



## G100 TEST QUESTIONS & STUDY GUIDE

### The Autoimmune Epidemic Donna Nakazawa (2008)

#### Foreword & Introduction

1. There is almost universal agreement among scientists and physicians that the environmental toxins and chemicals to which we are increasingly exposed are interfering with the immune system's ability to distinguish \_\_\_\_\_.
  - A. Bacteria from viruses
  - B. Self from non-self
  - C. Good from bad
2. Twin studies elucidate that \_\_\_\_\_ of the risk of developing autoimmune disease is acquired through some environmental trigger, genetic risk being the smaller part of the equation.
  - A. One-third
  - B. Two-thirds
  - C. Three-thirds
3. (True or False) Guillain-Barre syndrome (GBS) usually attacks a month or so after a patient has had a common viral or bacterial infection.
  - A. True
  - B. False



For some, GBS occurs after a vaccination. Both GBS and Multiple Sclerosis (MS) result in the destruction of **myelin sheaths of the nerves** and are considered to be autoimmune inflammatory diseases. The difference is where the damage occurs. GBS attacks the peripheral nervous system while MS attacks the brain and spinal cord nerve cells.

Acute disseminated encephalomyelitis (ADEM) is inflammation (swelling) of the brain and spinal cord, usually in children. It **damages the myelin that protects nerve fibers**. "In about 50% to 75% of all cases, the clinical onset of disease is preceded by viral or bacterial infections, mostly nonspecific upper respiratory tract infections. ADEM may also develop following a vaccination (postimmunization encephalomyelitis). Although ADEM is a relatively rare disorder, it is becoming increasingly relevant for several reasons. First, **vaccination schedules, particularly for children, have expanded over the past years**; second, ADEM may result in permanent neurological disability that is often acquired very early in life...Typically, there is a latency of 7 to 14 days between a febrile illness and the onset of neurological symptoms. In the case of vaccination-associated ADEM, this latency period may be longer...Because most patients present initially with nonspecific symptoms, such as headaches, fever, and lethargy, a lumbar puncture is typically indicated to rule out acute viral, bacterial, or parasitic meningoencephalitis....**Antiphospholipid antibody syndrome (APS) is increasingly being diagnosed in children, and the initial clinical presentation may be similar to that of ADEM**". - <https://jamanetwork.com/journals/jamaneurology/fullarticle/789775>

Amyotrophic lateral sclerosis (ALS), Lou Gehrig's Disease, is a neurodegenerative disorder characterized by the loss of the **nerve cells** (motor neurons in the brain and spinal cord) that control muscles. Chronic inflammatory demyelinating polyneuropathy (CIDP) is a neuromuscular disorder characterized by progressive weakness and impaired sensory function in the legs and arms. It is an autoimmune neuropathy usually caused by **damage to the myelin sheath** of the peripheral **nerves**.

## Chapter 1

4. In gastroesophageal reflux disease (GERD), the stomach overproduces gastric acid and the esophagus spasms, causing excess \_\_\_\_\_ to rise into the fragile lining of the throat.
  - A. Mucous
  - B. Biofilms
  - C. Acid
  
5. Antiphospholipid antibody syndrome (APS), also known as “sticky blood” or Hughes Syndrome, is an autoimmune disease in which the body produces antibodies, or immune fighter cells, that mistakenly disable the very proteins in the blood that the body needs to prevent excessive \_\_\_\_\_.
  - A. Clotting
  - B. Sweating
  - C. Hormone secretion

APS is a systemic autoimmune condition, in which individuals make antibodies that target their own body cells. These antibodies are known as antiphospholipid antibodies (aPL). The association of viral infections with the presence of aPLs is well described in the literature. Individuals infected with viruses such as **HIV, HBV, HCV, EBV and Parvovirus B19 are commonly associated with this condition.**

MayoClinic: Risk factors for antiphospholipid syndrome include:

- **Immune system disorders.** Having another autoimmune condition, such as lupus or Sjogren's syndrome, increases your risk of antiphospholipid syndrome.
  - **Infections.** This condition is more common in people who have certain infections, such as syphilis, HIV/AIDS, hepatitis C or **Lyme disease**.
  - **Medications.** Certain medications have been linked to APS including, hydralazine for high blood pressure, heart rhythm-regulating quinidine, anti-seizure medication phenytoin (Dilantin) and the antibiotic **amoxicillin**.
- 
6. In a wide range of autoimmune diseases, the body's immune cells lose their ability to read the difference between your own \_\_\_\_\_ and foreign bacteria, viruses, or other microscopic organisms that enter your body.
    - A. DNA
    - B. RNA
    - C. Healthy cells

7. Antibodies that turn on one's own tissue are known as \_\_\_\_\_.
- A. IgE antibodies
  - B. Auto-antibodies
  - C. IgA antibodies

Self-tolerance is the ability of the immune system to recognize self-produced antigens (molecules on human cell surfaces) as non-threatening while mounting a response to foreign antigens (molecules on the surface of pathogens or toxic substances). Antibodies are produced by plasma cells (B cells are able to differentiate into plasma cells) to target foreign antigens. Autoantibodies are antibodies that target self-cells and mark them for destruction. This failure to distinguish between "self" and "non-self" antigens is called a breakdown of tolerance, an autoimmune response. When there are several clones of cells that are autoreactive, the destruction of self-cells is excessive and is called an autoimmune disease.

## Chapter 2

8. According to a 2003 study by the Mount Sinai School of Medicine in NYC, in collaboration with the EWG, after testing the blood and urine of 9 representative Americans from around the country for 210 substances, scientists discovered that each volunteer carried an average of \_\_\_\_\_ industrial compounds, pollutants and other chemicals.
- A. 30
  - B. 91
  - C. 193

A research team from the IU School of the Public and Environmental Affairs, is believed to be among the few in the U.S. to detect the presence of PBDEs in samples drawn from matched mother-infant umbilical cord blood. "What is especially concerning is that we found consistently higher levels of PBDEs in the infant of each mother-infant pair, suggesting the babies have higher circulating concentrations of these potentially neurotoxic and endocrine-disrupting chemicals compared with their mothers," Salamova said". (<https://www.sciencedaily.com/releases/2017/06/170629085016.htm>)

9. Polybrominated diphenyl ethers (PBDE) are flame retardants which are not molecularly bound to anything in the products into which they are manufactured. As a result, they continually \_\_\_\_\_ out from the plastics that make up our computers, TVs, wire insulation, the insides of our window frames, etc.
- A. Cleave
  - B. Leach
  - C. Replicate
10. Teflon is manufactured with a chemical known as perfluorooctanoic acid, or PFOA - as are other nonstick cookware, car parts, flooring, computer chips, phone cables, etc... PFOA can now be found in the \_\_\_\_\_ samples of 96 percent of people in the United States.
- A. Blood
  - B. DNA
  - C. mRNA

11. Commonly used today on melons, traces of \_\_\_\_\_ are found in the food we eat more than any other pesticide.
- A. Endosulfan
  - B. DEET
  - C. Monosodium Glutamate
12. (True or False) One of the most potent by-products of exhaust fumes is dioxin, which is carried into the air by the fuel combustion of diesel trucks and buses. We each receive some small, additional daily dose of dioxin through our steady diet of seafood, meat, and dairy.
- A. True
  - B. False
13. Recently, researchers have observed that dioxin may work in more complex ways on the immune system. Not only by suppressing immune cells, but by overcoming control mechanisms that should \_\_\_\_\_ an autoimmune response.
- A. Prevent
  - B. Start
  - C. Enhance
14. T cells are made in the \_\_\_\_\_ and then they move to the thymus. It is in the thymus that T cells mature before they enter your bloodstream. Regulatory T cells act as the senior officers ensuring that educated T cells will not mistake the body for a foreign antigen and turn against the body's own organs or tissues as they diligently scour the body for invading agents.
- A. Lymph nodes
  - B. Brain stem
  - C. Bone marrow

Tregs, regulatory T cells, are specialized for immune suppression. When an infection or pathogen is cleared, the immune process (release of cytokines and other molecules) needs to be stopped to protect the body from excessive inflammation and cell death. An overactive or excessive immune response can damage tissues in the body and lead to autoimmune reactions. There is a delicate balance between immune reactions and immune suppression to prevent the development of an autoimmune disease.

15. When endocrine disruptors mimic estrogen they can wreak havoc in one of two ways: They block the estrogen receptor site altogether, keeping natural estrogen from triggering the responses it's supposed to so that it can do its normal job in the body. The second way is not by blocking communication completely, but by sending the wrong \_\_\_\_\_ between cells.
- A. Nutrients
  - B. Flags
  - C. Signals

16. (True or False) Most sufferers of any one autoimmune syndrome are twenty times more likely than others to develop additional autoimmune diseases down the road.
- A. True
  - B. False
17. Pound for pound, breast-feeding babies get more \_\_\_\_\_ per meal, at more concentrated levels, from the healthiest known food source on the planet (no matter how contaminated breast milk may be, it is still the best food for babies).
- A. Nutrients
  - B. Contaminants
  - C. Immunity
18. Ten percent of Americans have detectable levels of trichloroethylene (TCE) in their \_\_\_\_\_ from exposure through drinking water as well as breathing it in from the air around us. One of our most significant contacts, however, comes from taking \_\_\_\_\_.
- A. Hair : Baths
  - B. Lungs : Showers
  - C. Blood : Showers
- “The National Toxicology Program (NTP), EPA, and the International Agency for Research on Cancer has determined that trichloroethylene is a **known human carcinogen**. [https:// www.atsdr.cdc.gov](https://www.atsdr.cdc.gov); March 5, 2017
19. Environmental toxins appear to mess with normal internal signaling pathways, making it difficult for our \_\_\_\_\_ to recognize what is foreign and what is self.
- A. Liver
  - B. Immune cells
  - C. Neurons
20. In 2000, Gilbert and Pumford and colleagues published two groundbreaking studies: they were among the first immunologists and toxicologists to show that \_\_\_\_\_ exposure to environmental toxicants could be a \_\_\_\_\_ stimulator of an autoimmune response.
- A. Low-dose : Potent
  - B. High-dose : Potent
  - C. Low-dose : Insignificant
21. Investigators are still uncovering new lupus genes every year but the rough guesstimate is that about \_\_\_\_\_ - an estimated 20-25 percent of the general population - carry some combination of genes that make them more susceptible to one or more autoimmune disease.
- A. One in three
  - B. One in four
  - C. One in five

22. Twin studies show that autoimmune disease is roughly 30 percent genetic and \_\_\_\_\_ percent environmental. As one researcher put it, while genetics may load the gun, it's environment that pulls the trigger.
- A. 50
  - B. 60
  - C. 70

Autoimmune disease development is complex and includes various immune cells, genetics, epigenetics and molecular, cellular and environmental elements that ultimately result in the breakdown of immune tolerance. This breakdown leads to chronic inflammation and oxidative stress as dysregulated immune cells release pro-inflammatory cytokines. Research articles suggest that EPA (eicosapentaenoic acid), DHA (docosahexaenoic acid), vitamins A, B6, B12, C, D, E, and folate, as well as the trace minerals zinc, iron, selenium, magnesium, and copper may play a key role in the management of "cytokine storms".

23. For some, the final drop that spills the barrel may be an infiltrating \_\_\_\_\_ that taxes the immune system just one degree too much, setting an autoimmune response in motion; for others, it might be an unexpected environmental hit that pushes the immune system into overload and chaos.
- A. Nutrient
  - B. Gene
  - C. Virus

A wide variety of bacterial infections have been associated with rheumatoid arthritis (RA). However, *Porphyromonas gingivalis*, *Proteus mirabilis*, *Prevotella copri*, *Escherichia coli*, *Mycoplasma arthritidis*, *M. pneumoniae*, *M. salivarium*, and *M. fermentans*, has been strongly associated with RA. **There is often a systemic infection with more than one species in RA patients.** Pathogens that commonly circumvent the immune system include *Mycobacterium* species, *Borrelia* species, and the large herpesvirus family. There are eight known human herpes viruses that are able to establish a life-long latent infection with the ability to reactivate: herpes simplex 1, herpes simplex 2, alphaherpesvirus 3 (varicella zoster), herpesvirus 4 (EBV/Epstein-Barr), betaherpesvirus 5 (cytomegalovirus), herpesvirus 6A and 6B (roseolovirus), herpesvirus 7 (beta-herpesvirus subfamily) and herpesvirus 8 (Kaposi's sarcoma-associated herpesvirus).

24. (True or False) Cancer research claims 10 times the annual research funding of autoimmune disease, although cancer affects less than half as many people.
- A. True
  - B. False

25. Today, \_\_\_\_\_ chemicals are registered for use in the United States and the US Environmental Protection Agency approves an estimated seventeen hundred more a year with very little screening. The FDA approves about \_\_\_\_\_ percent of new compounds without restrictions.
- A. Three hundred : 50
  - B. Eighty thousand : 90
  - C. One million : 99

### Chapter 3

26. (True or False) In lupus, deranged immune fighter cells, triggered into acts of self-sabotage by a combination of genetic predisposition and environmental triggers, can turn against virtually any organ or tissue, including the joints, kidneys, heart, lungs, brain, blood, or skin, inflicting severe pain, inflammation, and cellular damage.
- A. True
  - B. False
27. Scleroderma is a progressive autoimmune disease in which the immune cells attack the connective tissue in the body - the \_\_\_\_\_ within human skin and tissue as well as the elastin in the ligaments that connect bones. Scleroderma can leave damaging scar tissue in the skin as well as organs.
- A. Lymph
  - B. Oil
  - C. Collagen
28. Lupus and other autoimmune diseases, unlike cancer, are **not** \_\_\_\_\_ diseases, meaning health departments do not collect information on who has an autoimmune disease, much less how many are afflicted with each of the nearly one hundred different diseases that fall under the autoimmunity umbrella.
- A. Contagious
  - B. Infectious
  - C. Reportable

In a study published April 8, **2020** the researchers “found that the prevalence of antinuclear antibodies (ANAs), the most common biomarkers of autoimmunity, is significantly increasing in the U.S. overall and particularly in certain groups...He and Miller **hope that a national registry of autoimmune diseases will be established** so that they can examine changes over time, define geographic hotspots, and eventually understand what is causing them”. (2020: <https://factor.niehs.nih.gov/2020/5/papers/autoimmunity/index.htm>)

29. Alopecia areata is an autoimmune disease in which, for reason unknown, the body’s own immune system attacks the hair \_\_\_\_\_ and disrupts normal hair formation.
- A. Follicles
  - B. Shafts
  - C. Sheaths

A relatively high rate of celiac disease is found in children and adults with alopecia. Celiac disease is also frequently associated with other autoimmune disorders. Individuals with MS have been shown to have an altered microbiome, increased intestinal permeability and changes in bile acid metabolism. “A more recent study confirmed this finding; up to 70% of MS patients had increased intestinal permeability. It has been hypothesized that an altered intestinal barrier might lead to bacterial translocation thus allowing the passage of noxious molecules such as microbial associated molecular patterns. This could then alter peripheral immune responses or allow these molecules to enter the CNS and alter neuroimmunity.” (<https://www.wjgnet.com/1007-9327/full/v24/i37/4217.htm>)

30. Blood serum levels of PCBs have been measured in a number of local residents (Anniston, Alabama) in excess of 100 parts per billion. The CDC considers a blood PCB level in excess of \_\_\_\_\_ parts per billion to be significantly elevated.
- A. 20
  - B. 60
  - C. 90

#### Chapter 4

31. “How does a virus attack my nerves?” I wanted to know. “An autoimmune reaction,” he said. “Most likely a \_\_\_\_\_ on the surface of a molecule of the virus you had looks like a protein on the surface of the molecules of your nerve tissue” - molecular mimicry.
- A. Cell
  - B. Protein
  - C. Parasite

Molecular mimicry is most likely going to occur with similar peptides instead of whole protein molecules. The infectious agent would need a peptide sequence on its surface that is similar or the same as the peptide found on a human cell. Peptides are “strings” of amino acids that are smaller than the “strings” of amino acids that form the large molecules we call proteins. Peptide>Amino Acid>Protein

**Viruses are not the only infectious agents that may indirectly cause autoimmune responses.**

Lipopolysaccharide (LPS) is a component of the outer membrane of gram-negative bacteria capable of inducing inflammatory reactions. Increased intestinal permeability leads to the transport of lipopolysaccharide into the blood and lymphatic systems. Examples of gram-negative bacteria include *Salmonella*, *Escherichia coli*, *Klebsiella*, *Proteus*, *Enterobacter*, *Citrobacter*, *Yersinia*, *Shigella*, *Neisseria*, *Haemophilus spp.*, *Helicobacter pylori*, and *Chlamydia trachomatis*. There are several studies that have linked LPS to autoantibodies/self antigen-specific T cells linked to autoimmune diseases. - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2327198/>

32. Researchers investigating Guillain-Barre syndrome have held suspicion that GBS might be linked to infectious pathogens, not only because patients so often report having been ill 6 weeks prior to getting the disease, but also because clusters of cases have been linked in timing and locale to large, national vaccination programs with vaccines containing \_\_\_\_\_.
- A. Antibodies
  - B. Antibiotics
  - C. Antigens
33. Immune cells that are programmed to recognize the proteins from the flu virus set out to find it and attack it. They are able to recognize these proteins as dangerous because they recognize the unique code of \_\_\_\_\_ on the surface of the virus.
- A. Amino acids
  - B. Antibodies
  - C. Genetic material

34. In a less healthy body, one \_\_\_\_\_ by genetic deposition, a heavy burden of chemicals, stress, a processed food diet, or some combination thereof, the immune fighter cells and the antibodies they send forth begin to make costly mistakes. They set out to obliterate all the cells and viruses that share the same sequences, just to be sure they are getting the job done.
- A. Infected
  - B. Indoctrinated
  - C. Compromised
35. (True or False) “Autoantibody,” the word scientists use to designate antibodies that have attacked and bound with healthy tissue in error, literally means “antibody against self.”
- A. True
  - B. False
36. Epstein-Barr virus is a common \_\_\_\_\_ infection that ordinarily causes anything from low-grade fever and sore throat symptoms in children to mononucleosis in teenagers and adults.
- A. Bacterial
  - B. Viral
  - C. Amoebic



Several herbs are well-known for their immune-modulating and antiviral properties including, *Andrographis paniculata* which has immune modulating/ stimulating activities that include inhibition of virus replication and enhancing the activity of natural killer cells cytotoxic T-cells and phagocytosis. *Uncaria tomentosa* (Cat's claw/Uña de Gato) is immune modulating without an immune-stimulatory effect. Cat's claw extract is suitable for conditions where the immune response is excessive (active autoimmune). *Astragalus membranaceus* promotes antibody production, restores impaired T cell functions, increases thymus and spleen function and can activate macrophages. In addition, during an infection Astragalus has been shown to enhance immunoglobulin (antibodies in the blood) production.

37. Scientists can now show the precise process by which \_\_\_\_\_ in streptococcal bacteria mimic cells in the heart, resulting in the autoimmune reaction known commonly as rheumatic heart disease.
- A. Proteins
  - B. Viruses
  - C. Borrelia
38. (True or False) In type 1 diabetes, an autoimmune disease also known as insulin-dependent diabetes mellitus, or IDDM, the spleen under-goes an attack by the body's own immune system and becomes incapable of making insulin.
- A. True
  - B. False

39. Researchers today are concerned about a more common and seemingly innocuous type of virus within the family of sixty-one nonpolio enteroviruses known as the \_\_\_\_\_ viruses.
- A. Epstein-Barr
  - B. Coxsackie B
  - C. Corona

Enteroviruses are small RNA viruses and include coxsackievirus, echovirus, and poliovirus. Enteroviruses are believed to have 2 distinct classes: polioviruses (types 1, 2, and 3) and nonpolioviruses (coxsackievirus, enterovirus, echoviruses, and unclassified enteroviruses).

“Viral myocarditis (VMC) is an important cause of heart failure and dilated cardiomyopathy with no effective clinical diagnosis and treatment, and has been commonly associated with Coxsackievirus B3 (CVB3) infection. Current evidence from CVB3 myocarditis in mice indicates that acute myocarditis is mainly mediated by the host immune responses, including Th1, Th17 and type I macrophages. Recently, innate immunity triggered by TLR3, TLR4, TLR8 and MDA5 has also been demonstrated to participate in the induction of inflammatory cytokines in response to CVB3. Apart from the heart tissue, **the intestine, which is the assumed initial infection and important replication site for CVB3**, needs to be investigated, where induction of innate immunity and interactions with microflora may shape the immune response involved in the pathogenesis of VMC”. <https://doi.org/10.2217/fmb.12.96>

Endocarditis is an inflammation of the inner lining of your heart (endocardium) and/or heart valves. The inflammation is typically caused by a bacterial or fungal infection that spreads to the bloodstream. Surgery, some types of dental work, gum disease, inflammatory bowel disease, catheters, and skin sores have been associated with endocarditis.

40. Researchers now know that most peptic ulcers are caused by an infection with the bacterium \_\_\_\_\_ and can be treated with antibiotics (rather than surgery).
- A. *Lactobacillus acidophilus*
  - B. *Haemophilus influenzae*
  - C. *Helicobacter pylori*
41. \_\_\_\_\_ signaling to the immune system to fight disease is a good thing, but when cytokine levels are elevated far too long and their signaling becomes uncontrolled, they can hijack the body’s immune system to turn against the body itself.
- A. Cytokines
  - B. Endocrines
  - C. Mannequins
42. In October 1976, the National Influenza Immunization Program officially began. By January 1977, more than \_\_\_\_\_ cases of Guillain-Barre syndrome had been reported as a direct result of the vaccine.
- A. 150
  - B. 375
  - C. 500

43. In 1992, 1993, and 1994, people developed Guillain-Barre syndrome after widespread influenza vaccination programs, cementing the epidemiological evidence that \_\_\_\_\_ strains other than the swine flu could also induce GBS.
- A. Influenza
  - B. Avian
  - C. Meningococcal
44. In 1994, the *Journal of the American Medical Association* reported a dangerous relationship between diphtheria, tetanus, and oral polio vaccines and a number of autoimmune disorders, including Guillain-Barre syndrome. Similarly, a correlation has been reported and debated in scientific journals for years between the \_\_\_\_\_ vaccine and multiple sclerosis as well as rheumatoid arthritis.
- A. Polio
  - B. Varicella
  - C. Hep B

“The relationship between mercury exposure and ALS has been inconsistent among several prior epidemiologic studies, however this past work has focused exclusively on inorganic mercury exposure. There have been many studies showing the neurological and developmental impacts associated with mercury via fish consumption, which results in exposure to the more bioavailable and toxic methylmercury species. **We observed a statistically significant 2.5-fold increase in toenail mercury levels in ALS patients in comparison to controls...** There is evidence of mercury within the brains of patients with ALS **and other neurodegenerative diseases.** Locus coeruleus and motor neurons had higher levels of silver nitrate autometallography staining (reflecting mercury or bismuth presence) in patients with motor neuron disease, compared to controls. Alzheimer’s disease patients also had a higher level of mercury in the brain microsomes, compared with controls’. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6034986/>

45. Mercury, in the form of one \_\_\_\_\_, is still used in some flu vaccines and some over-the-counter pharmaceuticals. Present until recently in virtually every vaccine children received throughout the 90’s, including Hep B, bacterial meningitis, diphtheria, whooping cough, and tetanus, thimerosal is now the subject of a well-known heated controversy questioning whether cumulative doses in childhood vaccines may play a role in autism and developmental delays.
- A. Elemental
  - B. Thimerosal
  - C. Methylmercury
46. In the US, coal-fired power plants alone spew about \_\_\_\_\_ of mercury into the air each year.
- A. 2 tons
  - B. 10 tons
  - C. 50 tons

Most of us are unaware of the mercury that enters the environment and eventually our food and water. "Between 1990-1993 and 2014, annual nationwide air emissions of mercury decreased from **246 tons per year to 52 tons per year**, a decrease of 79 percent". (<https://cfpub.epa.gov>)

47. (True or False) According to the CDC, 12 percent of women of childbearing age now have mercury levels that exceed the Environmental Protection Agency's safety standard. This is no small thing: researchers know that mercury can cross the placenta and affect the developing brain of the fetus. Mercury, like lead, is a potent neurotoxin.
- A. True
  - B. False
48. **Elemental** mercury is the type that you find in dental amalgam. People who have fillings with dental amalgam can build up body burdens of mercury because, over time, mercury from their teeth leaches into the body and accumulates in the \_\_\_\_\_.
- A. Liver
  - B. Gums
  - C. Kidneys

"In summary, the evidence presented in this paper strongly suggests that mercury may be an etiological factor in MS. The greatest source of mercury originates from dental amalgams. Many dentists have discontinued using amalgams or have reduced the use of them because of the possibility that amalgam mercury may cause health disorders. The evidence presented here suggests that when mercury dental amalgams are removed from people with MS, their number of exacerbations, nerve conduction velocity, hearing, immunity, and mental health all improve." - <https://www.iomcworld.org/open-access/a-hypothesis-and-additional-evidence-that-mercury-may-be-an-etiological-factor-in-multiple-sclerosis.pdf>.

49. Methylmercury exposure does not appear to damage to the central nervous system.
- A. True
  - B. False
50. Mercury produces such a potent response in the body that it creates surprising hybrid proteins and forces the immune system, in a process not fully understood, to react against pure \_\_\_\_\_.
- A. Body tissue
  - B. Minerals
  - C. Vitamins
51. In 1999, a baby who received all recommended vaccines at her two-month checkup might well have been injected with up to \_\_\_\_\_ times the EPA's safety limit for daily exposure to mercury.
- A. 2
  - B. 25
  - C. 118

52. Twenty million Americans now suffer from asthma, 7 million of these are children. The number of people suffering from asthma in the U.S. increased \_\_\_\_\_ percent between 1980 and 1996.
- A. 24
  - B. 74
  - C. 82
53. Celiac disease occurs when in order to protect the body from foreign substances in the digestive tract, the immune system produces antibodies that mistakenly attack the lining of the gut as well, resulting in autoimmune \_\_\_\_\_.
- A. Flare up
  - B. Tissue
  - C. Disease

“Celiac disease, and, more generally, gluten intolerance, is a growing problem worldwide, but especially in North America and Europe, where an estimated 5% of the population now suffers from it. Symptoms include nausea, diarrhea, skin rashes, macrocytic anemia and depression. It is a multifactorial disease associated with numerous nutritional deficiencies as well as reproductive issues and increased risk to thyroid disease, kidney failure and cancer. Here, we propose that glyphosate, the active ingredient in the herbicide, Roundup®, is the most important causal factor in this epidemic. Fish exposed to glyphosate develop digestive problems that are reminiscent of celiac disease. Celiac disease is associated with imbalances in gut bacteria that can be fully explained by the known effects of glyphosate on gut bacteria.

Characteristics of celiac disease point to impairment in many cytochrome P450 enzymes, which are involved with detoxifying environmental toxins, activating vitamin D3, catabolizing vitamin A, and maintaining bile acid production and sulfate supplies to the gut. Glyphosate is known to inhibit cytochrome P450 enzymes. Deficiencies in iron, cobalt, molybdenum, copper and other rare metals associated with celiac disease can be attributed to glyphosate's strong ability to chelate these elements. Deficiencies in tryptophan, tyrosine, methionine and selenomethionine associated with celiac disease match glyphosate's known depletion of these amino acids.

...Glyphosate residues in wheat and other crops are likely increasing recently due to the growing practice of crop desiccation just prior to the harvest. We argue that the practice of “ripening” sugar cane with glyphosate may explain the recent surge in kidney failure among agricultural workers in Central America. We conclude with a plea to governments to reconsider policies regarding the safety of glyphosate residues in foods”. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3945755/>

54. Should the mast cells signal the immune system to stay turned on just long enough to fight that virus, all is well. But if mast cells stay turned on for too long and continue to release \_\_\_\_\_ that further stimulate the immune system to attack the invading virus - and then seconds later send that same message alerting the immune system to respond to a chemical in a processed, food-colored cheese sandwich, and a second later do it again when it senses that the body has been exposed to flame retardants-the innate immune system never gets to rest from its high state of alert.
- A. Masts
  - B. Impulses
  - C. Cytokines

## Chapter 5

55. The accepted science has long held that \_\_\_\_\_ pathways can only grow during our initial development when we are still fetuses in the womb.
- A. Neural
  - B. Metabolic
  - C. Circulatory
56. (True or False) Myelin sheaths and axonal nerves are of critical importance in MS and transverse myelitis research. Much MS research is focused on an autoimmune process in which immune fighter T cells mistakenly attack and damage myelin.
- A. True
  - B. False
57. Lupus related \_\_\_\_\_ disease is an autoimmune disease in which sufferers experience symptoms such as dry eyes, dry mouth, and difficulty swallowing.
- A. Sjogrens
  - B. Raynauds
  - C. Rheumatoid arthritis
58. \_\_\_\_\_ antibodies are produced when the body's immune system fails to recognize insulin-generating islet cells produced by the pancreas as natural to the body and attacks them as if they are dangerous foreign substances.
- A. Immunoglobulin G
  - B. Immunoglobulin E
  - C. Islet Cell
59. Interleukin-6 (IL-6) is a \_\_\_\_\_ cytokine. High levels of the protein IL-6 can damage the oligodendrocytes which help to produce the protective myelin sheath around nerve cells.
- A. Anti-inflammatory
  - B. Pro-Inflammatory
  - C. None of the above
60. Women account for 80 percent of the 23.5 million Americans with autoimmune disease. \_\_\_\_\_ shifts in pregnancy, menopause, and aging are *associated with fluctuations* in the course of autoimmune disease. (This does not say hormones cause the disease, but that hormones can influence the symptoms.)
- A. Weight
  - B. Hormonal
  - C. Mood

**Did you know?** The age of puberty, especially female puberty, has been decreasing in western cultures for decades. “At the turn of the 20th century, the average age for an American girl to get her period was 16 or 17. Today, that number has decreased to 12 or 13 years.” (<https://vitalrecord.tamhsc.edu/decreasing-age-puberty>) While the above is alarming it is now considered normal for 8-9 year old girls to begin the onset of puberty! “The onset of puberty is considered normal if it begins at age eight or later in girls or age nine or later in boys. Sometimes, these developments begin too soon, and a child is diagnosed with precocious puberty.” (<https://www.uhhospitals.org/rainbow/services/pediatric-endocrinology>)

61. (True or False) What researchers do know is that sex hormone balance is a crucial factor in the optimum regulation of immune and inflammatory responses and that hormones such as estrogen that women produce modulate the activity of proteins in our bodies, leading in ways we do not yet fully understand to a more reactive autoimmune response.
- A. True
  - B. False
62. Currently on the market for treatment of rheumatoid arthritis and Chrohn’s disease are classes of drugs that remove or \_\_\_\_\_ certain immune activity, such as tumor necrosis factor, or TNF.
- A. Enhance
  - B. Inactivate
  - C. Activate

Tumor necrosis factor (TNF) is a pro-inflammatory cytokine originally identified as an **anti-tumor** protein molecule. During acute inflammation it is responsible for the signaling events within cells that lead to necrosis or apoptosis. In addition, TNF stimulates endothelial cells to produce ligands for white blood cell integrins. “Integrins are complex leukocyte-specific adhesion molecules that are **essential** for leukocyte trafficking, as well as for other immunological processes such as neutrophil phagocytosis and reactive oxygen species production, and T cell activation”. <http://faculty.ccbcmd.edu>

63. \_\_\_\_\_ necrosis factor, which belongs to a group of proteins that communicate with cells, is essential in maintaining cell life and death decisions and control of T-cell populations.
- A. Tumor
  - B. Fat
  - C. Gangrenous

“Childhood inflammatory arthritis can have several causes. Among those causes include chronic conditions such as **juvenile idiopathic arthritis (JIA)**, which presents with inflammation lasting for at least 6 weeks prior to a child’s 16th birthday. **Acute inflammatory arthritis** due to infections, medications, and vaccinations is also noted in the literature. For example, arthritis is well described with Lyme disease, gonorrhea, salmonella, and several viruses. The **rubella** vaccine, which is a live attenuated vaccine, can also cause an inflammatory arthritis. Although there is no live hepatitis B virus in the vaccine directed against this pathogen, the literature does describe inflammatory arthritis, termed “**reactive arthritis**,” in adult patients after hepatitis B vaccination. This finding is reported within higher frequency in patients carrying the human leukocyte antigen HLA B27. In the report herein, we present the first case in the literature of an infant who developed **inflammatory arthritis** soon after hepatitis B vaccination and review the literature on this association. Our objective in reporting this case is to ensure that healthcare providers are aware of this potential reaction in infants and children and particularly in those who carry arthritogenic HLA haplotypes.” <https://doi.org/10.1155/2021/5598217> **Idiopathic = we don’t know what causes \_\_\_\_\_.**

The first vaccine dose of Hep B is recommended within 24 hours of birth and includes premature babies. How is an infant supposed to tell someone that they have a headache, their back and joints hurt when you move them, they feel agitated, have confusion, get dizzy, or have blurred vision? Do you have a “fussy” baby or an infant experiencing side-effects from an injection?

## Chapter 6

64. \_\_\_\_\_ is a devastating autoimmune disorder can lead to paralysis in the legs and turn life threatening as it attacks nerves throughout the lower organs of the body, even shutting down the bladder and bowels.
- A. Multiple Sclerosis
  - B. Amyotrophic Lateral Sclerosis
  - C. Arachnoiditis
65. (True or False) Even in the field of inflammatory bowel disease the firm belief is that diet plays no role. “Yet we have clear data showing that changing an autoimmune-disease patient’s diet and adding in simple supplements can dramatically change the course of his or her illness.”
- A. True
  - B. False
66. One of the most significant ways that foreign antigens, which may trigger the immune system to overreact, can enter the body is through what we \_\_\_\_\_.
- A. Wear
  - B. Breathe
  - C. Eat
67. Processed meats are preserved with \_\_\_\_\_. Patient studies show that higher intake of nitrates and nitrites is associated with a higher risk of developing type 1 diabetes.
- A. Nitrates
  - B. Salt
  - C. Herbs
68. An essential first step for anyone suffering from autoimmune disease is to ensure that his or her gastrointestinal tract is \_\_\_\_\_.
- A. Thriving
  - B. Sealed
  - C. Sterile

The first step for any chronic disorder/disease/infection is to clear intestinal overgrowth (bacteria, yeasts/ molds, parasites of all sizes), tone the inside of the intestinal tract (leaky gut possibilities), eliminate any possible food sensitivities, and rebuild stores of vitamins, minerals, and other nutrients as fast as possible by using supplements. Chronic conditions include skin issues, Lyme disease, autoimmune, cancer, migraines, osteoporosis, kidney disease, reactivated EBV issues, and so much more!

69. A healthy \_\_\_\_\_ allows only digested nutrients to pass into the bloodstream. In patients with immune and inflammatory-based illnesses, the body's intestinal lining often becomes impaired, thus permitting larger molecules, such as bacteria and undigested foods, to slip through.

- A. Immune system
- B. Intestine
- C. Stomach

70. "Untreated gut \_\_\_\_\_ can perpetuate the autoimmune reaction", says Mullin.

- A. Mucosa
- B. Enzymes
- C. Permeability

Stool tests for parasites, candida, yeast are often false negative! "Almost all testing for parasites involves a microscopic analysis of a stool sample. This means that a very small smear of a much larger stool sample is viewed under a microscope. The parasite, or more likely the eggs from the parasite, must be present in that smear, and must be present in a significantly high amount to be found during the microscopic exam.

**And the lab technician must be proficient at recognizing it when they see it.** [www.ibstreatmentcenter.com](http://www.ibstreatmentcenter.com)

The CDC recommends that three or more stool samples, collected on separate days, be examined. Your health care provider MAY request that the lab use special stains or that special tests be performed to look for parasites not routinely screened for - **if you are looking for and using methods that will find 'ABC' you will miss 'DEF'.**

71. If food components or bacteria that \_\_\_\_\_ through that intestinal barrier share a similar protein sequence to a virus or other pathogenic microorganism that the immune system deems as unsafe, it can generate an immune response, leading to an autoimmune reaction.

- A. Congest
- B. Evaporate
- C. Escape

72. Food allergies are divided into two major categories: IgE mediated and T-cell mediated allergies. IgE allergic reactions are \_\_\_\_\_; after being exposed to the food, your body quickly overproduces what is called immunoglobulin E antibodies, or IgE.

- A. Slow-developing
- B. Immediate
- C. Common

Allergy is not the same as intolerance/sensitivity. Allergies involve the immune system immediately. Intolerance symptoms vary with the individual but include acid reflux, bowel cramping, constipation/diarrhea, body/joint aches, general inflammation, etc.

**NOTE:** Short list of common foods and additives to avoid, page 234.

73. According to the Center of Disease Control and Prevention \_\_\_\_\_ accounts for 12 percent of all food-borne illnesses- a number that has been on the rise as of late.
- A. Produce
  - B. Seafood
  - C. Organic
74. Food-borne illnesses have been linked to developing Guillain-Barre syndrome, the worsening of \_\_\_\_\_ disease, and sparking autoimmune disease flares.
- A. Spark's
  - B. Crohn's
  - C. Crim's
75. (True or False) Antioxidants: In the normal process of metabolism, cells produce unstable mercury molecules. These unstable molecules, known as free radicals, help repair damaged cells. Exposure to pollutants can decrease free radicals, as can smoking and use of cooking oils that become overheated.
- A. True
  - B. False

**NOTE:** Free radicals are oxygen-derived radicals, reactive oxygen species

Only an over-abundance of free radicals are "bad". "Oxygen-derived radicals are generated constantly as part of normal aerobic life. They are formed in mitochondria as oxygen and reduced along the electron transport chain. Reactive oxygen species are also formed as **necessary intermediates in a variety of enzyme reactions**. It is best not to think of oxygen radicals as "bad". They are generated in a number of reactions essential to life and, as mentioned above, phagocytic cells generate radicals to kill invading pathogens. There is also a large body evidence indicating that oxygen radicals are involved in intercellular and intracellular signaling". ([www.vivo.colostate.edu/hbooks/pathphys/misc\\_topics/radicals.html](http://www.vivo.colostate.edu/hbooks/pathphys/misc_topics/radicals.html))

76. Antioxidants can also be found in supplement and vitamin form. One particular antioxidant currently under study, alpha lipoic acid, has been shown to help in the treatment of MS by balancing T-cell activity and has also been found to help lessen symptoms in those with diabetic \_\_\_\_\_.
- A. Nephropathy
  - B. Retinopathy
  - C. Neuropathy
77. Seventy-five percent of Crohn's patients are deficient in \_\_\_\_\_. There is growing evidence that Vitamin D plays a central role in rebalancing T-cell activity, which is why it is proving to be such an important adjunct to the treatment of autoimmune disease.
- A. Vitamin C
  - B. Vitamin D
  - C. Vitamin E

78. The human gut is full of \_\_\_\_\_, most of it beneficial. But lacking a complete set of these healthy bacteria can interfere with food digestion and fighting off illness and inflammation.
- A. Food
  - B. Bacteria
  - C. Enzymes

February 11, 2019: "Researchers at EMBL's European Bioinformatics Institute and the Wellcome Sanger Institute have identified almost 2000 bacterial species living in the human gut. These species are yet to be cultured in the lab. The team used a range of computational methods to analyze samples from individuals worldwide...The human gut is home to many species of microbes, collectively referred to as the gut microbiota. Despite extensive studies in the field, researchers are still working on identifying the individual microbial species that live in our guts and understanding what roles they play in human health". <https://www.ebi.ac.uk>

79. In autoimmune disease, the link between stress and disease is profound. When we are stressed, our adrenal glands produce several hormones, including adrenaline and cortisol. The stress response starts in the \_\_\_\_\_, a part of the brain that also regulates body temperature, respiration, hunger, sleep cycle, sexual function, and blood pressure.
- A. Hypothalamus
  - B. Thyroid
  - C. Adrenals

80. (True or False) Cortisol plays a central role in the immune system's responses and activity. Under stress, cortisol mobilizes all major types of immune cells to battle stations in the body - primarily along the lymph nodes.
- A. True
  - B. False

81. Each day an average of \_\_\_\_\_ new chemicals are put out on the market in the United States without any testing as to whether or not they pose a challenge to the immune system.
- A. Five
  - B. Seventeen
  - C. Twenty-six

Both chronic emotional stress and chronic infection(s) result in the ongoing release of cortisol and other steroidal glucocorticoids. Prolonged exposure to glucocorticoids can disrupt the interactions between the hypothalamus, pituitary gland, and adrenal glands (HPA axis). The HPA axis is a neuroendocrine system that regulates digestion, the immune system, energy storage and expenditure, and influences our mood and emotions. HPA axis dysfunction increases the risk of depression, anxiety, digestive and sleep problems, headaches, weight gain or loss, and heart disease. Fatigue, muscular weakness, excessive free radicals, mitochondrial dysfunction and increased levels of pro-inflammatory cytokines are also associated with HPA axis dysfunction.

~ END OF TEST ~