally essential” is supported by several studies. **The conversion of ALA to DHA occurs primarily in the liver with reported rates of less than 15%**. Some plant oils that contain ALA are flaxseed (linseed), soybean, and canola oils. Foods that contain some of the highest amounts of ALA include chia seeds, pumpkin seeds, tofu, spinach, green beans, Brussel sprouts, broccoli, and walnuts.

It is important to read the diet chapters. Many clients will need simple guidelines or they get overwhelmed. So keep in mind things like No Grains (that includes gluten-free), No Dairy, No Corn, No Soy, No Processed Foods, No Artificial Flavorings or Colors. A list of all the items they CAN eat is very important (make a master copy) or they will think there is nothing left to eat! **No cream if there are milk sensitivities, and not in the beginning stage of changing the diet and healing the intestines.**

Supplementation: Chapter 3-4

67. In people with digestive problems, such as GAPS children and adults, it is virtually impossible to obtain vitamin A from fruits and _____.
    A. Dairy
    B. Nuts
    C. Vegetables

68. Vitamins A and D are _____!
    A. Opposites
    B. Antagonistic
    C. Partners

Digestive Enzymes

69. What two hormones are so important in normal food digestion that without them this digestion simply cannot happen?
    A. Gastrin, secretin
    B. Secretin, cholecystokinin
    C. Cholecystokinin, motilin

70. But in the stomach with low acidity, overgrowing microbes start _____ dietary carbohydrates, often with the production of various toxins and gas, which can make it very uncomfortable for the GAPS child or adult and make them refuse food.
    A. Absorbing
    B. Repelling
    C. Fermenting

71. Betaine HCl with added Pepsin should be taken at the _____ of each meal.
    A. Beginning
    B. Middle
    C. End

Only using food to heal leaky guts, decrease bacterial and parasite loads in the body, and rebuild mineral and vitamin stores is a slow process. While changing the diet is essential, it is best to use appropriate herbs, supplements, and homeopathics in addition to the diet for faster results - compliance is much easier when results are apparent.

~ END OF TEST ~