



## G300 TEST QUESTIONS & STUDY GUIDE

### Never Be Sick Again (2002) by Raymond Francis M.Sc.

#### Chapter 2

1. Only after massive numbers of cells \_\_\_\_\_ or die do you begin to notice symptoms of disease. In other words, you are already sick before you “get sick.”
  - A. Divide
  - B. Replicate
  - C. Malfunction
2. Healthy does not merely mean being ambulatory (able to walk, not bedridden) and free of obvious disease symptoms. Healthy means functioning at the highest level that [your] \_\_\_\_\_ capacity allows.
  - A. Energy
  - B. Genetic
  - C. Heart

Below is a small portion of an article from the National Institutes of Health. What first stood out while reading it was that they acknowledge that genes do not determine that a person will develop a disease, genes do however make you more susceptible to developing a disease. Secondly, they admit that environmental “triggers” can cause the disease. Thirdly, they completely ignore preventing the disease by determining which environmental triggers (food and water chemicals, agricultural and pest control chemicals, drugs, metals, nutrient deficiencies, chronic stress...) would cause diseases. They are not interested in prevention via avoidance but rather on what drugs can be developed to control the genes within the cells.

From the article: “As noted earlier, one of the benefits of understanding human genetic variation is its practical value for understanding and promoting health and for understanding and combating disease. We probably cannot overestimate the importance of this benefit...virtually every human disease has a genetic component. In some diseases, such as Huntington disease, Tay-Sachs disease, and cystic fibrosis, this component is very large. In other diseases, such as cancer, diabetes, and heart disease, the genetic component is more modest. In fact, we do not typically think of these diseases as “genetic diseases,” **because we inherit not the certainty of developing a disease, but only a predisposition to developing it.**

In still other diseases, the genetic component is very small.... Scientists estimate that each of us carries between 5 and 50 mutations that carry some risk for disease or disability. Some of us may not experience negative consequences from the mutations we carry, either because we do not live long enough for it to happen **or because we may not be exposed to the relevant environmental triggers.** The reality, however, is that the potential for negative consequences from our genes exists for each of us...The ability to test for the presence in individuals of particular gene variants is also changing the way drugs are prescribed and developed. A rapidly growing field known as pharmacogenomics focuses on crucial genetic differences that cause drugs to work well in some people and less well, or with dangerous adverse

reactions, in others... Experts predict that increasingly in the future, **physicians will use genetic tests to match drugs to an individual patient's body chemistry**, so that the safest and most effective drugs and dosages can be prescribed. After identifying the genotypes that determine individual responses to particular drugs, **pharmaceutical companies also likely will set out to develop new, highly specific drugs and revive older ones** whose effects seemed in the past too unpredictable to be of clinical value".  
(National Institutes of Health (US); Biological Sciences Curriculum Study. NIH Curriculum Supplement Series [Internet]. Bethesda (MD): National Institutes of Health (US); 2007. Understanding Human Genetic Variation. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK20363/>)

### Chapter 3

3. There is only one disease: \_\_\_\_\_ cells.
  - A. Cancer
  - B. Swollen
  - C. Malfunctioning
  
4. (True or False) There are only two causes of disease: Deficiency & Toxicity
  - A. True
  - B. False
  
5. According to the text which of the following is NOT one of the six pathways between health and disease:
  - A. Nutrition
  - B. Toxin
  - C. Psychological
  - D. Physical
  - E. Aging
  - F. Genetic
  - G. Medical
  
6. The scientific term for a malfunctioning cell is \_\_\_\_\_.
  - A. Apoptosis
  - B. Cytopathy
  - C. Supercalifragilisticexpialidocious
  
7. Humans can live long and healthy lives if we do two things right: provide our cells with all the \_\_\_\_\_ they need and protect of cells from toxins.
  - A. Nutrients
  - B. Drugs
  - C. Pesticides
  
8. Our bodies produce more than 10 million cells every \_\_\_\_\_, as we constantly rebuild our tissues.
  - A. Day
  - B. Hour
  - C. Second

“Each kind of tissue has its own turnover time, related at least partially to the workload endured by its cells. Epidermic cells, forming the easily damaged skin of the body, are recycled every two weeks or so. Red blood cells, in constant motion on their journey through the circulatory system, last only 4 months. As for the liver, the human body's detoxifier, its cells' lives are quite short - an adult human liver cell has a turnover time of 300 to 500 days.

Cells lining the surface of the gut, known by other methods to last for only five days, are among the shortest-lived in the whole body. Ignoring them, the average age of intestinal cells is 15.9 years, Dr Friséen found. Skeletal cells are a bit older than a decade and cells from the muscles of the ribs have an average age of 15.1 years. When looking into the brain cells, all of the samples taken from the visual cortex, the region responsible for processing sight, were as old as the subjects themselves, supporting the idea that these cells do not regenerate. 'The reason these cells live so long is probably that they need to be wired in a very stable way,' Friséen speculates. Other brain cells are more short-lived. Dr Friséen found that the heart, as a whole, does generate new cells, but he has not yet measured the turnover rate of the heart's muscle cells. And the average age of all the cells in an adult's body may turn out to be as young as 7 to 10 years, according to him.

Why then, if the body remains so eminently capable of renewing its tissues, doesn't the regeneration continue forever? Some scientists believe this is explained by the accumulation of mutations in the DNA, which gradually degrades its information. Another theory blames mitochondrial DNA, which lack the repair mechanisms available for the chromosomes, whilst a third theory postulates that stem cells, which are the source of new cells in each tissue, eventually grow feeble with age”. (<https://cordis.europa.eu/article/id/24286-life-span-of-human-cells-defined-most-cells-are-younger-than-the-individual>)

9. What we allow to enter our minds on a daily basis is critical. What we think and feel over a \_\_\_\_\_ plays a major role in our health or illness.
- A. Cup of tea
  - B. Lifetime
  - C. Mere seconds
10. The genetic pathway focuses on optimizing the \_\_\_\_\_ of our genes to promote health and limit any damage to the genes.
- A. Mutation
  - B. Expression
  - C. Toxicity

#### Chapter 4

11. Making a single bad choice here and there is generally not a problem, but when you \_\_\_\_\_ make bad choices, daily living can wear down your tissues faster than they can be repaired or replaced.
- A. Never
  - B. Rarely
  - C. Consistently

12. Building \_\_\_\_\_ starts in a mother's womb.

- A. Healthy Cells
- B. Habits
- C. A Career

"The study is the most extensive look yet at how the chemicals pregnant women are exposed to also appear in their babies' cord blood. It measured 59 chemicals, a broader array than has been examined before in a single study, providing a first indication of how several different classes of environmental chemicals found in a pregnant woman's blood are also present in the newborn. From 2010 to 2011, researchers collected maternal blood samples from 77 pregnant women at ZSFG. Once they delivered their babies, researchers collected umbilical cord blood samples from 65 of these women. **Almost 80 percent of the chemicals detected in maternal blood samples were also detected in the umbilical cord blood samples, indicating that they passed through the placenta and entered the fetal environment**". (<https://obgyn.ucsf.edu/news/toxic-chemicals-pregnant-women-and-their-newborns>)

13. Impaired cellular \_\_\_\_\_ is one of the most basic common denominators of disease, no matter how the disease happened or what it is called.

- A. DNA
- B. Growth
- C. Communication

14. Chemical reactions make life possible and an estimated \_\_\_\_\_ such reactions take place every second. Enzymes make these reactions possible.

- A. 6 Trillion
- B. 2 Million
- C. 4 Billion

15. Building a cell membrane from \_\_\_\_\_ oils impairs the passage of oxygen into the cell and oxygen deficient cells become cancerous.

- A. Olive
- B. Fish
- C. Hydrogenated

Abstract: "Various margarines containing trans-fatty acids were marketed as being healthier because of the absence of cholesterol, suggesting to use margarine instead of butter. **Fifteen years ago, research documented the grave health risk of trans-fats** (T-fat). US FDA in 2015 finalized its decision that T-fat is not safe and set a three-year time limit for complete removal of T-fat from all foods. The greatest danger from T-fat lies in its capacity to distort the cell membranes. The primary health risk identified for T-fat consumption is an elevated risk of coronary heart disease. T-fats have an adverse effect on the brain and nervous system. T-fat from the diet is incorporated into brain cell membranes and alter the ability of neurons to communicate. This can diminish mental performance. Relationship between T-fat intake and depression risk was observed. There is growing evidence for a possible role of T-fat in the development of Alzheimer's disease and cognitive decline with age'. (<https://pubmed.ncbi.nlm.nih.gov/27215959/>)

16. Free-radical chain reactions are \_\_\_\_\_ being produced and stopped inside the body. Cells were designed to cope with these reactions, but not of the magnitude that is present today.
- A. Constantly
  - B. Rarely
  - C. Never

## Chapter 5

17. Which group would be worst food choices:
- A. Tacos, Red Meat, White Potatoes, Ginger Ale
  - B. Sugar, White Flour, Processed Oils, Dairy
  - C. Kale, Tomatoes, Apples, Kombucha
18. Eating sugar is death by \_\_\_\_\_.
- A. Installment
  - B. Chocolate
  - C. Delight
19. To avoid health problems created by processed \_\_\_\_\_, choose whole grains such as millet, oats, quinoa, spelt, barley, amaranth, teff, kamut and brown rice. Cook the whole grains in a pot of water as you would rice.
- A. Sugar
  - B. Cheese
  - C. Grains
20. The best sources of absorbable calcium are dark \_\_\_\_\_ vegetables.
- A. Green
  - B. Orange
  - C. Purple
21. \_\_\_\_\_ allergies are the primary cause of ear infections in children. According to Dr. Oski, "At least 50% of all children are allergic to dairy."
- A. Peanut
  - B. Milk
  - C. Kiwi

Cow's milk has become a point of controversy among doctors and nutritionists. There was a time when it was considered very desirable, but research has forced us to rethink this recommendation... dairy products contribute to a surprising number of health problems (including) chronic ear problems..." - Benjamin Spock, M.D., "Child Care," 7th Edition

22. \_\_\_\_\_ percent of commercial chickens have cancer at the time of their slaughter.
- A. 3%
  - B. 10%
  - C. 90%

While I could not confirm the percentage of chickens with cancer at the time of slaughter, I did find that cancer/tumors are common in chickens. In the 1930s chickens were the first animal discovered with cancer caused by a retrovirus. Tumors caused by Marek's disease (herpes virus) are the most common. Less common diseases include avian leukosis/sarcoma viruses and squamous cell carcinoma. Tumors can be found almost anywhere in the chicken because lymphoid tissue is spread throughout the bird instead of having lymph nodes like mammals. "Other leukosis viruses affect adults sporadically as the virus is ubiquitous in poultry worldwide and is passed down through the egg as well as transmitted by direct or indirect contact".(<https://www.yourchickens.co.uk/care-and-advice/tumours-in-chickens-1-4187539>)

23. According to a study by the U.S. Department of Agriculture, of the 21,500 people in the study, not a single person was obtaining 100% (RDA standards) of just \_\_\_\_\_ nutrients on a daily basis.
- A. 8
  - B. 10
  - C. 12
24. The simple rules of food combining are: vegetables with protein, okay; vegetables with starch, okay; no protein with \_\_\_\_\_; eat fruit alone
- A. Starch
  - B. Vegetables
  - C. Fats
25. Most vitamins marketed today are \_\_\_\_\_ and often contain petroleum residues from their manufacture.
- A. Expensive
  - B. Synthetics
  - C. Food-based

## Chapter 6

26. To prevent or reverse disease, we must limit our exposure to \_\_\_\_\_ and we must give our bodies what they need to detoxify themselves.
- A. Sunshine
  - B. Toxins
  - C. Nutrients

27. Four hours into our conversation, David provided a key piece of information that gave me the answer. David said he liked \_\_\_\_\_, liked it so much that he typically ate two cans per day.

- A. Sardines
- B. Mandarin oranges
- C. Tuna fish

28. Name three highly contaminated oils:

- A. Peanut, cottonseed, soybean
- B. Hazelnut, Coconut, Peanut
- C. Soybean, Olive, Almond

29. What are mycotoxins? Toxins produced by \_\_\_\_\_.

- A. Mold
- B. Bacteria
- C. Viruses

“Aflatoxin is a type of mold that is considered a human carcinogen. It’s found in certain commonly eaten foods including legumes like peanuts, peanut butter and corn, and is most harmful in parts of the world where people consume large amount of these foods, such as Asia and Africa...Some research shows that crops being grown in humid locations such as Brazil and China are most likely to contain aflatoxin...There are actually at least 13 different types of naturally-occurring aflatoxin toxic molds that researchers have been able to identify. Of the 13 species, the type called aflatoxin B1 is considered the most toxic, capable of causing health problems such as liver disease or cancer, autoimmune responses, digestive issues and in rare cases even death”. - Dr. Axe

The USDA monitors peanuts for aflatoxin and the FDA routinely samples peanut products to make sure they don’t exceed maximum allowable levels. Some experts are concerned about chronic low-level exposure to aflatoxin.

30. The Department of Health Services in California reports that women who drink bottled or filtered water have substantially lower rates of \_\_\_\_\_ and miscarriages compared to women who drink tap water.

- A. Morning sickness
- B. Birth defects
- C. Seizures

31. Personal care products are the largest source of toxic absorption through the skin and \_\_\_\_\_ membranes.

- A. Ocular
- B. Lipid
- C. Mucus

32. (True or False) Intestinal toxemia is when toxins are generated in the lymphatic system, they enter our kidneys, and if these toxins are present in excess of the blood's ability to detoxify them, they damage cells all over the body.

- A. True
- B. False

The medical view/definition: Adult intestinal toxemia (also known as adult intestinal colonization) botulism is a very rare kind of botulism that can happen if the spores of the bacterium *Clostridium botulinum* and related species get into an adult's intestines, grow, and produce the toxin (similar to infant botulism).

Autointoxication is considered quackery by the medical field and they consider constipation to be uncomfortable but nothing to be concerned about if you are able to have a bowel movement a couple times a week (or even less!). It is however becoming increasingly clear that the gut microbiome influences health on many levels and that increased intestinal permeability allows bacteria and toxins to escape the intestines.. Could it be that the term autointoxication and its history (many harmful "cures") is the main difference? Should we, as natural health professionals, work within the medical vocabulary and use gut dysbiosis, metabolic waste, and intestinal permeability instead of using the term autointoxication? I would say yes. The paragraph below from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4222764/> is a great example.

"*C. albicans* normally thrives as a relatively harmless commensal organism in the microbiota of the skin, the oral cavity, and the gastrointestinal (GI) and urogenital tracts of most healthy individuals . However, *C. albicans* infection can be triggered by **perturbations of the normal microbiota** (e.g., by antibiotic treatments), **breaks in GI-blood barriers** (e.g., as a result of injury or surgery), or by the use of medical implants (upon which *C. albicans* can form elaborate biofilms that seed bloodstream infection)". - [breaks in GI-blood barriers is intestinal permeability and results in organisms and various molecules \(toxins\) escaping into the blood/lymphatic systems.](#)

33. (True or False) Yeast/Candida may physically invade and damage intestinal tissue.

- A. True
- B. False

34. At any given time, about \_\_\_\_% of all the blood in your body is in your liver, awaiting detoxification.

- A. 10%
- B. 25%
- C. 40%

35. Much of our body is made of water; the \_\_\_\_\_ need it to excrete water-soluble toxins.

- A. Adrenals
- B. Lymph nodes
- C. Kidneys

The kidneys are essential for homeostasis (maintaining a constant internal environment) of the body's extracellular fluids. Their basic functions include:

- 1. Regulation of extracellular fluid volume.** The kidneys work to ensure an adequate quantity of plasma to keep blood flowing to vital organs.
- 2. Regulation of osmolality.** The kidneys help keep extracellular fluid from becoming too dilute or concentrated with respect to the solutes carried in the fluid.
- 3. Regulation of ion concentrations.** The kidneys are responsible for maintaining relatively constant levels of key ions including sodium, potassium and calcium.
- 4. Regulation of pH.** The kidneys prevent blood plasma from becoming too acidic or basic.
- 5. Excretion of wastes and toxins.** The kidneys filter out a variety of water-soluble waste products and environmental toxins into the urine for excretion.
- 6. Production of hormones.** The kidneys produce erythropoietin, which stimulates red blood cell synthesis, and renin, which helps control salt and water balance and blood pressure.

## Chapter 7

36. (True or False) For Lisa and Ruth, certain “rewards” for being sick superseded their desires to get well or stay well. This way of life is not uncommon; people often have psychological reasons to get sick or stay sick - usually not on a conscious level. People often learn hopelessness instead of hopefulness.

- A. True
- B. False

37. Scientific work with the \_\_\_\_\_ proves what we already know instinctively: Beliefs, attitudes and patterns of behavior play a major role in health and disease.

- A. Nocebo
- B. Compass
- C. Placebo

38. Deepak Chopra, MD shared this observation in his book Creating Health: “I have frequently observed that a \_\_\_\_\_ progression of symptoms and then death from cancer occurred after the diagnosis of cancer was made. It is almost as if the patient was dying from the diagnosis and not from the disease.”

- A. Rapid
- B. Slower
- C. Normal

## Chapter 8

39. Exercise is like an \_\_\_\_\_ nutrient; without it, your body malfunctions.

- A. Iodide
- B. Anti-
- C. Essential

40. Just four hours of exercise per week lowers a woman's risk of breast cancer by almost \_\_\_\_\_%.
- A. 20%
  - B. 40%
  - C. 60%
41. Skin brushing for a few minutes before taking a bath or shower helps circulate \_\_\_\_\_ fluid and is especially important for people who do not get enough regular exercise.
- A. Lymphatic
  - B. Plasma
  - C. Spinal
42. Being deprived of adequate \_\_\_\_\_ for even a few nights dulls the brain, lowers energy levels, increases irritability and depression, and makes people more accident-prone.
- A. Nutrients
  - B. Sleep
  - C. Water
43. High cortisol levels can damage cells in the \_\_\_\_\_ that control learning and memory.
- A. Pituitary
  - B. Brain
  - C. Liver
44. Breathing downward with the diaphragm is also called \_\_\_\_\_ breathing.
- A. Distressed
  - B. Shallow
  - C. Belly
45. In other words, \_\_\_\_\_ may cause skin cancer, rather than preventing it.
- A. Sunscreen
  - B. Shade
  - C. Sunbathing
46. Our skin contains sweat and oil glands. Sweat gets rid of \_\_\_\_\_ toxins. Oil glands help remove oil-soluble toxins.
- A. Fatty
  - B. Oxygenated
  - C. Water-soluble

47. Taking saunas or other “heat treatments” is not a luxury, but like exercise, is a physical responsibility and an important element of the \_\_\_\_\_ pathway.

- A. Physical
- B. Emotional
- C. Medical

48. EMF stands for \_\_\_\_\_ .

- A. Electromotive force
- B. Electromagnetic field
- C. Early morning fasting

49. Cell phone \_\_\_\_\_ are capable of damaging cellular DNA.

- A. Ring tones
- B. Cases
- C. Microwaves

***When theory and observation collide: Can non-ionizing radiation cause cancer?***

Abstract: “This paper attempts to resolve the debate about whether non-ionizing radiation (NIR) can cause cancer—a debate that has been ongoing for decades. The rationale, put forward mostly by physicists and accepted by many health agencies, is that, “since NIR does not have enough energy to dislodge electrons, it is unable to cause cancer.” This argument is based on a flawed assumption and uses the model of ionizing radiation (IR) to explain NIR, which is inappropriate. Evidence of free-radical damage has been repeatedly documented among humans, animals, plants and microorganisms for both extremely low frequency (ELF) electromagnetic fields (EMF) and for radio frequency (RF) radiation, neither of which is ionizing. While IR directly damages DNA, NIR interferes with the oxidative repair mechanisms resulting in **oxidative stress, damage to cellular components including DNA, and damage to cellular processes leading to cancer**. Furthermore, free-radical damage explains the increased cancer risks associated with mobile phone use, occupational exposure to NIR (ELF EMF and RFR), and residential exposure to power lines and RF transmitters including mobile phones, cell phone base stations, broadcast antennas, and radar installations”. <https://doi.org/10.1016/j.envpol.2016.10.018>

50. Alice Stewart, M.D., concluded the radiation delivered in \_\_\_\_\_ doses over time (as we are exposed to today through common medical X rays) may carry a higher risk of cancer than the same total radiation delivered in a single dose.

- A. Four
- B. Small
- C. Iconic

“Accumulating epidemiological data show that in populations where mammography screening has been widespread for a long time, there has been no or only a modest decline in the incidence of advanced cancers, including that of de novo metastatic (stage IV) cancers at diagnosis. Moreover, breast cancer mortality reductions are similar in areas with early introduction and high penetration of screening and in areas with late introduction and low penetration of screening. Overdiagnosis is commonplace, representing 20% or more of all breast cancers among women invited to screening and 30–50% of screen-detected cancers. Overdiagnosis leads to overtreatment and inflicts considerable physical, psychological and

economic harm on many women. Overdiagnosis has also exerted considerable disruptive effects on the interpretation of clinical outcomes expressed in percentages (instead of rates) or as overall survival (instead of mortality rates or stage-specific survival). Rates of radical mastectomies have not decreased following the introduction of screening and keep rising in some countries (e.g. the United States of America)...**One third to one half of mammography-detected breast cancers would not have been clinical during lifetime (overdiagnosis).**". European Journal of Cancer, Volume 90, February 2018, Pages 34-62

## Chapter 9

*"Genetics may load the gun, but the environment pulls the trigger."* – Pamela Peeke

51. By enhancing the function of the cells, genetic \_\_\_\_\_ can remain potential problems, rather than becoming real problems, regardless of what "runs in the family".
- A. Predispositions
  - B. DNA
  - C. Mutations
52. You cannot control your \_\_\_\_\_; you can control the environment you create for your cells.
- A. Heredity
  - B. Food choices
  - C. Emotions
53. Which of the following may cause genetic mutations?
- A. Ionizing radiation
  - B. Non-ionizing radiation
  - C. Toxins
  - D. All of the above
54. Worse, if genetic mutations take place in a \_\_\_\_\_ cell, a 50/50 chance exists of passing these on to an unborn child.
- A. Reproductive
  - B. Brain
  - C. Muscle

### **Pesticide linked to three generations of disease: Methoxychlor causes epigenetic changes**

*Date: July 24, 2014; Source: Washington State University*

Washington State University researchers say ancestral exposures to the pesticide methoxychlor may lead to adult onset kidney disease, ovarian disease and obesity **in future generations**. "What your great-grandmother was exposed to during pregnancy, like the pesticide methoxychlor, may promote a **dramatic increase in your susceptibility to develop disease, and you will pass this on to your grandchildren in the absence of any continued exposures,**" says Michael Skinner, WSU professor and founder of its Center for Reproductive Biology.

Methoxychlor -- also known as Chemform, Methoxo, Metox or Moxie -- was introduced in 1948 and widely used during the 1970s as a safer replacement for DDT. It was used on crops, ornamental plants, livestock and pets. **It is still used in many countries around the world.** It was banned in the U.S. in 2003 due to its toxicity and ability to disrupt endocrine systems. Methoxychlor can behave like the hormone estrogen and **profoundly affects the reproductive system.**

When Skinner and his colleagues exposed gestating rats to methoxychlor at a range typical of high environmental exposures, they saw increases in the incidence of kidney disease, ovary disease and obesity in offspring **spanning three generations. The incidence of multiple diseases increased in the third generation or "great-grandchildren."**

The researchers say the pesticide may be affecting how genes are turned on and off in the progeny of an exposed animal, even though its DNA and gene sequences remain unchanged. This is called **transgenerational epigenetic inheritance.** In recent years, the Skinner lab has documented epigenetic effects from a host of environmental toxicants, including DDT, plastics, pesticides, fungicides, dioxins, hydrocarbons and the plasticizer bisphenol-A or BPA. The newest findings support those observations.

The work is also the first to show that a majority of transgenerational disease traits can be transmitted primarily through the female line. Additionally, the study identified mutations in the sperm epigenome of great-grandchild male rats. The epigenome functions like a set of switches for regulating gene expression and can be altered by environmental conditions. For people exposed to the pesticide, Skinner says his findings have implications such as reduced fertility, increased adult onset disease and the potential to pass on those conditions to subsequent generations. He suggests that ancestral exposures to methoxychlor **over the past 50 years** in North America may play a part in today's increasing rates of obesity and disease.. - <https://www.sciencedaily.com/releases/2014/07/140724144253.htm>

55. Perfect \_\_\_\_\_ using these gene-splicing techniques and knowing exactly what will be produced is almost impossible.
- A. Timing
  - B. Mutations
  - C. Accuracy

Two major elements of the human epigenome are covalent chemical modifications present on DNA and histones that define chromatin structure and are referred to as epigenetic marks. Epigenetic marks do not change DNA sequence, and therefore the entire genomic information or genotype, inherited from our parents remains untouched. However, epigenetic marks transform the local chromatin environment and thus affect DNA accessibility and regulate a wide range of DNA-templated processes, including gene transcription. **Once misplaced or aberrantly active, epigenetic marks can disrupt normal gene expression profiles, incorrectly turning genes on and off.** Dozens of epigenetic marks on histones and several on DNA have been identified, with methylation and acetylation of histones and methylation of DNA being the most prevalent. Unlike the fixed DNA sequence, epigenetic marks are less stable and can undergo changes during the cell cycle or in response to various stimuli required for normal cell growth and survival.

A wealth of recent studies suggests that epigenetic marks are also sensitive to environmental exposure. Nutrients, toxins, pollutants, pesticides and other environmental factors can impact, either directly or indirectly, levels and turnover of epigenetic marks. This in turn would result in transformed gene expression patterns and consequently affect our health for better or worse. Certain epigenetic alterations have been thought to pass to the next generation or cause a temporal modulation of subsets of genes eventually leading to progression of disease. - <https://www.nature.com/articles/s41467-018-05778-1>

56. America's crops are so \_\_\_\_\_ by genetic modification that the Organic Federation of Australia announced in 2001 that it could no longer verify the purity of organic crops imported from the United States.

- A. Purified
- B. Contaminated
- C. Fumigated

57. Defects caused by problematic conditions in the womb are \_\_\_\_\_, not genetic.

- A. Paternal
- B. Maternal
- C. Congenital

## Chapter 10

58. Conventional medical treatments can be both a blessing and a curse. These treatments are good, even excellent, in crisis intervention and treatment of \_\_\_\_\_. But conventional medicine does not prevent nor cure disease: it manages symptoms.

- A. Allergies
- B. Injuries
- C. Cancer

59. Cortisone damages the \_\_\_\_\_ system by inhibiting the productions of antibodies and "killer" T-cells.

- A. Immune
- B. Reproductive
- C. Circulatory

60. \_\_\_\_\_ strip nutrients such as magnesium, calcium, potassium, zinc and iodine.

- A. Cruciferous vegetables
- B. Diuretics
- C. Blood thinners

61. The United States has the most expensive, yet one of the most inadequate health care systems in the world. Our \_\_\_\_\_ mortality rate is worse than Cuba's.

- A. Infant
- B. All-cause
- C. Cancer

**The infant mortality rate for U.S. in 2020 was 5.681 deaths per 1000 live births, a 1.17% decline from 2019.**

“Becker and Blaxill provided no information about specific causes of infant deaths in 2020, and I could find none. They did convey anecdotes from emergency room physicians who reported seeing fewer SIDS cases since the beginning of the pandemic and associated lockdowns. Along with this, Becker and Blaxill ask whether the substantial decline in vaccine uptake after the emergency declaration could be relevant.

The suggestion that vaccinations could be one factor in the causation of SIDS is not new. American pediatric officials have steadfastly dismissed any role for vaccines in the causation of SIDS, based on a selection of observational studies. Nevertheless, **until properly controlled trials are done we will be unable to confirm or exclude a causal role for vaccines.**

There have been a number of reports from around the world that social distancing and lockdowns reduced the duration and severity of the recent flu season, including fewer hospitalizations for respiratory infections in children...They suggest that the question of vaccinations and SIDS urgently needs answering. I agree. Vaccinations have been lifesavers, as your editorial fervently explains, **but the foregoing observations should give us pause. More study is required and, in time, perhaps changes in the immunization schedule**. - *BMJ* 2020;369:m2392 - Allan S. Cunningham, Retired pediatrician

62. As soon as the doctor matched symptoms to a disease, treatments follow established protocols. Everyone with the same “disease” receives the same treatment. Such procedures completely ignore one of the greatest scientific discoveries of the twentieth century: \_\_\_\_\_ individuality.
- A. Synthetic
  - B. Nutritional
  - C. Biochemical
63. In practice, FDA-approved, properly prescribed (accepted use and also not mis-use) drugs kill about four hundred people every \_\_\_\_\_.
- A. Day
  - B. Week
  - C. Month
64. (True or False) The most recent annual estimate of hospital-caused death is divided into 5 categories. These numbers total 225,000 deaths per year, but the real total is far greater.... Medicine-caused deaths in outpatient settings have been estimated as an additional 200,000 per year.
- A. True
  - B. False
65. In March 1997 the Physicians Committee for Responsible Medicine published a statement saying that only \_\_\_\_\_ percent of hysterectomies are justified.
- A. 10
  - B. 30
  - C. 50

66. Unfortunately, when drugs cause \_\_\_\_\_, we have all been trained not to call it disease. Instead, we use the deceptive term “side effects”.

- A. Nausea
- B. Confusion
- C. Disease

67. NSAIDS cause intestinal bleeding by blocking action of messenger molecules called prostaglandins. Some prostaglandins cause inflammation and pain, and others stimulate healing and \_\_\_\_\_.

- A. Digestion
- B. Repair
- C. Absorption

68. (True or False) Beneficial intestinal bacteria produce vitamins, such as B-complex vitamins, vitamin B12 and vitamin K.

- A. True
- B. False

“The gut microbiota produce hundreds of bioactive compounds, including B-vitamins, which play significant physiological roles in hosts by supporting the fitness of symbiotic species and suppressing the growth of competitive species. B-vitamins are also essential to the host and certain gut bacterium. Although dietary B-vitamins are mainly absorbed from the small intestine, excess B-vitamins unable to be absorbed in the small intestine are supplied to the distal gut. In addition, B-vitamins are supplied from biosynthesis by distal gut microbiota. B-vitamins in the distal colon may perform many important functions in the body. They act as 1) nutrients for a host and their microbiota, 2) regulators of immune cell activity, 3) mediators of drug efficacy, 4) supporters of survival, or the fitness of certain bacterium, 5) suppressors of colonization by pathogenic bacteria, and 6) modulators of colitis”. - <https://doi.org/10.1002/mnfr.202000426>

69. (True or False) Yeasts also produce numerous immune-reactive substances that force the immune system to form antibodies constantly.

- A. True
- B. False

70. Steroids can cause \_\_\_\_\_ and devastating damage, even after a single dose; once the body is thrown out of its natural self-regulatory mode, it sometimes never “gets back”.

- A. Beneficial
- B. Self-limiting
- C. Permanent

71. (True or False) The British Medical Journal in August 1994 reported that extensive eye damage and visual loss can be caused by using topical, over-the-counter, 1/2 percent hydrocortisone ointment for three weeks.
- A. True
  - B. False
72. Hormones, such as birth control pills, create \_\_\_\_\_ imbalances in the gut, thus promoting yeast infections such as Candida.
- A. Chemical
  - B. Hydration
  - C. Elimination
73. To avoid an \_\_\_\_\_ disease, you don't need to have vaccinations; you need to keep your immunity strong.
- A. Inevitable
  - B. Insufficient
  - C. Infectious
74. Since 1988, the Environmental Protection Agency has classified scrap dental amalgams as a \_\_\_\_\_ waste.
- A. Industrial
  - B. Beneficial
  - C. Hazardous

“The **“Phase I [detoxification]”** cytochrome P450 superfamily of enzymes (CYP450) is generally the first defense employed by the body to biotransform xenobiotics, steroid hormones, and pharmaceuticals. These microsomal membrane-bound, heme-thiolate proteins, located mainly in the liver, but also in enterocytes, kidneys, lung, and even the brain, are responsible for the oxidation, peroxidation, and reduction of several endogenous and exogenous substrates.....Metallothionein, a cysteine-rich protein with the ability to bind divalent cations, including toxic metals such as mercury, cadmium, lead, and arsenic, is gaining recognition as an important component in heavy metal detoxification... **In addition to sequestering heavy metals, it is capable of scavenging free radicals and reducing injury from oxidative stress, as well as inhibiting NF-κB signaling.** [Metallothioneins are a family of proteins which are able to bind metals intracellularly, so their main function is to regulate the cellular metabolism of essential metals.]

Dietary patterns and nutrients may result in changes in metallothionein production. Lamb et al. (2011) reported a 54% increase in metallothionein mRNA production in a small clinical trial in women with fibromyalgia following an elimination diet in conjunction with a phytonutrient-rich medical food consisting of hops, pomegranate, prune skin, and watercress. Zinc supplementation (15 mg/day) to healthy men over 10 days led to significantly increased metallothionein mRNA, up to 2-fold in leukocytes and up to 4-fold from dried blood spots. Metallothionein has been shown to be decreased in the intestinal mucosa of patients with inflammatory bowel disease (IBD); however, zinc supplementation (300 mg zinc aspartate, equal to 60 mg elemental zinc per day for 4 weeks) in 14 zinc-deficient patients with IBD resulted in slightly higher metallothionein concentration in the intestinal mucosa. Cruciferous phytonutrients may also modulate metallothionein expression, as suggested by a 10-fold increase following a single oral dose of 50 μmol

sulforaphane to rats. Chromium may *inhibit* zinc-induced metallothionein expression, according to animal studies by Kimura et al. (2011). Early-stage, *in vitro* studies also suggest that quercetin and *Cordyceps sinensis*, a mushroom native to the Himalayan region, may upregulate metallothionein expression...

Therefore, at this time, a dietary pattern favoring whole, unprocessed, plant-based foods and the removal or reduction of toxic substances in one's environment is a two-prong approach that would seem to have the best overarching scientific underpinning...

After a xenobiotic has gone through the process of becoming hydrophilic through reactions overseen by CYP450 enzymes, its reactive site can be conjugated with an endogenous hydrophilic substance. This reaction is often referred to as "**phase II detoxification.**" Conjugation involves the transfer of a number of hydrophilic compounds (via their corresponding enzymes)...The result of the collective activity of these enzymes is an increase in the hydrophilicity of the metabolite, **theoretically leading to enhanced excretion in the bile and/or urine**".

(Hodges RE, Minich DM. Modulation of Metabolic Detoxification Pathways Using Foods and Food-Derived Components: A Scientific Review with Clinical Application. *J Nutr Metab.* 2015;2015:760689. doi:10.1155/2015/760689)

## Chapter 11

75. If a product cannot be ingested without \_\_\_\_\_ you, then it is not safe enough to put on your skin or your hair or your teeth.
- A. Benefiting
  - B. Poisoning
  - C. Depleting
76. Like any disease, skin problems are the result of \_\_\_\_\_ cellular malfunction.
- A. Local
  - B. Systemic
  - C. Permanent
77. Allergies should be looked upon as a serious acquired immune \_\_\_\_\_ syndrome and treated by improving cellular health and strengthening the immune system.
- A. Deficiency
  - B. Disney
  - C. Dysfunction
78. Modern medicine is based on the belief that you are healthy until you have a \_\_\_\_\_ disease...
- A. Diagnosable
  - B. Chronic
  - C. Deadly

79. (True or False) Because the food supply is unhealthful, and has been for several generations, we are now seeing entire populations where no real perspective of “health” exists. Disease has become the norm, so we view ourselves as healthy.

- A. True
- B. False

80. A massive misconception in America is that most of us are \_\_\_\_\_. In reality, most of us are sick. You don’t have to look sick to be sick.

- A. Fat
- B. Young
- C. Healthy

81. Health is a choice. Disease is the result of poor choices, and almost all diseases are \_\_\_\_\_.

- A. Inevitable
- B. Life-threatening
- C. Preventable

Six in ten Americans [60%] live with at least one **chronic disease**, like heart disease and stroke, cancer, or diabetes.

“More than two thirds of all deaths are caused by one or more of these five chronic diseases: heart disease, cancer, stroke, chronic obstructive pulmonary disease, and diabetes. Additional statistics are quite stark: **chronic diseases are responsible for seven out of 10 deaths in the U.S.**, killing more than 1.7 million Americans each year; and more than 75% of the \$2 trillion spent on public and private healthcare in 2005 went toward chronic diseases. What makes treating chronic conditions (and efforts to manage population health) particularly challenging is that **chronic conditions often do not exist in isolation. In fact, today one in four U.S. adults have two or more chronic conditions, while more than half of older adults have three or more chronic conditions.** And the likelihood of these types of comorbidities occurring goes up as we age. Given America’s current demographics, wherein 10,000 Americans **will turn 65** each day from now through the end of 2029, **it is reasonable to expect** that the overall number of patients with comorbidities will increase greatly.” - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5876976/>

**\*\*\*It is reasonable to expect more than one disease in those who are 65! If it is “normal” why do we say that chronic diseases are increasing?**

~ END OF TEST ~