Chapter 2: Biological Aging, Health, and Longevity

Test Bank

Multiple Choice

1. The Hayflick Limit refers to _____.

A. the immortality of our cells

B. normal human cell division and replication

C. the explanation for cell division

D. why we age

Ans: B

Cognitive Domain: Knowledge

Answer Location: Why Do We Age? Theories of Biological Aging

Difficulty Level: Easy

2. Which of the following is not a characteristic of a good theory?

A. parsimonious

B. generalizable

C. has heuristic value

D. accounts for error

Ans: D

Cognitive Domain: Comprehension

Answer Location: Why Do We Age? Theories of Biological Aging

Difficulty Level: Medium

3. Generalizability means that something can _____.

A. not be applied to other groups

B. be used to explain a wide range of findings

C. offer a vague explanation for a phenomenon

D. contains a universal process

Ans: B

Cognitive Domain: Knowledge

Answer Location Why Do We Age? Theories of Biological Aging
Difficulty Level: Easy

4. Theories of biological aging can be divided into two main groups, genetic programming theories and _____ theories.

A. variable-rate

B. variable success

C. error success

D. programming error

Ans: A

Cognitive Domain: Knowledge

Answer Location: Why Do We Age? Theories of Biological Aging
Difficulty Level: Easy

5. What are the protective ends on chromosomes that prevent loss of genetic information?

A. master clocks

B. free radicals

C. Senescence

D. telomeres

Ans: D

Cognitive Domain: Comprehension

Answer Location: Why Do We Age? Theories of Biological Aging
Difficulty Level: Medium

6. Which of the following is not impacted by sensory aging?

A. memory

B. audition

C. olfaction

D. vision

Ans: A

Cognitive Domain: Knowledge

Answer Location: Generational Cohorts

Difficulty Level: Easy

7. A(n) _____ is considered to be an age-normative visual change.

A. increase in the pupil’s resting diameter

B. thinning of the aqueous humor

C. strengthening of the ciliary muscles

D. thickening, yellowing, and increased opacity of the lens

Ans: D

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Vison

Difficulty Level: Easy

8. Which of the following relates to the eye's adjustment to focus and/or refocus?

A. presbyopia

B. glaucoma

C. absolute threshold

D. static visual acuity

Ans: A

Cognitive Domain: Application

Answer Location: Age-Related Changes in Vison

Difficulty Level: Hard

9. As one ages, there is a reduced ability to discriminate among _____.

A. blues and reds

B. blues and yellows

C. yellows and orange

D. blues and violets

Ans: D

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Vison

Difficulty Level: Easy

10. Three-quarters of older adults experience _____ or more chronic health conditions.

A. one

B. two

C. three

D. four

Ans: A

Cognitive Domain: Knowledge

Answer Location: Specific Chronic Health Conditions

Difficulty Level: Easy

11. The buildup of fatty plaques in the walls of the coronary arteries is known as _____.

A. cancer

B. laterosclerosis

C. angina

D. atherosclerosis

Ans: D

Cognitive Domain: Knowledge

Answer Location: Specific Chronic Health Conditions

Difficulty Level: Easy

12. When the brain experiences a sudden lack of blood, it is referred to as _____.

A. a stroke

B. diabetes

C. anxiety

D. a heart attack

Ans: A

Cognitive Domain: Knowledge

Answer Location: Specific Chronic Health Conditions

Difficulty Level: Easy

13. Who created a life expectancy calculator based on environmental characteristics, lifestyle and behavioral choices, and genetic factors?

A. Serle

B. Andersen

C. Feldman

D. Perls

Ans: D

Cognitive Domain: Knowledge

Answer Location: Life Expectancy and Life Span

Difficulty Level: Easy

14. Intermittent fasting has shown all of the following benefits EXCEPT _____.

A. improved tissue repair and reduced damage from oxidative stress (free radical damage)

B. improved function due to decreased inflammation

C. decreased metabolic homeostasis via improved protein synthesis

D. healthier mitochondria

Ans: C

Cognitive Domain: Knowledge

Answer Location: From Theory to Application: Life Extension and Health Span

Difficulty Level: Easy

15. Studies of calorie restriction in humans have suggested that it _____.

A. does not reduce life span or reduce disease

B. increases life span but does not reduce disease

C. may reduce disease but might not increase life span

D. reduces disease and increases life span

Ans: C

Cognitive Domain: Comprehension

Answer Location: From Theory to Application: Life Extension and Health Span

Difficulty Level: Medium

16. Cumulative models suggest that exposure to specific risks at each stage of development may _____.

A. result in a cascading of effects

B. strengthen reserve capacity

C. leave social trajectories unaltered

D. improve coping with future illnesses

Ans: A

Cognitive Domain: Knowledge

Answer Location: Integrating Across Topics

Difficulty Level: Easy

17. Some studies have suggested that additional factors can contribute to the length of one's life, including restricting the number of hours per day or days per week in which one eats. This practice is best referred to as _____.

A. intermittent fasting

B. caloric restriction

C. dieting

D. intake restriction

Ans: A

Cognitive Domain: Knowledge

Answer Location: From Theory to Application: Life Extension and Health Span

Difficulty Level: Easy

18. Gender-based differences in life expectancy result partly from interactions with _____.

A. education and profession

B. education and race

C. marital status and race

D. profession and marital status

Ans: B

Cognitive Domain: Knowledge

Answer Location: Life Expectancy and Life Span

Difficulty Level: Easy

19. Some areas in the United States, such as rural Appalachia, have lower life expectancies. This is referred to as _____.

A. differential life span

B. discriminatory health

C. place-based health disparities

D. factor-based impact

Ans: C

Cognitive Domain: Application

Answer Location: Life Expectancy and Life Span

Difficulty Level: Hard

20. The maximum life expectancy of a human is _____ years.

A. 75

B. 100

C. 125

D. unknown

Ans: C

Cognitive Domain: Knowledge

Answer Location: Life Expectancy and Life Span

Difficulty Level: Easy

True/False

1. Biological aging refers to the decline in functioning in mid to late adulthood.

Ans: F

Cognitive Domain: Knowledge

Answer Location: Biological Aging, Health, and Longevity

Difficulty Level: Easy

2. The free radical theory suggests that damaged is caused to DNA by the buildup of waste materials.

Ans: T

Cognitive Domain: Comprehension

Answer Location: Why Do We Age? Theories of Biological Aging
Difficulty Level: Medium

3. Women experience more frequent and severe losses in hearing, taste, and smell.

Ans: F

Cognitive Domain: Knowledge

Answer Location: Sensory Aging

Difficulty Level: Easy

4. Individuals experience peak visual functioning around late adolescence or emerging adulthood.

Ans: T

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Vison

Difficulty Level: Easy

5. In middle-aged and older adults, the experience of glare can result in car accidents.

Ans: T

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Vison

Difficulty Level: Easy

6. Approximately 30% of individuals older than 80 have significant hearing loss.

Ans: F

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Audition

Difficulty Level: Easy

7. Decreased sense of taste is the most common sensory loss among adults.

Ans: T

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Gustation

Difficulty Level: Easy

8. Evidence suggests that rate of decline in olfaction does not different by race or gender.

Ans: F

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Olfaction

Difficulty Level: Easy

9. Older adults have a reduced ability to regulate their body temperature.

Ans: T

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Somesthesis

Difficulty Level: Easy

10. Car accidents are the leading cause of traumatic brain injuries among older adults.

Ans: F

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Somesthesis

Difficulty Level: Easy

Short Answer

1. Explain what it means when we say that a good theory has heuristic value.

Ans: A good theory offers heuristic value or fecundity. Heuristic value is defined as usefulness for inspiring or producing additional insights.

Cognitive Domain: Knowledge

Answer Location: Why Do We Age? Theories of Biological Aging

Difficulty Level: Easy

2. What are three genetic programming theories of aging?

Ans: Immunological, neuroendocrine theory, and programmed senescence.

Cognitive Domain: Comprehension

Answer Location: Why Do We Age? Theories of Biological Aging

Difficulty Level: Medium

3. Pick one error/variable rate theory and describe it.

Ans: (1) Wear and tear: Biological resources cannot repair sustained damage. (2) Oxygen-free radicals: Free radicals cause damage within the body, which builds up over time. (3) Autoimmune failures: Immune system falsely recognizes healthy tissue as pathogenic.

Cognitive Domain: Knowledge

Answer Location: Why Do We Age? Theories of Biological Aging

Difficulty Level: Easy

4. Describe two age-related changes in vision.

Ans: As we age, we require more light to perform daily activities like reading or using our cell phones. This increase in absolute threshold, the minimum level of stimulus energy or intensity required to see an object, increases with age. With aging, there is a decrease in the ability of the eye to focus and/or refocus on objects at varying distances. There are also age decrements in dynamic visual acuity, which is the ability to accurately identify a moving target, such as a television message, a weather warning, or a street sign seen from a moving car.

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Vison

Difficulty Level: Easy

5. Describe presbycusis and explain how it impacts individuals as they age.

Ans: Typical age-related changes in hearing, termed presbycusis, include an increase in the absolute threshold for detecting sound, such that sounds must be louder in order to be detected; difficulty distinguishing between certain sounds (e.g., “s” versus “th”); and a loss of ability to hear high-frequency sounds such as speech by women or children. Presbycusis is bilateral (i.e., occurs in both ears) and progressive so that a person is often not aware of the gradual loss in hearing.

Cognitive Domain: Knowledge

Answer Location: Age-Related Changes in Audition

Difficulty Level: Easy

Essay

1. Compare and contrast the characteristics of genetic programming theories and variable rate or error theories of aging.

Ans: Genetic programming theories rest on the idea that there is a biological limit to the integrity of our bodies--it is built into our genetics. These include the immunological theory, neuroendocrine theory, and the programmed senescence. Variable rate or error theories share the common assumption that aging occurs because of damage to the organism over time. The wear-and-tear approach states that our bodies age as a function of use and lack of proper repair or maintenance.

Cognitive Domain: Analysis

Answer Location: Why Do We Age? Theories of Biological Aging

Difficulty Level: Medium

2. Describe two common disorders that may increase with advanced age and their treatments.

Ans: Cataracts are a clouding of the lens of the eye, interfering with our ability to focus, producing halos around objects, and increasing problems with glare. Cataracts can be caused by a variety of environmental factors, such as smoking or eye injury, but there may also be a familial influence. The clouding begins around age 60 but may not cause noticeable vision difficulty until age 75 years. By age 75, most people will have cataracts. Treatment includes environmental changes such as increased lighting, but the cataract can only be removed by surgery. Glaucoma refers to a group of eye diseases which result in damage to the optic nerve. Pressure inside the eye increases, causing damage to the optic nerve and reducing peripheral vision and giving the experience of tunnel vision. Over time, even this tunnel vision may decrease until the person has no vision remaining. Glaucoma is the leading cause of blindness in the United States and is more common among African Americans over age 40 years, Mexican American adults over age 60 years, and those with a family history of glaucoma. Currently, there is no cure for glaucoma, but eye drops and surgery may be helpful. Age-related macular degeneration (AMD): With age, some people experience a

decreased blood supply to the macula, within the retina of the eye. The macula is responsible for sharp focus. With a reduced blood supply, the macula and the entire retina are damaged. AMD results in a loss of sharp, central field vision, making reading and other detail-oriented tasks difficult. Although the causes of AMD are not yet certain, White adults, women, people with a family history of AMD, adults who eat a high-fat diet, and cigarette smokers are at a higher risk. Diabetic retinopathy is caused when diabetes damages the blood vessels in the retina. This damage leads to blurry vision, floaters that appear as splotches obstructing the visual field, haloes around lights, loss of central vision, and loss of color vision. Adults with type 1 or type 2 diabetes, especially if poorly controlled, are at high risk. Women who experienced gestational diabetes during pregnancy are at high risk as well. Surgery and medications may help.

Cognitive Domain: Application

Answer Location: Age-Related Changes in Vison

Difficulty Level: Hard

3. Explain two different models of how socioeconomic position factors might influence heath across the lifespan.

Ans: (1) The immediate effect model looks to identify immediate causes for effects, with the assumption that once a risk factor is removed, symptoms or functioning should change. Scientists can test this model by using designs in which a person serves as her own statistical control. For example, if we were interested in studying how caffeine leads to an increase in blood pressure, we could test blood pressure before, during, and after ingestion of caffeine. We assume that once the caffeine was out of person's system, their blood pressure would return to its baseline measure. (2) A social trajectory model suggests that exposure to certain factors creates a persistent pathway of exposure to other risk factors. For example, Glymour and colleagues discuss the influence of lower educational attainment. Lower education levels are associated with lower paying jobs, which in turn affect the foods one eats, where one lives, and the general environmental conditions such as pollution and crowding. Thus the effects on health under a social trajectory model may persist across the life span or may be able to be disrupted at some point. 3. Cumulative models adhere to the idea that risk exposure at each stage of development may cause a cascading of effects, because not only are social trajectories altered, but the risks directly alter the physiological hardiness of the person. Thus early exposure may weaken a person's reserve capacity such that they are less able to deal with future illnesses or diseases. (4) Sensitive period models suggest that the effects of

exposure to specific risks may be magnified or minimized depending on when a person experiences the exposure. For example, Ingber and Pohl (2016) present data with lab animals' exposure to methylmercury (MeHg) which highlight the need to distinguish effects based on the timing of exposure, dose of exposure (including doses for specific systems), differences in effects across species, and the effects' specific mechanisms of action (i.e., genetic mutations, chromosome damage, chemical imbalances). (5) Physiological effects of trajectory models focus explicitly on how the changes in risk factors that are present in the environment lead to later disparities. These kinds of models examine how the magnitude and direction of risk exposure influences health over time. Thus, they focus on the severity of adverse events, not just their mere presence.

Cognitive Domain: Comprehension

Answer Location: The Multidimensional Nature of Age

Difficulty Level: Medium

4. Compare and contrast the neuroendocrine theory and the immunological theory of biological aging.

Ans: The immunological theory attributes biological aging to decreases in the efficiency of our immune system and its production of antibodies. The master genetic control for the immune system is known as the main histocompatibility complex (MHC) and systems associated with it, and the thalamus are the sites of decline. Critics of this approach note that declines in immune system functioning are not universal, but all humans do age. Critics of the immunological approach point out that the immune system is comprised of cells, and these cells are aging. The neuroendocrine theory focuses on the roles of hormones in the aging process and recognizes the importance of the hypothalamic-pituitary-adrenal (HPA) axis as a "master clock." The HPA is involved with coordinating communication within and across body systems, coordinating physiological responses to external stimuli, and maintaining a homeostatic balance of resources across reproductive and repair functions in the body. Thus, changes in the HPA axis have profound effects on the entire body in terms of homeostasis and resilience. Human menopause, the cessation of menstruation and ovulation in adult females, is often cited as evidence for the neuroendocrine theory of aging. As a consequence of menopause, women experience a reduction in both estrogen and progesterone, which are associated with decreases in immune function.

Cognitive Domain: Analysis

Answer Location: Why Do We Age? Theories of Biological Aging

Difficulty Level: Medium

5. What are the three primary qualities of a good theory? Explain each.

Ans: To be viewed as a theory, one must specify conceptual definitions of the topic being studied. There must be an awareness of the limitations of the theory and the domains to which it can be applied. It should help us to see additional relationships among domains. Theories also lead to testable predictions. Additional characteristics help to determine whether a theory is good. Among those qualities of a good theory is parsimonious, the preference for simple explanations rather than overly complicated or convoluted ones. A good theory offers heuristic value or fecundity. Heuristic value is defined as usefulness for inspiring or producing additional insights. A good theory is also generalizable, in that it can be used to explain a wide range of findings.

Cognitive Domain: Knowledge

Answer Location: Why Do We Age? Theories of Biological Aging

Difficulty Level: Easy