Prepare Early. . .Score Higher

Behavioral Sciences

9th edition

- 500 USMLE-type questions, answers, & explanations
- High-yield facts reinforce key concepts
- Targets what you really need to know
- Student-tested and reviewed

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High-Yield Facts

Anxiety Disorders: Among the most common psychiatric disorders, affecting upward of 15% of the population:

- Phobic disorders affect 8 to 10%
- Generalized anxiety disorder found in 5%
- Panic disorder found in 1 to 3%
- Obsessive-compulsive disorder found in 1 to 3%

Attention Deficit Hyperactivity Disorder (ADHD): Inability to maintain attention, poor impulse control, low frustration tolerance, excessive activity; characterized by the following:

- Occurs in 5 to 12% of school age boys
- M:F = 6:1
- 50% have learning disorders
- Extends into adulthood in 33% of cases
- Twin studies show strong genetic influence
- Rx: behavior therapy and/or methylphenidate or dextroamphetamine

Bipolar Affective Disorder

- Lifetime prevalence rate of 0.6 to 1.1%
- Equally distributed among males and females
- Two subtypes, Bipolar I (recurrent major depressive episodes with manic episodes) and Bipolar II (recurrent major depressive episodes with at least one hypomanic episode)
- Characteristic symptoms are labile affect with predominant euphoria, expansiveness, grandiosity, racing thoughts, flight of ideas, mood-congruent delusions, loosening of associations, increased motor activity and rate of speech, increased spending, pressured speech

Cardiovascular Disease: Reduced morbidity/mortality rates over the past 25 years:

- 40% of reduction is the result of medical developments (drugs, technology, new Dx and Rx, surgery, transplants, training)

- 50% of reduction is attributed to awareness of risk factors, individual behavior, and lifestyle changes to reduce risks
- 30% is attributed to exercise, less fat intake, lower cholesterol, and better diet
- 24% to reduced smoking

Classical Conditioning: Pairing a natural reaction to an internal or external stimulus with a specific behavior (Pavlov).

Compulsion: Repetitive behaviors or thoughts that patient feels driven to perform to produce temporary relief from anxiety (handwashing, counting behaviors, checking and rechecking).

DSM-IV: Biopsychosocial diagnostic symptoms for psychiatric/mental health disorders:

Axis I: Majority of clinical psychiatric and psychological disorders; schizophrenia, mood disorders, anxiety, physical and substance abuse, noncompliance

Axis II: Personality disorders and mental retardation; schizotypal, antisocial, and developmental disorders, such as mental retardation, autism, dyslexia

Axis III: General medical disorders; arteriosclerotic heart disease, psoriasis

Axis IV: Psychosocial and environmental stressors before and after mental disorder (severity is quantified on an ordinal scale)

Axis V: Patient's overall global assessment of functioning, prior year and present

Fetal Risk from Alcohol: Risks from alcohol consumption during pregnancy: pre- and postnatal development, retardation, microcephaly, facial abnormalities, limb dislocation, heart and lung fistulas.

Grief: Typically lasts 6 to 12 months, characterized by

- Shock (I can't believe it)
- Denial (can't be; it didn't happen)
- Guilt (why didn't I do/say . . . ; if only I had . . .)
- Acceptance (I'm doing this for them; my life will be better).

Heritability: In older twins, highest degree of heritability is general cognitive ability (80%), followed by interpersonal skills and domestic skills.

Immune System: Function can be altered by behavioral factors (e.g., stress, depression, isolation, bereavement, diet, suppressed emotions, relaxation, conditioning, anxiety, anger).

Incidence: The number of new cases in a population over a period of time.

Infant Deprivation of Affection and Contact: Results in poor socialization and language skills, decreased muscle tone, anaclitic depression, lack of inquisitive investigation, and increased risk of infection.

Infant Mortality Rate: In 1995, the U.S. infant mortality rate

- Was 7.6 deaths per 1000 live births
- Ranked twenty-fifth among industrialized nations
- Was 2.4 times higher for black infants than for white infants

Kübler-Ross Stages of Dying: Stages progress at different rates and often vacillate:

- Denial (can't be; not me)
- Anger (why me; not fair)
- Bargaining (please, God, I promise I'll never do it again; I'll dedicate my life to . . . if I can survive this)
- Grief (I feel so sad/down/depressed)
- Acceptance (I can take it, I've had a good life; I must plan for those who live on).

Major Depressive Disorder

- Lifetime prevalence rate is 3 to 6%
- Two to 3 times more common in adolescent and adult females than males
- Major signs and symptoms include depressed mood, anhedonia, appetite change, sleep disturbance, psychomotor retardation, loss of energy, feelings of worthlessness and guilt, decreased concentration, suicidal ideation

Meta-analysis: Pooling data from several studies investigating the same hypothesis to achieve greater statistical power (not able to overcome methodological limitations or bias of an individual study).

Motor Vehicle and Firearm Deaths: The two leading causes of injury death in the U.S. in 1995; 29 and 24% of all injury deaths, respectively. Poisoning was the third leading cause of injury death at 11%. In 1994, the firearm injury death rate among U.S. males 15 to 24 years of age was 32% higher than the motor vehicle injury death rate.

Nursing Home Residents: Between 1992 and 1995

- The number of nursing home residents per 1000 elderly population declined 8% to 408
- Nursing home occupancy rates declined 5 to 81%

Obsession: Having recurrent, intrusive, and persistent thoughts, impulses, or images that cannot be ignored by logical effort; associated with anxiety, core fear (germs, death, insecurity).

Obsession and compulsion: Both usually are concealed and associated with anxiety, impairment of daily functions and time-consuming behavior.

Operant Conditioning: Reinforcing desired target behavior that may not be natural to the individual; antecedents and consequences determine behavior (Skinner).

Overweight Americans: The percentage of overweight

- Adolescents 12 to 17 years of age increased from 6% in the years between 1976 and 1980 to 12% between 1988 and 1994
- Children 6 to 11 years old increased from 8 to 14%
- Adults increased from 25 to 35%

***P* < 0.05:** Probability is less than 5% that results have occurred by chance.

Poverty: In 1995, 36.4 million people lived in poverty in the U.S.; 40% of these were children.

Poverty in Women: Women constitute a majority of the poor in all societies. In the U.S.,

- One-third of families headed by women live in poverty
- One-half of African American and Latino women live in poverty
- 20% of women over 65 years of age live in poverty

Prevalence: The total number of cases that can be found in a population.

Primary Prevention: Prevents the occurrence of disease (e.g., vaccination).

Reliability: A test or measurement produces the same result or score if remeasured.

Responses to Stress: Physiologic responses to stress include sympathetic activation, suppression of immune system, decreased NK cell activity, decreased B cells and cytotoxic T lymphocytes, disruption of DNA repair, suppression of interferon, release of epinephrine, norepinephrine, and enkephalins, activation of latent viruses, cardiac arrhythmia, angina pectoris, increased cortisol and circulating neutrophils, increased use of drugs, smoking, and alcohol, increased heart rate, blood pressure, and respiration.

Schizophrenia

- Incidence of 1% throughout all societies in the world
- Three syndromes comprise positive, negative, and disorganization symptoms
- Characteristic symptoms are delusions, hallucinations, disorganized speech and thought processes, grossly disorganized or catatonic behavior, affective flattening, alogia, avolition

Schizophrenia Heritability: One percent in population; first-degree relatives, 10% (whether reared together or apart); fraternal twins, 17%; identical twins, 48%; may be linked to chromosome 6.

Secondary Prevention: Early detection of disease (e.g., Pap smear, mammogram).

Stages of Development: Typical stages of lifetime psychological development; tasks versus consequences of not dealing with them successfully (Erik Erikson):

Stage	Task versus Consequence
0–1 yr:	Trust versus mistrust
1–3 yrs:	Autonomy versus shame/doubt
3–6 yrs:	Initiative versus guilt
6–12 yrs:	Industry versus inferiority
12–20 yrs:	Identity versus role confusion
20–30 yrs:	Intimacy versus isolation
30–65 yrs:	Generativity versus self-absorption
65+ yrs:	Integrity versus despair

Suicide: Major risk factors include white, male, no spouse, prior attempts, presence of plan, alcohol or drug use, family history, medical illness, taking three or more prescription drugs.

Support Groups with Psychotherapy: Women being medically treated for active breast cancer participating in a support group with psychotherapy

- Extend their survival time by approximately 18 months
- Have double the survival time of women with medical therapy but with no support group

Symptoms of Heroin Addiction: Abstinence syndrome, including dilated pupils, lacrimation, sweating, irritability, rhinorrhea, muscle aches, needlestick scars; often leading to hepatitis, overdose, abscesses, hemorrhoids, HIV, and right-sided endocarditis.

Tertiary Prevention: Reduces disability from disease (e.g., insulin, rehabilitation).

Type A Behavior: Most significant factors are anger and hostility.

Type I Error: Concluding that a difference exists when it does not.

Type II Error: Concluding that a difference does not exist when it does.

Unintentional Injury: In 1995

- Unintentional injury accounted for 61% of all injury deaths; suicide for 21%; homicide for 15%
- Unintentional injury mortality and suicide rates were highest for the elderly
- Homicide rates were highest for adults 20 to 24 years of age

U.S. Elderly Population: By the year 2000 with U.S. population of 300 million, 35 million will be over age 65 (13% increase over 1995), with the greatest increase over age 85 (expect similar increase in health care costs).

Validity: A test or measurement truly measures what it is intended to measure.

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Biologic Correlates of Behavior

Questions

DIRECTIONS: Each item below contains a question or incomplete statement followed by suggested responses. Select the **one best** response to each question.

1. The immune system is not an autonomous system. This discovery was confirmed by demonstrating that the immune system can be altered by

a. Stress
b. Suppressed emotions
c. Diet
d. Conditioning
e. Relaxation

2. For almost three years, a 50-year-old woman has been caring for her mother who is chronically ill with Alzheimer's disease. A recent immunologic assessment of the caregiver daughter found that her

a. Cellular immune system control of latent viruses was poor
b. Percentage of T lymphocytes was high
c. Helper/suppressor ratio was higher than normal
d. Circulating neutrophils were decreased in number
e. Natural killer cells were higher in number

3. In studying the interaction of psychological stress and DNA repair, suppressed DNA repair was found in persons with

a. Chronic stress more often than those with acute stress
b. Low distress over an extended period of time
c. A diagnosis of major depression
d. Increased anxiety and depression from bereavement
e. Recently diagnosed cancer

4. A 40-year-old man develops depressed mood, anhedonia, initial and terminal insomnia, loss of appetite, a 10-lb weight loss, and difficulty with sexual arousal. The clinical features of the patient's psychiatric illness suggest dysfunction of the

a. Frontal lobes
b. Pituitary
c. Hippocampus
d. Hypothalamus
e. Corpus callosum

5. The fact that the pituitary secretion of endorphins is closely linked to the secretion of adrenocorticotropic hormone (ACTH) suggests that endorphins facilitate the ability to respond to

a. Retarded growth
b. Hypertension
c. Stress
d. Chronic pain
e. Tachycardia

6. A 25-year-old male reports to his physician that he has not been able to sleep for over two days and has been having "strange reactions." These reactions are most apt to be caused by

a. Increased levels of blood cortisol
b. Physiologic stress in response to sleep deprivation
c. The effects of the rebound phenomenon
d. Perceptual distortions
e. Feelings of excessive tiredness

7. A 47-year-old, recently divorced, male bookkeeper experienced a gnawing epigastric pain over the past week, very similar to a bout of pain he had experienced a year ago and which was diagnosed as a duodenal ulcer. The factor most likely responsible for the exacerbation of his ulcer is

a. Expression of a characteristic personality
b. Chronic anxiety and stress
c. Frequent consumption of spicy foods
d. Socioeconomic status
e. Family history of ulcer disease

8. A 26-year-old woman has a several-year history of ulcerative colitis. Recently she has been treated with alprazolam 0.5 mg tid. This pharmacologic treatment can be expected to

a. Result in long-term improvement
b. Reduce interpersonal dilemmas
c. Produce a mild stimulus
d. Be used without development of tolerance
e. Reduce high levels of stress

9. The diathesis-stress model of psychophysiologic disorders postulates the presence of which of the following major factors?

a. Inadequate coping style
b. Individual response stereotype
c. Lack of health belief resolution
d. Adequate homeostatic restraints
e. Unconditioned stimulus

10. Harry Harlow's work with inanimate surrogate mothers for rhesus monkeys suggests that the early experience critical to the ultimate development of normal attachment and sexual behavior is

a. Positive reinforcement
b. Protection from danger
c. Contact comfort
d. Need-reduction by nursing
e. Sexual stimulation

11. The theory of pain that states that psychological processes directly exert influence on the pain perception process is the

a. Gate control theory
b. Nociceptor theory
c. Pattern theory
d. Polymodal nociceptor theory
e. Specificity theory

12. The biologic mechanism that allows behavioral factors to have the greatest influence on the development of coronary heart disease is the

a. Complex interaction of sympathetic-adrenal-medullary (SAM) and pituitary-adrenal-cortical activity
b. Acute behavioral stressors that can raise thresholds for ventricular fibrillation
c. Limbic system that allows emotional responses to activate the endocrine system
d. Heart rate and pressor response to behavioral stressors that increases the turbulence and sheer stress that promote arterial injury
e. Stress-induced increased levels of corticotropin (ACTH) and cortisol secretion and decreased levels of brain norepinephrine

13. Which of the following is the most powerful endogenous opioid peptide?

a. Dynorphin
b. Morphine
c. Neoendorphin (α-endorphin)
d. β-Endorphin
e. Enkephalin (γ-endorphin)

14. The hormone with the greatest role in aggression is

a. Thyroxine
b. Testosterone
c. Estrogen
d. Progesterone
e. Aldosterone

15. When an inactive substance or condition induces a therapeutic change, the procedure (result) is called

a. Modulated conditioning
b. Reaction formation
c. Placebo effect
d. Fantasy reaction
e. Nonpharmaceutical reaction

16. The most common organic explanation for a sleep disturbance in a healthy person is

a. Disruption of normal circadian rhythms
b. Accumulation of hepatic enzymes
c. Overarousal and high activity during the day
d. Suppressed REM sleep
e. Misuse of hypnotics

17. The relationship between social and biologic processes in the causation of psychopathology has historically been classified by which of the following terms?

a. Classically conditioned
b. Organic and functional
c. Genetic and familial
d. Neuropathologic and sociopathologic
e. Psychoanalytic and dynamic

18. A 22-year-old male has just entered medical school and has decided to "assert himself" by beginning to smoke cigarettes. In an attempt to persuade him that smoking will damage his entire body, you inform him that the most immediate effect of cigarette smoking is

a. Lower lymphocyte function
b. Lower immune function
c. Mucociliary damage
d. Addiction to the nicotine
e. Destruction of the macrophages in his lungs

19. A college student who is worried about final examinations presents to the student health service with rapid breathing and a high degree of anxiety. Hyperventilation is most apt to result in

a. Increased sympathetic activity
b. Increased CO_2 in the blood
c. Increased acid in the blood
d. Decreased vasoconstriction
e. Increased oxygen to the brain

20. Damage to dopamine neurons in the midbrain is a central feature of the pathophysiology of Parkinson's disease. The loss of midbrain dopamine in this disease is accompanied by

a. An increase in the dopamine transporter
b. A decrease in dopamine 1 receptor density
c. An increase in dopamine 2 receptor density
d. A decrease in dopamine synthesis in remaining dopamine neurons
e. An increase in both dopamine 1 and dopamine 2 receptor density

21. A type I diabetic patient has been treated with relaxation techniques daily for one month. This treatment is likely to affect the management of her diabetes by

a. Increased levels of plasma cortisol
b. Increased sensitivity to insulin
c. Increased glucose-stimulated secretion of insulin
d. Significant improvement in glucose tolerance
e. No significant change in requirements for exogenous insulin

22. A college student takes part in a sleep laboratory experiment in which he is awakened repeatedly when his electroencephalogram (EEG) indicates that he has entered rapid-eye-movement (REM) sleep. This disruption of normal sleep is most likely to produce

a. A rebound phenomenon of increased dreaming
b. An increase in anxiety and irritability
c. Acceleration of memory formation of emotionally toned words
d. A decrement in intellectual function
e. A temporary increase in nightmares

23. Which of the following statements about natural killer cells is true?

a. Their activity increases with the secretion of corticosteroids through the hypothalamic-pituitary-adrenal axis
b. They play a role in inhibition of tumor growth
c. They are ineffective in deterring the spread of distant cancer
d. Their activity increases under conditions of psychosocial stress

24. A young woman is being unfairly singled out in the workplace by being repeatedly criticized regarding her work, even though other employees are not held to the same standard. Coping effort on her part, associated with the negative emotions of embarrassment and feeling harassed, is likely to result in the preferential synthesis and release of

a. Corticotropin
b. Norepinephrine
c. Epinephrine
d. Catecholamines
e. Cortisol

25. The daughter of a 65-year-old man describes her father as having changed from an active, vivacious, caring person to one who occasionally has trouble learning new facts, has very little motivation to do any activity, and rarely expresses feelings or emotions for his grandchildren whom he has adored. The area of the brain most apt to be involved in this type of behavior change is the

a. Hypothalamus
b. Reticular activating system
c. Heteromodal association areas
d. Limbic system
e. Unimodal association areas

26. A 30-year-old secretary who is a single mother with two preschool children has frequent symptoms of anxiety, tension, headaches, and insomnia. Which of the following behavioral interventions could be the most effective in relieving her symptoms?

a. Progressive muscle relaxation
b. Psychoanalytic psychotherapy
c. Hypnosis
d. Selective biofeedback
e. Interpersonal psychotherapy

27. Individuals with borderline hypertension are most often considered to have a physiologic pattern that is consistent with

a. Excess dietary salt intake
b. Increased activation of the sympathetic nervous system
c. Higher prevalence among poor black Americans
d. Obesity
e. Sustained vigilance in the individual

28. A young woman has a diagnosis of irritable bowel syndrome. She has a constitutional predisposition to respond physiologically to a situation in a particular way, has inadequate homeostatic restraints, and develops symptoms when exposed to activating situations. This etiological sequence in a psychophysiologic disorder follows the

a. Specific-attitudes theory
b. Diathesis-stress model
c. Weak organ/system theory
d. Individual response stereotypy
e. Specific-response pattern model

29. Of all the following endocrine glands, which one is not subject to control by the brain?

a. Pancreatic islets
b. Pituitary
c. Parathyroid
d. Thyroid
e. Adrenal

30. When an axon is cut, rapid local degeneration of the axon and myelin sheath occur, as well as changes in the cell body that affect synapses with other neurons. This pattern of degeneration is caused by

a. Gliosis
b. Axonal transport
c. Phagocytosis
d. Excitatory neurotransmitters
e. Depolarization

31. You are conducting a clinical experiment on the effects of psychosocial stress on immunocompetence using several measures, such as lymphocyte proliferation to mitogen stimulation and activity of natural killer cells. One group has been exposed to acute stress, and a second group to chronic stress, over a year or more. You would predict that immunocompetence can be suppressed by

a. Acute but not chronic stress
b. Chronic but not acute stress
c. Neither acute nor chronic stress
d. Both acute and chronic stress to a similar degree

32. Antibody titers to latent viruses, e.g., Epstein-Barr or herpes simplex, can be decreased by the following

a. Relaxation training
b. Immunosuppressive chemotherapy
c. The stress of academic examinations
d. Loneliness
e. Sustained noise

33. A middle-aged woman in good health is under extreme psychosocial stress because of the sudden death of her husband. Which of the following changes might be anticipated in her immune function?

a. Decrease in the activity of natural killer cells
b. Increase in lymphocyte cytotoxicity
c. Increase in the rate of microbe engulfment by polymorphonuclear granulocytes
d. Decrease in antibody titers to latent viruses such as herpes simplex

34. A 34-year-old man has been diagnosed with chronic paranoid schizophrenia for 10 years. He is currently in a psychiatric hospital and is not on psychotropic medications. More than 50% of individuals with this diagnosis and off medications would have abnormalities in which of these tests?

a. Lactate infusion test
b. Dexamethasone suppression test
c. Eye pursuit test
d. Thyrotropic releasing hormone (TRH) stimulation test
e. Prolactin stimulation test

35. A 40-year-old man has abused alcohol for over five years and currently meets criteria for alcohol dependence. His immune function is likely to demonstrate

a. Increased T cell cytotoxicity
b. Inhibition of antibody production
c. Decrease in overall number of lymphocytes
d. Increased interferon production
e. Weakened chemotaxis of macrophages

36. You have referred a patient in your practice for a nighttime sleep study because of his complaint of excessive daytime fatigue. When REM sleep is disrupted or interrupted, a tiredness can develop during waking hours. The proportion of REM sleep that you would expect in a normal sleep study is

a. 5%
b. 10%
c. 20%
d. 30%
e. 40%

37. A lesion of the axons of motor neurons that innervate skeletal muscle (lower motor neurons) will result in which one of the following consequences?

a. Paralysis of individual muscles on the contralateral side of the lesion
b. A paradoxical increase in reflex activity
c. Compensatory increase in muscle mass
d. Increase in muscle tone
e. Sealing off of the axoplasm

38. When one faces stressors for which there is no apparent coping strategy, one manifests vigilant inaction, which results in the following physiologic response:

a. Increased skeletal movement
b. Decreased blood pressure
c. Vagus nerve–mediated bradycardia
d. Decreased levels of corticotropin (ACTH) and cortisol
e. Increased levels of brain norepinephrine

39. All the following medications can cause sexual dysfunction. Which one does not inhibit desire or decrease arousal?

a. Amphetamines
b. Phenothiazines
c. α-Methyldopa
d. Guanethidine

40. Which of the following statements about sleeping pills are correct?

a. Barbiturates gradually lead to a decrease in the activity of hepatic enzymes
b. Patients develop tolerance for benzodiazepines much more rapidly than for pentobarbital
c. Barbiturates enhance REM sleep
d. There is often a broad cross-tolerance to other hypnotics

41. A patient is taking part in a sleep study. When the patient begins to dream, the following physiologic change would be expected:

a. Electroencephalographic desynchrony
b. More visual imagery during non-REM (NREM) sleep
c. Delta waves on electroencephalogram
d. Increase in sternocleidomastoid tonus

42. When a person has no sense of control over a highly stressful situation, the following physiologic reaction would be expected to occur:

a. Weaker corticosteroid elevations will develop
b. An endogenous opioid peptide will be released
c. Diminished suppression of the cytotoxicity of natural killer cells will occur
d. A stronger immune response to mitogen stimulation will develop

43. You have been asked to consult regarding stress in the workplace in a busy factory. One group of workers have jobs that are self-paced. A second group have jobs that are machine-paced and therefore largely out of the workers' control. The workers who do not control their pace of work would be differentiated from the other group in physiologic response by a much greater release of

a. Catecholamines
b. Thyroid hormone
c. Serotonin
d. Prostaglandins
e. γ-Aminobutyric acid (GABA)

44. Communication between the brain, immune system, and endocrine cells has been confirmed by the following finding:

a. Stimulation of the anterior hypothalamus diminishes immune responsivity
b. Low concentrations of peptides are found in the limbic system
c. Stimulation of the posterior lobe of the hypothalamus enhances immune reactivity
d. Some brain peptide hormones stimulate T cells to produce lymphokines
e. The autonomic nervous system controls the immune response

DIRECTIONS: Each group of questions below consists of lettered headings followed by a set of numbered items. For each numbered item select the **one** lettered heading with which it is **most** closely associated. Each lettered heading may be used once, more than once, or not at all.

Questions 45–48

For each description that follows, select the substance with which it is most closely associated.

a. Dopamine
b. Dopamine-β-hydroxylase
c. 6-Hydroxydopamine
d. Norepinephrine
e. Acetylcholine

45. Transmitter that ultimately mediates all overt behavior

46. Substance that poisons neurons by forming peroxides and has been implicated in the cause of schizophrenia

47. Agent that mediates behavioral reward and is found at high levels in the median forebrain bundle

48. Agent that is a putative transmitter and also a precursor of another transmitter in the brain reward system

Questions 49–53

Match the following descriptions with the appropriate stages of sleep.

a. Stage 1 REM sleep
b. Stage 1 NREM sleep
c. Stages 1 through 4 slow wave sleep (NREM)
d. Stage 4 delta wave sleep (NREM)
e. Stage 2 NREM sleep

49. Decline in heart rate, blood pressure, and respiration and increase in gastrointestinal movements

50. Greatest likelihood of sleeper awakening spontaneously

51. Highest frequency of dream recall

52. Longer duration during the first half of night

53. Continuous decline in the elderly

Questions 54–58

Match the descriptions below with the substances produced by smoking behavior.

a. Nicotine
b. Carbon monoxide
c. Hydrogen cyanide
d. Both hydrogen cyanide and carbon monoxide
e. Both nicotine and carbon monoxide

54. Contribution to increased prevalence of fatal and nonfatal cardiovascular disease

55. Promotion of chronic obstructive pulmonary disease, emphysema, and chronic bronchitis

56. Valuable in the discrimination of smokers from nonsmokers

57. Decreased oxygen content in fetal blood and subsequent complications in pregnancy

58. Elevated blood levels from exposure to smoke from other people's cigarettes

Questions 59–62

For each description select the biologic system or substance with which it is most closely associated.

a. Endocrine and autonomic nervous systems
b. Hypothalamic-limbic-midbrain circuits
c. Adrenal cortex and thyroid
d. Neuropeptides
e. Dopaminergic circuit or system

59. Highly relevant for Parkinson's disease and schizophrenia

60. Active in mediating integrative processes relevant to survival

61. Substantially involved in mediating adaptive functions of memory appraisal and motivational-emotional response

62. Especially active when one becomes very upset, angry, or depressed for an extended period of time

Questions 63–67

For each stress response, select the lettered biologic system or anatomic region with which it is most closely associated.

a. Sympathoadrenomedullary system (SAM)
b. Hypothalamic-pituitary-adrenocortical (HPAC) system
c. Immune system
d. Endorphin-enkephalin system
e. Anterior hypothalamus

63. A 19-year-old medical student who has been studying hard for two days is anxious and feels a high degree of stress upon entering the examination room

64. A 32-year-old male is forced to walk two miles in a snowstorm, exerting a great deal of effort

65. A 17-year-old female involved in a car accident is in a panic as she tries to extract herself through the driver's door in spite of a severe cut on her left hand

66. A 65-year-old female fears she is having a coronary because she is experiencing mild angina pectoris, her heart is beating fast, and she can feel a thumping arrhythmia in her chest

67. A 27-year-old bookkeeper is worried because he found some inconsistencies in his financial books. He has delayed informing his boss of his findings for three days and is trying to minimize the significance of the inconsistencies

68. You wish to conduct a study of the effects of various stresses on health and illness. In considering previous research in this area, you would evaluate using a scale for quantifying the stress effects of life change developed by the following individual(s):

a. Robert Ader
b. George Solomon
c. Ronald Glaser
d. Thomas Holmes and Richard Rahe
e. Janice Kiecolt-Glaser

69. The original concept that psychological processes can affect the function of the immune system developed from observations of

a. Varying coping skills of AIDS patients affecting survival time
b. The death of a spouse affecting the incidence of a variety of serious illnesses
c. Operant conditioning of immune responses in humans
d. Antidepressant drugs producing changes in T cell function

70. Rats with a bacterial infection are trained to consume immunity-suppressing and nausea-producing cyclophosphamide in saccharine-flavored water. Before training, the cyclophosphamide administration led to an increased death rate. After training, even when cyclophosphamide is removed from the flavored water, the increased death rate persists. This modification of the immune system is an example of

a. Operant conditioning
b. Classical conditioning
c. Avoidance training
d. Adversive experience
e. Overwhelming stress

Questions 71–72

For each description, match the appropriate response or pathway that is preferentially active.

a. Epinephrine and norepinephrine response
b. Hypothalamic-pituitary-adrenocortical pathways
c. Corticotropin (ACTH) and cortisol pathways
d. Sympathoadrenomedullary pathways
e. Catecholamine biosynthetic pathways

71. An individual is responding to a stressful situation at work with a new supervisor by a problem-focused coping strategy. He is taking actions to avoid conflict and change his work production

72. An individual is responding to a workup for a prostate cancer triggered by an abnormal prostate specific antigen (PSA) test. He is engaged in an emotion-focused coping strategy by using denial, and by minimalizing the possible consequences

Questions 73–77

For each manifestation described, select the area (zone) in the cerebral cortex with which it is most closely associated.

a. Wernicke's area
b. Primary sensory/motor areas (ideotypic)
c. Unimodal association areas (homotypic)
d. Braca's area
e. Heteromodal association areas (homotypic)
f. Corpus callosum
g. Paralimbic areas
h. Occipital lobe
i. Limbic areas

73. A 47-year-old woman presents with considerable loss of affect and occasional disruption of her memory

74. A 60-year-old male pianist complains that his sense of touch is not as acute and responsive as it used to be

75. A 70-year-old man is hospitalized for a suspected stroke; suddenly he is unable to recognize family or friends

76. A 65-year-old woman has noticed that she is having increased difficulty naming familiar objects, such as a telephone, automobile, or pencil

77. A 30-year-old secretary complains that he cannot orient the fingers of his right hand to the computer keyboard after stumbling and hitting the left side of his head on a desk

Questions 78–81

For each concept in behavioral science, select the person to whom it is attributed.

a. Alfred Adler
b. Harry Stack Sullivan
c. George Engel
d. Sigmund Freud
e. Neal Miller
f. René Spitz
g. Franz Alexander

78. The biopsychosocial model in medical practice and medical education

79. Instrumental conditioning of autonomically mediated visceral responses

80. Psychological factors that lead to development of specific illnesses

81. Overcoming inferiority through power and mastery

Questions 82–84

For each description, select the neurochemical transmitter with which it is most closely associated.

a. Acetylcholine
b. Glutamate
c. Norepinephrine
d. Serotonin
e. Dopamine
f. γ-Aminobutyric acid (GABA)

82. A 45-year-old woman has become increasingly withdrawn and depressed over the past month. She has anhedonia, decreased social interaction, and suicidal ruminations.

83. A 24-year-old man, who is a graduate student, has become increasingly anxious about his comprehensive examinations. He feels anxious much of the time, has bouts of tachycardia, and has difficulty concentrating.

84. A 71-year-old man has begun to have difficulty remembering names on his schedule of events for the day. His remote memory is intact, but his recent memory function is impaired.

Questions 85–91

For each lettered biobehavioral or psychosocial factor below, select the cancer or aspect of the immune system with which it is **most** closely linked.

a. Alcohol use
b. Anxiety
c. Depression
d. Diet
e. Environmental pollution
f. Exercise
g. High fat intake
h. Obesity
i. Pessimism
j. Smoking
k. Social/cultural background
l. Stoic style of coping
m. Support group psychotherapy
n. Stress

85. Can reduce the patient's survival time from cancer

86. Has more effect on growth and prognosis of cancer rather than being its cause

87. Can disrupt DNA repair

88. Causes reduced immunosurveillance

89. Related to colon cancer

90. Reduced mortality for metastatic cancer

91. Related to breast cancer

Biologic Correlates of Behavior

Answers

1. The answer is d. *(Baum, pp 169–173.)* R. Ader and N. Cohen discovered that the immune system could be conditioned by neutral taste stimuli. The immunosuppressive drug cyclophosphamide (CY) was used in a taste aversion study to cause nausea and vomiting. They found that a single pairing of saccharin-flavored water with CY and a subsequent exposure to saccharin water alone produced the desired conditioning, as well as immunosuppression. Follow-up studies reconfirmed that immune system responses can be conditioned to neutral stimuli in both animals and humans. Immunologists previously had assumed that the immune system was autonomous. Ader and Cohen's discovery opened up a new area of research—psychoneuroimmunology. Studies in this area have demonstrated that many immune components can be altered by behavioral factors such as stress, depression, isolation, relaxation, and bereavement. All of the options listed in the question have some effect on the immune system, but the ability to modify the immune system by conditioning was an outstanding discovery that greatly advanced the entire field of immunology.

2. The answer is a. *(Baum, pp 179–183.)* J. K. Kiecolt-Glaser and B. A. Esterling both reported studies of the changes that occur in the immune systems of caregivers who have been under the constant stress of caring for a family member with Alzheimer's disease for many months (average 33 months). A battery of immunologic assessments found that the caregivers had suppressed immune systems; cellular immune system control of latent viruses was poorer than that of a matched control group, the percentage of T lymphocytes was lower, and the helper/suppressor ratio was smaller. The data suggest that chronic and, at times, severe stress can cause persistent changes in immunity. Furthermore, these changes can occur in several components of immunosurveillance.

In a study of residents living near Three Mile Island, Baum reported that even six years after the nuclear accident, long-term stress resulted in negative changes in the residents' immune systems. This finding was indi-

cated by poor cellular control over latent viruses, higher numbers of circulating neutrophils, and lower numbers of B cells and cytotoxic T lymphocytes in the residents.

Thus, stress has a direct psychophysiologic effect on immunity. Some bodily changes, such as increased levels of cortisol, can actually destroy immune tissue. Stress also can change physiologic systems and may result in increased drug use, smoking, and alcohol use, which can contribute to negative chronic effects on the immune system.

There is some evidence that adaptation to stress can occur, but this doesn't appear to happen in more severe cases such as the caretakers of patients with Alzheimer's disease.

3. The answer is c. *(Baum, pp 194–198.)* In studying peripheral blood lymphocytes (PBLs) from patients with a major depression, it was found that they had poorer DNA repair (PBLs exposed to radiation damage) than lymphocytes obtained from nondepressed or low-distressed persons. When patients with a diagnosis of major depression were divided into low- and high-distress subgroups, the PBLs from the high-distress subgroup had poorer DNA repair than the PBLs from the low-distress subgroup. While acute stress is immunosuppressive, chronic stress over time is associated with adaptation and can even enhance immunity. It is hypothesized that the impact of psychosocial stress (distress) on DNA repair could increase cancer risk. While the impact of psychosocial stress and DNA repair on the initiation of cancer has not been demonstrated, stress-induced suppression of the immune system, and enhancement of the immune system, has been shown to affect the growth and progression of neoplasms. The increased anxiety and depression from bereavement does produce suppressed lymphocyte proliferative response to mitogen stimulation 2 to 6 weeks after the death of a spouse. Such impairments of the immune system can be potentially significant in the etiology of cancer.

4. The answer is d. *(Kandel, pp 1209–1221.)* Clinical studies of patients with major depressive disorders indicate that an intrinsic regulatory defect involving the hypothalamus underlies the disorder. It also involves the monoamine pathways. The hypothalamic modulation of neuroendocrine activity has been implicated, as have been the neurotransmitter systems of serotonin and norepinephrine. Recent evidence suggests a major role for the heritability of such neurochemical disorders. The role of behavior in

stimulating or triggering such mechanisms is also being explored. While the frontal lobes, the pituitary, the hippocampus, and the corpus callosum are related to the emotions, memory, and neural communications, they do not play as major a role in the depressive disorders as does the hypothalamus.

5. The answer is c. *(Kandel, pp 286–296.)* Under stressful conditions, the organism secretes endorphins and ACTH together. Proopiocortin is a common precursor. The close link between endorphins and ACTH suggests that they serve a mediation function for a closely related set of adaptation responses. Thus, they can facilitate one's response to stress and at the same time help one to withstand pain and mobilize for coping activity to deal with the stressful challenge or threat. Almost every physical stress agent increases plasma levels of β-endorphin as well as adrenocorticotropin and corticosterone.

6. The answer is d. *(Carlson, pp 259–267.)* Most of the human research on sleep has found that after a few days of sleep deprivation people report perceptual distortions or, in a few cases, even hallucinations. These studies have documented statements such as "the floor seems wavy" or "steam seems to be rising from the floor," indicating that sleep deprivation affects cerebral functioning. Another research finding is that being sleepy is distinctly different from being tired, as after exercise. Sleepiness can occur even without any activity and sleep deprivation does not appear to interfere with the ability to perform physical exercise. Likewise, there is no evidence of a physiologic stress response to sleep deprivation, indicated by little change in blood levels of cortisol and epinephrine. Sleep does appear to be necessary for the brain to function normally. After a period of sleep deprivation a rebound phenomenon does occur. The individual will sleep longer and spend a much greater time in REM sleep, but will not regain the number of sleepless hours lost.

7. The answer is b. *(Fauci, pp 1599–1609.)* Duodenal ulcer is a chronic and recurrent disease in 6 to 15% of the population. It is difficult to establish biologic and behavioral etiologies. It was once thought that it occurred in persons with a unique personality exhibiting oral-receptive characteristics and unmet oral needs, but such a personality has not been substantiated. Chronic anxiety and stress play a major role in the recurrence and

exacerbation of ulcer activity. Cigarette smoking and dietary practices (including consumption of alcohol and coffee) can also trigger ulcer activity. Socioeconomic status, occupation, age, race, and gender have not been identified as factors in frequency of duodenal ulcers. In addition to the recent identification of the gram-negative bacillus *Helicobacter pylori,* chronic anxiety and stress continue to play a role through mucosal ischemia and tissue injury from increased gastric acid secretion.

8. The answer is e. *(Baum, p 224.)* Traditionally, minor tranquilizers have been used as a standard approach to the treatment of psychophysiologic disorders. Their major defect is that they fail to deal with the underlying psychological, social, or physiologic problem, especially on a long-term basis. They are effective in providing short-term relief for high levels of stress or anxiety and can be more effective if combined with behavior therapy or psychotherapy. Interpersonal dilemmas are not affected, though they may seem to be temporarily dulled with minor tranquilizers. They often have the side effect of drowsiness, can lead to tolerance with the need for increased dosages, and can produce withdrawal symptoms of insomnia, tremors, and even hallucinations.

9. The answer is b. *(Baum, pp 102–105.)* The diathesis-stress model of psychophysiologic disorders states that individuals are predisposed toward a particular mental or physiologic reaction and that the disorder will become manifest as a reaction to stress. Two major factors are postulated by the model: (1) individual response stereotype, consisting of a predisposition to respond physiologically to various situations and in a particular way; and (2) inadequate homeostatic restraints caused by stress-induced breakdown, previous accident, infection, or trauma, or by genetic predisposition. Situational determinants play an important role as does one's perception of the situation, which generates increased or decreased physiologic response. While one's coping style and one's values or attitudes can play a role, they are not considered to be major factors in the diathesis-stress model. The role of learned response can also be important, but is not a major postulate.

10. The answer is c. *(Kaplan, pp 35, 165–167.)* In the late 1950s, Harry Harlow discovered that monkeys reared with a substitute "mother" covered with terry cloth were much more likely to engage in effective heterosexual relationships as juveniles than were monkeys raised with a substitute mother

made of steel wire. He concluded that the comfort provided by the clothed (or natural) mother was a critical precursor of the feeling of love. He also demonstrated its importance for positive social and emotional development.

11. The answer is a. *(Baum, pp 313–321.)* We know that pain is not the result of direct transmission from the skin to the brain. A complex pathway allows opportunities for alteration and modulation of the incoming pain signals by other signals, including the inhibiting impulses that descend from the brain. The gate control theory proposes that there is a structure in the dorsal horn of the spinal cord that acts as a gate for increasing or decreasing nerve impulse flow from the peripheral fibers to the central nervous system. This allows sensory input to be reviewed and modified at the gate before it evokes pain. Sensory input is increased or decreased by the activity of large diameter fibers (Aβ fibers), small diameter fibers (Aδ and C fibers), and descending fibers from the brain.

Impulses from the large fibers can close the gate, inhibiting transmission, while activity from the small fibers can open the gate to enhance transmission. Efferent impulses from the brain provide further influence and the access route for the psychological processes of anxiety, depression, attention, and past experience to alter the gate and thus directly influence the pain perception process. When the output of the spinal cord T cells exceeds a critical threshold level, neuromechanisms are activated that are responsible for both pain perception and behavioral responses to the pain. Nociceptors are nerve endings that transmit pain. Polymodal nociceptors are nerves that maximally respond to mechanical and temperature stimulation. The pattern theory states that pain sensations are the result of nerve impulse patterns being transmitted from and coded at the peripheral site. The specificity theory states that there are specific sensory receptors for touch, warmth, and pain.

12. The answer is a. *(Baum, pp 135–148.)* The sympathetic-adrenal-medullary (SAM) and hypothalamic-pituitary-adrenal-cortical (HPAC) activity interaction is the most influential biologic factor for the development of coronary heart disease. Other mechanisms are active but less influential. Behavioral stressors can cause arterial injury through turbulence and sheer stress. Biochemical sources can be toxic to coronary arteries through increased levels of catecholamines and corticosteroids. Catecholamines can influence atherogenesis through platelet aggregation and mobilization of

serum lipids. Behavioral stressors can lower ventricular fibrillation thresholds, and sudden cardiac death can be caused by arrhythmic activity promoted by the central nervous system.

13. The answer is a. *(Fauci, p 1987. Carlson, pp 207–211.)* The study of endorphins that bind to various opiate receptors in the brain has led to some interesting discoveries. Dynorphin, a natural brain endorphin, is far more potent than morphine or any other known endorphin. With such high potency, dynorphin can bind with great specificity to pain receptors. Dynorphins, endorphins, and enkephalins arise from different biosynthetic pathways.

The pituitary is the richest site of endorphins. The limbic system is well supplied with immunoreactive endorphins, suggesting a role in memory, learning, and emotion. Enkephalins are widely distributed in the neurons of the spinal cord to help inhibit pain transmission. They are also found in the longitudinal muscles of the gastrointestinal tract. Enkephalins are also released, along with epinephrine and norepinephrine, in the sympathetic response to stress. Opiates are known to decrease the function of the pituitary-adrenal axis. The pathogenesis of shock may be mediated by enkephalins and endorphins. β-endorphin is the most abundant of the various endorphins.

14. The answer is b. *(Carlson, pp 352–359.)* In most species, the male tends to be more aggressive than the female. Animal handlers long have taken advantage of the fact that castration, by reducing aggression, makes animals more tractable. Testosterone administered postpubertally to castrated rats can restore aggressiveness to almost normal levels. Similarly, neonatal female mice develop masculine aggressive behavior on receiving androgens. Androgens also promote aggression in humans. Boys are more aggressive than girls at ages 3 to 10, as has been demonstrated in studies of children. Criminals with a history of violence have also been found to have differences in testosterone levels, but it is not yet certain whether the higher androgen levels promote violence or the aggression increases the androgen levels. Probably both mechanisms are active. Positive reinforcement may also play an important role.

15. The answer is c. *(Sierles, p 405.)* A placebo effect is the ability of an inactive substance or condition to induce a therapeutic effect. The thera-

peutic change is usually positive, but it can also be negative, as can the effect of a chemically active drug. In conditions of pain and anxiety, the greater the pain or anxiety, the greater the placebo effect (contrary to common belief). The placebo effect is thought to be mediated by endogenous opiates stimulated by the brain, which can also play a modulating role in the immune response. Modulated conditioning is not a therapeutic mechanism. Reaction formation is the adoption of attitudes or behaviors that are the opposite of one's real feelings. Fantasy reaction is not related to placebo, which is a real reaction or change. Nonpharmaceutical reaction can be the result of a placebo, but placebo is much broader than a pharmaceutical or nonpharmaceutical reaction.

16. The answer is a. *(Kandel, pp 936–947.)* About 30 to 35% of the people who cannot sleep have a relatively simple organic cause for the problem. The two most frequent organic causes are disruption of normal circadian rhythms and the inevitable consequences of aging. The most common disruptions of normal circadian rhythms are related to travel (jet lag) and behavioral changes in one's normal daily routine, such as napping, irregular sleep hours and conditions, alteration in meal times, and unusual work schedules. Normal aging is the next most common factor as it is more difficult to reset one's biologic clock the older one gets. It has been estimated that most people over age 60 sleep only about 5.5 h per day, and since stage 4 NREM sleep also declines with age, the lighter stages of NREM sleep allow the person to awaken more often, sometimes generating the worry that one cannot sleep or that one is not getting enough sleep. Accumulation of hepatic enzymes is a frequent side effect of prolonged use of sleeping pills. The most common psychosocial cause of insomnia is emotional disturbance.

17. The answer is b. *(Kandel, pp 1188–1226.)* The relationship between social and biologic processes has historically been regarded by psychiatry and medicine as organic and functional. Organic mental illnesses have included the dementias and the toxic psychoses. The functional mental illnesses have included the various depressive syndromes, the schizophrenias, and the neuroses. When anatomic evidence of brain lesions was produced, the diseases were called organic, and those that lacked these features were labeled functional. This distinction should be considered artificial and historical since organic and functional diseases affect mentation

and vice versa. In fact, all mental processes are biologic and any alteration of these processes is organic. The most significant questions to ask about disease or behavior concern the degree to which a biologic or behavioral process is determined by genetic and developmental factors versus toxic or infectious agents versus environmental, social, or behavioral determinants. Psychoanalytic (dynamic) approaches and an understanding of conditioning (learning) played important roles in the evolution and development of a more integrated biobehavioral understanding of human behavior and human biology.

18. The answer is c. *(Baum, pp 182–185.)* The most immediate effect of cigarette smoking is damage to the respiratory tract's mucus and cilia. Damaged mucus and cilia have a reduced ability to trap invading organisms, dust, and other foreign particles. As a result, the work of other agents of the immune system will be increased. Initially, low levels of tobacco smoke and nicotine have a stimulatory effect on lymphocytes, but then shift to an inhibitory effect at higher doses. Smoking stimulates macrophages at first, but later they are destroyed. The other options listed in the question also occur, but not as rapidly as the mucociliary damage.

19. The answer is a. *(Fauci, pp 1479–1480.)* Hyperventilation is a physiologic response to anxiety, panic, hypervigilance, or threat cues. There are physiologic, behavioral, and psychological changes as a result of hyperventilation. Typically, there is reduced CO_2 in the blood, which lowers the blood's acid level. Other results of hyperventilation include increased sympathetic activity, cardiac arrhythmias, increased heart rate, decreased oxygen supplied to the brain, and increased cerebral vasoconstriction. There is a sense of fear that is focused on a threatening situation or somatic complaint, a temporary impairment, and defective decision making marked by vacillation and an impulsive choice of options.

20. The answer is e. *(Cooper, pp 317–322.)* Although there are hypotheses and models of neurotransmitter dysfunction for many psychiatric and neurologic diseases, Parkinson's disease remains the model disorder in which damage to a specific neural pathway characterized by a particular neurotransmitter can explain most or all of the pathophysiology of the disease. It has been known for decades that patients with Parkinson's disease have biochemical evidence of greatly decreased dopamine function in the

brain because of degeneration of the nigrostriatal tract. A neurotoxic model of the disease, produced in primates by administration of a derivative of meperidine (MPTP), demonstrated that severe damage to dopamine-containing nigrostriatal neurons produced nearly all of the signs and symptoms of Parkinson's disease. As dopamine neurons in the nigrostriatal tract degenerate, compensatory changes occur that also contribute to the pathophysiology. These changes include a matching loss of the dopamine transporter and a compensatory rise in both dopamine 1 and dopamine 2 postsynaptic receptor density. The remaining dopamine neurons synthesize and release more dopamine as a compensatory mechanism. These secondary physiologic changes probably explain some of the signs and symptoms seen in patients with advanced Parkinson's disease who are being treated with agents that augment dopamine production. One example is the "on-off" phenomenon in which patients have abnormal increases in movement after administration of dopamine-augmenting agents, probably because of hypersensitive dopamine receptors in remaining neurons of the nigrostriatal tract.

21. The answer is d. *(Taylor, pp 530–531.)* The use of relaxation techniques to reduce stress has proved very effective. Studies of diabetic patients who practiced progressive muscle relaxation showed significant improvement in glucose tolerance following relaxation training. Plasma cortisol levels were also reduced in patients trained in relaxation. Relaxation, however, did not affect insulin sensitivity or glucose-stimulated secretion of insulin. Stress reduction techniques, such as relaxation, are effective in reducing requirements for exogenous insulin and in the management of both insulin-dependent and non-insulin-dependent diabetes.

22. The answer is a. *(Kandel, pp 936–947.)* Paradoxical sleep is a term given to REM sleep, which is considered paradoxical because its electroencephalographic pattern resembles that of the alert waking state. Dreaming occurs during REM sleep. When a person is repeatedly awakened during dreaming, a dream deprivation occurs and there is a rebound phenomenon of increased frequency and lengthening of dreaming when the person is permitted to sleep normally. Dream deprivation does not result in a major decrement in psychological or intellectual functions (as does sleep deprivation), but it does appear to retard the memory formation of emotionally

toned words. While earlier studies suggested the presence of bizarre behavior, anxiety, irritability, and nightmares, more recent studies have found no such changes in humans even after 16 days of deprivation of dream sleep.

23. The answer is b. *(Taylor, pp 569–570.)* Of the immunologic components that interact with tumor cells, such as T lymphocytes, macrophages, and humoral antibodies, the natural killer cells show a decrease in activity after psychosocial stress; the most active mechanism is corticosteroid production through the hypothalamic-pituitary-adrenal axis. Natural killer cells play a role in the inhibition of tumor growth and in the surveillance against newly developing primary tumors, at distant sites as well as locally in the body. Recent studies by Glaser, Kiecolt-Glaser, Schleifer, Keller, and others have linked the activity of natural killer cells to examination stress, vulnerability to viruses, depression, infectious illness, and bereavement.

24. The answer is c. *(Sierles, pp 400–402.)* During active coping (Cannon's fight or flight) there is an increase in heart rate, cardiac output, activity of striate muscle, catecholamines, and cortisol, along with vasodilation in the muscles. Under the condition of coping effort without distress, there is an increase in catecholamines (especially norepinephrine), but with a suppression of cortisol. On the other hand, coping effort associated with negative emotions (e.g., embarrassment or feeling harassed) leads to preferential secretion of epinephrine. Attempts to cope with such stressful situations over a long period of time have important implications for health maintenance and vulnerability to disease.

25. The answer is d. *(Carlson, pp 91–94.)* The limbic system includes regions of the limbic cortex, as well as a group of interconnected structures that surround the core of the forebrain. The limbic system forms a circuit whose primary function was formerly regarded as modulating motivation and emotional responses. Studies have discovered that the hippocampal formation and the limbic cortex that surround it are involved in learning and memory, rather than emotional behavior. However, the remaining sections of the limbic system are responsible for emotions, feelings, moods, and motivation. Thus, the 65-year-old man's limbic system is the site primarily responsible for his learning difficulty, lack of motivation, and his recent loss of emotional feelings for his grandchildren.

26. The answer is a. *(Baum, pp 297–301.)* Progressive muscle relaxation, or a reasonable variation, can serve as a powerful therapeutic technique for treating generalized anxiety, insomnia, headaches, neck tension, and mild forms of agitated depression. It has also effectively been used to reduce pain, the side effects of cancer chemotherapy, nausea, and mild hypertension, preferably before pharmacologic intervention. Relaxation therapy is based on the premise and observation that muscle tension is a physiologic response to anxiety and stress. There is a significant reduction in experienced anxiety if tense muscles can be relaxed. Muscle relaxation also can change the physiologic activation process. The Jacobson relaxation procedure involves tensing selected muscles for about 10 seconds, and then completely relaxing them and noticing the difference in sensation. Eventually, the patient is able to relax particular muscle groups from their present level of tension. Other effective methods of relaxation include systematic deep breathing, transcendental meditation, and yoga.

27. The answer is b. *(Baum, pp 157–164.)* Essential hypertension, perhaps more accurately called "established" hypertension, has no single cause that can be identified. Fifteen percent of the population, over 35 million people, are inflicted with this disease/disorder. Its occurrence increases with age, is more prominent among poor black Americans, and is less frequent among women before the age of 50. Because increased blood pressure does not have observable symptoms and the most effective drugs to treat it often cause unpleasant side effects, compliance of individual patients is often low. Physiologic factors associated with risk of hypertension are age and heredity, and behavioral factors are salt intake, obesity, and stress. It is increasingly recognized that, like coronary heart disease, numerous social, behavioral, environmental, and cultural factors interact with physiologic and genetic factors to predispose an individual to hypertension.

While all of the options in the question are valid for general hypertension, borderline hypertension represents an increased activation of the sympathetic nervous system by the interaction of all of the listed biologic, environmental, and behavioral factors. Different physiologic and/or behavioral mechanisms may be implicated at different stages of hypertension. For example, elevated output of blood from the heart with little increased resistance to flow in the body's vasculature exists with borderline hypertension and results from increased activation of the sympathetic nervous system.

This, along with increased levels of blood and tissue catecholamines, is the body's response to psychological and environmental stress. In older persons with more established hypertension, the output of the heart is more normal, but the resistance to blood flow is elevated.

28. The answer is b. *(Baum, pp 211–220.)* Psychophysiologic disorders were formerly referred to as psychosomatic illnesses. They are characterized by physical symptoms from organs of the body that have become dysfunctional through an interaction between psychological, biologic (including genetic), and sociocultural factors. Specifically, the most common psychophysiologic disorders are hypertension, bronchial asthma, dysmenorrhea, headache, neurodermatitis, peptic ulcer, irritable bowel syndrome, rheumatic arthritis, and ulcerative colitis. Diabetes, along with many other diseases, has a strong psychological component, but is not considered to be a psychophysiologic disorder.

29. The answer is c. *(Baum, pp 569–570.)* Most glands receive either direct neural control from the brain or indirect control from hormones secreted by the hypothalamus. Thus, thyroid secretion is subject to hypothalamic control, whereas insulin secretion depends in part on adrenergic influence from the autonomic nervous system. The parathyroids are notably free of brain control; in regulating calcium metabolism, they in turn are regulated by blood levels of calcium.

30. The answer is b. *(Kandel, pp 730–735.)* When the axon is cut, the axon and synaptic terminals are deprived of essential metabolic connections with the cell body. Since axonal transport occurs in both directions, the result is a rapid local degeneration of the axon and myelin sheath, with the cell body also being affected. Synapses mediate both electric signals and nutritive interactions between neurons. Thus, changes occur in the cell body (retrograde changes) and also in subsequent neurons that receive synapses from the damaged neurons. Macrophages from the general circulation enter the trauma area and phagocytose axonal debris, and glial cells (astrocytes and microglia) proliferate to assist in the process. This proliferation of fibrous astrocytes forms a glial scar around the trauma area, which can then block the course of regenerating axons and the reformation of central connections. The behavioral effects of nerve lesions are peculiar to the location of the lesion in the brain and the nerve cell connections, so the

same type of injury will have different behavioral effects depending on its location.

31. The answer is a. *(Baum, pp 173–184.)* Immunocompetence refers to the ability of the various components of the immune system to recognize, respond to, and reject elements and antigens that do not belong in the body. The immune system can no longer be regarded as an autonomous system. The autonomic and central nervous systems and the endocrine system have been known to influence and to be influenced by the immune system, and it has now been demonstrated that psychosocial factors can also influence the immune system and affect its ability to respond to invading organisms and antigens. Psychosocial stress can suppress immunocompetence. While acute stress tends to suppress the immune system, chronic stress tends to enhance the immune system, especially over time.

32. The answer is a. *(Baum, pp 174–178.)* The immune system may control latent viruses such as Epstein-Barr or herpes simplex, but it cannot destroy or eliminate them. If the immune system is weakened so that the virus becomes more active, the antibody titers to the virus will increase. Immunosuppressive drugs will increase antibodies to latent viruses. Kiecolt-Glaser and Glaser, working with medical students and elderly residents of nursing homes, were able to demonstrate that the stress of examinations and loneliness were associated with elevated antibody titers. Sustained noise also causes a rise in antibody titers initially, but after a few days the organism seems to adapt and titers return to normal. Studies have also demonstrated that relaxation training produces decreased antibody titers to latent viruses by generating an increase in natural killer cell activity.

33. The answer is a. *(Baum, pp 174–183.)* A number of experimental and clinical studies on the effects of psychosocial stress on the human immune system have demonstrated a decrease in the activity of natural killer cells in healthy human subjects. Likewise, stress was related to a decrease in lymphocyte cytotoxicity and a decrease in the rate of microbe engulfment by polymorphonuclear granulocytes. There was also a depression in the response of T lymphocytes to mitogens. Latent viruses, such as herpes simplex or Epstein-Barr, are generally controlled by the immune system, but when the immune system is suppressed, the antibody titers to the virus will increase. Another study demonstrated that sleep deprivation

decreased the ability of blood neutrophil granulocytes to phagocytose *Staphylococcus aureus* and increased the production of interferon by blood lymphocytes. Also, the phytohemagglutinin-induced DNA synthesis of blood lymphocytes was reduced after sleep deprivation of 48 h.

34. The answer is c. *(Sierles, pp 185–187. Ebert, pp 268–270.)* Many psychiatric disorders manifest evidence of brain dysfunction. Evidence of such brain dysfunction has been found in 50% or more of patients with schizophrenia. For example, a neurologic examination will demonstrate soft signs (e.g., grasp reflex, rooting reflex, motor impersistence) in 70% of adult schizophrenics; 75% (whether ill or recovered) will also demonstrate abnormalities in eye pursuit; 75% will have moderate-to-severe bilateral impairment on neuropsychological tests; and 50% will have nonspecific abnormalities on the EEG. Also, 50% will have some cortical atrophy and ventricular enlargement on imaging tests. The lactate infusion test induces panic behavior in 80% of patients with panic disorder, but not in patients with schizophrenia.

35. The answer is e. *(Baum, p 185–187.)* Consumption of alcohol has been shown to affect the immune system, apparently in relation to dose. Macrophages are inhibited and move more slowly toward chemical signals released by the body. Proliferation and cytotoxicity of T cells are also inhibited. Increased doses of alcohol can damage certain bodily tissues, such as the thymus. However, no inhibition of production of antibodies has been observed.

36. The answer is c. *(Kaplan, pp 737–741.)* Sleep is divided into two distinct states: D sleep (desynchronized EEG pattern sleep) and S sleep (synchronized EEG pattern sleep). D sleep is also known as REM (rapid-eye-movement) or dreaming sleep; S sleep as NREM (non-rapid-eye-movement), orthodox, or quiet sleep. S sleep (NREM) is divided into stages 1, 2, 3, and 4; stage 1 is the lightest and stage 4 the deepest. NREM sleep lasts from 60 to 100 min, followed by 10 to 40 min of REM sleep, and the cycle is continued throughout the night. Typically, about 80% of an adult's sleep time is spent in NREM sleep and 20% in REM sleep. REM sleep tends to increase during the second half of the night. The amount of REM sleep appears to determine the amount of rest. When REM sleep is interrupted, tiredness tends to develop. A newborn spends about 50% of sleep time in REM sleep.

Deep sleep begins to be replaced by longer periods of lighter sleep after the age of 30.

37. The answer is e. *(Kandel, pp 1108–1109.)* The cutting of a nerve tract within the brain or of a peripheral nerve results in the following sequence: both ends of the cut axon immediately seal off the axoplasm, retract, and begin to swell; there is rapid degeneration of the axon and the myelin sheath; the macrophages from the general circulation enter the area and phagocytose axonal debris; there is also a proliferation of glial cells, which act as phagocytes; and fibrous astrocytes proliferate in the central nervous system, which leads to glial scar formation around the zone of trauma that often blocks the course taken by regenerating axons and causes a barrier against the reformation of central connections. Degeneration spreads along the axon in both directions from the zone of trauma. The retrograde reaction in the proximal segment usually progresses a short distance and appears in the cell body after 2 to 3 days. In the distal segment, degeneration appears in the axon terminal in about 1 day, and within 2 weeks the distal synapses degenerate completely.

38. The answer is c. *(Sierles, pp 400–402. Baum, pp 112–121.)* Different kinds of stressors elicit different physiologic responses. Vigilant inaction is a condition in which one is facing stressors for which there is no apparent coping strategy or opportunity for defense. In that case there is increased blood pressure and peripheral blood flow resistance, vagus nerve–mediated bradycardia, decreased cardiac output, increased secretion of corticotropin (ACTH) and cortisol, and decreased levels of brain norepinephrine. When active coping is pursued or becomes an option, adrenal medullary secretion of epinephrine and hypothalamic-pituitary-adrenocortical activity decrease.

39. The answer is a. *(Sierles, pp 393–397.)* Side effects on sexual function are frequently produced by antihypertensives, other cardiovascular compounds, and psychotropic medications. Sexual dysfunctions can be produced through anticholinergic parasympathetic and sympathetic ganglionic-blocking, antiandrogenic, β-adrenergic, progestational, antihistaminic, and dopamine antagonist actions. Tricyclics, phenothiazines, α-methyldopa, and guanethidine all have the effect of decreasing sexual arousal. They can also inhibit desire and produce orgasmic difficulties.

Amphetamines can produce orgasmic difficulties, but do not appear to inhibit desire or decrease arousal. The physician must always consider that drug combinations can create untoward effects on sexual function.

40. The answer is d. *(Kandel, pp 498–959.)* Even though many sleeping pills are initially helpful, they lose their effectiveness within 2 weeks. The repeated administration of barbiturates (e.g., pentobarbital or phenobarbital) results in a gradual increase in hepatic enzymes, which normally are responsible for the degradation of the barbiturates. Not only is their pharmacologic action decreased, but since the liver enzymes are relatively nonspecific, the result is often a broad cross-tolerance to other hypnotics. Barbiturates are known to suppress REM sleep, so when the drug is withdrawn, a marked REM rebound results, often aggravating insomnia. Even though the benzodiazepines are also addictive, flurazepam increases hepatic enzymes at a much slower rate; hence patients develop a tolerance much more slowly than for pentobarbital. However, an active metabolite of flurazepam remains in the body for a longer period of time (more than 24 h), which results in a gradual increase of these breakdown substances in the blood. Thus, the effects of the drug are often felt during the daytime as diminished alertness and hand-eye coordination. These symptoms are also aggravated by alcohol.

41. The answer is a. *(Kandel, pp 945–946.)* The physiologic responses to dreaming listed in the question can easily be recorded in most people several times each night. If awakened at such times, people usually confirm that they were dreaming. This complex of physiologic signs (e.g., electroencephalographic desynchrony, rapid eye movements, loss of muscle tonus, and cardiorespiratory irregularities) is commonly referred to as REM sleep or paradoxical sleep. The term *paradoxical sleep* was applied originally because the associated electroencephalographic pattern is characteristic of the alert waking state even though the dreaming person is, in fact, sound asleep. Dreams occurring during NREM sleep are less easily recalled, less vivid, less visual, less emotional, and more pleasant.

42. The answer is b. *(Baum, pp 116–121.)* Stress without the sense of control has been found to influence the release of endogenous opioid peptides, such as β-endorphin. When one learns that one has no control over a stressful situation, an opiate-based analgesia occurs. Both uncontrollable and con-

trollable stressors produce a brief poststressor analgesia, but only the opioid produced by inescapable stressors can be blocked by administering opiate antagonists. Both controllable and uncontrollable stress situations suppress the cytotoxicity of natural killer cells, but inescapable and uncontrollable stress results in greater suppression than does controllable and escapable stress. Corticosteroid release during uncontrollable or inescapable stress is somewhat greater than when the stress can be controlled or escaped. Corticosteroid levels also decline more slowly after uncontrollable stress.

43. The answer is a. *(Baum, pp 116–121.)* Having some sense of control over a stressful situation is an important factor in coping with stress and reducing the physiologic reactions to stress. In situations that are uncontrollable, unpredictable, inescapable, or uncertain, the levels of corticosteroids and catecholamines are increased. Furthermore, corticosteroid levels decline more slowly after the termination of an uncontrollable or inescapable stress. Unpredictable shock with no control has also produced an increased incidence of gastric ulceration in animals. In stressful occupational situations, those workers whose jobs are self-paced show fewer symptoms of stress and less catecholamine excretion than those whose jobs are machine-paced. Thus, the potential danger of sustained higher levels of physiologic reactions to stress is reduced by the person's having some level of control. Situations involving uncertainty also involve an increase in the excretion of epinephrine, norepinephrine, and cortisol.

44. The answer is d. *(Sierles, pp 404–405.)* The brain and the endocrine and immune systems communicate with and influence each other. Studies of the hypothalamus have demonstrated that stimulation of the anterior hypothalamus enhances immune responsiveness, and stimulation of the posterior lobe inhibits immune reactivity. Removal of the thymus gland will result in the atrophy of these hypothalamic neurons. Also, the limbic system contains high concentrations of neuropeptide receptors, as do the lining of the intestines and lymphocytes. It has also been found that immune cells produce the same neuropeptides that are produced in the brain. Some of these peptide hormones that are produced in the brain stimulate T cells to produce lymphokines, such as interleukins and interferon. Historically, the immune system was thought to be a more or less autonomous system that involved only the autonomic nervous system (ANS), but with the demonstration of the "hard wiring" connections of the

immune system with the central nervous system and of neural, endocrine, and behavioral interactions, the ANS is now considered to be only one of the interacting and collaborating systems.

45–48. The answers are 45-e, 46-c, 47-d, 48-a. *(Carlson, pp 61–70.)* Acetylcholine is the transmitter agent at the neuromuscular junction. It is released from presynaptic neuron terminals in quantal amounts and excites contractile mechanisms in postsynaptic muscle fibers. Since muscular contractions are the substrate of all behavior patterns, it may be said that acetylcholine is the ultimate mediator of all behavior.

The enzyme dopamine-β-hydroxylase catalyzes the conversion of dopamine to norepinephrine. Evidence suggests that the brains of schizophrenic persons may be deficient in this important enzyme. It is unclear whether this psychopathology results from an accumulation of dopamine or from a relative lack of norepinephrine.

Schizophrenia may result in part from the presence of 6-hydroxydopamine in the brain. This substance destroys noradrenergic terminals because of its tendency to form toxic peroxides. In theory, an inborn error of metabolism could produce a high cerebral concentration of 6-hydroxydopamine. Schizophrenia would then occur because of disturbed function in the noradrenergic terminal fields of the brain.

The brain structure most effective in producing positive reinforcement of operant behavior from electric stimulation is the median forebrain bundle. This structure is closely related anatomically and physiologically to the lateral hypothalamic nucleus. The median forebrain bundle contains very high levels of norepinephrine. Apparently, as a neurotransmitter norepinephrine is involved in mediating behavioral reward and motivational processes.

Both dopamine and norepinephrine are capable of functioning as neurotransmitters. Norepinephrine is formed from dopamine in the presence of dopamine-β-hydroxylase. Insofar as norepinephrine may be involved in behavioral reward, its precursor, dopamine, also would be involved.

49–53. The answers are 49-c, 50-a, 51-a, 52-d, 53-d. *(Kandel, pp 936–947.)* Sleep is a rhythmic and active neural and behavioral process. The sleep-wake cycle is an endogenous rhythm of the body (as are such rhythms as body temperature, urine formation, and cortisol secretion). Human sleep varies from five to seven orderly cycles each night and is

characterized by stages 1 through 4 (with increasing slow wave NREM sleep) occurring in the first 30 to 45 min, stage 4 being the deepest sleep; the EEG shows that the same stages are then retraced in reverse order. As the stages or depths of sleep increase, the autonomic indicators demonstrate a parasympathetic dominance, with heart rate, blood pressure, and respiration declining and becoming more even, and gastrointestinal mobility increasing. The sleeper is more apt to be awakened spontaneously in stage 1 REM sleep than in stage 4 REM sleep.

Stage 1 REM sleep is distinguishable from stage 1 NREM sleep by additional electrooculographic and electromyographic criteria. Stage 1 REM sleep is considered to be the dream phase. The first REM sleep period is usually short (5 to 10 min) but tends to increase with each successive sleep cycle. Stages 3 and 4 NREM sleep dominate during the first third or half of the night and are less frequent during the later or early morning cycles. Dreams are recalled best when one is awakened from stage 1 REM sleep and less well during subsequent deeper NREM stages of sleep.

Stage 4 NREM sleep decreases with age and sometimes disappears in persons over 60 years of age. This continuous decline in the elderly is correlated with an increase in the number of spontaneous awakenings. REM sleep and stage 4 NREM sleep are differentially affected by certain psychoactive drugs, especially alcohol and barbiturates, which suppress REM sleep; stage 4 NREM sleep is especially decreased by the benzodiazepines diazepam (Valium) and chlordiazepoxide (Librium).

Stage 2 NREM sleep increases toward the end of the sleep period and occupies about half of the total sleep time. Dream recall is less if one is awakened during stage 2 NREM sleep than if awakened during stage 1 NREM or stage 1 REM sleep.

54–58. The answers are 54-e, 55-c, 56-c, 57-b, 58-b. *(Baum, pp 353–358.)* Carbon monoxide produced by smoking behavior is a major health hazard for smokers and nonsmokers. Elevated levels play a role in the etiology of most cardiovascular diseases, including coronary heart disease. It has been associated with peripheral vascular disease, reduced cardiac output, and reduced duration of exercise prior to angina. It also results in decreased oxygen content of fetal blood in a pregnancy, as well as subsequent complications in pregnancy. The combination of carbon monoxide and nicotine in smokers contributes to the increased prevalence of fatal and nonfatal cardiovascular disease.

Even though cigarette smoking is by far the major source of exposure to carbon monoxide, occupational exposure (e.g., in blast furnace workers, automobile mechanics, traffic control officers, taxi drivers, truck drivers) as well as urban living and exposure to other people's cigarette smoke can lead to elevated carbon monoxide levels, often with concentrations as high as those of smokers. Other factors affecting one's carbon monoxide level include individual response variability, the way a cigarette is smoked, rate of consumption, the smoker's activity levels, and the variety of tobacco product being smoked. Alcohol consumption will also affect carbon monoxide levels.

Hydrogen cyanide gas is a constituent of cigarette smoke and a primary ciliatoxic agent in cigarette smoking. It is implicated in the development of chronic obstructive pulmonary disease, emphysema, and chronic bronchitis. The combination of hydrogen cyanide gas and carbon monoxide is also implicated in the development of atherosclerosis. Measurement of thiocyanate, the primary metabolite of hydrogen cyanide, serves as an excellent index of smoking behavior and it is also valuable in the discrimination of smokers from nonsmokers. Thiocyanate is also associated with stomach cancer.

Nicotine is inhaled with each puff of cigarette smoke and is now regarded as the major pharmacologic addicting agent in smoking. It is absorbed from the lungs so quickly that in only 5 min it can be found in the brain, adrenal medulla, and sympathetic ganglia. Most persons smoke to obtain pharmacologically satisfying doses of nicotine, and they become so addicted to certain levels of nicotine that they maintain these levels by titrating nicotine intake and adjusting their smoking behavior accordingly. Even though nicotine has central nervous system and cocarcinogenic effects, it primarily acts upon the cardiovascular and respiratory systems. Its deleterious actions on the cardiovascular system include a hemodynamic response of increased work for the heart, increased circulation of fatty acids, and an increase in platelet adhesion and aggregation. While nicotine increases the amount of work of the heart, carbon monoxide reduces the amount of oxygen available to the heart muscle; thus, the combination of carbon monoxide and nicotine links smoking behavior with an increased incidence of atherosclerosis and thrombosis.

59–62. The answers are 59-e, 60-b, 61-b, 62-c. *(Carlson, pp 61–70, 91–96, 357–364, 465–471, 545–549.)* One of the major advances of recent

research has been the revelation of the brain's strong regulatory influence on the endocrine and autonomic nervous systems. This is most relevant when the organism is exposed to changes in its environmental conditions. The more severe the changes, the more severe the stress. The transmission of information in the brain and between the brain and other tissues and systems involves about a dozen amino acids and monoamines. These neurotransmitters function either at the level of the synapse, or as modulators of information flow between neurons. The best-documented neurotransmitters are dopamine, norepinephrine, serotonin, and γ-aminobutyric acid.

Each neurotransmitter is differentially distributed in the brain for transmission of information from cell to cell. One such system is the dopaminergic circuit or system. Parkinson's disease and schizophrenia are strongly related to the dopaminergic system.

The hypothalamic-limbic-midbrain circuits exert a strong regulatory influence on both the endocrine system and the autonomic nervous system. As such, these circuits have a major influence on the cardiovascular and gastrointestinal systems. They also play a major role in mediating the adaptive functions of memory, appraisal, and motivational-emotional responses. Thus, the human neocortex is able to mobilize a metabolic and cardiovascular adaptive response for action by first using these circuits to appraise the functional significance of the environment or of ongoing events. By the brain's maintaining a constant reappraisal from ongoing feedback, these hypothalamic-limbic-midbrain circuits are able to mediate the integrative processes relevant to action or survival.

These circuits are also influenced by neuropeptides (e.g., endorphins, enkephalins, vasopressin). Neuropeptides exist as neurotransmitters and as hormones. By clinging to the nerve cell membrane for varying periods of time, they can modulate the flow of information. Thus, it is believed that the neuropeptides may be able to "fine-tune" one's mood.

Psychological stress influences the adrenal cortex and the thyroid. These functional changes occur when one is very upset, anxious, angry, or depressed for a long period of time. In effect, all glands controlled by the anterior pituitary are influenced by a stressful experience.

The hypothalamic hormones influence and coordinate the endocrine system and the autonomic nervous system. They are known as the coordinators of coordinators, since the endocrine system and autonomic nervous system both have major coordinating functions.

63–67. The answers are 63-c, 64-a, 65-d, 66-a, 67-b. *(Sierles, pp 48–67, 399–407. Baum, pp 27–37, 73, 89, 173–183.)* The sympathoarenomedullary system (SAM) plays a major role in the response to stress, interacting with the hypothalamic-pituitary-adrenocortical (HPAC) system. The sympathetic nervous system stimulates many systems of the body to increase blood flow and glucose production so that the body can be mobilized to work harder in response to threat. It increases heart rate, blood pressure, respiration, and other organ activity for action, but it also inhibits some organs such as the gut and skin to initiate conservation. This is the basic "fight or flight" response described by Cannon. The adrenal medulla and sympathetic neurons secrete epinephrine and norepinephrine, respectively. The SAM increases metabolic activity in response to stressful situations and physical exertion. It is active in hypertension, angina pectoris, and cardiac arrhythmia and is preferentially active during problem-focused coping.

The HPAC system is the endocrine system that regulates bodily activity. Regulation begins with the release of corticotropin releasing hormone (CRH) which stimulates the pituitary to release hormones that stimulate the adrenals to produce corticosteroids. Corticosteroids play a major role in regulating metabolic activity throughout the body. They also assist in controlling inflammation of the immune system. Glucocorticoids, primarily cortisol, help regulate glucose in the blood. Mineralocorticoids, the other form of corticosteroids, regulate the blood's electrolyte balance. Cortisol has a strong effect on carbohydrate metabolism, but is secreted predominately due to the stress of physical exertion, trauma, cold, heat, and sympathetic stimulation. It causes the adrenal medullae and sympathetic neurons to release epinephrine and norepinephrine. The HPAC system is preferentially active during emotion-focused coping.

Stress is one of the prominent suppressors of the immune system. In studies of the effects of stress on the immune system, the impact of medical school examinations on various components of immune suppression has been documented. Examination stress produced decreased NK cell activity, fewer T cells, suppressed production of interferon, and decreased proliferative response to mitogen challenge. A suppressed immune system increases susceptibility to infection and tumor growth.

There are bodily mechanisms both to perceive pain and to reduce pain. The endogenous opiates of the endorphin-enkephalin system of the brain play that role. Pain that requires active coping stimulates secretion of

endogenous opiates to produce analgesia. This has led to experiments that confirm the effectiveness of acupuncture needles stimulating axions and nerve endings which in turn stimulate secretion of endogenous opiates. This has been demonstrated by the blocking effect of Naloxone.

The anterior hypothalamus elicits the relaxation response, while the posterior hypothalamus stimulates the fight or flight reaction. The anterior portion produces decreased muscle tone, blood pressure, respiratory rate, and constricted pupils.

68–70. The answers are 68-d, 69-a, 70-b. *(Baum, pp 168–173. Sierles, pp 400–407.)* Robert Ader, a psychologist, discovered that the immune system can be suppressed through classical conditioning. When he conditioned infected rats to avoid immunity-suppressing and nausea-producing cyclophosphamide as the unconditioned stimulus, he found that the rats continued to die from the infection, even after he stopped giving them cyclophosphamide in the saccharine-flavored water. The immune system had become conditioned to the suppressant effects of the drug. When he used this same protocol with a strain of rats susceptible to an autoimmune disease similar to lupus erythematosus (LE) he found that these rats had learned to suppress their immune system, thus retarding the autoimmune process, and lived longer than the LE rats. Subsequent experiments established that the human immune system can also be behaviorally conditioned, thus demonstrating the modulating effect of behavior on the immune system through the central nervous system.

George Solomon, an eminent psychiatrist, coined the term *psychoimmunology* in 1964. His published paper with Ruddy Moos (a psychologist)—"Emotions, Immunity, and Disease: A Speculative Theoretical Integration"—was far ahead of its time. Solomon also studied coping activities of AIDS patients and found that those who were more involved in coping activities and who actively participated in their medical care and exercise program had a longer survival time.

Thomas Holmes and Richard Rahe developed a questionnaire to quantify the stress effects of life change and the subsequent development of numerous illnesses. The death of a spouse was a high stressor, while changing a residence was considered relatively low. Even higher levels of positive correlations between life stress events and illness have been achieved by taking into account the meaning and perception of the life event. In general, negative events, such as losses, are more stressful than positive events,

and the higher the stressful life change/event, the greater the likelihood of the development of an illness. Ronald Glaser (a microbiologist and psychoneuroimmunologist) provided molecular biologic documentation that stress and distress significantly suppress the process of cellular DNA repair. He found (working with rats) that under conditions of rotational stress, there was a depression of the ability of splenic lymphocytes to synthesize methylguanine DNA methyltransferase, which is an essential enzyme in the metabolic pathway of DNA repair. This has helped document the crucial importance of recognizing the interaction between psychosocial stress, modulation of DNA repair, and the potential increased risk for the development of abnormal cells or the lack of immunologic protection from such cells.

Janice Kiecolt-Glaser (a psychologist) made some major initial contributions by studying the influence of psychosocial factors (stress) on the immune system of medical students before and after examination time. She then showed that medical students with the most suppression of immune function scored highest on loneliness. Psychiatric inpatients who scored high on loneliness had poorer mitogenic responses. She also documented that caretakers of patients with Alzheimer's disease had to endure severe stress and loneliness, which resulted in poorer cellular immune function than that of controls.

71–72. The answers are 71-d, 72-b. *(Sierles, pp 400–402.)* Potential stressors are evaluated through a process called cognitive appraisal, and on the basis of this appraisal, a coping strategy is determined—either one that is problem-focused or one that is emotion-focused. Either may be adaptive or maladaptive, and it is possible for them to occur in combination at various proportions. Problem-focused coping attempts to manage, alter, or take some action to relieve the stressor. Different kinds of stressors and coping responses elicit different autonomic responses. It is now known that the physiologic response to threat is a very complex interaction, and that the sympathoadrenomedullary (SAM) system is preferentially active during problem-focused coping. Learning and conditioning also play important roles in the process of cognitive appraisal.

In emotion-focused coping, the effort is directed at regulating the emotional response to the threat or problem. This is especially active when the threat or stress cannot be averted. Examples of emotion-focused coping are denial, avoidance, or minimizing. These responses may be adaptive,

e.g., they may facilitate recovery and reduce complications during and after a myocardial infarction, but they may be maladaptive before and after hospitalization. During emotion-focused coping, the hypothalamic-pituitary-adrenocortical (HPAC) system is preferentially active.

Epinephrine and norepinephrine responses, corticotropin and cortisol pathways, and catecholamine biosynthetic pathways are all involved in stress and coping responses in various ways, but are not preferentially active during problem-focused or emotion-focused coping.

73–77. The answers are 73-i, 74-b, 75-c, 76-e, 77-c. *(Sierles, pp 33–46. Kandel, pp 317–336.)* The limbic area includes the septum pellucidum and septal nuclei, the amygdaloid complex and its nuclei, the hippocampus, and the olfactory tubercle, bulb, and striae. Its main function relates to control over the internal milieu, the modulation of instincts and drives, memory, and learning, and the emotional and affective coloring of experiences. Since the limbic system modulates the formation of everyday affective experiences (e.g., feelings, emotions, and moods), it is important to recognize that diseases or disorders of the limbic system can cause mood disorders and other psychopathology. Influenza epidemics and viral infections of the limbic system have resulted in various psychopathologies such as obsessive-compulsive, manic-depressive, and schizophrenia-like states. Damage to the limbic system has also led to disorders of memory, as in Korsakoff's psychosis and thiamine (vitamin B_1) deficiency found in some alcoholics.

The primary (ideotypic) sensory and motor areas of the cortex respond to the external environment. In the case of the pianist, the primary sensory cortex is not responding to (not receiving) the usual sensory feedback from his fingers when they strike the keys of the piano. The primary sensory cortex also receives sensations of light, sound, and pain from the external environment. The primary sensory and motor areas of the cortex include the primary visual cortex as well.

The unimodal association areas connect with the primary sensory and motor areas and organize sensations, such as light, into recognizable patterns (e.g., image of a face or door). The loss of blood supply caused by the stroke infarctions in the 70-year-old man had disconnected the perception of faces from previous memories of those faces. The unimodal motor association areas contain specific motor programs for complex movements, such as speaking, figure skating, piano playing, typing, or sewing. Thus, the muscle contractions (under sensory guidance) are able to carry out learned, complex motor acts without the person having to think through each step.

In the case of the 30-year-old secretary, this was disrupted in the left side of his brain, so the fingers of his right hand (opposite) were affected.

The heteromodal association areas handle the cross-modal associations. They connect the unimodal and sensory association areas to the limbic system and allow communication. This allows us to assign and recall the words and names of objects, recognize and name what we touch, express our feelings, and read and write. When damage occurs to these areas, the effect can be dysnomia (impaired naming of objects, as in the 65-year-old woman), dyslexia (impaired reading), dysgraphia (impaired writing), and dyscalculia (impaired ability to calculate numbers).

The paralimbic areas form a girdle between the limbic system and the brain's heteromodal association areas described above.

78–81. The answers are 78-c, 79-e, 80-g, 81-a. *(Baum, pp 14–21. Sierles, pp 3–6, 83–91.)* George Engel (an internist and psychiatrist) proposed the biopsychosocial model in 1977. He recognized the tremendous advances being made in molecular biology and the basic biologic sciences of medicine, which he labeled the biomedical model. He also recognized medicine's increasingly narrow focus, so he proposed the biopsychosocial model as a broader approach, which included incorporating both the biomedical and psychosocial components as crucial to medical practice, medical education, and prevention. He proposed that all must be addressed in the consideration of the etiology, diagnosis, or treatment of each disease and each person.

Neal Miller developed (with John Dollard) a learning theory of psychotherapy that stated that fear can motivate learning. He also used a variety of behavioral techniques to study the effects of electrical and chemical stimulation of the brain (especially the hypothalamus). Perhaps most important in terms of modern behavioral medicine, he was able to prove that a variety of autonomically mediated visceral responses are subject to instrumental learning. This finding launched a whole new area of investigations that explored and demonstrated mechanisms of interaction between human behavior and human neurophysiology.

Franz Alexander (1891–1964) hypothesized that certain psychological and personality factors had a major influence on the development of certain illnesses. These illnesses were duodenal ulcer, essential hypertension, ulcerative colitis, syncope, thyrotoxicosis, rheumatic arthritis, and bronchial asthma. This represented a major step in the subsequent development of research in psychosomatic medicine. Even though the concept of a certain

personality tied to a specific disease has not held up in most psychosomatic research, it has led to the identification of many psychosocial factors that interact with the disease process. Alexander also stressed the role of the therapist's personality as an important factor in psychotherapy.

Alfred Adler (1870–1937) disagreed with Freud over the dominant role of sexuality in psychopathology. He considered feelings of inferiority to be the original psychological state as a result of the infant's helpless dependency. The goal of healthy personality was to overcome feelings of inferiority. Inferiority was to be overcome by gaining power and mastery. His greatest influence was probably in the development of child guidance movements in Europe and in the United States.

Sigmund Freud (1856–1939), a psychiatrist and founder of psychoanalysis, developed the concept of the unconscious and the technique of dream analysis. He also introduced many other concepts such as instinctual drives, death instinct, sexuality, the dominant role of psychosexual development, narcissism, catharsis, and sexually based neurotic disorders.

Harry Stack Sullivan (1892–1979) was a psychiatrist and psychoanalyst. He deviated from Freud except for unconscious motivation, defense mechanisms, and dream interpretations. He considered the release of energy to be controlled by social relations and the development of personality as the result of interpersonal relations. He elaborated on the importance of self-esteem for mental health. He also insisted that the role of the therapist be one of participant-observer.

René Spitz (1897–1974) proposed that development and organization of the ego originates through the relationship between mother and child. The goal is to further the person's autonomy by progressing through a sequence of ego-organizing tasks. Social smiling, stranger anxiety, bonding with parents, and negative head-shaking are typical tasks. One of his major contributions was his study of the development of infants in a foundling home who were given good medical care, but very little contact with other human beings. These children had lower scores on developmental indices; many had anaclitic depression and very little curiosity or happiness and were prone to infections.

82–84. The answers are 82-c, 83-f, 84-a. *(Sierles, pp 55–60.)* Norepinephrine (NE) has been found to play a role in the development of depression. Most of the evidence is based on the fact that the drugs that are effective in relieving depression enhance the transmission of NE. Of the

two groups of antidepressant drugs, the cyclic antidepressants block the presynaptic uptake of NE and the monoamine oxidase inhibitors block the enzymatic degradation. Furthermore, an antihypertensive drug, such as reserpine, can cause depression by disrupting the transmission of NE. This is sometimes referred to as the catecholamine hypothesis of mood disorders in which a functional deficiency of NE results in a depressed mood. While this is probably only a part of the total mood disorder equation, it is important to keep in mind that metabolic reactions can be bidirectional and behavior can affect the modulation of neurochemicals, as well as be affected by neurochemical reactions.

γ-aminobutyric acid (GABA) is an amine acid neurotransmitter that is associated with a modulating effect on anxiety. It is bound to brain receptors, and when GABA neurons fire, they dampen excitement generated in the central nervous system (CNS). When GABA receptors are blocked, the excitability in the brain increases, sometimes leading to seizures. When the postsynaptic receptors are bound with GABA, the chlorine channels open and the influx of chlorine negative ions hyperpolarizes the cell membrane, thus decreasing the likelihood of firing. Acetylcholine is a neurotransmitter that is essential for memory. Persons given an anticholinergic drug that blocks acetylcholine acquire a memory deficit. When this is counteracted by another drug, memory is restored. Other studies of patients with Alzheimer's disease have confirmed the importance of acetylcholine in memory. The cholinergic hypothesis of memory has also been confirmed by pathology studies.

85–91. The answers are 85-c, 86-n, 87-n, 88-j, 89-g, 90-m, 91-g. *(Baum, pp 190–201. Fauci, pp 563–572.)* As with myocardial infarction and cardiovascular disease, depression is an active component of cancer. Roughly one-half of cancer patients suffer from at least moderate symptoms of depression. If the depression becomes severe and persists, it can seriously reduce the patient's survival time. Likewise, its remission can increase the disease-free period. Other emotional disruptions, such as isolation or lack of social support, can elevate mortality and morbidity rates. While stress has only partially been implicated in the initiation of cancer, it has a major effect on the progression and prognosis of cancer. Much of this effect is through the impact of stress on the immune system. Lymphocytes appear to be directly weakened by stress, and the ability of the immune system to combat and limit the growth of the active cancer cells is severely reduced.

Ronald Glaser found that stress is able to disrupt DNA repair within cells by reducing the level of the enzyme that assists with the cell's ability to repair itself. Without this ability to repair DNA, or even with a reduction of it, the cancer-causing agents cannot be minimized. Furthermore, a cell with damaged DNA can multiply without direction or control, possibly facilitating tumor growth. Another study of stressed psychiatric patients by Janice Kiecolt-Glaser showed poor DNA repair in lymphocytes. Researchers are beginning to explore the mechanism by which stress may affect immune function and cancer disease states.

Smoking has been well established as a risk factor for lung cancer. Smoking affects the immune system and reduces immunosurveillance, increasing the opportunity for tumor growth. Direct organ system damage also can occur, as in lung cancer.

Recent research has linked high fat intake with colon cancer. This is especially relevant for the high animal fat diets most often seen in upper socioeconomic populations. Epidemiologic studies have established a direct correlation between colon cancer and elevated serum cholesterol and consumption of calories, meat protein, and dietary fat.

High fat intake is also related to breast cancer. There is an associative risk between total caloric intake and breast cancer, but the strongest link is with high fat intake. There is evidence for social and cultural effects on dietary etiology. For example, Japanese women who have "Americanized" their diets appear to be more susceptible to breast cancer than Japanese women who consume the traditional Japanese diet.

Support group psychotherapy has a positive effect on the mortality and morbidity rates of women with metastatic cancer of the breast. Spiegel established a one-year group psychotherapy intervention program for women with active metastatic breast cancer and followed them for several years. The women receiving the standard medical care plus the group support lived an average of 18 months longer than the control group receiving only the standard medical care. The group intervention women also revealed more effective coping, less pain, and better mental health and mood. This was attributed to the opportunity for mutual support, social comparison, and expression of emotional distress.

Behavioral Genetics

Questions

DIRECTIONS: Each item below contains a question or incomplete statement followed by suggested responses. Select the **one best** response to each question.

92. In studies of older twins, which of the following characteristics has the highest degree of heritability?

a. Nonclinical depression symptoms
b. Longevity
c. Interpersonal skills
d. General cognitive ability
e. Intellectual ability

93. Which of the following characteristics has the greatest genetic heritability change over time?

a. Blood pressure
b. Body weight
c. Alcoholism
d. Heart rate
e. Nicotine addiction

94. Which of the following anxiety disorders has the strongest degree of heritability?

a. Panic disorder
b. Generalized anxiety
c. Specific phobia
d. Posttraumatic stress disorder
e. Obsessive-compulsive disorder

95. Parents of a child with attention deficit hyperactivity disorder (ADHD) consult with you to inquire about the heritability of the disorder. The husband had attention span and learning problems in secondary school. One of his brothers did also, and an uncle may have had learning problems. You response would include the fact that ADHD has a heritability of approximately

a. 70%
b. 60%
c. 50%
d. 40%
e. 30%

96. Of the following illnesses or syndromes, which is most related to genetic factors?

a. Schizophrenia
b. Panic disorder
c. Bipolar disorder
d. Alcoholism
e. Antisocial personality

97. Ethology was originally developed by which of the following concepts?

a. Behavior is best studied under controlled conditions
b. Behavior is best studied comparatively
c. Behavior is the result of interaction between genetic endowment and environment
d. Innate behavior is triggered by a sign stimulus or releaser
e. Previous learning is unnecessary for the successful expression of a fixed action pattern

98. A young man consults you because his older brother has schizophrenia and he is concerned about his risk of developing schizophrenia. Obviously several issues need to be addressed. With regard to the genetic risk, a sibling of a patient with schizophrenia is more likely to develop the disease than a person with a negative family history by a factor of about

a. 3
b. 6
c. 9
d. 12
e. 15

99. The most frequent genetic cause of mental retardation is

a. Bartholin-Patau syndrome
b. Edwards' syndrome
c. Down's syndrome
d. Turner's syndrome
e. Klinefelter's syndrome

100. Which of the following studies is most effective in estimating the genetic risk of an alcoholic offspring's becoming an alcoholic if adopted or raised by a nonalcoholic family?

a. Family studies
b. Studies of twins reared together
c. Adopted twin studies
d. Nontwin adoption studies
e. Pedigree and linkage studies

101. A person with Klinefelter's syndrome has the genotype

a. XYX
b. YY
c. XXY
d. XYY
e. XXX

102. Heredity accounts for approximately what percentage of total variation in IQ scores within a family?

a. 5%
b. 25%
c. 50%
d. 75%
e. 100%

103. From studies of twins reared together and reared apart, which of the following characteristics has been confirmed as having the highest heritability?

a. Aggressiveness
b. Extroversion
c. Empathy
d. Stress reaction
e. Neuroticism

104. A young woman had an initial episode of psychosis at age 19, with paranoid delusions, auditory hallucinations, and disorganized behavior. She responded well to an atypical neuroleptic, but has not been able to live independently and develop an occupation. She has had two subsequent psychotic episodes similar to the initial one. The etiology of her chronic psychiatric illness is most strongly related to

a. Environmental factors
b. Polygenic inheritance
c. A chromosomal abnormality
d. Simple recessive inheritance
e. An inborn error of metabolism

105. A disorder resulting from a single gene defect that may produce severe behavioral disturbance is

a. Major affective disorder, bipolar type
b. Dyslexia
c. Phenylketonuria
d. Porter's syndrome
e. Down's syndrome

106. Which of the following choices shows the highest heritability in later life?

a. Type A behavior
b. Locus of control
c. Depressive symptoms
d. Dementia
e. Self-perceived competence

107. Which of the following traits has been most useful for behavior geneticists studying heritability of personality?

a. Agreeableness and likeability
b. Conscientiousness and conformity
c. Culture and openness
d. Extraversion and neuroticism
e. Friendliness and achievement

108. Genetic counseling most often involves

a. Resolving concern about the risk of a disease for other children
b. Helping to resolve major ethical dilemmas
c. Reassuring the patient or parents by administering more definitive tests
d. Conveying information about risks and burdens
e. Being nondirective but emphasizing the rights of the individual

109. The importance of genetic factors in alcoholism is demonstrated by which of the following clinical research findings?

a. Close relatives of alcoholics have a 10-fold increased risk
b. An alcoholic's children who are given up for adoption at birth are at fourfold increased risk
c. Close relatives of alcoholics are significantly more vulnerable for other psychiatric illnesses
d. Children of an alcoholic become more intoxicated at a given alcohol level than do controls

110. A young man consults you regarding his drinking habits and his risk for developing alcoholism given his family history. He has several male relatives who have had alcoholism, including a paternal uncle and his brother who is his monozygotic twin. Which of the following characteristics would be most heritable, given his brother's history?

a. Tendency to develop dependence
b. Craving for alcohol
c. Rate of alcohol metabolism
d. Functional tolerance to alcohol
e. Positive reinforcement from alcohol

111. Of the following variables that influence gender identity and /or behavior, which one does not influence gender identity?

a. Chromosomal configuration (XX or XY)
b. Gender assigned at birth
c. Internal reproductive structures
d. Role model of parent
e. Response of parent to child's assigned gender

112. Ethology has made major contributions to understanding human behavior through the following concept:

a. Instinctual driver
b. Ethnic bonds
c. Operant conditioning
d. Critical period
e. Developmental stages

113. An infant smiles every time the parents approach the crib and look at him. Emotional expressions in an infant, such as smiling, are stereotyped sequences of movements that are under the control of

a. A specific sign stimulus
b. Genetic influences
c. A conditioned response
d. Imprinting
e. Cultural determinants

114. Which of the following is least likely to be considered an ontogenetic stage of synaptic development and modification?

a. Synapse formation under genetic and developmental control
b. Maintenance of newly developed synapses occurring during critical periods
c. Regulation of transient and long-term effectiveness of synapses
d. Integration of cellular structure for human mentation
e. Alteration of preexisting pathways and development of new patterns

115. Major patterns of human behavior have the potential of containing major innate (i.e., genetic, or not learned) components as well as learned cultural components. Which of the following behavioral patterns is a learned cultural behavior?

a. Intelligence
b. Brow flash response
c. Facial expressions of anger, fear, disgust, and joy
d. Smiling
e. Handshake greeting

DIRECTIONS: The group of questions below consists of lettered headings followed by a set of numbered vignettes. For each numbered vignette select the **one** lettered heading with which it is **most** closely associated. Each lettered heading may be used once, more than once, or not at all.

Questions 116–118

For each later condition or behavior listed below, select the most closely associated early predictor.

a. Birth weight
b. Handedness
c. Temperament
d. Age of mother at birth
e. Intelligence
f. Malnutrition
g. Aggressiveness
h. Assertiveness

116. A middle school child is performing poorly in school. Which early childhood characteristic would be the most likely to predict later school performance?

117. You are conducting a study of early childhood tracts or characteristics that predict the need for evaluation or services provided to adults at a mental health center. Which early predictor would have the strongest association?

118. You are conducting a study of childhood behaviors or conditions that would be early predictors of adolescent and young adult violence. Which early characteristic would have the strongest association?

Behavioral Genetics

Answers

92. The answer is d. *(Plomin, pp 217–232.)* From studies of monozygotic and dizygotic twins and adoption studies, it is clear that there is a very strong genetic contribution to general cognitive ability. Over a lifespan, the heritability of cognitive ability is comparable to that of height. In later life, the heritability estimates reach 80%, one of the highest heritability levels reported for behavioral traits. Interpersonal skills, intellectual abilities, and domestic skills show heritabilities of about 50%. Nonclinical depression in older twins has shown only a modest level of genetic influence (about 15% heritability). However, for twins with shared environmental influence, the heritability is quite strong (about 25% of the variance).

93. The answer is b. *(Plomin, pp 217–229.)* Genetic research has demonstrated substantial genetic influence on body weight and obesity with heritability of about 70%. In the first year of life, there is almost no heritability of body weight. After the first year heritability begins to increase, especially during adolescence, and then at adulthood it levels off at approximately 70%. Even though eating habits, exercise, and other environmental factors can greatly affect the expression of genes, twin and adoption studies are consistent in their findings of approximately 70% risk of obesity in diabetes, cardiovascular disease, and other illnesses. Heritability does not in any way support the inevitability of obesity. However, it does constitute "double jeopardy" and reinforces the need for disciplined consumption of proper and limited diets and sufficient activity throughout childhood, adolescence, and adulthood.

The linking of acute psychological stressors with blood pressure and heart rate to heritability has shown 50% heritability. Evidence shows that genetic contribution increases from middle to late adulthood from about 30 to 50%. Twin and adoption studies have also shown that a moderate heritability for alcoholism exists (about 40% in first-degree male relatives and about 20% in female relatives). Nicotine is a highly addictive drug with individual susceptibility characteristics and its addictive properties are influenced by genetic factors. The results of twin studies show that if one

twin is addicted to smoking, the other twin will also be addicted in 75% of identical twin cases and 63% of fraternal twin cases.

94. The answer is c. *(Plomin, pp 183–187.)* The disorders involving anxiety are broad, and include panic disorder, generalized anxiety, specific phobias, posttraumatic stress disorder, acute stress disorder, medical condition anxiety, substance-induced anxiety, and obsessive-compulsive disorder (which is most often an attempt to ward off anxiety).

While anxiety disorders are not as crippling as schizophrenia or depressive disorders, they are still the most common form of mental illness, and they can lead to other disorders, especially depression and alcoholism. The incidence for panic disorder is 3 to 7%; generalized anxiety, 5%; specific phobias, 11%; social phobia, 13%; and obsessive-compulsive, 3%. Panic, generalized anxiety, and specific phobias are twice as common in women as in men.

Genetic research on anxiety disorders is somewhat mixed, but a family study of panic disorder found a risk of 25% in first-degree relatives and 2% in controls. Generalized anxiety disorder is also familial with first-degree relatives having a 20% risk (versus a 5% risk in the general population). A recent family study of specific phobias found 31% for first-degree relatives and 11% for controls. Posttraumatic stress disorder (PTSD) found a small genetic influence in one twin study. Obsessive-compulsive disorder family studies found heritability to be small but unclear.

95. The answer is a. *(Plomin, pp 188–192.)* Twin studies have consistently shown a strong genetic effect for the heritability of attention deficit hyperactivity disorder (ADHD). The findings show the heritability to be about 70%. The genetic component for ADHD is stronger than for most other psychopathologies except autism. Adoption studies also support the high heritability of ADHD.

The *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)* defines ADHD as a disorder in which a child is very restless, has a poor attention span, and acts impulsively. Prevalence is about 4% of elementary school children, with boys outnumbering girls. European psychiatrists put more emphasis on the pervasive hyperactivity and early onset, but not on high anxiety. One problem with the *DSM-IV* grouping ADHD with disruptive behavior disorder is that disruptive behavior disorder shows only

modest genetic influence and doesn't involve hyperactivity or inattentiveness. Nevertheless, there is some overlap between hyperactivity and conduct disorder symptoms, e.g., early onset hyperactivity has an increased risk for the later onset of conduct problems. However, the comorbidity rate has diminished for the "pure" ADHD probands who do not show symptoms of conduct disorder.

96. The answer is a. *(Sierles, p 66. Ebert, pp 61–79.)* Using family heritance, twin, and adoption studies, schizophrenia, bipolar disorder, alcoholism, and antisocial personality have all been demonstrated to have genetic factors. On the other hand, panic disorder has been shown to have a familial factor but has not been demonstrated to be strongly genetic by monozygotic and dizygotic twin and adoption studies. Other illnesses or syndromes with strong genetic components are unipolar disorder, depression, anorexia nervosa, obsessive-compulsive disorders, and some anxiety disorders.

97. The answer is e. *(Kandel, pp 9–18.)* Ethology was developed by Konrad Lorenz and Nicholaas Tinbergen during the period from 1920 to 1950 by conducting comparative studies of unlearned behavior with special emphasis on its mechanisms, ontogeny, and evolution. They emphasized the observation of behavior under natural conditions and recognized that all behavior is the result of the interaction between the animal's genetic endowment and the animal's internal and external environment. Innate behavior is a relatively complex sequence of responses, called a fixed action pattern, which is triggered by a sign stimulus or releaser. Thus behavior patterns (e.g., mating) in lower animals can be activated by a specific stimulus (e.g., the male stickleback fish develops a bright red abdomen [the sign stimulus] that triggers mating behavior [fixed action patterns] of the female). A fixed action pattern, somewhat like a reflex, does not require previous learning for its expression.

98. The answer is c. *(Plomin, pp 26–27.)* The risk of schizophrenia in the general population is about 1%. Studies of the risks for relatives of schizophrenics reveal that schizophrenia runs in families. Siblings of schizophrenics are approximately nine times more likely to become schizophrenic than are persons chosen randomly from the population; this rate almost doubles when those siblings have an affected parent as well as an affected sibling.

The risk is no greater when the mother is schizophrenic than when the father is schizophrenic. If both parents are schizophrenic, the risk becomes four times as great as when only one parent is schizophrenic. Grandchildren of schizophrenics have about twice the risk as the general population since grandchildren share about one-fourth of the grandparent's segregating genes; great-grandchildren (sharing about one-eighth of the genes) have a slightly more than average chance of becoming schizophrenic.

99. The answer is c. *(Plomin, pp 1–2, 116–118.)* Almost all chromosomal abnormalities influence general cognitive ability and growth. Down's syndrome is the most frequent genetic cause of mental retardation. It often bears a strong relationship to maternal age. Persons with Down's syndrome have 47 chromosomes instead of the normal 46. The syndrome was originally named trisomy 21 because, at the time, the trisomy was thought to involve the next to the smallest autosome (number 21 by the Denver system of enumeration). It is now known that the smallest autosome is the one in triplicate. Even though Down's syndrome should really be called trisomy 22, the error is so firmly entrenched in the literature that it is still referred to as involving chromosome 21.

Turner's syndrome (XO) occurs in females with the absence of one of the two X chromosomes. Although most sufferers have a normal IQ, Turner's syndrome nearly always involves sterility, with some limited secondary sexual development. Persons with Klinefelter's syndrome (XXY) are phenotypic males with an extra X chromosome. About 1% of males institutionalized for retardation have Klinefelter's syndrome. Bartholin-Patau syndrome (trisomy 13) and Edwards' syndrome (trisomy 18) are caused by trisomy of chromosomes 13 and 18, respectively. Sufferers are characterized as severely retarded, and most die in the first few months of life.

100. The answer is d. *(Sierles, pp 64–65. Ebert, pp 61–79.)* A nontwin adoption study can be most helpful in determining the effect of being raised by a nonalcoholic family on the offspring of an alcoholic parent. The genetic effect of having an alcoholic biologic parent can be determined by longitudinally observing the rate of alcoholism in the offspring of alcoholic parents who were adopted by (raised by) nonalcoholic families and comparing it with the rate of alcoholism in adopted children of nonalcoholic biologic parents. A higher rate of alcoholism will occur in the adopted children of alcoholic parents, but it will be less than that of those raised by an

alcoholic parent. A similar strategy can determine the effect of having a biologic parent who is mentally ill, but of being raised by a parent who is not mentally ill. A cross-fostering variation of nontwin adoption studies can also determine the effect of being reared by a mentally ill parent.

101. The answer is c. *(Plomin, pp 118–119.)* Persons with Klinefelter's syndrome, a genetic disorder of men, exhibit a variety of male morphological and behavioral characteristics. This phenomenon is attributed to the extra X chromosome in such a person's genotype (XXY). These persons represent nearly 1% of males institutionalized for retardation, epilepsy, or mental illness; the incidence in the general population is 1 per 750 newborn males. They generally have abnormally small testes, low levels of male hormone (testosterone), and sterility. In spite of a high incidence of mental retardation, about 75% have IQs within the normal range. In females with the triple X syndrome (XXX), the occurrence of the extra X chromosome is about 1 in 1000 female births. The average IQ for Klinefelter's females is about 85, which is lower than the IQ for Klinefelter's males.

102. The answer is c. *(Plomin, pp 139–142.)* Studies of several decades ago calculated that heritability accounted for about 70 to 75% of the total variation in IQ scores within a family. More recent studies involving much larger samples show that the individual differences in general cognitive ability within families are actually closer to 50%. Inheritance is still a major factor in the development of individual differences in IQ, since no specific environmental influence has been found to account for even as much as 10% of the variance in IQ scores within families.

103. The answer is a. *(Sierles, pp 66–68. Ebert, pp 61–79.)* Aggressiveness—the readiness to argue or fight or even to be vindictive—has been shown by studies of monozygotic (MZ) and dizygotic (DZ) twins reared together and apart to have a high heritability. Extroversion, empathy, and neuroticism have been found to have a high heritability in twins reared together, but not in twins reared apart. Similarly, stress reaction (feeling vulnerable or given to worry) has been found to have a high heritability whether twins are reared together or apart, but not as high as aggressiveness. Many traits of MZ and DZ twins have been found to have a high heritability of 39 to 58%, whether the twins were reared together or apart.

104. The answer is b. *(Plomin, pp 26–37.)* Complex behavioral traits such as schizophrenia, which may vary widely in nature from person to person, are considered to involve anomalies at more than one gene locus. The science of behavior genetics deals with the quantitative analysis of these polygenic traits. The results of a great variety of investigations now favor the view that schizophrenia is a genetically determined disorder, but it also may be substantially affected by environmental influences.

105. The answer is c. *(Plomin, pp 5–6, 111–112.)* Phenylketonuria (PKU) results from the inheritance of a double recessive gene. Affected persons suffer an inability to metabolize phenylalanine, a common amino acid in food. If the condition is undetected in time for treatment with special diets, serious mental deficiency results, presumably as a consequence of the toxic effect of abnormal blood levels of phenylpyruvic acid on the developing brain. About 1% of institutionalized persons with retardation have PKU. Most persons with PKU do not become mentally retarded if they are given a diet low in phenylalanine during the developing years. Early identification of affected infants combined with replacement of milk with galactose-free substances has been quite successful in reducing the subsequent mental retardation. PKU is a good example of genes affecting behavior in the same way genes affect phenotypes. Its treatment also provides an example of an environmental intervention successfully bypassing a genetic problem.

106. The answer is e. *(Plomin, pp 229–232.)* A study of older twins found that self-perceived competence showed a heritability of about 50%. This includes interpersonal skills, intellectual abilities, and domestic skills. Self-perceived competence is particularly important because it directly relates to quality of life. Physicians and health care providers try to develop programs and services that enhance the quality of life of the elderly through the preservation and continued growth of self-perceived competence.

Depressive symptoms in later life have shown a 15% heritability—a moderate rate. Type A behavior also has shown moderate heritability, typical of personality measures in older twins. Locus of control was also judged to have moderate heritability. However, the perceived role of luck in determining life's outcomes showed no genetic influence but did show shared environmental influence. Several twin studies have shown a moderate genetic influence, but it is a very active area in molecular genetic research.

Several genes have been identified that account for a form of dementia with onset in middle age. Apolipoprotein-E has been identified in late-onset dementia. More recent twin studies of dementia have found identical twin concordances to be approximately 60% and fraternal twin concordances to be approximately 30%.

107. The answer is d. *(Plomin, pp 195–201.)* Behavioral geneticists and psychologists have focused on the "big five" traits for many years. Extraversion and neuroticism have been studied the most. Extraversion includes such traits as sociability, impulsiveness, and liveliness, while neuroticism includes emotional stability, moodiness, anxiousness, and irritability. The other three traits of the big five have been studied less intensively; they are agreeableness as in likeability and friendliness, conscientiousness as in conformity and the will to achieve, and culture as in openness to experience.

To study extraversion and neuroticism, twin studies were conducted in five different countries. Correlations were approximately .50 for identical twins and about .20 for fraternal twins. Lower heritability was found in adoption studies, perhaps due to nonadditive genetic variance and to special environmental effects. The conclusions drawn from other twin studies are that nearly all personality traits show moderate heritability, but environmental variances make children who grow up in the same family different from one another. This means that even identical twins growing up in the same family do not have the same experiences or environment, and physicians should keep that in mind as they observe and relate individual behavior variability to the etiology of illness and health.

The other three traits of agreeableness, conscientiousness, and culture have yielded heritabilities of 35%, 38%, and 45%, respectively. Plomin asserts that additional methods should be explored for measuring personality traits, including the use of time sampling, storytelling, and autobiographical material and observations to confirm the present evidence for genetic influence. The association between personality and psychopathology is also important, especially to explore the reports of specific genes that may be associated with a certain personality.

108. The answer is d. *(Plomin, p 104.)* Genetic counseling is a crucial task performed by the health care professional. It most often consists of conveying fact-oriented information to the parents or the patient about the risks and burdens of a disease. Genetic counseling usually does not include

an opportunity to alleviate anxiety through a nondirective discussion. While factual information is important, dispelling mistaken beliefs, allaying anxiety, and having the opportunity to discuss the personal and ethical options with someone who knows, cares, and is willing to follow up on the initial session is a good start toward meeting the needs of the patient, parents, or family.

109. The answer is b. *(Fauci, p 2506.)* Family, twin, and adoption studies support the importance of genetic factors in alcoholism. Close relatives of alcoholics have a fourfold increased risk, which is still true even if the children of alcoholics are given up for adoption at birth without the alcohol problems of their parents being known. The fourfold increased risk of close relatives for alcoholism does not make them significantly more vulnerable for other psychiatric illnesses. Twin research has shown that the risk for the identical twin of an alcoholic is much higher than for a fraternal twin. Other studies suggest that the children of an alcoholic become less intoxicated at the same blood alcohol level than do controls. This occurs even before alcoholism develops. At the age of 20, this is a powerful predictor of alcoholism at the age of 30.

110. The answer is c. *(Fauci, pp 2503–2506.)* Studies have demonstrated that animals can be selectively bred for their preference for and consumption of alcohol and for their susceptibility to the effects of alcohol upon the central nervous system. Individual differences also occur in the amount of acquired functional tolerance and positive reinforcement. The rate of metabolism is more concordant in monozygotic twins than in dizygotic twins. Alcohol dehydrogenase (ADH) metabolizes alcohol and results in an increased level of toxic acetylaldehyde. This acts to suppress alcohol consumption, presumably through aversion control. Studies have also shown that some aspects of dependence are heritable, especially severity of dependence and craving for alcohol.

111. The answer is d. *(Schuster, p 301.)* Seven significant variables potentially influence one's gender identity. They are (1) chromosomal configuration (XX or XY), (2) gonad endowment (ovaries or testes), (3) internal reproductive structures (uterus or prostate), (4) external genitalia (vagina or penis), (5) hormonal balance (estrogen or androgen), (6) gender assigned at birth, and (7) response of the parents to the child's

assigned gender. The role model of either parent is an important influence on a person's gender behavior but not on gender identity, which occurs earlier than the learning of gender behavior.

112. The answer is d. *(Kaplan, pp 162–168.)* Ethology in psychology and biology has made a number of conceptual contributions to understanding human behavior through the comparative study of animal behavior in relation to natural habitat. Ethologists have found evidence to suggest that some aspects of human behavior may be a function of species membership in the form of predispositions to learn and respond in certain ways rather than the fixed sequences of motor activity found in lower animals. The fixed action pattern is a genetically established sequence of motor activity that is triggered by a sign stimulus that is sufficient to release the fixed action pattern of behavior. These links between sign stimulus and fixed action pattern are weaker and more variable in humans because of the overriding effects of experience and learning. However, certain predispositions to respond to certain stimuli in certain ways are presently being explored. Imprinting includes the tendency of very young animals to become fixed on and follow a member of their own species (usually their mother, but another animal or even an object can be substituted). The period of development when there is maximum receptivity to these crucial cues is known as the critical period. Bond formation between infants and adults does occur in both humans and lower animals, but ethnic bonds appear to be almost totally learned rather than biologically established.

113. The answer is a. *(Kandel, pp 36–60.)* Humans have a number of simple behaviors that resemble the fixed action patterns of lower animals. Such emotional expressions as the startle response and smiling are stereotyped sequences of movements. In human infants smiling appears to be under the control of a specific sign stimulus. Studies show that the smiling response is not triggered by the face as a whole, but rather by certain specific features. For example, the eyes are of particular importance as a sign stimulus, and as the child matures, other features of the face become important. The brow flash response (rapid raising and dropping of eyebrows) is a stereotyped response present in widely different cultures and is used as part of a greeting response. A complex set of human behaviors that is universal in emotional expression across cultures and that involves a stereotyped sequence of fixed action patterns includes the facial expres-

sions of anger, fear, disgust, and joy. As an example, babies who are born blind can have emotional facial expressions that appear normal. While apprehension may include some of the responses also found in fear, it does not include as many, nor are the responses as severe.

114. The answer is d. *(Kandel, pp 175–186.)* In general, there are at least three ontogenetic stages of synaptic modification. The first is the stage of synapse formation, which occurs under genetic and developmental control. The next stage is that of maintaining and fine-tuning of the newly developed synapses during early critical periods of development. This requires an appropriate pattern of environmental stimulation. The third stage is the regulation of the transient and long-term effectiveness of the synapses, which takes place throughout life as one initiates and accumulates day-to-day behavioral experience. An overall stage involving environmental and learning factors brings out the latent and potential capabilities for all behaviors by altering the effectiveness of preexisting neural pathways and effecting the expression of new patterns of behavior.

115. The answer is e. *(Kandel, pp 1247–1279.)* Even though most research on innate behavior has been done on nonmammalian species, nonhuman primates also exhibit innate behavior with innate releasing mechanisms. Some studies with humans demonstrated innate (i.e., genetic, or not learned) determinants of human behavior (e.g., hormonal determinants of gender identity). Since genes control so much of the formation and organization of the basic components of all behavior, including human behavior, behavior must to some extent be under genetic control. Inherited factors nearly always depend on the interaction of genetic and environmental factors to be expressed. Some severe mental illnesses, such as schizophrenia, Down's syndrome, and bipolar depression, have known hereditary factors. Intelligence also has a strong genetic component. Certain human behaviors are universal across cultures—for example, deep tendon reflexes, the eyeblink, and startle reflexes. There are also common drives and needs, such as hunger, thirst, and sex, and probably the need for social contact and a number of sensory experiences. Certain emotional expressions and facial motor patterns are also universal—for example, facial expressions of anger, fear, disgust, and joy. Infant smiling is a stereotyped behavior that appears to be controlled by a specific sign stimulus, not always in response to another smiling human face. The brow flash response

is also stereotyped and consists of a rapid raising and dropping of the eyebrows as a part of the greeting response between persons who know each other, while a handshake is a learned cultural behavior.

116–118. The answers are 116-e, 117-c, 118-g. *(Sierles, pp 66–71, 128–131, 358–363. Kaplan, pp 34–35.)* Childhood behaviors or conditions often predict later behaviors. Childhood intelligence tends to predict later school performance. Since there is a high heritability of IQ (50 to 70%) and school performance depends heavily on specific cognitive abilities such as verbal ability, spatial ability, learning, and retention, early demonstration of these attributes will predict a higher school performance in the future.

Temperaments expressed during childhood are predictive of adult temperaments, and persons with difficult temperaments are more apt to require later psychiatric care. The measurement of temperament has nine components: activity level, rhythmicity (the regularity of body functions, such as sleeping and eating), tendency to approach or withdraw from new persons or situations, adaptability, response to stimulation, intensity, quality of mood (whether the subject is pleased, friendly, crying, unfriendly), distractibility, and attention span. For example, the difficult child (about 10%) will demonstrate intense reactions, show irregularity of functions, tend to withdraw, and adapt poorly. Even though temperament has a heritable component, the environment and especially interpersonal relationships with parents and their expectations can modify and "harness" a difficult temperament.

Aggression in childhood can predict future expressions of aggression and violence in adolescence and adulthood. This higher expectancy of continued aggression and violence is in part related to heritability confirmed by studies of twins, whether reared together or apart. Other studies have also confirmed that family environment has a strong influence on the transition of aggression and antisocial behavior into violence. For example, the risk of antisocial and violent behavior in adulthood is increased by low social status; low educational attainment; lax, inconsistent, or severe discipline; instability of early home environment; and being reared by a violent or criminal parent. The triad of male, young, and poor is overrepresented in the perpetrators of violence and in the victims of violence. The principle that past behavior tends to predict future behavior still holds.

Individual Behavior and Personality

Questions

DIRECTIONS: Each item below contains a question or incomplete statement followed by suggested responses. Select the **one best** response to each question.

119. Retrospective studies have shown that the psychological response exhibited by the patient upon receiving the diagnosis of breast cancer that is associated with a shortened survival time is

a. Forceful denial
b. Stoic acceptance
c. Fighting spirit
d. Anxiousness
e. Helplessness

120. Cancer screening and early detection of cancer are important public health goals. The factor that is most likely to lead to effective participation is

a. Convenience
b. A friend's opinion
c. Knowing and understanding the seven warning signs of cancer
d. Mass media appeals
e. Perceived risk

121. A 50-year-old man asks for help in establishing an effective weight loss program. He has been 40 lbs overweight for several years. In planning a weight loss intervention, the most effective self-management procedure is

a. Information control
b. Self-monitoring
c. Self-punishment
d. Self-reward
e. Enlisting social support

122. A 40-year-old man is asked to be evaluated by the company physician because he failed a mandatory random drug screen. The history indicates a pattern of substance abuse. The psychosocial factor most likely to be found in this person is

a. Delusions of grandeur
b. Depressed mood
c. Rationalization
d. Denial
e. Antisocial behavior

123. Which of the following negative emotional states or conditions most commonly precedes relapse in the treatment of addictive behaviors?

a. Stress
b. Depression
c. Anxiety
d. Anger
e. Frustration

124. Although there is no uniform asthmatic personality type, the most frequent psychological characteristic of boys with bronchial asthma is

a. Hostility
b. General anxiety
c. Frustrated oral needs
d. Dependency
e. Latent homosexuality

125. According to psychoanalytic theory, which of the following statements about the development of the superego is true?

a. It is present at birth
b. It begins to develop during the first two years of life
c. It begins to develop during the fifth or sixth year of life
d. It begins to develop during puberty
e. It begins to develop in late adolescence

126. Freud maintained that neuroses were primarily a result of

a. Overly severe toilet training
b. Inappropriate identification
c. Primary processes
d. Inadequate superego development
e. Sexual disturbances

127. All of the following psychiatric disorders are diagnosed more often in women than in men. The most frequently diagnosed disorder in women is

a. Depression
b. Obsessive-compulsive disorders
c. Anxiety disorders
d. Bulimia
e. Anorexia nervosa

128. The *DSM-IV* classification of psychiatric disorders represents a major advance in psychopathology by

a. Detailing the treatments for various mental disorders
b. Predicting the outcome of less severe psychological problems
c. Evaluating the efficacy of various drug treatments
d. Assessing the potential etiology of abnormal behaviors
e. Defining by empirical criteria a wide variety of psychiatric disorders

129. Mr. Baker, a 40-year-old stockbroker, is stressed and worried because he feels he has many of the personality and physical characteristics that place him at risk for coronary heart disease. His physical examination, laboratory results, symptoms, and electrocardiogram tapes confirm that he is indeed at moderate risk. To assess which of his personality and behavioral patterns could put him at an even higher risk, it would be best to test him with the

a. Millon Behavioral Health Inventory
b. Cohen Perceived Stress Scale
c. Rosenman and Friedman Type A Structured Interview
d. Jenkins Activity Survey of Type A Behavior
e. Cook-Medley Hostility Inventory

130. Freud maintained that interruptions in the flow of free association were indicative of which of the following?

a. Reaction formation
b. Resistance
c. Repression
d. Parapraxis
e. The pleasure principle

131. The most common mental disorder in the U.S. population is

a. Phobic disorder
b. Anxiety disorder
c. Schizophrenia
d. Mood disorder
e. Obsessive-compulsive disorder

132. A 30-year-old man with recently developed AIDS is referred to you, as a primary care physician. What is apt to be the most prominent psychosocial factor or reaction that you can expect from him and perhaps help prevent?

a. Loss of independence
b. Fear of losing confidentiality
c. Guilt
d. Depressed mood
e. Suicidal thoughts

133. In traditional psychoanalysis, transference is the process wherein

a. Psychic energy, or libido, is transferred from the id to the ego and superego
b. A patient invests the analyst with attitudes and feelings derived from vital earlier associations
c. Certain psychological symptoms seemingly defer to new symptoms that frequently are more accessible to analysis
d. Early object choices are gradually decathected
e. Latent dream content is transformed into manifest content

134. The Thematic Apperception Test (TAT) would be most useful for which of the following purposes?

a. As an aid in differential diagnosis
b. In prediction of suitability for psychotherapy
c. In assessment of suicidal risk
d. In assessment of intellectual level
e. In assessment of motivational variables

135. One of the most frequent behavioral manifestations that may be helpful in identifying a child who has been sexually abused is

a. Simulation of sex acts with dolls
b. Decrease of hugging and body touching
c. Inclusion of genitalia in drawings
d. Verbal references to molestation
e. Sleep or phobia disorders

136. In the assessment of personality, the normative and objective method refers to

a. The use of inkblot techniques
b. Sophisticated techniques for measuring the accuracy of a person's perception of reality
c. Predictions of behavior on the basis of intensive interviewing
d. Predictions of behavior on the basis of data from personality tests
e. A way of evaluating personality rather than of simply assessing how a person behaves

137. Among combat veterans, the greatest risk for posttraumatic stress disorder is among those who

a. Were violent prior to service
b. Have a prior history of depression
c. Have coexisting sociopathy
d. Participated in violence towards noncombatants
e. Have a history of substance abuse

138. In Freudian theory, patients suffering from obsessive-compulsive neurosis customarily display which of the following behavior patterns?

a. Explosive outbursts of temper
b. Isolation, undoing, and reaction formation
c. Conversion of psychological conflicts to somatic symptoms
d. Willingness to engage in antisocial activities and in deviant sexual activity
e. Anxiety when placed in novel situations

139. A person with which of the following mental disorders is most apt to seek medical help?

a. Major depressive disorder
b. Bipolar depressive disorder
c. Dysthymic disorder
d. Anxiety disorder
e. Obsessive-compulsive disorder

140. According to Freud, the superego contains the

a. Conscience
b. Pleasure principle
c. Ego instincts
d. Reality principle
e. Internalized ego

141. Which of the following type A, or coronary-prone, behavioral factors appears to be the best predictor of coronary heart disease?

a. Hostility
b. Competitiveness
c. Time urgency
d. Explosive speech
e. Hyperactivity

142. A middle-aged man is admitted to the hospital for further workup of a suspected malignancy. Which of the following defense mechanisms is most likely to be observed in this individual?

a. Rationalization
b. Projection
c. Displacement
d. Sublimation
e. Denial

143. Patients who have somatization disorder are diagnosed on the basis of their

a. Having unexplained symptoms that persist after treatment
b. Experiencing symptoms in multiple organ systems
c. Having a history of past and present illnesses that have not responded to self-treatment
d. Having a specific number of medically unexplained symptoms
e. Demonstrating positive test results for several chronic illnesses at the same time

144. The most frequent psychiatric disorder of postpartum women is

a. An episode of mild schizophrenia
b. An episode of mania
c. Postpartum blues
d. Major depression
e. Postpartum psychosis

145. The importance of unconscious determinants was most strongly emphasized by which one of the following personality theorists?

a. B. F. Skinner
b. Carl Jung
c. Kurt Lewin
d. Henry Murray
e. Margaret Mead

146. A young adult is in rehabilitation after suffering a closed head injury and a fracture of the femur in an automobile accident. Which of the following psychometric assessments would be most useful in the detection of brain damage?

a. Thematic Apperception Test (TAT)
b. Bender-Gestalt Test
c. California Personality Inventory
d. Minnesota Multiphasic Personality Inventory (MMPI)
e. Millon Behavioral Health Inventory (MBHI)

147. The highest compliance with pharmacologic treatment is found in which of the following illnesses?

a. Diabetes
b. Cancer
c. Hypertension
d. Coronary artery disease
e. Glaucoma

148. Contrary to coping mechanisms, defense mechanisms

a. Confront a problem directly and continue to generate possible solutions
b. Get help when one is unable to handle the problem
c. Work to remove awareness of the conflict
d. Consciously drop certain habits or form new ones
e. Gather information

149. Patients with a strong sense of an external locus of control of health will be more apt to respond to inpatient treatment in the following way:

a. They delegate control of their health to their doctor or significant other
b. They can be relied on to follow treatment orders when they are discharged for outpatient follow-up
c. They respond poorly and less comfortably to inpatient care
d. They prefer to make as many decisions about their care as possible
e. They prefer to maximize their own decision making about their own health care

150. Patients with a strong perception of an internal locus of control regarding health are more apt to respond to their physicians and to outpatient treatment in which of the following ways?

a. They willingly accept the authority of their own physician regarding inpatient treatment
b. They are unlikely to make personal adjustments in the diet prescribed by their own physician
c. They rarely make independent decisions on drug dosages prescribed by their physician
d. They consider themselves and the physician to be a team

151. Which of the following statements is correct with regard to how personality changes over the lifespan?

a. A person's personality traits after age 50 tend to be less variable
b. The personalities of adolescents show levels of stability similar to those of adults
c. Most people redefine and make alterations in their personalities during the period of midlife crisis
d. Personality traits are relatively stable over one's lifespan

152. In designing a behavior modification program for an obese patient, it is important to take into consideration internal and external cues that the patient responds to. The obese patient is least responsive to which of the following cues?

a. Gastric contraction
b. Taste
c. Smell
d. Attractiveness of food
e. Abundance of food

153. Various parameters of behavior and personality are being followed in a cohort of individuals over decades. Which characteristic would be least constant between ages 40 and 80?

a. Emotional stability
b. Sociability
c. Assertiveness
d. Selfishness
e. Wisdom

154. In the health belief model, the patient's compliance is least affected by the

a. Patient's analysis of costs and benefits
b. Patient's perception of severity of the illness
c. Patient's readiness to act
d. Cue to action
e. Objective characteristics of the illness

155. Which of the following psychological tests is not a projective test?

a. Thematic Apperception Test (TAT)
b. Draw-a-Person Test
c. Sentence Completion Test
d. Rorschach test
e. Minnesota Multiphasic Personality Inventory (MMPI)

156. Which of the following statements about the etiology of schizophrenia is correct?

a. Twin, family, and adoption studies have demonstrated that schizophrenia has a significant genetic basis
b. Higher socioeconomic status correlates positively with the incidence of schizophrenia
c. Aberrant patterns of interaction between mother and infant play an etiologic role
d. Communication conflicts in families of schizophrenics play an etiologic role

157. The development of psychoanalytic theory brought a new understanding to the study of psychopathology with regard to the relationship of normal and abnormal mental function. Which of these statements is not part of psychoanalytic theory?

a. All mental events and attitudes have unconscious antecedent causes
b. A significant portion of the contents of the mind is unconscious
c. Normal and pathologic mental functioning are qualitatively different
d. People strive to maximize pleasure and minimize tension
e. Early experience is important in the formation of individual personality

158. You are asked to give a presentation about the relationship between performance and anxiety to an Employee Assistance Program of a corporation. In preparing for the talk, you find that which one of these statements about anxiety is true?

a. Intelligence has no effect on the relationship between performance and anxiety
b. Anxiety as subjectively experienced bears no consistent relationship to physiologic responses commonly associated with it
c. Anticipation of a stressful event usually increases the actual level of anxiety the event evokes
d. Performance levels rise and fall with anxiety levels in a linear fashion
e. Avoidance behavior is reinforced when it reduces an anxiety state

DIRECTIONS: Each group of questions below consists of lettered headings followed by a set of numbered items. For each numbered item select the **one** lettered heading with which it is **most** closely associated. Each lettered heading may be used once, more than once, or not at all.

Questions 159–162

For each patient below, select the lettered psychosocial assessment tool that would best assist in managing the physical and psychosocial aspects of each case.

a. The Sickness Impact Profile (SIP)
b. The Monitor-Blunter Style Scale (MBSS)
c. The Multidimensional Health Locus of Control (MHLC) Scale
d. The Ways of Coping Checklist
e. The SCL-90/SCL-90A Inventory

159. The 45-year-old executive of a clothing manufacturing company has just learned that she has metastatic breast cancer. Her husband reports that she will do well at this stressful time, even though she seems to be seeking emotional release, blaming herself, and avoiding the reality of her situation. It is important to assess how she has responded to stress in the past to plan the best way to help her in the future

160. A 70-year-old engineer has been diagnosed with prostate cancer. Sometimes he insists on knowing his options, but at other times he seems to prefer not to think about his condition. You need help in predicting and working with his reactions

161. A 40-year-old cross-country truck driver says he is bored and is asking for disability for a pain that is ruining his health and his marriage. What tool would help verify the seriousness of his disability?

162. A 30-year-old graduate student, married with three children, complains of many physical symptoms and feelings of anxiety. His wife says that she thinks he is obsessive-compulsive and even a little paranoid at times. You need a quick way to assess the validity of the wife's observations before he leaves the clinic

Questions 163–166

For each of the vignettes below, select the psychological test with which it is most closely associated.

a. Halstead-Reitan Battery (HRB)
b. Wechsler Adult Intelligence Scale (WAIS)
c. Minnesota Multiphasic Personality Inventory (MMPI)
d. Thematic Apperception Test (TAT)
e. Bender-Gestalt Test

163. In working up a child who is having difficulties in the classroom, you have concluded that psychological testing needs to be performed to assess visual motor coordination and the child's maturational level, and also to look for signs of organic brain dysfunction

164. In working up a new patient presenting with depression, paranoid thinking, and a possibility of other psychotic symptoms, you decide that psychological testing would be helpful in diagnosis

165. A patient is presenting with behavioral changes, impulsivity, and memory difficulties, following a closed head injury sustained in an automobile accident. The best choice of a psychological test to help locate and quantify the extent of deficit produced by a specific brain lesion would be

166. In working up a 17-year-old high school student who is having considerable difficulty with schoolwork, and is socially inappropriate at times, you wish to obtain psychological testing to ascertain his abilities to perform what is expected of him in his class

Questions 167–169

For each pairing of unconscious attitude and conscious attitude that conceals it, choose the defense mechanism to which it most closely corresponds.

a. Reaction formation
b. Undoing
c. Denial
d. Projection
e. Isolation

167. I hate him (unconscious); I love him (conscious)

168. I hate him (unconscious); he hates me (conscious)

169. I hate him (unconscious); I don't hate him (conscious)

Questions 170–173

For each combination of sibling relatedness and rearing, select the correlation coefficient which is associated with the two IQ scores.

a. 0.85
b. 0.72
c. 0.60
d. 0.47
e. 0.24

170. Fraternal twins reared together

171. Identical twins reared together

172. Identical twins reared apart

173. Siblings reared together

Questions 174–176

For each concept relating to stress, select the investigator or team of investigators with whom it is most closely associated.

a. Hans Selye
b. Walter Cannon
c. Hippocrates
d. John Mason and Marianne Frankenhauser
e. Richard Lazarus

174. Emotional and physiologic response to danger

175. General adaptation syndrome

176. Psychological appraisal of a potentially stressful event or stimulus followed by coping strategies and/or reappraisal

177. A lay behavioral characteristic of the type A behavior pattern, which has been shown to be a risk factor for coronary artery disease, is

a. Anxiety
b. Passivity
c. Suppressed anger
d. Aggressiveness
e. Neuroticism

178. Type A behavior can be assessed by interview or a variety of self-administered tests and questionnaires. One such instrument that is useful is the

a. Jenkins Activity Survey
b. Beck Anxiety Inventory
c. Halstead-Reitan Battery
d. MMPI
e. Thematic Apperception Test

179. The type A behavior pattern is best conceptualized as a(n)

a. Anxiety disorder
b. Axis 2 disorder
c. Inherited behavior pattern
d. Adjustment disorder
e. Coping style

180. Some recent epidemiologic studies have not found a relationship between type A behavior and coronary artery disease. The best explanation for this inconsistency in the literature is that type A behavior may not be a risk factor in

a. Low risk groups
b. Older subgroups
c. High risk groups
d. Younger subgroups
e. Higher socioeconomic subgroups

Questions 181–184

For each patient described, select the most appropriate personality disorder.

181. A 30-year-old warehouse clerk helps himself to selected items because he feels that the management is overcharging and robbing the customers

a. Schizoid
b. Antisocial
c. Paranoid
d. Borderline
e. Narcissistic

182. A 40-year-old unemployed salesman has superficial charm but is easily irritated; he lost his job because he was intentionally abusive to the boss's dog

a. Schizoid
b. Antisocial
c. Passive-aggressive
d. Borderline
e. Narcissistic

183. An 18-year-old female student was found perched atop the bell tower balcony of her high school; she told the fire chief that she hated her parents and that she felt empty and alone

a. Histrionic
b. Borderline
c. Narcissistic
d. Schizoid
e. Antisocial

184. A 35-year-old bookkeeper in a construction firm has become increasingly frustrated and unhappy with his job over the past 10 years and with the people for whom he has been working, and he complains constantly to his few friends; he finds himself dawdling, procrastinating, forgetting, and arriving late for work, but as his mistakes at work increase, he feels less guilt about them

a. Narcissistic
b. Dependent
c. Avoidant
d. Passive-aggressive
e. Antisocial

Individual Behavior and Personality

Answers

119. The answer is b. *(Baum, pp 193–194.)* While psychological variables may not be identified as a strong causal factor in cancer, they do have an important impact on the course of the disease. Attitudes, beliefs, and behavioral styles that link personality variables with coping mechanisms not only affect the general course of the illness, but also have an impact on recurrence and length of survival. Stoic acceptance resulted in the shortest survival time while a fighting spirit had the most positive effect on the course of the disease and survival time.

120. The answer is e. *(Baum, pp 200–201.)* Cancer screening and early detection are important defenses against the disease and can enhance the treatment potential. Yet it has proved difficult to achieve consistent participation in such programs. Individuals who perceive and believe themselves to be at greater risk are more apt to undergo cancer screening. Friends' opinions are of next importance, but a person will still avoid or postpone screening unless they perceive and believe that they are at risk. Mass media appeals to inform the public, detailing the seven warning signs of cancer, and improving the convenience and access to proper screenings are all helpful, but are still not sufficient. The problem of lack of participation in screenings is not limited to just mammograms or breast self-examination, but also exists for testicular, skin, colon, lung, and most other potential sites of cancer. Most cancers are relatively slow developing, which can provide further incentive for procrastination, and the phenomenon of denial and fear of knowing the truth encourages the delay.

121. The answer is d. *(Baum, pp 304–306.)* There is an increased interest in self-control or self-management programs in terms of what individuals can do for themselves. Many weight loss programs have established that self-reward is the most effective tool during both posttreatment and follow-up. Self-reward acts as a contingent reinforcement for losing weight. Self-monitoring is a part of some self-management programs, but is not as effective as self-

reward. Self-control procedures have been applied to other areas, such as self-management of diabetes where patients can pay attention to specific adaptive behaviors that they can control. Thus, self-reinforcement becomes a powerful cognitive-behavioral intervention.

122. The answer is d. *(Sierles, pp 295–296. Ebert pp 233–259.)* Even though there is no single personality type associated with substance abuse, denial is the major psychosocial factor in these persons. Denial can also complicate the treatment, even though the substance abuser may admit to the addiction. Substance abusers do frequently display delusions of grandeur, are often in a depressed mood, frequently display antisocial behavior, and often rationalize their behavior or situation, but denying the seriousness of their drinking or drug problem and its effect on their life or loved ones is the most common psychosocial factor seen. Denial is a form of self-deception that permeates their psychological and social behavior. A physician must be constantly aware of the influence of denial on the patient's self-reported history and the effect of denial on prognosis.

123. The answer is c. *(Taylor, pp 108–114.)* Negative emotional states of anxiety, depression, anger, frustration, and stress are related to relapse in the treatment of addictive behaviors involved in such disorders as alcoholism, smoking, obesity, and drug addiction. Most patients (about 70%) have negative affects preceding the relapse. The most common negative affect or mood state is anxiety related to the need for the addicting substance to relieve the anxiety. This is followed by anger, frustration, and depression. Furthermore, patients are at increased risk for relapse if they smoke, drink, eat, and so on in an attempt to reduce negative affect.

124. The answer is d. *(Kaplan, p 759.)* Clinical research has determined that the historic formulation of the so-called asthmatic personality is not valid. Psychological factors are important, however, and it has been determined that about one-half of the patients with asthma have strong unconscious wishes for protection centering on persons on whom they are dependent. Threat of loss or separation from the mother can produce attacks of bronchial asthma in some persons, whereas in others the wish for protection produces an intense conflict, so separation can actually produce a remission from an attack. Asthmatic boys, rather than girls, tend to be more dependent on their mothers, whereas asthmatic girls tend to be more

dependent on their fathers. Although girls may try to be self-sufficient, they are frequently chronically depressed. Boys are also apt to be passively dependent, timid, and immature. Both, however, appear to be dominated by a fear of losing parental support.

125. The answer is c. *(Kaplan, pp 206–223.)* Freud maintained that the superego begins to develop around the age of 5 or 6 as part of the resolution of the Oedipus complex. At the end of the phallic stage of psychosexual development (which lasts from around 2½ to 6 years of age), children must abandon the sexual and aggressive impulses that were directed toward their parents to avoid the parents' strong disapproval. In abandoning these impulses, children identify with their parents. Part of this identification involves the internalization of parental standards of morality; this internalization marks the beginning of the superego.

126. The answer is e. *(Sierles, pp 83–88. Kaplan, pp 206–223.)* Although Freud modified many aspects of his theory of neuroses, he never wavered in his conviction that sexual disturbances were the most important causal factor in neurotic development. One of the first to recognize the existence of sexual feelings and curiosity in children, Freud maintained that in the course of socialization some of a child's sexual feelings become repressed. Occasionally, the act of repression reaches extreme proportions, consuming enormous amounts of psychic energy. Freud believed that under stress, this repression often would fail, allowing the sexual impulses, partially freed, to appear in the form of neurotic symptoms.

127. The answer is a. *(Fauci, pp 21–24.)* The most frequently diagnosed psychological disorders in women are depression, anxiety disorders, bulimia, and anorexia nervosa. Obsessive-compulsive disorders are almost equally distributed between adult men and women (prevalence about 2%), but with a slightly higher prevalence among boys than girls. Psychological disorders may have a higher prevalence in women because men are more reluctant to consult a physician for emotional problems. Another explanation is that physicians may be more apt to diagnose vague mood and anxiety complaints as psychological if there is no obvious organic basis.

128. The answer is e. *(Baum, pp 264–271.)* The *DSM-IV* is a multiaxial classification and categorization manual for a wide variety of psychological

disorders. One of its newer contributions is that each individual is scored according to broad categories and axes so that an individual may be classified as having several disorders rather than being forced into a single category or disorder.

The various categories or axes are

Axis I: Primary psychiatric disorders (includes physical and sexual abuse, medication-induced disorders, noncompliance)
Axis II: Personality disorders and mental retardation (can also be used for maladaptive personality and defense mechanisms)
Axis III: General medical conditions (general physical health important to the total diagnostic picture)
Axis IV: Psychosocial and environmental problems (family, personal, or situational problems that might affect the diagnosis, treatment, or program)
Axis V: Global assessment of functioning (a scale of the level of functioning at the time of evaluation and at other time periods)

129. The answer is e. *(Baum, pp 138–148, 275–281.)* Hostility and anger are major triggers for a coronary and increased mortality rate. The Cook-Medley Hostility Inventory is a scale devised from the hostility components of the Minnesota Multiphasic Personality Inventory (MMPI) and has a high predictability of incidence of coronary heart disease and death from all causes.

The Millon Behavioral Health Inventory is a 150-item inventory assessing personality, coping styles, stress, psychosomatic correlates, and indices that predict complications or difficulties with illness. The Cohen Perceived Stress Scale contains a general distress factor, a perceived coping-ability measure, and a scale for symptoms related to depression. The Rosenman and Friedman Type A Structured Interview has a high degree of interrater agreement in categorizing people as having type A or type B personality characteristics: tense, impatient, hostile, and urgent versus relaxed, quiet, and less hostile, respectively. The Jenkins Activity Survey of type A behavior is a self-report questionnaire asking about specific type A behaviors such as hurrying a person along or setting deadlines and quotas that fit the stereotype of the coronary-prone individual. All of the tests listed can provide information on personality factors linked to coronary proneness, but the Cook-Medley Hostility Inventory is the best behavioral predictor because it yields the most accurate data on hostility.

130. The answer is b. *(Sierles, p 88. Ebert, pp 125–136.)* One of the most important techniques in psychoanalysis is free association, in which a patient is encouraged to say whatever comes to mind, however absurd or objectionable it might seem. This can be a difficult undertaking. Frequently, the flow of associations is interrupted and a patient's train of thought is blocked or lost because of resistance, which is a defensive maneuver that prevents repressed material from emerging into consciousness.

131. The answer is b. *(Sierles, pp 255–266. Ebert, pp 53–60.)* Anxiety disorders are the most common mental disorders in the U.S.; 4 to 14% of general medical patients suffer from anxiety states. Patients with anxiety disorders are more apt to seek help from general physicians or to use the emergency room than are patients with other psychiatric disorders. Mood disorders are the second most common mental disorders in the U.S.; they afflict 5% at any point in time, with a 1-year prevalence of 9.5% for all mood disorders. Prevalence of mood disorders among patients seeking help in a primary care outpatient setting ranges from 4.8 to 8.6% for major depressive disorder to 2.1 to 8.7% for dysthymic disorder. That adds up to 10.2 to 21% of primary care outpatients who suffer from clinically significant mood disorders. They are also high users of nonpsychiatric medical and primary care and of emergency services. Anxiety disorders and mood disorders should be a part of the differential diagnosis when a patient seeks help for depressive symptoms.

132. The answer is d. *(Sierles, pp 9–11. Wedding, pp 366–377.)* A depressed mood and depressive illnesses are the most common psychosocial reactions of persons with AIDS. A depressive illness can be secondary to a viral infection of the brain and nervous system or a side effect of drugs used to treat AIDS, or it can arise from preexisting mood disorders. Depressed mood and depressive illnesses can also occur from psychosocial stress generated from such factors as reception of a fatal diagnosis, loss of confidentiality, stigma of having AIDS, rejection by friends and family, loss of independence, loss of bowel and bladder control, or loss of occupational competence. Adaptation is a psychosocial factor that affects depression, especially in terms of what the illness means to the patient—e.g., the illness as a challenge, an enemy, a punishment, a weakness, a strategy for life, an irreparable loss or injury, an incentive to change behavior, or a threat to coping capacities. Some of the behaviors that can be observed in depressed

moods and illnesses include a sad, apathetic, or anxious mood, loss of self-esteem, guilt, hopeless or helpless feelings, insomnia, loss of appetite, and suicidal thoughts.

133. The answer is b. *(Kaplan, pp 885–888.)* In traditional psychoanalytic treatment, analysts purposely reveal very little about themselves to their patients. That is intended to help promote transference—to create an ambiance that facilitates a patient's ability to transfer his or her past emotional attachments to the psychoanalyst. The analyst becomes a substitute for the parental figure. In positive transference, the patient becomes attached to the analyst to obtain love and emotional satisfaction, whereas in negative transference the analyst is seen as an unfair, unloving, and rejecting parental figure. Interpretations of transference may help the patient see the positive or negative feelings as a reflection of previous emotional entanglements.

134. The answer is e. *(Kaplan, pp 197–198.)* The Thematic Apperception Test (TAT), which consists of a series of 30 ambiguous pictures about which subjects are asked to construct a story, is most useful in assessing motivational variables. It provides a case-study exploration of a person's personality. Although it also has been employed to assess variables such as intellectual level, other tests are more suitable for such purposes (e.g., IQ tests). The TAT is not particularly helpful in differential diagnosis.

135. The answer is a. *(Sierles, pp 142–143. Ebert, pp 590-591.)* There are over 250,000 reported cases of sexual abuse each year, yet except for physical signs of genital or anal trauma, STD, or recurrent urinary tract or vaginal infections, the physician (or family) has very few methods of securing supporting evidence, especially in the younger child. Frequently, certain behavioral manifestations can be of assistance. These may include a child's simulation of sex acts with dolls, the inclusion of genitalia in drawings, veiled verbal references to molestation, occasional sleep or appetite disorders, or even phobias relating to being touched (e.g., during bathing) or reacting against a certain person or room. Depression and suicidal behavior can also develop in an older child. Hugging and body touching of others is more often decreased rather than increased. The most frequent intrafamilial abusers of girls are uncles, stepfathers, fathers, first cousins, and brothers.

136. The answer is d. *(Kaplan, pp 195–199.)* Normative and objective methods involve statistical prediction based on quantified data. Applied to the assessment of personality, such methods are independent of any particular theory of personality, relying on the use of a mathematical relationship between relevant test scores and a particular behavioral outcome that is to be predicted. The 1950s and 1960s witnessed a controversy over the relative merits of personality assessment and prediction on the basis of clinical interviewing techniques versus those of actuarial and statistical data. Today, researchers and clinicians usually view these procedures as complementary, and both methods currently are employed for different types of research or personality assessment.

137. The answer is d. *(Sierles, pp 264–266. Ebert, pp 341–350.)* Posttraumatic stress disorder (PTSD) is a cluster of symptoms that can occur in a person after exposure to a severely stressful event (e.g., rape, combat, natural disaster). There are three categories of symptoms: reexperiencing the event (e.g., nightmares, daydreams, obsessions, flashbacks), withdrawal (e.g., avoiding movies about war and rape and feeling detached from others who have not experienced the event), and hyperarousal (e.g., insomnia, irritability, hypervigilance, severe anxiety). Most patients with PTSD recover, especially those with good premorbid functioning and support. The greatest risk for PTSD among combat veterans is among those who killed noncombatants, participated in atrocities, or were wounded. Another factor associated with increased risk for PTSD is violence or behavioral problems, sociopathy, or psychiatric disorders prior to the trauma. Substance abuse, including alcoholism, is also relevant. It is estimated that as many as 480,000 American veterans of the war in Vietnam have PTSD.

138. The answer is b. *(Kaplan, pp 609–617.)* The rigid defensive style characteristic of persons who have obsessive-compulsive neurosis is accomplished by the mechanisms of isolation, undoing, and reaction formation. Isolation is the exclusion of an event from the continuum of meaningful experience; for example, an idea or action may be separated from its original emotional content. Undoing connotes the repetitious patterns of ideation and behavior that are typical of obsessive rituals; an affected patient may feel compelled to undertake an action that counteracts an idea that has recently been expressed or an event that has just occurred. Reaction formation refers to the way in which obsessive-compulsive patients

attempt to control an unacceptable wish by undertaking an exaggerated opposing action; kindly actions, for example, may be a reaction against sadistic wishes. In learning theory, obsessions can represent a conditioned stimulus to anxiety so that formerly neutral objects or thoughts become conditioned stimuli that are able to trigger anxiety or discomfort. In compulsion, a certain action is found to reduce anxiety; thus, avoidance strategies (compulsions or rituals) are developed to control the anxieties.

139. The answer is d. *(Fauci, pp 2486–2490.)* Anxiety symptoms are very common in both medically ill patients and those otherwise well. Five to 20% of inpatients have anxiety symptoms and 5 to 20% of general medical outpatients suffer from anxiety states. Patients with anxiety disorders are more likely to seek help from general physicians and to use emergency room services than are patients with other types of mental disorders. Furthermore, it has been documented that over the past 15 years, antianxiety medications have been the most frequently prescribed medication in the U.S. Also, primary physicians write over 80% of these prescriptions. In terms of other mental disorders, over 5% of the U.S. population suffers from mood disorders—including major depressive, bipolar, and dysthymic—yet they are less apt to seek medical help. Panic disorders occur in 1 to 2% of the population and 29% of these persons seek help from emergency room services. Obsessive-compulsive disorder usually begins in adolescence or young adulthood, but is not often recognized by general physicians. Help may not be sought because of the private nature of the disorder.

140. The answer is a. *(Kaplan, pp 217–218.)* According to Freud, the superego is the conscience and develops in the ego with the resolution of the Oedipus complex. The conscience refers to the set of internalized moral prohibitions that guides personal behavior. Children build identifications with heroes, teachers, and admired persons to form their moral standards, values, aspirations, and ideals. The ego maintains a relationship to the outside world through a sense of reality, reality testing, and adaptation to the reality.

141. The answer is a. *(Baum, pp 144–148.)* Among the psychosocial variables considered to be risk factors for coronary heart disease, the type A behavior pattern is most prominent. The type A behavior pattern consists of

extremes of competitiveness, a chronic sense of time urgency, easily evoked hostility, aggressiveness, explosive speech, and increased rate of activity. More recent studies have shown that aggressiveness and hostility (especially unexpressed hostility) are the most consistent and important factors.

142. The answer is e. *(Taylor, pp 418–424.)* Of the psychological defense mechanisms listed, denial is the most common. Most defense mechanisms involve an unconscious mental process and are protective measures for the relief of anxiety or guilt. In denial, the patient attempts to reject the threat of the perception of illness and the developing anxiety. While failure to face one's illness can be harmful, denial can also be a useful defense mechanism, especially during recovery or rehabilitation. In rationalization, a patient attempts to justify an irrational feeling, behavior, or thought. Projection involves attributing one's own problem or conflict to another person or situation. In displacement, a feeling, thought, wish, or fear that is unacceptable is transferred to another person or situation. Sublimation is a defense mechanism whereby wishes that are unacceptable are diverted into acceptable channels; thus partial gratification is achieved.

143. The answer is d. *(Sierles, pp 266–269. Ebert, pp 366–377.)* Between 0.5 and 3% of the population experience many vague and fluctuating symptoms in multiple organ systems over time. They are explored with medical tests and treated, but are never cured. The unexplained symptoms can start in childhood, are usually diagnosed by 25 years of age, and can continue many years undiagnosed. The *Diagnostic and Statistical Manual of Mental Disorders,* 4/e (*DSM-IV*) lists many relevant symptoms from multiple organ and psychological systems. A diagnosis of somatization disorder (SD) can be made if a patient experiences the following medically unexplained symptoms: 4 pain symptoms, 2 gastrointestinal symptoms, 1 sexual symptom, 1 psychoneurologic symptom, and/or if the physical complaints and social or occupational impairments are in excess of the expected. This "lumping" of so many related and unrelated symptoms into one disorder has resulted in some disagreement among clinicians who argue that it is label-oriented and does not contribute to an understanding of causality or treatment. Nevertheless, it is a serious disorder that should receive more recognition and research.

The symptoms have to concern the patient enough to take prescribed medication, to change behavior (e.g., to miss work), or to consult a physi-

cian. Episodes of symptoms, sometimes intense, typically last 6 to 9 months, with less intense, but continuing symptoms for 9 to 12 months. Generally, SD is a lifelong condition, and patients with SD consider themselves to be sick. Eighty-six percent report that their symptoms are so disabling that their work is limited. Seventy-five percent are not employed full-time, as compared with 33% of patients with other psychiatric diagnoses. When compared with the general population, they are more likely to visit doctors, be hospitalized, and receive unnecessary surgery. Eighty to 90% report past depression, 27% have hysterectomies for non-cancer-related causes, 17 to 25% have irritable bowel syndrome, and 12% experience chronic pain.

SD patients are also at increased risk for panic disorder, phobias, general anxiety disorder, obsessive-compulsive disorder, and alcoholism; 47% have coexisting personality disorders (avoidant, paranoid, and histrionic). Female-to-male ratios between 2:1 and 20:1 have been reported. There is often an inability to identify and articulate their emotions, they have difficulty habituating to stimuli, and they receive positive reinforcement from medical attention. No treatment cures SD, but patients can be taught about SD and taught a relaxation procedure. Patients should establish regular doctor visits (versus responding to symptoms). Physicians should direct conversation to the patient's personal life and a healthy lifestyle, while deemphasizing symptoms and praising tolerance for symptoms.

144. The answer is c. *(Sierles, pp 125–126. Kaplan, pp 27–28, 500–501.)* The most frequent (about 50%) postpartum disorder is a self-limited condition known as postpartum blues, with rapid swings of mood and irritability, decreased concentration, and tearing. Next is postpartum major depression (occasionally mania) in about 10% of postpartum women, but most severe is postpartum psychosis (about 1 to 2 per 1000) beginning about 2 to 3 weeks after childbirth. It is still not clear whether postpartum psychosis is a discrete condition or an affective or schizophrenia-like condition precipitated by postpartum stress or endocrine changes. Postpartum psychiatric disorders respond favorably to treatment and have a good prognosis, but in all women who experience a postpartum depression, there is a suicide rate of 5%, an infanticide rate of 4%, and a recurrence rate of 25% for postpartum psychosis and depression after subsequent pregnancies.

145. The answer is d. *(Kaplan, pp 223–239.)* Although Sigmund Freud is best known for the development of the theory of the unconscious, Henry

Murray incorporated the unconscious in the development of his theory of personality. Both Freud and Murray constructed a system of human needs and wishes that existed in the unconscious part of the mind. According to the theory, these unconscious needs and wishes express themselves through the personality and exert considerable influence on individual behavior. Freud arrived at his discovery through the observation of his patients and the analysis of his own dreams, from which he developed his technique of dream analysis. Murray applied the concept of the unconscious in his theory of personality. He is best known for his development of the Thematic Apperception Test, which uses a projective technique to elicit personal and interpersonal conflicts, needs, and attitudes. Carl Jung also placed a strong emphasis on unconscious factors in personality. B. F. Skinner and Kurt Lewin deemphasized the unconscious in the normal personality. Skinner provided experimental analyses of operant behavior to demonstrate that personality is the result of reinforcement and conditioning. Lewin constructed a field theory of action and emotion modeled on physical theory and topology. Margaret Mead had confidence in the psychodynamic unconscious as developed by Freud, but she is best known for her studies demonstrating the importance of cultural mores in molding personality.

146. The answer is b. *(Kaplan, p 201–203.)* The Bender-Gestalt Test can be useful in the assessment of maturation and of brain damage. Various atypical responses to the Rorschach cards (e.g., poor form responses) also have been found to be related to brain damage. The Bender-Gestalt Test consists of nine test figures that a subject is asked to copy; difficulties in this easy task often are indicative of brain dysfunction. Neither the Thematic Apperception Test nor the California Personality Inventory has been found to be a sensitive indicator of cerebral damage. The MMPI tests a wide range of personality factors and the MBHI is a psychodiagnostic inventory of personality, coping style, and symptoms for the physically ill. Other than a few cognitive factors, neither is adequate for the detection of brain damage. Another frequently used test for brain damage is the Halstead-Reitan Battery of neuropsychological tests.

147. The answer is b. *(Baum, pp 249–250.)* The most usual kinds of compliance are prevention, taking of medication, and alteration in lifestyle. Medication treatment has an alarmingly low level of compliance and pre-

vention has the lowest. Compliance with chemotherapy for cancer is very high—better than 90%. Medication treatment for hypertension, glaucoma, coronary heart disease, and diabetes achieves from 40 to 70% compliance from the patient.

148. The answer is c. *(Kaplan, pp 217–221.)* Coping mechanisms are actions that resolve conflicts in socially or personally desirable and effective ways. Conflicts are often the results of inconsistencies that exist in our behaviors, our cognitions, or between conflicting cognitions and behaviors. If we are capable of coping, we take action to resolve the problem as well as we can and see that it does not occur again. For example, if there is a conflict between two behaviors, resolution may require considering the behaviors in relationship to our ideals and then changing one or both of them. Or, if the conflict is between two cognitions, we may need to seek information, then pursue changing one or both of the cognitions. If the conflict is between cognition and behavior, then we generally attempt to change either or both to make one conform with the other. Thus coping involves a resolution of the conflict achieved by changing one or both of the conflicting elements. This is not to be confused with the use of defense mechanisms to resolve conflicts. Although defense mechanisms can be appropriate or at least preferable to other available alternatives, they generally "defend" us and do not generally change behavior or resolve the conflict itself. Coping mechanisms confront the problem directly, continue to generate possible solutions, generate more information, get help when needed, and allow us consciously to drop certain habits or form new ones. They allow us to take action to eliminate the undesirable cognition or behavior causing the conflict. Defense mechanisms are most often driven by unconscious forces, such as repression of threatening impulses or ideas, and tend to remove awareness of the conflict. They allow the conflicting elements to continue and provide an illusion of solution, but the problem continues.

149. The answer is a. *(Sierles, pp 103–104. Wedding, pp 378–390.)* Persons with a strong sense of an external locus of health control delegate responsibility for their health to an external force, such as fate, powerful others, chance, or God. They can be relied on to follow treatment orders in the hospital, where they are in an authoritarian system, but as outpatients they cannot be relied on to take responsibility for their own care. They prefer to

make as few decisions as possible about their own health and prefer to accept the authority and orders of their own physician, except if the authority is not present to follow up on them. Patients with a strong sense of internal control tend to accept responsibility for and control their own health. This information can be of help to physicians by allowing them to establish follow-up procedures that will ensure maximum compliance.

150. The answer is d. *(Sierles, pp 103–104. Wedding, pp 378–390.)* The locus of control regarding health deals with patients' perception of the forces that control their own health. With the perception of an internal locus of control, patients view themselves as being in charge of their own health, take direct responsibility themselves, and consider themselves and their physician to be a team. While physicians often promote this shared responsibility to improve compliance, they must recognize and deal with the tendency of those patients to make their own adjustments in the prescribed diet, drug dosage, exercise, or other parts of the regimen. In external locus of control, patients view their health as being controlled by fate, chance, or some other power or authority.

151. The answer is d. *(Hazzard, pp 159–170.)* There is much conventional wisdom about how personality changes over the lifespan, especially during midlife crises and retirement, and how dormant aspects of personality emerge in late life, but the data show otherwise. Studies of adolescents who are followed into adulthood do show somewhat lower levels of stability during adolescence, but there is still considerable continuity in personality from childhood on throughout life. By age 30, both men and women have attained their adult personality, which remains stable with little or no change. While some people experience the legendary midlife crisis, most often this phenomenon takes the form of concern over career choice, physical decline, or discontent with marriage; it is a crisis for only a relatively small portion of middle-aged persons and does not usually result in a personality change. The personality traits of neuroticism, extraversion, openness, agreeableness, and conscientiousness are remarkably stable over time, with the exception that persons with high levels of neuroticism seem to be predisposed to having crises at all ages. Since personality affects health perceptions and health behaviors, it is important that physicians be able to assess and predict the interaction of personality and the patient's reactions to health, illness, and treatment.

152. The answer is a. *(Sierles, pp 81–82. Baum, pp 341–352.)* Many studies have shown that obese persons respond less well than do normal persons to internal cues, such as gastric contraction. They also overrespond to external cues such as the taste, smell, attractiveness, abundance, and accessibility of food. This is significant because behavior modification can be used to influence eating behaviors by changing the exposure to and pattern and nature of the external cues. Since behavior patterns are learned, they can be changed or unlearned.

153. The answer is e. *(Hazzard, pp 159–170.)* Theorists have postulated that the universal processes of aging include the decline of emotionality, the reversal of sex-role-linked characteristics, and the development of wisdom. Longitudinal studies, however, have shown that a person's personality shows little or no change with age. There is little or no change in traits such as emotional stability, sociability, assertiveness, and other characteristics of the individual personality. In other words, a 40 year old who is well-adjusted, assertive, and liberal is apt to be a well-adjusted, assertive, liberal 80 year old; likewise, a 40-year-old person who is neurotic and selfish is apt to be a neurotic and selfish 80 year old. Wisdom does appear to increase with age because of experience and education. This is consistent with Erik Erikson's final stage of human development—one attains either integrity or despair.

154. The answer is e. *(Baum, pp 255–257.)* The health belief model is based on three components of predicting one's compliance behavior: the patient's perceived readiness to act or perception that action is necessary, an estimation of costs and benefits of compliance, and the need for a cue to action, i.e., for an indication that something is wrong. The health belief model takes into account the patient's subjective state or belief regarding his or her health, rather than the objective characteristics of it. The costs and benefits are emphasized, as the patient must believe that the treatment will be effective; i.e., the benefits must outweigh the costs in terms of side effects, disruptiveness, and unpleasantness. The patient's readiness to comply is important, in terms of either internal signals such as pain or discomfort, or external stimuli such as screening programs, costs, and benefits. The health belief model also considers that the patient's perception of the severity of an illness is much more predictive of compliance than is the actual severity of the illness as defined by the doctor or other data.

155. The answer is e. *(Kaplan, pp 195–199.)* Projective methods of personality assessment comprise those measures that are relatively unstructured and have no correct answers. Subjects' responses to such measures are presumed to be more indicative of individual characteristics than is the case with more structured tests, responses to which are inclined to be determined more by the nature of the test than that of the subject taking it. The Thematic Apperception Test, Draw-a-Person Test, Sentence Completion Test, and Rorschach test are all considered to be projective methods of measurement. The Minnesota Multiphasic Personality Inventory (MMPI) is a structured personality inventory of 550 items that must be answered "True," "False," or "Cannot Say."

156. The answer is a. *(Fauci, pp 2499–2501.)* Schizophrenia is a serious mental disorder with about 1% prevalence across all cultures. It has a 6-month or longer duration and causes significant social, occupational, and personal disability and suffering. Diagnosis includes at least 6 months of bizarre delusions often with persecutory or jealous content, auditory hallucinations, and grossly disorganized behavior. The most significant etiologic factor is genetic as confirmed by twin, family, and adoption studies. There is a higher incidence in persons of lower socioeconomic status, but it is difficult to determine whether this is because of a "social drift" of more vulnerable persons or the stresses of lower socioeconomic status, especially in genetically vulnerable persons. A major psychosocial factor is a frequent pattern of communication conflicts between parents and between parents and the child or developing adult, but this is now thought to be secondary to the developing disease in the adolescent or young adult. There is also a stress-diathesis model whereby predisposed persons are vulnerable to certain stressful circumstances. Antipsychotic agents, especially clozapine, are the most effective form of chemical treatment.

157. The answer is c. *(Kaplan, pp 206–223.)* Before the development of psychoanalytic theory, psychopathologic manifestations were considered to be evidence of mental disorders having nothing in common with normal mental functioning. One of Freud's greatest contributions lies in his recognition that the same psychological processes operate in both normal and abnormal mental functioning, i.e., that any differences between normality and abnormality are quantitative, not qualitative. The necessary implication of Freud's perception is that any judgments as to a person's normality

are relative and that there are no absolute criteria by which a person can be classified as psychologically ill.

158. The answer is b. *(Kaplan, pp 581–583.)* There is no simple linear relationship between task performance and level of arousal or anxiety. The Yerkes-Dodson theory posits a curvilinear relationship between these variables in which performance is enhanced at a certain optimal level of arousal; anxiety levels lower or higher than this optimum have a detrimental effect on performance. There is evidence in support of the Yerkes-Dodson formulation. It also has been demonstrated that such factors as task complexity, instructional set, and intelligence alter the quantitative features of the curvilinear relationship between performance and anxiety.

159–162. The answers are 159-d, 160-b, 161-a, 162-e. *(Baum, pp 272–292.)* The Ways of Coping Checklist assesses an individual's coping strategies and reactions to stressful events. There are 68 items that categorize strategies used in coping that could influence health-related events. Problem-focused coping includes attempts at active coping, planning, suppression of competing activities, restraint coping, and seeking of social support. Emotion-focused coping consists of seeking emotional support, acceptance, denial, self-blame, avoidance, and often a turn to religion. It has been useful in predicting the patient's choice of various health behaviors. Use of more problem-based coping has been related to better psychosocial health.

The Monitor-Blunter Style Scale (MBSS) measures differences in the amount of information the patient feels is necessary when encountering a threatening situation. Monitors prefer to seek out information about the threat, as opposed to Blunters who use distraction to avoid thinking about the threat. This ambivalence is expressed by the engineer in the question, but with data as to his usual pattern of coping you will be better able to provide what he needs and to support him at this trying stage of his disease. One study showed that when distress is short-lasting, denial and blunting generate less distress and arousal, but when distress is chronic, monitoring results in less distress. A study of soldiers involved in war over a period of two years showed that the soldiers who used monitoring strategies suffered less trauma-related psychopathology than those who used blunting and denial.

The Sickness Impact Profile (SIP) documents the disability and behavioral impact of an illness on a medical patient. One hundred thirty-six

items describe specific dysfunctional behaviors from physical, psychosocial, and independent-living categories. Patients indicate whether each item applies to them.

The SCL-90 and SCL-90A are self-report symptom inventories to measure both psychopathology and medical dimensions. They are useful and timesaving (versus the time-consuming MMPI) and were developed for use with outpatients. The nine subscales include somatization, obsessive-compulsiveness, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. The survey of symptoms can assist with the diagnosis and there is general agreement on its effectiveness as a screening device for general psychological distress in a medical situation.

The Multidimensional Health Locus of Control (MHLC) Scale measures a person's beliefs about who or what controls his or her health. Some people feel that their own behavior is responsible for and controls much of their health. Others believe that their health is controlled or influenced by luck, other people, or spiritual forces. Those who feel that they are more responsible for their own health are considered to possess an internal locus of control, while those who believe that they have very little to do with their health possess an external locus of control. A recently designed third inventory, Form C, was developed for specific diseases such as cancer, rheumatoid arthritis, chronic pain, and diabetes. It is so important for treatment adherence to be able to assess the extent to which patients will assist with specific treatments versus their unwillingness to accept any responsibility, expecting medicine to cure them or protect them from illness.

163–166. The answers are 163-e, 164-c, 165-a, 166-b. *(Kaplan, pp 195–199.)* The Bender-Gestalt Test is a test of visual motor coordination and is useful in both children and adults. Initially it was used as a measure of a child's maturational level, according to how many of the nine designs a child could reproduce at various levels of accuracy. It is now used most frequently with adults as a screening device for signs of organic brain dysfunction. It can also be used in assessing mental retardation, aphasias, psychoses, neuroses, and malingering.

The Minnesota Multiphasic Personality Inventory, an objective self-report test to assess personality, is one of the most widely used tests for clinical and research purposes. It provides scores on 10 clinical scales: hypochondriasis (Hs), depression (D), hysteria (Hy), psychopathic deviation (Pd), masculinity-femininity (Mf), paranoia (Pa), psychasthenia (Pt), schizophrenia (Sc), hypomania (Ma), and social distance (Si); plus 3 addi-

tional scales: a lie scale (L) to detect attempts to present oneself in a good light, a frequency scale (F) of unconventional beliefs and attitudes, and a correction scale (K) for guardedness or defensiveness in test-taking. The MMPI, like all tests, is most effectively used in conjunction with other information about the patient. It is currently being restandardized based on a contemporary sample of normal people.

The Halstead-Reitan Battery of neurologic tests was developed in the early 1940s to determine the location and effects of specific brain lesions. It is composed of 10 tests: category test (to identify common elements in a set of pictures for concept function, abstraction, and visual acuity), tactual performance test, rhythm test, finger-oscillation test, speech-sounds perception test, trial-making test, critical flicker frequency, time sense test, aphasia screening test, and sensory-perception test. The usefulness of the Halstead-Reitan battery can be enhanced by using it in conjunction with the MMPI and the Wechsler Adult Intelligence Scale.

The Wechsler Adult Intelligence Scale (WAIS) is the best standardized test of intelligence in use today. There are 6 verbal subtests and 5 performance subtests and it yields a verbal IQ, a performance IQ, and a combined IQ. The 11 subtests are general information, comprehension (proverbs), arithmetic, similarities (between two things), digit-span (recall of two to nine digits), vocabulary (definitions), picture completion (with a missing part), block design (matched color and designs), picture arrangements (arrange series to tell a story), object assembly (organize objects in order), and digit symbol (pair symbols with digits). There is also a scale for children ages 5 through 15, and a preschool version for ages 4 to 6½ years.

The Thematic Apperception Test (TAT), designed by Henry Murray and Christiana Morgan in 1943, has 30 pictures with ambiguity in each picture. The subject creates a story about each picture that reveals approach to organization, sequence, vocabulary, style, preconceptions, assumptions, and outcome. It is especially useful for inferring motivational aspects of behavior rather than as a diagnostic test.

167–169. The answers are 167-a, 168-d, 169-c. *(Kaplan, pp 218–219.)* Reaction formation is the defensive process whereby an unacceptable feeling or impulse is converted into, and consciously experienced as, its opposite. Thus, in reaction formation, "I hate him" becomes "I love him."

Projection is the process through which unacceptable impulses are at once denied and attributed to someone else or to something in the environment. Thus, in projection, "I hate him" is converted into "he hates me."

Denial is the defense mechanism by means of which any aspect of reality, e.g., forbidden thoughts, is actively denied. With this defense mechanism, "I hate him" becomes "I don't hate him."

The defense mechanism of undoing refers to an action that is meant somehow to reverse or undo the damage that is felt to have been caused by an unacceptable wish. Isolation is the conscious experience of an unacceptable wish or thought without the painful effect associated with it. Isolation and undoing both are defenses characteristic of people who have obsessive-compulsive personality styles.

170–173. The answers are 170-c, 171-a, 172-b, 173-d. *(Plomin, pp 27–28, 67–69.)* Dizygotic (fraternal) twins have similar but not identical genes. The similarity of their genes, however, is not significantly greater than that of other siblings. The fact that the IQs of fraternal twins reared in the same environment are more alike (correlation coefficient: 0.60) than those of other siblings reared in similar circumstances (0.47) must reflect experiential influences on IQ.

The highest correlation between IQ scores is obtained from monozygotic (identical) twins. Identical twins reared together have a correlation coefficient of 0.85; those reared apart, 0.72. This high correlation may be assumed to be a result of both hereditary and environmental factors. In fact, since monozygotic twins have identical genomes, it may be argued that an even higher correlation would exist were it not for the unavoidable factor of slight differences in experience.

The correlation between IQs of siblings reared together (0.47) is higher than that for siblings reared apart (0.24). This observation seems to suggest that environmental factors affect IQ scores considerably. The significant correlation between IQs of siblings reared apart demonstrates the contribution of hereditary factors to intelligence.

A relatively high correlation appears between the IQ scores of siblings reared together. It is much lower, however, than the correlation between dizygotic twins, although their genomes are about equally heterogeneous. This difference is probably attributable to the fact that both society and families tend to treat twins more alike than they do other siblings.

The lowest observed correlation between IQs of offspring occurs for siblings reared apart. However, the correlation is significantly higher than that for unrelated persons who are reared together. Thus it seems that hereditary factors are somewhat more potent determinants of IQ than either environmental or experiential factors.

174–176. The answers are 174-b, 175-a, 176-e. *(Baum, pp 65–71.)* The medical profession has been concerned with stress for centuries. Hippocrates spoke of suffering caused by disease (pathos), but separated it from the toil involved in resisting and fighting disease (ponos). He thus suggested a stresslike aspect of illness.

Walter Cannon suggested that stress had both physiologic and psychological components in response to danger. He is most famous for his description of the sympathetic nervous system acting to ready a threatened organism for fight or flight by producing a heightened state of arousal. Stress can aid in survival, but it can also disrupt emotional and physiologic stability (homeostasis). Thus, emotional stress can cause physiologic disturbances that lead to medical problems.

Hans Selye developed the general adaptation syndrome (GAS), which consisted of three stages: the alarm reaction, the stage of resistance, and the stage of exhaustion. The presence of a noxious stimulus or stressor causes an alarm reaction in preparation for resisting the stressor. When the body's reserves are mobilized, the stage of resistance applies various physiologic and psychological coping mechanisms to adapt or fend off the stressor, but usually with a decrease in resistance to other stimuli or threats. When these reactions are repeated many times or over a prolonged time, the stage of exhaustion is reached and the organism is at risk for irreversible physiologic damage. With reserves depleted and resistance no longer possible, the wear and tear and exhaustion then lead to the onset of diseases of adaptation, such as kidney disease, arthritis, and cardiovascular disease.

John Mason and Marianne Frankenhauser extended Selye's GAS into the psychosocial realm. They postulated that stress is more than a reaction to nonspecific stimuli and that some kind of psychological awareness of noxious or stressful events may be necessary for stress to occur. More important, they demonstrated that psychological factors can actually alter bodily functioning and lead to illness. These and other findings have established an important link between psychosocial factors and health.

Richard Lazarus recognized the significance of psychological stress. For an event to evoke a stressful reaction, it must be appraised by the individual as threatening. This allows one to evaluate the dangers and benefits of the stressful event, select a coping option, and even reappraise the event as it evolves. Personality, experience, and goals can also affect the interpretation. Thus, the same event can be interpreted by one person as a threat

and by another as a challenge. Lazarus also postulated that daily problems can be just as important in causing stress as less frequent but more severe threats.

177–180. The answers are 177-d, 178-a, 179-e, 180-c. *(Baum, pp 7–8, 144–154.)* Sir William Osler (1892) observed that the typical coronary patient was robust, keen and ambitious, vigorous in mind and body, and one "whose engine is always at full speed ahead." In the late 1950s Richard Rosenman and Milton Friedman described the type A behavior pattern and developed a reliable technique for its assessment. They characterized the type A behaviors as excessive competitive drive, impatience, hostility, and vigorous speech. The type B person was considered to possess a relative lack of these characteristics and have a more easygoing style of coping. Rosenman and Friedman developed a structured interview focused on observable behavior based on speech characteristics and how persons responded to questions rather than how they described themselves.

David Jenkins in the early 1970s developed the Jenkins Activity Survey (JAS). The JAS is a questionnaire relying on a person's report of his or her own behavior. It is still frequently used as a clinical screening measure as well as a research tool.

David Glass emphasized that the type A pattern should be considered more as a coping style used to establish and maintain control over stressful situations. Type A persons respond to stress or to a challenge by accelerating the pace of their work and by becoming more competitive, aggressive, or hostile. He found that type A persons respond to uncontrollable stress or situations by working harder or faster than do type B persons. Also, they perceive challenges as more threatening, which arouses a sense of urgency, competitiveness, hostility, and a greater physiologic response with increased sympathetic arousal and secretion of epinephrine and norepinephrine.

Karen Mathews explored the genesis of type A behavior in one's early years, as early as age 5. She developed the Mathews Youth Test for Health, which is completed by an observer of a child's behavior. Mathews has demonstrated type A and type B patterns of behavior in children as young as age 9 and has recently developed a scale for adolescents. She has found that the behaviors of achievement, anger-arousal, and impulsiveness are stable from about 6 to 10 years of age to adulthood and that these type A children experience the same elevations in heart rate and blood pressure in response to psychological challenges as do their adult counterparts.

Neil Miller and Neil Scheiderman developed an insight into brain-behavior relationships, demonstrating that basic biologic activity can be consciously controlled by the brain. This set the stage for subsequent theory and research in the areas of health psychology and behavioral medicine. Health psychology, behavioral medicine, and psychosomatic medicine altered the evolution of the biomedical sciences and the understanding of the role of behavior in the study of health and disease.

181–184. The answers are 181-c, 182-b, 183-b, 184-d. *(Sierles, pp 272–274. Ebert, pp 467–484.)* Persons with a paranoid personality disorder are suspicious, hypervigilant, and preoccupied with others' fidelity and often perceive themselves as righteous and others as corrupt. The warehouse clerk could be expressing hostility by projecting or rationalizing his own behavior as a kind of righteous defense against a boss whom he chooses to label a robber. The prevalence of paranoid personality disorder is not known, but there is some evidence that there is a heritable link with delusional disorder and schizophrenia. Psychotherapy and perhaps a low dose of antipsychotic medication to relieve anxiety will help, although many patients will not take any medication.

A person with an antisocial personality is considered a sociopath who is callous, lacks remorse or guilt, is often cruel to animals, and is selfish. These persons can be very sociable with a superficial charm (which can make them excellent con artists), but they become irritable and resentful if their needs are not met or if they do not get their way. Antisocial personality disorder begins in childhood and continues throughout life. The life expectancy of those with this disorder is shortened by accidents, homicide, and the consequences of substance abuse. In childhood they are often truant, run away from home, fight, vandalize, lie, and rob with confrontation of the victim. As adults, they avoid working, abandon jobs, fight, abuse or neglect family, malinger, and engage in reckless behavior. Three-fourths of convicted felons have antisocial personalities. They often feel that their behavior is justified because of the alleged mistreatment to which they have been subjected. These patients are difficult to treat with psychotherapy because of their self-destructive behavior.

Persons with borderline personality disorder have an intense intolerance for feeling alone. They act dramatically and can be self-destructive. The student on the balcony took dramatic action, which provoked a rescue that could be taken as the rescuer's love. Persons with borderline personal-

ity disorder are unstable, idealize love, erupt violently at times, and have moods that range widely from boredom or emptiness to rage. Mood disorders are common in their families. Psychotherapy or a combination of psychotherapy and pharmacotherapy is standard treatment.

A person with a passive-aggressive personality disorder demonstrates covert noncompliance, especially with authority. The bookkeeper's forgetting, procrastinating, and arriving late can be a passive way to express aggression in response to anger and frustration. Psychotherapy is the treatment of choice.

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Learning and Behavioral Change

Questions

DIRECTIONS: Each item below contains a question or incomplete statement followed by suggested responses. Select the **one best** response to each question.

185. During the past 25 years, epidemiologic studies have determined that over half of the reduction of the death rate from heart disease can be attributed to

a. Improvement in new cardiac drugs
b. Effective changes in lifestyle
c. New surgical procedures and technology
d. More aggressive intensive care units
e. Increased numbers and better training of diagnostic cardiologists

186. Which of the following interventions best accomplishes voluntary control over major physiologic functions?

a. Cognitive restructuring
b. Self-control techniques
c. Stimulus control
d. Contingency management
e. Biofeedback

187. Behavior change intervention strategies involving applied behavioral analysis have been used most frequently for which of the following health problems?

a. Alcohol abuse
b. Obesity
c. Cardiovascular disease
d. Smoking
e. Health promotion

188. A behavior pattern that increases in frequency when followed by a reward is an example of

a. Classical conditioning
b. Shaping
c. Respondent conditioning
d. Operant conditioning
e. Generalization

189. In operant conditioning, the rate of extinction is most effectively slowed when the response or learning has been maintained on a reinforcement schedule of

a. Fixed ratio
b. Variable ratio
c. Fixed interval reinforcement
d. Continuous reinforcement
e. Piecework reinforcement

190. The idea that experimental extinction, which is produced by nonreinforcement after classical conditioning, is an active inhibitory process finds support in the phenomenon of

a. Generalization
b. Spontaneous recovery
c. Experimental neurosis
d. Passive avoidance
e. Active avoidance

191. Which of the following behavioral methods of treating asthma has proved to be most effective when combined with medical treatment?

a. Psychotherapy
b. Behavioral self-management
c. Psychoanalysis
d. Employment of suggestion strategies
e. Diminishment of emotional reactions

192. A major distinction between the methods for producing classical and instrumental conditioning is that in instrumental conditioning the reinforcing stimulus is

a. Always appetitive in nature
b. Contingent on the behavior to be learned
c. Invariant
d. Solely under the control of the experimenter
e. Unnecessary to produce learning

193. The term *learning disabilities* most often refers to problems in learning

a. To do arithmetic
b. To read
c. To write compositions
d. Eye-hand coordination
e. Achievement orientation

194. A middle-aged man has undergone a series of biofeedback sessions to control brief elevations in blood pressure under stressful situations. The most important component of this treatment is

a. Feelings
b. Information
c. Motivation
d. Attitude
e. Interpersonal relations

195. In educational programs designed to limit the spread of HIV infection, which of the following intervention strategies has been most effective in producing behavioral change?

a. Provision of health education
b. Random testing of a person's knowledge of AIDS
c. Recruitment to an STD clinic program
d. Use of peers as endorsers of behavioral change
e. Appeal to sexual partners to change behavior

196. A woman diagnosed with breast cancer is undergoing antineoplastic chemotherapy and develops severe nausea before chemotherapy begins. Behavioral conditioning results in anticipatory nausea in patients receiving chemotherapy in

a. Two-thirds of these patients
b. The more hopeful and optimistic patients
c. Patients high in chronic anxiety
d. The more gregarious patients
e. The less inhibited patients

197. In applying behavioral modification to weight reduction, the most important initial step is to

a. Work with the patient to establish a baseline diet
b. Do a daily caloric intake analysis
c. Begin a mild but systematic exercise program
d. Identify all medications being taken
e. Compile a detailed history of the patient's eating patterns

198. A young woman has recently completed an inpatient program for alcohol dependence. Using the classical conditioning model, the patient's risk of relapse is increased if she is

a. Maintained in an environment free of alcohol-associated stimuli
b. Provided therapeutic strategies to extinguish alcohol-compensatory conditioned responses
c. Returned to an environment different from the one in which the dependence was acquired
d. Provided procedures to extinguish conditioned associations between aversive affective states and alcohol
e. Allowed to substitute the use of other nonalcoholic drugs when negative affective states occur

199. You have just told a patient with a family history of cardiovascular disease to stop smoking. What percentage of the patients given such advice will quit smoking?

a. 5%
b. 10%
c. 15%
d. 20%
e. 25%

200. In B. F. Skinner's view, the study of behavior

a. Should be concerned with the fundamental motives that are found in all organisms
b. Should employ factor-analytic procedures to identify the basic dimensions of personality
c. Must be based entirely on an understanding of classical conditioning
d. Cannot make extrapolations about principles of learning from subhuman species to humans
e. Need not make inferences about unobservable organismic states and inner motives

201. The most effective behavioral intervention to deter the onset of smoking among adolescents is

a. Stress inoculation training
b. Intensive health education
c. Operant conditioning strategies
d. Biofeedback techniques
e. Social learning theory

202. A 34-year-old patient with chronic schizophrenia is hospitalized on a chronic ward of a psychiatric hospital and is on an appropriate dose of antipsychotic medication. He frequently shouts in the halls, disrupting activities and annoying the other patients. The best behavioral strategy for this patient would be

a. Psychological counseling
b. Contingency management
c. Stimulus control
d. Role-play therapy
e. Modeling

203. Of the social factors that play a major role in influencing junior and senior high school students to smoke, the most powerful one is

a. Lack of negative consequences
b. Cigarette advertising
c. Modeling
d. Social inoculation
e. Experimentation

204. You are designing a weight-reduction program for a patient with long-term obesity. You wish to use a group of behavioral techniques that derive from the principle of stimulus control. Which of these instructions would be consistent with this plan?

a. Watching TV or reading when eating
b. Eating only when hungry, not at specific times
c. Eating in a variety of different places
d. Shopping for groceries only when hungry
e. Eating at specific times and places

205. The process of memory formation involves short-term and long-term processes. One important feature of these processes is

a. Memory traces are localized to specific structures
b. Recall of memory involves a faithful reproduction of the internal store
c. The temporal lobes and hippocampus are registers or banks for memory storage
d. Localized trauma can completely destroy stored memory
e. Long-term memory results in physical changes in the brain

206. For operant conditioning to be effectively applied to a chronic psychiatric disorder (e.g., shouting obscenities), one can increase positive, constructive behavior by

a. Frequent psychoeducational interventions
b. Identifying an effective reinforcer
c. Facilitating the development of insight
d. Punishing undesired behavior

207. Repeated exposure to uncontrollable events can produce a depressive-like reaction called learned helplessness. A key factor in the development of this pattern of behavior is

a. Self-blame
b. Illusion of control
c. Perceived choice
d. Depressive explanatory style
e. Noncontingent behavior and outcome

208. A 50-year-old man consults you for behavioral treatment of mild hypertension. In discussing the risk benefit analysis of such an approach, which one of the following methods of behavioral treatment of hypertension has been found effective?

a. Contingency conditioning
b. Assertiveness training
c. Reinforcement of control
d. Biofeedback
e. Operant conditioning

209. Operant conditioning differs from classical conditioning in the following respect:

a. It is restricted to a specific reflex response
b. Simultaneous stimuli presentation is important
c. A certain stimulus predicts a subsequent stimulus
d. The reinforcer must follow the desired response without delay
e. The person or animal must be able to discriminate between the two stimuli

210. The methods of modeling, desensitization, extinction, and direct reinforcement are derived from the theory of

a. Classic conditioning
b. Social learning
c. Psychoeducation
d. Cognitive restructuring
e. Operant conditioning

211. A patient is being treated by a behavioral technique for a phobia that is precipitated by being in a crowded situation. The patient is taught muscular relaxation; then, while using the relaxation to inhibit the anxiety, the patient is told to imagine a series of progressively more severe anxiety-provoking situations. This technique is called

a. Modeling
b. Stress inoculation
c. Systematic desensitization
d. Conditioned compensatory response
e. Contingency conditioning

212. In the process of administering a clinic that sees patients at high risk for contracting HIV infection, you wish to incorporate behavioral strategies that lead to change of high-risk behavior. An effective technique would be

a. Promoting fear by case examples
b. Training peers as endorsers of behavioral change
c. Operant conditioning against risky sexual contact
d. Expressing disapproval of risk-taking behavior

213. You are treating a patient for migraine headaches. The patient is on appropriate acute and prophylactic medication for migraine headaches, but has not responded optimally. It is apparent that the headaches are stress-related. Which of the following behavioral treatments would be most desirable to add at this point?

a. Dynamic psychotherapy
b. Behavioral psychotherapy
c. Biofeedback of finger temperature
d. Assertiveness training
e. Contingency conditioning

214. In attempting to understand how adolescents develop the habit of smoking, social learning theory would predict that the least important factor would be

a. Lack of learned negative expectations
b. Acquired positive expectations
c. Inhibition
d. Learned behaviors
e. Powers of observation

215. Our knowledge regarding techniques and strategies for changing health behavior is best documented, and the results are most successful, for

a. Immediate intervention regarding poor health habits
b. Maintenance of good health habits
c. Health promotion strategies
d. Risk-reduction regimens
e. Compliance with treatment plans

216. You are treating a middle-aged woman who has chronic pain in her back and right arm due to long-term orthopedic sequela after an automobile accident. In addition to appropriate use of pain medication, you wish to include in your treatment plan a behavioral approach to pain management. Which principle would you keep in mind in constructing this plan?

a. Behavior in response to pain is significant in its own right
b. Environmental consequences have a little effect on pain-related behavior
c. Pain behavior is difficult to observe and measure
d. Understanding internal causative factors of conflict or anxiety is crucial
e. Classical conditioning mechanisms are involved

217. Behaviorally conditioned alterations of immune response are demonstrated by the following:

a. Conditioned compensatory responses
b. Conditioned enhancement of cell-mediated immune responses
c. Extinction of tolerance to an immunomodulating agent
d. Conditioning of the immunologic effects of stress

DIRECTIONS: Each group of questions below consists of lettered headings followed by a set of numbered items. For each numbered item select the **one** lettered heading with which it is **most** closely associated. Each lettered heading may be used once, more than once, or not at all.

Questions 218–221

Match each description below with the appropriate learning mechanism.

a. Contact desensitization
b. Shaping
c. Systematic desensitization
d. Operant conditioning
e. Classical conditioning

218. In a psychology laboratory, a neutral stimulus (a bell) is paired with a stimulus (food) that produces an autonomic response (salivation)

219. A rat receives positive reinforcement (a food pellet) for pressing a bar that turns on a red light, but not an adjacent bar that turns on a green light

220. A patient has a phobia of boarding a plane and taking off from the airport. Deep muscle relaxation is paired with a series of imagined (or visually presented) scenes that are arranged in a hierarchy from the least to the most anxiety-producing

221. A rat is positively reinforced by food pellets for each of the closer and closer approximations, such as approaching a bar or lever, rising upon hindlegs, putting front paws on bar, and pressing the bar

Questions 222–223

For each description, select the most appropriate learning mechanism.

a. Negative reinforcement
b. Modeling
c. Habituation
d. Operant conditioning
e. Classical conditioning

222. A 45-year-old female patient is undergoing regular chemotherapy for her breast cancer; at her last visit she became nauseated and vomited as she entered the clinic room

223. A medical student becomes more comfortable in the anatomy laboratory after several weeks of exposure to it

Questions 224–225

For each case, select the most appropriate learning mechanism involved.

a. Stimulus control
b. Desensitization
c. Fixed interval reinforcement
d. Variable ratio reinforcement
e. Variable interval reinforcement

224. An obese woman is not losing weight on a weight-loss program and is returning to your office for the monthly checkup; she confesses to not adhering to the program during the first few weeks and then going on a crash diet during the week preceding the planned checkup

225. An obese man who is trying to lose weight observes that he enjoys nibbling on certain foods while watching television; you advise him to limit his eating to the kitchen and to refrain from nibbling on anything while watching television

Questions 226–227

For each case, select the most appropriate learning mechanism involved.

a. Habituation
b. Aversive conditioning
c. Stimulus control
d. Variable ratio reinforcement
e. Systematic desensitization

226. In a program aimed at cessation of smoking, a 45-year-old woman is required to smoke many cigarettes in a small booth and over a short period of time

227. A 40-year-old man who works for the state as a highway and bridge designer becomes extremely anxious when he has to drive across any bridge. Which technique can best help him?

Questions 228–231

For each description below, match the appropriate mechanism of behavior change.

a. Contingency management stimulus control
b. Cognitive restructuring
c. Thought-stopping procedures
d. Self-control techniques
e. Biofeedback

228. Effective in controlling one's autonomic bodily functions by using visual and auditory cues

229. Effective in changing the frequency of behavior by systematically using reinforcement or the consequences of behavior

230. Effective in reducing anxiety

231. Effective in reducing obsessions

Learning and Behavioral Change

Answers

185. The answer is b. *(Baum, pp 135–138.)* A 1994 report from the National Heart, Lung, and Blood Institute stated that over the past 25 years the death rate from heart disease has decreased. These dramatic changes are due partially to medical developments such as new drugs, improvements in medical technology, and advances in biomedical diagnostic and treatment procedures. These advances include bypass surgery, angioplasty, heart transplant technology, modern drug therapies, and better training for cardiologists. At the same time, more than half of the population has become aware of the research findings of significant heart disease risk factors and has taken sincere steps toward modifying their behavior and lifestyle to reduce their own risk for heart disease. Epidemiologists have estimated that 40% of the reduction in the cardiovascular mortality rate is due to improvements in medical care and drug treatments for hypertension. However, they also found that more than one-half of the decrease in the mortality rate (54%) is from behavioral and lifestyle changes such as exercise, better diet, lower fat consumption, lower cholesterol levels (30%), and reductions in cigarette smoking (24%). These data further confirm the important links between individual lifestyle, behavioral change, and the risk for coronary disease.

186. The answer is e. *(Baum, pp 306–310.)* Voluntary control over physiologic functions such as accelerating heart rate, erection of body hairs, producing cardiac arrest for several seconds, and even raising skin temperature in one hand while lowering it in the other was demonstrated back in the 1930s.

More recently, biofeedback techniques have allowed the average person to learn to control physiologic responses. When we receive feedback or information concerning the response we have just made, we can then make appropriate adjustments. Essentially, this is how we learn to perform everyday skills such as steering a car. We see and feel the feedback of our last action and either alter or maintain that action. Since the pioneering work

of Neal Miller in the late 1950s and early 1960s, human subjects have learned to control many responses that were assumed to be involuntary responses, such as blood pressure, heart rate, sweat gland activity, skin temperature, neuromuscular activity, and various brain wave rhythms.

187. The answer is b. *(Baum, pp 383–384.)* Behavior change and treatment strategies are based on learning theory. Applied behavioral analysis is based on the operant conditioning principle that behavior is determined by its antecedents and consequences. It is necessary to first identify a specific target behavior to be modified, next to observe the antecedents of the behavior, and last to examine its consequences. The environmental antecedents and consequences must also be examined. At this point, the environmental antecedents and consequences are changed to modify the occurrence rate of the behavior.

The attempt to control obesity is an example of a widespread application of applied behavioral analysis. More people have received behavioral treatment for obesity than for all other conditions combined. In obesity, the first task is for the subject to keep a diary record of each act of eating: the time of day, the people they are eating with, and the feelings they are experiencing. Next, one identified stimulus or event (e.g., television or a filled candy dish) that may cue the eating is excluded from the place of eating. Finally, patients are reinforced for weight loss and behavioral changes.

Cognitive-behavioral perspective is based on the premise that much of learning is cognitively mediated. People respond to their conception of the environment, rather than to the environment itself. It also recognizes the value of combining and integrating cognitive-based treatment techniques with those based on performance, as in smoking cessation and maintenance of cessation.

Other combinations of social learning, education, and behavior modification have been applied to health promotion (e.g., the Stanford Heart Disease Prevention Project).

188. The answer is d. *(Sierles, pp 76–68.)* The influence of behavior by rewards and punishments has its roots in classical studies of learning. In the earlier classical conditioning experiments, Pavlov investigated the acquired associations between environmental stimuli (food, bell) and smooth muscle responses (salivation). By pairing the food and bell, he elicited salivation using only the bell. This is known as generalization of a response to two or

more stimuli. In operant conditioning, the desired behavior is rewarded or reinforced with an object, food, praise, or other reward of pleasing consequence to the learner. Shaping involves rewarding the person's behavior as it begins to approach or approximate the desired or ideal behavior until the desired behavior is reached or mastered. The therapeutic use of this ability to increase or control certain behaviors by reinforcing the desired behavior is the essence of behavioral modification. Behavioral modification has repeatedly demonstrated its efficacy in changing behavior and establishing desired behaviors in such areas as self-care, social behavior, psychiatric pathology, eating behaviors, smoking, and pain.

189. The answer is b. *(Kaplan, p 149.)* Extinction is the gradual reduction of a conditioned response, usually the result of withholding or altering the reinforcement or reward. Extinction is slowed when reinforcement occurs on a variable schedule (i.e., not every response being rewarded) rather than a continuous reinforcement schedule (every response rewarded). Gambling behavior, for example, is maintained powerfully through variable ratio reinforcement, even when there are long periods of nonreinforced responses. A fixed ratio schedule would provide a reinforcement after a specific number of responses or objects were produced (e.g., in a factory worker's schedule). In a fixed interval schedule, a person is reinforced only after a certain time has elapsed, such as with a monthly salary check. Piecework reinforcement is similar to a fixed ratio schedule with a reward being provided after each piece of work is produced.

190. The answer is b. *(Baum, pp 293–297.)* Spontaneous recovery, first described by Pavlov, is the return of response strength in due course after extinction. If extinction produced forgetting, then presumably the loss of responsiveness would be permanent. Return of the previously learned material suggests that it is not lost but rather suppressed by some active process resulting from nonreinforcement. Additional support for this concept comes from the finding that responses may return at full strength following a single reinforcement at the end of extinction.

191. The answer is b. *(Fauci, pp 1419–1426.)* Asthma is a very complex respiratory condition. An attack can be triggered or precipitated by a multitude of stimuli and events. The old psychoanalytic explanations and models of several decades ago have been almost completely discredited and

even the remaining hope for the efficacy of individual psychotherapeutic treatment lacks sufficient evidence. There is no cure for asthma, but there is considerable evidence that some degree of control can be attained. It is in this context that both sound medical treatment and behavioral self-management can be combined to greatly enhance the control of the disorder. The behavioral self-management program includes education (e.g., mechanics of breathing, use of medications) and self-management training (e.g., self-monitoring and observation of reactions, use of diaries, information processing of own data, decision making with most appropriate options, and self-instruction at all phases of the program). Suggestion can sometimes alter pulmonary function in asthmatic patients, but it has not had adequate success. Even though emotional reactions can act to trigger an asthmatic attack, attempts to eliminate or reduce emotional reactions have proved less effective than self-management in controlling asthma.

192. The answer is b. *(Baum, pp 294–296.)* A contingency relationship between response and reinforcement is characteristic of instrumental conditioning. For this form of learning, reinforcement occurs only if the desired response is emitted. Therefore, the occurrence of reinforcement is at least partly under the control of the learner.

193. The answer is b. *(Sierles, pp 37, 67.)* Learning disability is the label given to children who show a discrepancy between their estimated academic potential and their actual level of academic performance. Failure to learn academically does not necessarily imply general impairment in intellectual capacity, but it can seriously affect broad adaptive functioning. Most persons with learning disabilities show a largely selective deficit, despite apparently normal schooling exposure, seemingly normative family settings, appropriate motivational predispositions, intact sense organs, adequate physical status, and normal intelligence; yet they fail to learn with normal proficiency. Research studies show that the criterion of failure to learn to read is the most frequent manifestation of a learning disability. This form of learning disability is generally known as dyslexia and is a problem of major proportions, especially during adolescence.

194. The answer is b. *(Baum, pp 306–310.)* Biofeedback is a process of learning to control various components of one's autonomic responses by using visual or auditory feedback of information from one's physiologic

functions. The feedback of information about one's physiologic responses and one's ability to learn and practice control can be influenced by such factors as motivation, feelings, attitude, and interpersonal relations, but information feedback is the primary component in the learning process. Just as one learns to improve one's motor skills by feedback of information and observations of distance, time, space, improvement, and so on, one can learn to exert influence on physiologic responses. Formerly these physiologic responses had been regarded as autonomic because we had no visual electronic or mechanical mechanism for feeding back such information.

195. The answer is d. *(Sierles, p 10. Wedding, pp 378–391.)* One of the most effective methods of changing behavior is through the participation and appeal of popular and influential leaders. This has been demonstrated in educational programs to prevent sexual transmission of HIV with the use of popular leaders in the male homosexual community who had been trained to serve as endorsers of behavioral change. Anal intercourse was reduced after 2 months from 37 to 28% and the proportion of men who had multiple partners was decreased by 18%. Intravenous drug users also increased the use of bleach to clean their needles and syringes if they believed their friends and peers did likewise. Such peer leaders have also proved effective in reducing smoking among adolescents.

196. The answer is c. *(Taylor, pp 570–572.)* The behavioral conditioning process is very active in cancer patients who are receiving chemotherapy. The conditioned response of anticipatory nausea occurs because certain personal, environmental, or situational stimuli may elicit nausea before the administration of the chemotherapy that can cause nausea in its own right. About one-third of cancer patients on chemotherapy develop anticipatory nausea. It also occurs more frequently in patients who are less hopeful and more pessimistic, isolated, and inhibited, and those who have more chronic anxiety. The anticipatory nausea also appears to be related to the severity of the dose of chemotherapy. The major stimuli involved can be the hospital, the clinic, the nurse, or the smells encountered before administration of the chemotherapy.

197. The answer is e. *(Fauci, pp 459–461.)* The most important initial component is to explore and compile a detailed history of the individual patient's eating patterns. It may also be important to analyze the daily

caloric intake, establish a diet, begin an exercise program, and identify current medications, but these are not initial concerns. The history should identify (and document when possible) such eating patterns as time of day, length of eating period, place of eating (kitchen, television room, dining room, in front of stove or refrigerator), whether the patient stands or sits while eating, simultaneous activities (watching television, reading, dressing), emotional state, companions (relatives, friends, alone), the kinds and quantities of foods eaten, and dieting practices in the past (successful and unsuccessful). Once the eating practices are known, an individualized strategy for behavioral change can be developed (with the patient) designed to disrupt or abolish certain patterns that initiate or prolong "unhealthy" practices and substitute behavioral changes that will promote weight loss. Emotional states frequently affect eating, especially if food is used as a pacifier. For example, in behavioral modification, other activities can be substituted when the patient recognizes the occurrence of a vulnerable emotional state. The success of this strategy is gauged by its identification and modification of patterns of eating and the long-term maintenance of improved patterns of eating and physical activity.

198. The answer is e. *(Baum, pp 363–372.)* Evaluations of treatment methods using the classical conditioning model have demonstrated that relapse is more likely to occur in the presence of alcohol-associated stimuli. Thus, the most effective treatment conditions should maintain an environment that is as free as possible of alcohol-associated stimuli, and the patient should be returned to an environment that is different from the one in which dependence was acquired. Since dependence is acquired by the patient's developing alcohol-compensatory conditioned responses, specific, therapeutic strategies should be implemented and practiced over time prior to discharge to extinguish these alcohol-compensatory conditioned responses. Aversive affective states, such as depression or anxiety, can also act to increase the likelihood of relapse, so all treatment procedures should attempt to extinguish conditioned associations between aversive affective states and alcohol. The patient will probably experience relief from withdrawal symptoms if allowed to substitute other drugs; thus the very conditioned responses targeted for extinction will be maintained.

199. The answer is b. *(Sierles, pp 79–81. Wedding, pp 378-391.)* Even though most smokers say that they would try to quit smoking if their

physician told them to quit, only a third even try and only 10% actually do quit. Studies show that two-thirds of smokers have not been told by their physicians to quit or even to smoke less, although the number of physicians giving such advice is increasing. However, it is still considered good advice, even with a 10% success rate, since this still adds up to a significant number of people who actually quit. There are now several excellent behaviorally based programs for cessation of smoking that the physician can recommend and monitor.

200. The answer is e. *(Kaplan, pp 148–150.)* B. F. Skinner's radical behaviorist approach to psychology is based on the idea that the behavioral sciences should be restricted to the recording and analysis of observable behavioral responses. Skinner argued that it is unnecessary to make inferences about such inner states as arousal, need levels, motives, and cognitions. Skinner analyzed behavior in terms of the principles of classic Pavlovian conditioning and, more important, operant learning. Operant learning (instrumental conditioning) involves changing the relationship between reinforcement schedules and response outcomes.

201. The answer is e. *(Baum, pp 384–386.)* Since 1964 there has been a decrease in adult smoking, but an increase in adolescent smoking, especially among teenage girls and younger women. Response to social pressures is a dominate factor, including acceptance by peers and imitation of family members and role models, such as actors and athletes. These social forces described in social learning theory also promote alcohol and drug use.

A three-year longitudinal Houston intervention project used a social learning theory model to test whether students could be inoculated against the social influences of smoking by their peers and role models. The persuasive film messages and posters they developed taught coping techniques (stalling for time, putting counterpressure on the smoker, explaining health risks, and so on) to give students a repertoire of skills to resist social pressures to smoke. There were also films demonstrating the physiologic consequences of smoking (e.g., carbon monoxide poisoning, cancer, and poor health). A study of hundreds of students at the start and during a follow-up period of three years showed a positive impact on smoking cessation and a lower intention to smoke when compared with the matched control group. Other projects were developed and implemented to focus on alcohol and drug

addiction in adolescents. These interventions have shown a reduced rate of smoking onset by 50% and a substantial reduction in the use of drugs. It is very important to target intervention materials to the most appropriate ages and socioeconomic levels.

202. The answer is b. *(Sierles, pp 76–80. Wedding, pp 274–275.)* Contingency management is the technical term often used for positive reinforcement or stepping. It involves the process of changing the frequency of a behavior by controlling the consequences of that behavior with positive reinforcement to encourage or discourage a particular behavior. The procedure is used daily in our family and professional lives, such as rewarding (or punishing) children for their behavior and receiving (or being denied) a raise at work. Thus, a particular behavior becomes associated with a certain positive or negative consequence and the individual eventually accepts the desired behavior as being preferable. Behavior therapists have developed a wide range of applications for this learning procedure. A successful example is the token economy program (receiving tokens redeemable for snacks, movies, special privileges, and the like) which rewards destructive individuals for exhibiting appropriate behavior such as participating in rehabilitation activities. Contingency management has been effective with chronically hospitalized schizophrenic patients, such as the patient in the question who was disrupting the ward by shouting in the hall. Often, well-timed praise or friendliness will serve as an appropriate reinforcer to foster patient compliance, as will a lollipop for a child, or a follow-up phone call to a patient who has recovered or stopped smoking to reinforce your interest in their wellness, as well as their illness.

In stimulus control, the attempt is to eliminate the stimulus or cue that triggers undesired behavior. Modeling exposes the individual to desirable behavior or stimuli (e.g., posters or advertisements showing high status persons resisting smoking or explaining how to resist peer pressure).

203. The answer is c. *(Sierles, pp 79–81. Wedding, pp 386–387.)* The modeling of parents, teachers, and significant others has been found to play a major role in influencing a person to smoke. Peer pressure is also a major influence, especially in adolescence. Cigarette advertising, which may use celebrity models and link smoking to such attractions as sports, sex, and prestige, impresses youth with the pleasurable, grown-up, and no-risk aspects of smoking. Social inoculation is a process whereby persons

are inoculated with arguments and behavioral skills to reinforce the effects of positive modeling, the social skills to counteract peer pressure to smoke, and various content analyses of the techniques used by advertisers to persuade youth to smoke. Experimentation is a common characteristic of adolescence and smoking is one of the most frequent behavioral trials.

204. The answer is e. *(Fauci, pp 459–461.)* Empirical studies have revealed a number of changes in eating habits that will significantly discourage the tendency to eat more food than is required by the body. Nutritional experts recommend that we eat more slowly, serve ourselves smaller portions, wait at least 20 min after we have eaten our first serving before taking a second one, restrict all our eating to one or two places in the home, do not watch television or read while we are eating, and let family and friends know that we are trying to cut down on food intake. In addition, we should go grocery shopping only after we have eaten a satisfying meal, not leave food out where we repeatedly see it and can easily reach it many times a day, try to spend less time in the kitchen, get someone else in the family to clear the plates and put away the leftovers, and monitor eating habits by keeping a detailed log or diary of all food intake. Such activities will help to disrupt previously learned, but inappropriate, eating behaviors and establish appropriate environmental conditions and eating behaviors.

205. The answer is e. *(Kandel, pp 1238–1239.)*. Memory can be divided into short-term and long-term stages. Recently acquired memories are more easily disrupted by such factors as trauma, whereas long-term memories, or older memories, are fairly resistant to disturbance. Short-term memory is transformed into a more permanent long-term store. Thus, the memory process is always undergoing continual change with time. Both short-term and long-term memories are encoded in neural activity that involves a physical change in the brain with apparent alterations of the connections between neurons. It is also clear that the memory traces are not localized to any one brain structure, and that all parts of the nervous system have the plastic properties needed for memory storage. The recall involves an active reconstruction rather than a faithful reproduction of the internal store, and the complex nature of learning itself ensures that the involved neurons are widely distributed in the nervous system. Fortunately, the brain has the capacity to take limited remaining information (memory) and reconstruct a relatively good reproduction of the original

memory. The temporal lobes and associated areas and the hippocampus are not registers or banks for memory storage but are actively involved in the storage and retrieval process. Since memory traces are not localized in any one brain structure, trauma to one part of the nervous system can create initial memory loss, but some memory gradually returns even though the lesion or trauma seemed to have caused complete amnesia.

206. The answer is b. *(Wedding, pp 274–275.)* Specific behavioral problems (such as shouting obscenities, messiness, or poor hygienic habits) that are often found in institutionalized psychiatric patients can be reduced and replaced with positive and constructive behavior through operant reinforcement by first precisely defining the behavior to be established, then finding an effective reinforcement (e.g., praise, attention, compliments, privileges, money, tokens, food), and finally training the staff to provide the appropriate reinforcement when the desired behavior is emitted by the patient. Punishment is not usually a part of operant reinforcement if one wishes to establish positive and constructive behavior.

207. The answer is e. *(Baum, pp 121–125.)* Repeated instances of noncontingent behavior and outcome can result in learned helplessness, with a person learning and expecting that most events are not controllable or will not be successful. A number of parallels have been drawn between learned helplessness and depression. Although both learned helplessness and depression are very complex phenomena, the characterizations of passive behavior, negative expectations ("I won't be able to do this"), hopelessness, and a feeling of having no control over life's events are present in both. Failing continuously because of one's lack of ability or skill is more apt to relate to depression, while failing because of one's feeling of lack of control over outcomes is more apt to lead to a feeling of helplessness.

208. The answer is d. *(Baum, pp 159–164.)* Biofeedback and relaxation training have been used to modify the stress-induced components of hypertension. This results in a small but significant reduction in blood pressure—frequently about 15 mmHg systolic and 10 mmHg diastolic. Meditation and yoga have also been effective in lowering blood pressure. These modest declines in blood pressure have been demonstrated to be especially effective with the person who is at the stage of mild or even mod-

erate hypertension. Weight reduction accomplished by changing one's eating behaviors will also reduce one's blood pressure, even when the salt intake is held constant. Contingency conditioning has not proved effective.

209. The answer is d. *(Kaplan, pp 148–151.)* Timing is critical in both classical and operant conditioning. In classical conditioning, the conditional stimulus and unconditional stimulus must be presented closely, otherwise learning is poor or slow. In operant conditioning, the reinforcer must follow the desired response without delay, or only weak conditioning will occur. The person or animal must be able to discriminate between the two stimuli (stimuli discrimination) in classical conditioning for the second stimulus to be able to elicit the response. Extinction occurs in classical conditioning if the conditional stimulus is repeatedly presented without the unconditional stimulus. Likewise, if reinforcement is not given when the desired response occurs in operant conditioning, the probability of the response's occurring decreases until the response eventually ceases. Simultaneous stimuli presentation is relevant for classical conditioning but not necessary for operant conditioning. Classical conditioning is usually restricted to a specific reflex response (e.g., salivation) that is evoked by a specific stimulus (e.g., food). Operant conditioning involves any behavior that will tend to repeat itself if properly rewarded (reinforced). The learning of predictive relationships between stimuli and behaviors is important in both classical and operant conditioning. In classical conditioning, the person (animal) learns that a certain stimulus (food) predicts a subsequent stimulus (bell) or event. In operant conditioning, the person learns to predict the consequences of his or her behavior as the result of reinforcement (reward).

210. The answer is b. *(Taylor, pp 84–87.)* Social learning theory suggests that all the following are methods of attitude change: direct reinforcement—rewarding an expression of the desired attitude or behavior; extinction—denying the rewards that maintain the attitude that is to be changed; and modeling—watching someone else being rewarded for desired responses and punished for undesired ones. Desensitization is a technique for conditioning neutral or positive responses to previously fear-inducing stimuli. It, too, is based on social learning principles. Social learning theory is based primarily on considerations of nurture and has done very little to attempt to integrate considerations of nature (i.e., biologic factors).

211. The answer is c. *(Kaplan, pp 151–152.)* Systematic desensitization was developed by Joseph Wolpe in an effort to decrease neurotic anxiety or phobias that are learned and are usually precipitated by certain environmental situations, such as fear of heights or crowds. The patient is taught muscular relaxation; then, while using the relaxation to inhibit the anxiety, the patient is told to imagine a series of progressively more severe anxiety-provoking situations (e.g., climbing to the second step of a ladder, then the fourth step, and so on) until the anxiety-provoking situation of the highest (strongest) level can be brought to mind without the accompanying anxiety or fear. The anxiety-provoking situation is not brought to mind to be treated by any special form of psychotherapy but becomes paired with the anxiety-reducing relaxation. Most of these anxiety-provoking situations are situation-specific; however, the desensitization often generalizes to other real-life situations that may be potentially anxiety-provoking.

212. The answer is b. *(Sierles, pp 10–11. Wedding, pp 366–377.)* Prevention is still the best hope for controlling the HIV epidemic, and strategies dealing with the perception of health risk and leading to the change of high-risk behavior have proved most effective. While knowledge alone is insufficient to change behaviors that are so powerfully reinforced by pleasurable experiences, it can become an important factor when combined with other strategies of behavioral change, especially modifying how persons perceive the seriousness of the health risk, their vulnerability, and the benefits and personal costs of changing versus not changing one's behavior in the interests of health. The training of peers as endorsers of behavioral change has proved effective in the homosexual community, as has the implementation of needle-exchange programs among IV drug users. Strategies emphasizing disapproval, negative attitudes, fear, or rejection have not proved to be effective. Physicians can play a major role in the promotion of healthy behavioral change, as can social support from valued individuals and groups.

213. The answer is c. *(Baum, pp 216–217, 309–310.)* The migraine headache is associated with vascular dysfunction. The headache is typically preceded by intense constriction of the intra- and extracranial arteries in the temporal region. This is followed by a rebound dilation of the vasculature and then a sterile inflammation and edema of the arteries. Medication and psychotherapy are only marginally effective. By using biofeedback of finger skin temperature with the patient imagining a feeling of warmth in

the fingers and hands, vasodilation is produced in peripheral blood vessels. The patient learns to control the dilation of peripheral blood vessels, which is also associated with constriction of cranial arteries. Patients taught to constrict their temporal arteries have also reported decreases in headache activity compared with controls. Similar results were demonstrated using EMG biofeedback with the frontalis muscle. Patients using such biofeedback technology have reported fewer and shorter headaches and less use of pain pills. Subsequent research has also demonstrated the effectiveness of relaxation training in reducing general sympathetic tone. Systematic desensitization is also effective and augments the effect of relaxation so that the individual patient can identify and reduce specific stress responses.

214. The answer is c. *(Sierles, pp 79–81. Wedding, pp 20–25.)* Social learning theory, developed by Albert Bandura, suggests that through observation children acquire certain expectations and learned behavior with regard to smoking. Through media and models they can learn vicariously, for example, that smoking appears to relieve tension or anxiety. Also, when they observe a model appearing to enjoy the behavior, and without negative consequences, a condition of disinhibition results. The young person's learned expectation of negative consequences does not occur, and the expectation of negative consequences becomes weakened. This becomes an important factor in the ultimate decision regarding smoking.

215. The answer is a. *(Taylor, pp 127–129.)* There is a wide range of intervention strategies and technologies, many of which are very successful (e.g., 50 to 70%), but the relapse rate is also high, especially during the first 6 to 9 months after the behavioral change program has terminated. This emphasizes the need to continue some strategy to sustain the behavior, as one might continue to prescribe a drug for hypertension or diabetes. While the behavioral technology for changing behavior is well developed, we are not so well informed about how to prepare and motivate people to decide to adopt risk reduction and health promotion regimens. Outstanding progress has been made on identifying and modifying risk factors and risk behavior, but we know much less about health promotion, since promoting health is far more complex than eliminating risk factors and risk behaviors. A far greater percentage of people are able to successfully initiate, complete, and maintain risk-reducing behaviors if they do so on their own. This success appears to be related to self-direction, but little is known

about how this occurs, just as medicine knows little about how certain illnesses or conditions abate without medical intervention.

216. The answer is a. *(Baum, pp 323–328, 337–339.)* Pain and pain-related behavior can be influenced by the environment via basic learning mechanisms. This concept has made a major contribution to the understanding and management of chronic pain. It recognizes that the pain behavior itself (the overt actions and reactions of the person) is significant in its own right and not necessarily attributed to some underlying anxiety or conflict. Also, it emphasizes operational measurement and observation of the pain behavior itself (e.g., moaning, inactivity, use of medications), not the pain or inferred concepts as to why the person is feeling or reacting to pain. Using these concepts, the pain behavior can be conditioned as separate from the pain itself. Operant conditioning mechanisms are involved as the pain behavior is affected by such environmental consequences as reward (positive) or punishment (negative) factors, which act as reinforcers.

217. The answer is d. *(Sierles, pp 404–406. Baum, pp 166–189.)* The functional relationship between the nervous system and the immune system has been demonstrated by the ability to condition alterations of immune responses. The evidence is compelling and is based on such findings as the ability to condition immune suppression or enhancement of antibody- and cell-mediated immune responses, the ability to extinguish such conditioned responses, the development of tolerance to an immunomodulating agent, and the immunologic effects of stress that have been conditioned. Conditioning effects have also been observed using antigens as unconditioned stimuli. Thus far, studies have been unable to demonstrate conditioned compensatory responses in the immune system, but there have been some inferences of compensatory mechanisms.

218–221. The answers are 218-e, 219-d, 220-c, 221-b. *(Baum, pp 293–306.)* Classical conditioning is a basic form of learning. It was first described by Ivan Pavlov working on the conditioned reflex. He was able to take an autonomic reflex (e.g., salivation to food) that was thought to be unconditioned and demonstrated that it could be conditioned to respond to a new stimulus (e.g., a bell) if the new stimulus was presented along with

or prior to the unconditioned stimulus (food). After a number of such presentations the new stimulus (bell) would elicit the autonomic unconditioned response. The autonomic response had, in effect, learned to respond to the new stimulus (i.e., a learned association or connection between the two stimuli had occurred). Pavlov called this learned association stimulus substitution.

Operant conditioning, sometimes called instrumental conditioning, was formulated by Edward Thorndike and later developed by B. F. Skinner. In operant conditioning a new behavioral response is learned, as compared with classical conditioning in which a new stimulus is conditioned (learned) to elicit the same response or behavior. In operant conditioning reinforcement becomes the key stimulus that increases the likelihood that the desired behavior will be repeated or strengthened.

Systematic desensitization is a behavioral technique developed on basic principles of classical conditioning. Joseph Wolpe developed it as a means of alleviating anxiety. Deep muscle relaxation is paired with a series of imagined scenes that depict situations or objects that are associated with anxiety and thus produce anxiety. The scenes or situations are graded into a hierarchy and the pairing with relaxation proceeds from the most simple to the most severe scenes. The patient thus learns to tolerate more and more severe or difficult scenes and becomes desensitized as the relaxation acts to inhibit the anxiety response. The behavioral technique has been especially effective with phobias, insomnia, and stress-related disorders.

Shaping is a reinforcement and learning process wherein a series of successive responses that approximate the desired response are reinforced until the desired response is learned. It is basically an operant conditioning procedure and was originally developed using the bar-pressing response of rats as the act to be learned. The rat was positively reinforced for each of the closer and closer approximations, such as approaching the bar, rising upon hind legs, putting front paws on the bar (lever), and pressing the bar. This is also known as the successive approximation shaping procedure. After the desired behavior has been learned, the experimenter can then introduce different reinforcement schedules to maintain the learned behavior. A discriminative stimulus can also be introduced, such as pressing the bar only when a certain light is on, so that the animal will learn not to press the bar except when the light is on. The shaping technique has been used to train circus and other animals to perform complicated acts used in most

zoo and marine animal shows. The process of shaping is considered to be prominent, although greatly modified, in many social and cultural learning situations of everyday life.

Contact desensitization is a variation of systematic desensitization that combines modeling and guided participation procedures. In a fearful person, the therapist (or teacher) models the appropriate behavior and then guides the fearful person through each step of a hierarchy. Contact desensitization has been very effective in the treatment of phobias, such as the fear of snakes. The therapist would model appropriate behaviors, such as approaching the snake, touching the snake, and progressively allowing the snake to crawl around the therapist's arms and shoulders. The fearful person is then encouraged to perform each of these behaviors, beginning with the lowest behavioral task in the hierarchy. With the assistance of the therapist, each behavioral task is repeated until the fear and anxiety associated with the snake are extinguished. This method differs from systematic desensitization in that while a hierarchy is used, relaxation training is not. The procedure is based on extinction rather than depending on relaxation to inhibit the anxiety.

222–223. The answers are 222-e, 223-c. *(Sierles, pp 74–76.)* The woman who became nauseous prior to chemotherapy demonstrates a case of classical conditioning as developed by Pavlov. In his famous experiment, he gave meat powder to a dog and noted the unconditioned response (UCR) of salivation. He then paired the meat powder with a bell (unconditioned stimulus) and eventually was able to make the dog salivate at the sound of the bell (conditioned response) alone. A similar classical conditioning occurs when a patient associates some aspect of the oncology clinic (e.g., the room, smell, sight of the intravenous infusion bottle) with the nausea previously experienced during the intravenous process itself. Thus, the mere sight or smell of one or more components of the experience can produce the conditioned response of nausea and vomiting. A similar type of conditioning (fear or anxiety) can occur in a child at the sight of a white coat after having experienced a shot or other painful procedure, or in an adult whose blood pressure can increase at the prospect of having blood pressure measured for hypertension.

The decline in responsiveness or reaction to the repeated presentation of a stimulus is known as habituation. Thus, a medical student may feel very queasy in the first few days or weeks in the anatomy laboratory, or

when exposed to blood in surgery, or in dealing with an intoxicated or violent patient in the emergency room, but after multiple exposures, habituation takes place and the student becomes more comfortable in that setting. Habituation can also be a part of an effective therapeutic process in patients with certain phobias, fears, troubling thoughts, or obsessive-compulsive behaviors. When presented with anxiety-producing stimuli of various intensities over time, these patients may become habituated to the stimuli.

In negative reinforcement, the unpleasant stimulus is removed, contingent on a desired response. Modeling is the presentation of another person (usually of high status or recognized experience) as a model of desired behavior.

Instrumental (operant) conditioning is a mechanism for increasing the probability of a response by introducing a reward or reinforcement. B. F. Skinner pioneered the study of behavior that anticipates a reward or reinforcement. This reinforcement can be either positive or negative.

224–225. The answers are 224-c, 225-a. *(Sierles, pp 77–78. Baum, pp 349–351.)* The female patient is engaged in a fixed interval schedule of reinforcement. While this may not be a desirable procedure for the patient's health, she has adopted it as a way of coping with a requirement. By establishing a fixed interval checkup, the physician may have unwittingly allowed the patient too many opportunities to avoid adherence to the dietary component of the program. A variable interval schedule or some other means of monitoring the adherence and the weight could have produced a better result. An on-call checkup would be an example of a variable interval schedule. Behavior established with a variable interval schedule will also be sustained for a longer period of time and is less easily extinguished.

Stimulus control is an attempt to limit or exclude certain stimuli or cues that tend to trigger certain behaviors. Studies of eating behavior have found that many persons are stimulated to eat by cues (e.g., the presence of food, a comfortable environment, or a commercial interlude on television), resulting in the consumption of excess calories that maintain or increase their obesity. By attempting to identify and eliminate such environmental cues (stimulus control), one can reduce or eliminate unwanted behaviors. Stimulus control is also effective in programs for cessation of smoking. The goal is to reduce or eliminate specific stressful situations (e.g., interpersonal encounters) or environments (e.g., the smoking section in a restaurant) that may serve as a cue to reach for and to smoke a cigarette.

In desensitization, one is attempting to reduce the reaction to a stimulus to which the patient has become oversensitized. This is usually related to a phobia or anxiety reaction. An effective therapeutic procedure would be to identify a hierarchy of fear responses and work to desensitize the patient's responses from the least to the most severe.

A variable ratio reinforcement is best illustrated by a slot machine player, who may be rewarded after 6 lever pulls, again after only 3 pulls, but next after 20 pulls. The person is motivated to continue to play and at an increased number of pulls. A variable ratio schedule is most resistant to extinction.

226–227. The answers are 226-b, 227-e. *(Sierles, pp 76–79. Baum, pp 341–370.)* The smoker is being exposed to an aversive stimulus. The physiologic and psychological trauma is so severe and so aversive that the patient may choose to avoid smoking in the future. This can also be regarded as a form of punishment. In positive punishment, an unpleasant stimulus is applied, such as spanking or other acts that produce pain; in negative punishment, a positive reinforcer is removed (e.g., withdrawing use of the family car or other privileges). While punishment is not as effective in changing behavior as other more positive reinforcers, it can be effective, at least in dangerous situations and for the short term. Punishment during a longer period can produce resentment, it does not demonstrate positive alternative behaviors, and with certain persons (e.g., a child or adult who is seeking attention) it can become a substitute for positive reinforcement (i.e., the attention gained during spanking can sometimes outweigh the pain).

Systematic desensitization can reduce anxiety in a situation by identifying a hierarchy of situations that produce anxiety from low to high. For example, the bridge designer can be taught progressive muscle relaxation until he is as relaxed as possible, at which point he will begin by driving across the shortest or least anxiety-producing bridge (in vivo exposure). As he successfully experiences crossing the lowest anxiety-producing bridge, he can proceed up the hierarchy of bridges until he masters crossing the most anxiety-producing bridge. This process of systematic desensitization can also be used cognitively if, after identifying the hierarchy, he can practice muscle relaxation, fantasize about crossing the lowest bridge without becoming anxious, and then proceed up the hierarchy. This principle can also be used to treat anxiety over such situations as going to the dentist or entering a crowded room, or a number of anxiety phobias. The muscle

relaxation involves an important principle of reciprocal inhibition—a person cannot be relaxed and anxious simultaneously.

228–231. The answers are 228-e, 229-a, 230-b, 231-c. *(Baum, pp 293–312.)* From studying a mnemonist and various yogi experts who could control their heart rates, skin temperatures, and other physiologic processes, it was documented that an average person can learn to accomplish the same control by using certain visual or auditory feedback cues. We learn skills and everyday behaviors by using the basic learning principle that we can learn and improve performance by receiving feedback about our response and then making appropriate adjustments. Learning to drive a car, throw a baseball, or perform a venipuncture requires continuous feedback. By providing visual or auditory feedback (biofeedback) of physiologic responses, we can also learn to control voluntarily such physiologic functions. Pioneering experiments by Neal Miller in the late 1950s and early 1960s with animals were extended to demonstrate human subjects' ability to learn to control many responses that were assumed to be involuntary responses, such as blood pressure, heart rate, activity of the sweat glands, skin temperature, neuromuscular activity, and various brain rhythms. The clinical application of the behavioral technology of biofeedback continues to be explored and effectively applied to certain disorders, such as hypertension, Raynaud's disease, migraine headache, asthma, gastrointestinal disorders, dyskinesias, epileptic seizures, cardiac arrhythmias, anxiety, headache from muscle contraction, and muscular pain.

Contingency management is an attempt to control or manage the contingency between reinforcement (reward) and certain behavior (e.g., pressing a bar) in order to increase the frequency of that behavior. It involves systematically controlling the consequences with appropriate reinforcement. This method is used extensively in everyday activities to encourage or discourage certain behaviors in children, patients, or others with whom we relate. As an example, token economy programs, which give tokens as exchangeable awards, have proved to be very effective in treatment and rehabilitation, especially when the goal is to decrease undesirable behavior, psychotic talk, or the bizarre patterns of behavior of schizophrenics. The contingency management methods are also very effective in increasing the frequency of socially adaptive behaviors, responsibility, and self-reliance.

Cognitive restructuring is a therapeutic technique based on the fundamental discovery by Albert Ellis (1962) that cognitions and faulty or irra-

tional patterns of thinking can produce emotions and other psychological disorders, such as anxiety. By changing the internal or covert sentences that people say to themselves, they can reduce or eliminate negative emotional responses. This became known as cognitive restructuring, and while it may sound deceptively simple, it has added further confirmation to earlier studies showing that not only do attitudes affect behavior, changing behavior also affects attitudes. By integrating the biobehavioral perspective, we can demonstrate how specific thoughts or verbalizations to oneself can give rise to the psychological and physiologic aspects of anxiety. By identifying and modifying (restructuring) these negative verbalizations to oneself and replacing them with more positive statements to oneself, anxiety can be reduced. Similar to systematic desensitization, cognitive restructuring has demonstrated in controlled experiments that it is highly effective in reducing anxiety. Systematic desensitization is more effective with certain phobias, and cognitive restructuring is more effective with multiple fears in interpersonal situations.

Thought-stopping is a variation of restructuring. The client concentrates on specific anxiety-producing thoughts, which are then interrupted by a sudden shock statement "stop" by the therapist. After several interruptions, the locus of control is then shifted to the client by the client's learning to emit a subvocal "stop" at any time he or she begins to engage in the self-defeating rumination. In another technique, the client snaps a rubber band worn on his or her wrist when such ruminations occur. Even though this has a slight punishing effect, it does serve to provide an impressive stop signal and interrupts the destructive thinking. The thought-stopping procedures are especially effective with clients who have difficulty controlling distressing obsessional thoughts. The techniques of cognitive restructuring mentioned above can be effective in helping patients cope with psychological stressors that are linked to the precipitation exacerbation of physical symptoms. Again, what appears to be deceptively simple and superficial actually works and is based on more recent knowledge in neuroscience and behavioral science than are the traditional psychotherapeutic principles.

There has been much renewed interest in techniques of self-control and self-management for controlling problem behaviors. Some of the more successful techniques have been developed by working with patients attempting to control obesity but can also be applied to smoking, stress, tension, and other problems. Such techniques involve identifying signifi-

cant rewards and punishments that can be used by patients to reinforce the behavior they are attempting to monitor and control. For example, in the control of obesity there is self-monitoring of daily weight, calories, and exercise; self-reward with extra money, purchases, or privileges; and self-punishment with fines and denial of special privileges or favored activity. Self-monitoring and self-reward are more effective reinforcers than is punishment. Social support is also an effective reinforcement for self-control.

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Lifespan Development

Questions

DIRECTIONS: Each item below contains a question or incomplete statement followed by suggested responses. Select the **one best** response to each question.

232. The most important finding of René Spitz's classic study of deprivation was that

a. Prison nursing home children have a higher incidence of infections than foundling home children
b. Balanced and adequate nutrition is essential in the early months of life
c. The best medical care can guide infant development as well as home care
d. Social interaction with other humans is essential for normal development
e. No visits from parents is better for an infant than sporadic visits

233. Morbidity and mortality rates differ between men and women. Which of the following is the leading cause of death for women after the age of 65?

a. Breast cancer
b. Lung cancer
c. Cerebrovascular disease
d. Motor vehicle accidents
e. Ischemic heart disease

234. Jill and Tom have been neighbors and close friends their whole lives. They are both 13 years old and are in the same eighth grade class. Jill has begun to notice and talk about a few of the ninth grade boys and she spends less time with Tom. Tom is upset and feels hurt and inferior. The most likely cause of this situation is that

a. Other boys are beginning to notice Jill
b. Jill's girlfriends are beginning to spend more time with new friends
c. Tom's physical development is slower than Jill's
d. Jill's cognitive and social development has made her more interested in her girlfriends
e. Tom's physical development has made him show more interest in competitive sports

235. Erik Erikson views the stage of young adulthood as being best described by a crisis of

a. Trust versus mistrust
b. Intimacy versus isolation
c. Identity versus role confusion
d. Initiative versus guilt
e. Autonomy versus dependence

236. According to current research, a daughter is most likely to have traditional vocational aspirations if she has a

a. Nonworking mother
b. Working mother
c. Mother in a traditionally masculine occupation
d. Working father
e. Father with high occupational status

237. Sequential studies of human development found that the growth of intelligence continues through

a. Late adolescence
b. Early adulthood
c. Middle adulthood
d. Late adulthood
e. Old age

238. The leading nutritional problem among senior citizens in the United States is

a. Vitamin deficiencies
b. Fiber deficiency
c. Malnutrition
d. Undernutrition
e. Obesity

239. The most rapidly increasing rate of mortality is found in

a. Infancy
b. Childhood
c. Adolescence
d. Middle age
e. Old age

240. The complex of symptoms characteristic of children who are deprived of their mother or of a mother substitute during infancy and often extending into the first years of life is known as

a. Stranger anxiety
b. Anxiety neurosis
c. Autism
d. Childhood schizophrenia
e. Anaclitic depression

241. Which of the following statements about the development of moral standards during childhood is true?

a. Only at puberty do a child's moral standards become independent of external rewards and punishments
b. The development of guilt as a reaction to transgressions is fostered by parental warmth
c. Children of 11 or 12 years of age are more likely to make inflexible, absolute moral judgments than those 7 or 8 years of age
d. Older children are more likely than younger children to judge behavior as right or wrong in terms of its reinforcement outcomes
e. The development of moral reasoning is independent of general intellectual maturation

242. You have been asked to evaluate a 62-year-old man for a possible early dementia. The initial interview with the patient is not remarkable. The most common presenting feature of Alzheimer's disease that you should now focus your diagnostic evaluation on is

a. Change in personality
b. Loss of memory
c. Difficulty in learning new information
d. Impairment of orientation to time
e. Loss of intellectual skills

243. Language development in childhood is characterized by which of the following?

a. Infants 15 to 20 weeks of age use different patterns of vocalization to identify discomforts such as hunger, fright, and pain
b. Most children master all consonant sounds by the age of 3 to 3½ years
c. The first words spoken are usually verbs
d. Vowels emerge in hierarchical order between ages 3½ and 7 years

244. You are taking charge of a geriatric clinic. You would like to collect data on the significant changes in physiologic and cognitive functioning that develop with age. In designing a plan of data acquisition, you would take into account previous studies of aging that show that

a. Intraindividual variability is decreased with aging
b. Interindividual variability is decreased with aging
c. There is more age-related decline found in longitudinal methods than in cross-sectional methods
d. Lifestyle and experiences play a major role in retention of various cognitive functions
e. Sustained attention is reduced considerably by age 80

245. As a primary care practitioner, a middle-aged patient of yours seeks advice about her aging parents. She is concerned about what to expect in terms of declining cognitive and physiologic function, and in terms of providing for health care. Which of the following statements to her would be accurate?

a. Twenty percent of aged persons live in long-stay institutions (nursing homes, mental hospitals, homes for the aged)
b. The majority of old people feel bad most of the time
c. Aged drivers have more accidents per person than drivers under age 65
d. All five senses tend to decline in old age
e. Personality traits become unstable in the elderly

246. Which of the following statements about aging are true?

a. The maximal lifespan has increased in the United States over the past 20 years
b. Life expectancy would increase 30 years if heart disease and cancer were eliminated
c. The biomedical model is becoming increasingly applicable in accounting for death in the elderly
d. The $V_{O_{2max}}$ can be used as an integrated measure of the functional limits of the whole body

247. Educational stimulation of disadvantaged children results in a subsequent improvement in cognitive and academic performance when stimulation includes the following:

a. Weekly exposure to academic intervention
b. Institution of aid during latency years
c. A focus on cognitive, language, and number skills
d. Attempts to separate these children from the influence of their family

248. All the following research findings on adult development are true except that

a. Significant developmental changes continue to occur throughout adulthood
b. As people age, there is an increasing range of differences between individuals
c. Changes in adulthood occur in all areas of development (cognitive, physical, and social-personal)
d. Adult cognitive changes may show quantitative reduction on an ability test, but a qualitative acquisition of a different form of intelligence
e. Just as is the case in childhood and adolescence, there are predominant and universal developmental stages in adulthood

249. Stages in the child's normal development of speech are characterized by which one of the following statements?

a. Between 6 and 12 months, infants invent new noises and experiment with them
b. Infants 4 to 5 months old will repeat sounds they hear
c. Infants between 18 and 24 months will intentionally use a word appropriate to the situation
d. Between 36 and 48 months, infants use 200 to 300 words in phrases and two-word sentences
e. By 48 months of age, the child should have a vocabulary of about 1500 words

250. All the following factors are included in gender identity except

a. Gender role behavior
b. Parental and cultural attitudes
c. External genitalia
d. Sexual behavior
e. Genetic influence

251. Gender role identification and behaviors are learned early in life. Which of the following statements regarding early gender role identification is correct?

a. Gender-related differences in play behavior are evident as early as 6 months
b. Females are generally more aggressive in their play and problem-solving activities than are males
c. Children who experience gender reassignment after the age of 2 are considered to be high-risk candidates for psychological disorders
d. Children between 2 and 3 years of age are able to make gender-appropriate choices according to Western stereotypes
e. Females 3 to 5 years old appear to be more concerned about gender-appropriate play activities than are males of a similar age

252. The phenomenon of parent-infant bonding that occurs during the first weeks of life produces which one of the following changes in behavior and/or development?

a. Enhancement of infant's language development
b. Enhancement of infant's growth curve
c. Decrease in parental touching and fondling
d. Increase in amount of crying done by infant
e. Increase in unwarranted maternal concern

253. Which of the following factors is least powerful in the development of a child's identification with a parent?

a. Perception of physical and behavioral similarities
b. Communication from others concerning similarities
c. Imitation of parental mannerisms
d. Attractiveness of the parent
e. Obedience to parental authority

254. Perinatal gonadal hormones do not have a developmental impact on

a. Sex-linked neural differentiation
b. Sexuality in adulthood
c. Neural morphology
d. The permanent organization of parts of the nervous system
e. Hermaphroditism in genetic males

255. Which of the following patterns of cognitive skills in children is not characteristic of the specified age group?

a. At 18 months, a child begins to follow simple one-part directions, begins many questions with "what," imitates people in his or her environment, and infers causes from observing effects
b. At 2 years, the child begins to learn about time sequences, matches simple shapes and sizes, attempts new solutions to old problems, and may arrange several words in grammatically incorrect sentences
c. At 3 years, the child asks many "why" questions, talks in sentences using four or more words, can give his or her first and last name, and may talk about fears
d. At 4 years, the child may begin many questions with "how," knows the days of the week, can identify coins correctly, and can follow a three-step direction in proper order
e. At 5 years, the child asks the meaning of words, talks more, and is more externally focused

256. The concepts of death and pain are different at various stages of child development. Which of the experiential and cognitive reactions below are not characteristic of the identified age group?

a. Between birth and 2 years of age, separation is more apt to be experienced as synonymous with death
b. Children 3 and 4 years of age believe that a toy feels pain when it is broken
c. Children 5 to 6 years old fantasize that the dead person continues to experience emotion and biologic function in the grave
d. Children 7 to 9 years of age realize the inevitability of death for all living things, no longer feel responsible for the death of others, and yet feel that death can be avoided
e. At 10 to 12 years of age children see death as the result of aggression or trauma and can accept the concept of nonexistence

DIRECTIONS: Each group of questions below consists of lettered headings followed by a set of numbered items. For each numbered item select the **one** lettered heading with which it is **most** closely associated. Each lettered heading may be used once, more than once, or not at all.

Questions 257–260

For each description of a child's behavior below, select the age with which it is most closely associated as part of the growth and development sequence.

a. 18 months
b. 2 years
c. 3 years
d. 4 years
e. 5 years

257. Cuts around pictures with scissors; buttons a small button; can copy a square

258. Can drink from a cup without much spilling; turns several pages of a book together; builds a tower of four or five blocks

259. Can copy a circle; can wash and dry hands; can brush teeth—but not adequately; begins to use blunt scissors

260. Can turn doorknobs that can be reached; can drink from small cup using one hand; builds a tower of six or seven blocks

Questions 261–263

Match each view of illness with the developmental age at which it is characteristic.

a. Preschool age
b. Elementary school age
c. High school age
d. Adult
e. Elderly

261. Person views self as immortal or immune to external agents (e.g., germs)

262. Person regards illness as a consequence of "bad" behavior

263. Person fears loss of control

Lifespan Development

Answers

232. The answer is d. *(Sierles, pp 132–133. Kandel, pp 1128.)* René Spitz had the opportunity to observe infants in a foundling home where the infants had very little contact with humans except for receiving adequate medical care and feeding. He compared them with the infants in a prison nursing home who had visitations from parents and similar medical care and feeding. After a year, the infants in the foundling home were far behind those in the prison home in almost every measure of development.

Many of the foundling home infants were withdrawn, had developed anaclitic depression, and showed little curiosity or happiness. Even though they had adequate medical care, they were more prone to infection. After two or three years, all of the prison home children were walking and talking normally, whereas of the 26 foundling home children, only 2 were able to walk or say more than a few words. Other studies have confirmed the necessity for sensory and social interaction with other human beings to have any chance of normal development.

233. The answer is e. *(Fauci, pp 21–24.)* Differences in morbidity and mortality rates between men and women have not been well studied. We do know that women live longer than men, have 25% more restricted activity, have 40% higher bed disability, and make more visits to physicians than men. We don't know how much these variables are related to health.

Most individuals think of men as being much more vulnerable to ischemic heart disease (IHD), but the actual mortality rates are the same for men and women, with a slightly higher rate for women over the lifetime. Ischemic heart disease is the leading cause of death in women between the ages of 65 and 74 in the United States. The next cause of death at less than half the rate is lung cancer, followed by cerebrovascular disease and breast cancer. The death rate for breast cancer is decreasing and for lung cancer is increasing. The IHD death rate for men has decreased over the past few decades while the IHD death rate for women has remained the same. There is little data to evaluate some important differences for women such as changing gender roles, increased poverty in female-headed households, participation in the workforce, decreased health insurance, and changes in

lifestyle. Mortality rates for women at other ages are as follows: for ages 24 to 34, the highest rate is from motor vehicle accidents, followed by homicide, suicide, and non–motor vehicle accidents; for ages 45 to 54, the highest rates are from breast cancer, lung cancer, and cerebrovascular disease.

234. The answer is c. *(Conger, pp 55–68.)* The growth spurt takes approximately 4½ years for both boys and girls but it normally occurs at about age 13 for boys and at about age 11 for girls. The range is between three to four years on either side of the average, making the variability of growth in adolescence considerable. At age 13, Tom is probably just beginning his growth spurt, while Jill, although the same age, is a year or two ahead of him developmentally and has already begun or reached her menarche. This is a critical time socially and emotionally for both. Tom's growth spurt may have just begun while other boys in the school may be much farther ahead, resulting in feelings of inferiority and poor self-concept for not meeting some fantasized ideal. Jill, on the other hand, has begun to menstruate and, like Tom, is experiencing radical changes, lowered self-concept, and even depression for fear of not "measuring up" to fantasized and media-portrayed ideals. It may be important to note that menarche occurs about nine months earlier in girls from families with higher incomes than from families with lower incomes.

235. The answer is b. *(Sierles, pp 90–91. Wedding, pp 24–32.)* Erik Erikson's stage theory of psychosocial development provides descriptions of personality development that are consistent with a lifespan perspective. It has served as a major basis for research on human development. Erikson viewed the individual as having to develop the capacities (the ego functions) to meet the expectations of society. At each of the eight stages of psychosocial development there is an accompanying ego crisis. These stages are trust versus mistrust (birth to 1½ years), autonomy versus shame or doubt (1½ to 3 years), initiative versus guilt (3 to 6 years), industry versus inferiority (6 years to puberty), identity versus role confusion (adolescence), intimacy versus isolation (young adulthood), generativity versus stagnation (adulthood), and integrity versus despair (maturity). During intimacy versus isolation in the stage of young adulthood, there is psychosocial pressure for a person to form a close, stable interpersonal relationship. Thus, to the extent that one can attain an unconditional interchange and relationship, one will

feel a sense of intimacy in feelings, ideas, and goals. If one cannot share and be shared, then one will feel a sense of isolation.

236. The answer is a. *(Sierles, pp 154–160.)* When females develop within a family in which their mother is employed, they have less stereotyped views of female roles than do daughters of nonworking mothers, have a broader definition of female roles, and are more likely to emulate their mothers. It is hypothesized that homes with working mothers have different family interactions than do homes with nonworking mothers. The modeling influence for working and the development of achievement orientations appear to be major factors in developing nontraditional vocational aspirations. Also, fathers of high occupational status are more apt to promote nontraditional vocational achievement in their daughters. Interaction in such family settings may promote the development of vocational role orientations and behaviors that are nontraditional. In contrast, the daughter of a nonworking mother will be more influenced by the traditional model of the nonworking mother and will develop achievement orientations more consistent with the traditional female roles.

237. The answer is e. *(Conger, pp 91–92.)* Studies of intelligence suggest that a person's IQ score is somewhat variable in the early years, becomes increasingly stable through middle adolescence, and at about age 18 reaches a maximum score that is maintained for some time. Early cross-sectional studies indicated a decrease in IQ scores from middle adolescence into adulthood, but data from later longitudinal research indicated more stability or actual increases in scores. In 1956, Schaie began to study 500 people ranging in age from 21 to 70. When the data were analyzed cross-sectionally, the adolescent-to-adulthood decline typically seen in such studies was observed, but when the data were looked at longitudinally within each of the birth cohort groups in their sequential design, a decline on only one of the four measures (visual motor flexibility) of intelligence was found. Knowledge attained through education and socialization (e.g., verbal comprehension, number skills) and the ability to organize and process visual information resulted in a systematic increase in scores for all age groups. Clearly, the course of intellectual change from adolescence onward is not just an age-related phenomenon. One may expect that many of the levels and types of ability present in adolescence will be maintained

or enhanced in the adult and aged years, in large part depending on such factors as education, experiences, and cognitive activities.

238. The answer is e. *(Sierles, p 167.)* Obesity is the leading nutritional problem of older persons in the United States. It affects one in five senior citizens and is reported to be increasing. Overnutrition (too many calories), lack of exercise, high-fat diet, and lack of balanced diet are the major contributing factors, with overnutrition and lack of exercise sharing major responsibility. Vitamin deficiency, fiber deficiency, and undernutrition (often due to poor dentition, poverty, or living alone) are contributing factors to obesity, but of lesser influence. The assessment of lifestyle and nutrition (including eating habits) is especially important in all interviews of the elderly because the cumulative effects of lifestyle factors such as smoking, lack of exercise, obesity, and alcoholism take their toll as patients age.

239. The answer is c. *(Fauci, pp 30–31.)* In general, the mortality rate for adolescence is relatively low. However, adolescence and young adulthood is the only age period in which the mortality rate is actually rising. The potential loss is even greater for adolescents and for society when one calculates the years of life lost and loss of potential productivity over the lifespan. Among males, the leading causes of deaths are accidents, especially motor vehicle accidents, homicide, and suicide. Mortality rates for males are double the rates of females. In black males 15 to 19 years old, the mortality rate is ninefold greater than for white males.

240. The answer is e. *(Kaplan, pp 147, 163–164.)* Anaclitic depression refers to the complex of symptoms exhibited by young children who are deprived of their mother or of a mother surrogate during the first few years of life. This reaction comprises a number of stages. On first being separated from its caretaker, an infant will protest vigorously. If the caretaking figure is not restored to the infant, the infant enters what is known as the phase of despair and ceases protesting. This phase can be followed by a refusal to eat, which sometimes is fatal, or by a phase of detachment in which the infant withdraws from any interaction and engages in various forms of self-stimulation.

241. The answer is b. *(Schuster, pp 337–345.)* While the cognitive development the child undergoes brings about a great awareness of moral values

and standards, orientation to abiding by them depends on other factors, primarily identification with the parents and the experiencing of guilt for violation of guidelines. The development of conscience can be seen in internal reactions to transgressions in the form of guilt or by the child's adopting standards that the child feels personally responsible for maintaining. A number of studies indicate that conscience development is fostered by the presence of parental love and warmth of a degree adequate for positive identification and modeling. Such positive identification and modeling more readily occur if the parents' own conscience and moral standards are mature and reasonable rather than either deficient or overly strict, harsh, and inflexible.

242. The answer is b. *(Hazzard, pp 1036–1037.)* Alzheimer's disease is a progressive, disabling, degenerative disease and the most common cause of dementia in the elderly. The most common presenting feature of Alzheimer's disease is loss of memory. It is also usually accompanied by a gradual decline in intellectual function and impairment of orientation to time and place, judgment, problem solving, language, perception, and learning. Personality change often involves alteration or accentuation of premorbid traits, delusions, apathy, or depression.

243. The answer is a. *(Schuster, pp 261–262.)* Before children begin to talk, they use a variety of vocalizations to express themselves and to communicate with others. The 15- to 20-month-old child frequently emits long vocalizations that are qualitatively differentiated to communicate discomforts such as hunger, pain, or fright. Vocalizations of very young infants generally consist of vowel sounds. Most children master all the vowel sounds of American English by the age of 3 to 3½ years. Consonants emerge in hierarchical order as mastered phonemes between ages 3 and 7. Some consonants are more difficult to produce than others and are mastered later in the development sequence. The first words spoken are usually nouns.

244. The answer is d. *(Hazzard, pp 1016–1017.)* There are significant changes in cognitive and physiologic functioning that develop with age. Most studies of aging use cross-sectional methods, which usually show greater age-related declines than do longitudinal methods, which show the age-related declines to occur at an older age. The result has been to recognize that there is a great degree of individual variability to be found in cog-

nitive and in physiologic functioning. Inter- and intraindividual variability have been found to increase with aging. Therefore, group or normative data do not reveal results as valid as those of longitudinal data, nor are group norms or cross-sectional data as valid a measure of an individual's variability. For example, various cognitive abilities show a decline in the group means in cross-sectional studies, whereas longitudinal studies show individuals to experience cognitive decline at different ages and at different rates. One's lifestyle and educational, intellectual, and other growth experiences have been found to play a major role in the retention or delayed decline of various cognitive functions. Tests of sustained attention show that the elderly perform extremely well into old age with less than one standard deviation of change between ages 20 and 80.

245. The answer is d. *(Hazzard, pp 125–141, 154, 177–184.)* A major problem in attempting to provide health care for the elderly is understanding and counteracting some of the common stereotypes of aging. Although it is generally true that all five senses tend to decline in old age, it is not true that most elderly people feel miserable most of the time. In fact, recent studies show that the majority of the aged see themselves as being as happy as they were when they were younger. Boredom and lack of meaningful activity do become major factors with some aged, however. Another misconception is that a high percentage of the aged population live in long-stay institutions, such as nursing homes, mental hospitals, and homes for the aged. Actually, only about 5% of persons 65 and over, and about 10% of persons age 75 and over, are in long-stay institutions. Attempting to retain one's social, physical, and cognitive independence is a dominating factor and priority among the aged. Also, contrary to the stereotype that older drivers have a high automobile accident rate, older drivers have about the same accident rate per person as middle-aged drivers and a lower rate than drivers under age 30. By age 85, however, the crash rate is highest per mile driven. Longitudinal research has demonstrated that personality traits are highly stable after about age 30.

246. The answer is d. *(Hazzard, pp 3–16.)* In spite of advances in medical science, there has been no extension of the limit of the lifespan, although a greater proportion of the population is reaching the apparent biologic limit of 85 plus or minus 10 years. It is estimated that life expectancy would increase only about 20 years if all heart disease and can-

cer were eliminated. In effect, prevention and intervention have improved cohort survival as specific causes of fatal diseases have been conquered. In general, the risk of death in the elderly increases exponentially with time. However, the biomedical model for diseases is not as applicable today since death increasingly occurs in the absence of disease. One series of studies has shown that some cells are apparently programmed for a fixed and limited number of reproductions, and then they die. This has provided some new concepts on aging and death. The $V_{O_{2max}}$ has been determined to be an integrated measure of the functional limits of the whole body. Furthermore, the relative impairment and functional age of a person can be evaluated by the use of a simple nomogram.

247. The answer is c. *(Schuster, pp 281–293.)* Over the past two decades, many programs have attempted to improve the school performance of children from lower-class or disadvantaged homes. Most such studies have focused on developing competencies and motivational patterns that would provide the skills necessary to improve cognitive and academic performance. In general, they have demonstrated considerable success in improving subsequent cognitive and academic performance, including IQ. The degree of success is most often related to instituting the educational stimulation as early as possible; focusing directly on cognitive, language, and number skills; maintaining the effort over a prolonged period of time (years); and providing the stimulation on a daily basis rather than occasional exposure. These studies have also shown the importance of working with the powerful forces exerted on children by the values of the family and the community and the patterns of identification with social class and ethnic groups. A few isolated months or years of intervention cannot always offset the conditions and influences of the socioeconomically disadvantaged child. Programs that have been declared as unsuccessful in enhancing the intellectual functioning and academic success of such disadvantaged children have most often failed to provide one or more of the four listed components.

248. The answer is e. *(Hazzard, pp 102–112.)* Although significant developmental changes continue to occur throughout adulthood, there is an increasing range of differences, or variability, between individuals of the same chronologic age. Hence, there are no predominant and universal developmental stages in adulthood as one finds in childhood and adolescence. Even

if such predominant stages could be defined, the age at which people experience such stages or the sequence in which they occur is much more variable. In adulthood, changes occur in all areas of development (cognitive, physical, and social-personal). These changes may be a quantitative change in level, rate, or degree or a qualitative change in the nature or type. Thus, an aging adult's level of performance on an ability test may be reduced quantitatively, but qualitatively different forms of intelligence unique to adulthood, such as wisdom, may be acquired. Positive growth and change are expected and encouraged in childhood and adolescence, but in adulthood society does not provide such expectations and encouragement. The full potential for adult development has not begun to be realized.

249. The answer is e. *(Schuster, p 262.)* To assess the normal development of a child, it is important to understand the complex process and sequence of developmental skills that are involved in acquiring speech. Starting in the first 6 months of life, babies invent new noises and appear to experiment with them. Cooing usually begins around 2 months of age and occurs especially when the babies appear to be happy. By 4 or 5 months, babbling occurs. This is the practice of expressing alternative vowel and consonant sounds such as "baba." Babbling is an important skill to acquire before a child can learn to repeat sounds heard from other humans. Between 6 and 9 months of age, babies begin to repeat sounds or sound combinations that they have heard and advance to the lalling stage (chains of vowel sounds). Within the next several months, the babies attempt to imitate any and all sounds they hear. They begin to select those sounds that help them communicate their wants or that amuse them. Between 24 and 36 months of age, infants will be able to use 200 to 300 words in phrases and two-word sentences. By the age of 48 months, a child should have a vocabulary of about 1500 words that can be used in short sentences with almost 100% intelligibility.

250. The answer is d. *(Kaplan, p 677–678.)* A person's sense of maleness or femaleness is known as gender identity. It is both biologic and social. One's biologic sex of physique, including external genitalia and genetic influence, interrelates with a complex series of rewards, punishments, parental and cultural attitudes, and gender roles to influence gender identity. Gender role behavior is learned and is also derived in part from gender

identity. A normal and healthy developmental outcome requires a reasonable congruence of gender identity and gender role behavior.

251. The answer is c. *(Schuster, p 296.)* Significant gender role identification and behaviors are learned early in life. Gender-related differences in play behaviors are evident as early as 13 months of age. Males are generally more aggressive in their play and problem-solving activities than are females. These early behaviors are apparently so critical to one's core gender identity that children who experience gender reassignment after the age of 2 are high-risk candidates for psychological disorders. Recent research involving choices in child play indicates that children 3 to 4 years of age are able to make gender-appropriate choices according to Western stereotypes. Three- to five-year-old male children appear to be more concerned about gender-appropriate play activities than are females at that age. This continues into adolescence, as adolescent males also appear to be more conscious of gender roles than are females of that age.

252. The answer is a. *(Schuster, pp 680–687.)* While background variables of economic status, race, culture, housing, education, parity, and age may be more important variables in determining subsequent behavior of infants, the phenomenon of parent-infant bonding has recently been shown to be important also. The bonding that occurs during the critically sensitive period from the first hours and weeks of life has been shown to enhance such factors as language development, cognitive development, length of breast feeding (which may be both a cause and an effect), and touching and fondling by parents. The lack of parent-infant bonding tends to increase the amount of crying done by the infant, failure to thrive, and subsequent child abuse or neglect. While cause and effect may be interacting here, there are extensive animal studies that demonstrate the importance of biologic bonding. These findings have had a humanizing effect on physicians and hospital policies.

253. The answer is e. *(Schuster, pp 537–546.)* Children identify with their parents because they want to and, involuntarily, because of a perception of similarities. Insofar as most parents are seen by a child as having desirable attributes (e.g., power, freedom, ready access to pleasures, mastery over the environment), the child, wishing to become the same, identifies with his or

her parents. If the parents should provide such poor models that the identification process is hampered, the child is then likely to identify with other significant adults in his or her environment. Parental authority is a powerful force; obedience is quite different and distant from identification.

254. The answer is e. *(Kandel, pp 1141–1143.)* Recent evidence has shown that there are morphologic and functional differences in the nervous system of males and females. It is known that hormonal deficiencies during early development may result in two syndromes: Turner's syndrome, an anhormonal state in which gonadal tissue does not form (resulting in a phenotypic female, but one who fails to show pubertal changes), and androgen insensitivity syndrome, which is primarily associated with genetic males. (This latter syndrome was formerly called testicular feminization, but persons afflicted with it do not have feminizing testes and do not secrete estrogen-type hormones; they possess abnormal genes and are indistinguishable from phenotypic females in external appearance and psychosexual orientation and libidinal interests.) It is thought that this genetic disorder prevents or blocks responsiveness to androgens throughout development. It is also known that fetal exposure to heterotypical steroid hormones (hormones of one sex given to or influenced by the hormones of another sex) can cause hermaphroditism in genetic females, but it has not been demonstrated in genetic males. If, during the fetal period, the female fetus is exposed to an unusual amount of male hormone, the female organ development is distorted, partially reversing the differentiation of the peripheral sex apparatus. The adult sexual behavior of hermaphroditic females is also altered. Thus, the effect is not only on the differentiation of external genitalia, but also on the differentiation of neural tissues that mediate later patterns of sexual behavior. The developing nervous system of both genders is considered to be bipotential. While the female anatomic and behavioral patterns can develop in either an anhormonal or maternal-dominated prenatal environment, the active influence of androgens is required for the development of a male pattern. Furthermore, there is a critical time period during which specific interactions between the developing brain and its environment (internal and external) will mold neuronal and behavioral capabilities. There is increasing evidence that the effects of the perinatal male hormones upon subsequent sexual behavior are more upon the developing central nervous system than upon the peripheral sexual apparatus.

255. The answer is d. *(Schuster, pp 223–225.)* Cognitive skills in children develop in a fairly predictable pattern. Most cognitive behaviors can be expected to emerge chronologically. In comparing average age with expected behaviors of early childhood, one can expect the average 18-month-old child to begin many questions with "what," imitate almost everything in his or her environment, understand space only from his or her own activity of moving through it, begin to follow simple one-part directions, and begin to infer causes from observing effects. The average 2-year-old child can be expected to begin to learn about time sequences (e.g., "after lunch"), may arrange several words together in grammatically incorrect two- or three-word sentences, matches simple shapes and colors, attempts new solutions to old problems, and demonstrates a beginning cooperation in toilet training by anticipating a need to "go." By the age of 3, the child can be expected to ask many "why" questions, talks in sentences using four or more words, may talk about her fears, can give her first and last name, and may explore the environment outside the home if given the chance; in addition, many retain urine through a night's sleep and wake up dry. By the age of 4 years, the child begins many questions with "where," may talk with an imaginary playmate, may threaten to run away from home, can give opposites (up-down, hot-cold, and so on), and can associate familiar holidays with their seasons. Asking questions with "how," knowing the days of the week, identifying coins correctly, and following a three-step direction in proper order usually do not occur until the age of 5 years. At 5 years, the child may also begin asking the meaning of words, talks more "constantly," and may need to be reminded to eat or go to the bathroom because attention is so externally focused that he may fail to recognize subtle internal physiologic cues. Knowing the average age at which certain cognitive skills can be expected to develop can be of great assistance in helping the physician monitor the normal, or typical, growth or development of individual children.

256. The answer is e. *(Schuster, pp 376–392.)* Although a child's discovery of death is a private and individual experience, it is closely related to cognitive and affective developmental stages. Cognitively, a child must be able to conceptualize animate versus inanimate objects, comprehend cause-effect relationships, and deal with concrete factors before dealing with the abstract. Affectively, sufficient ego-strength, separateness, uniqueness, vulnerability, and coping skills must be developed. The infant must develop a concept of self before being able to comprehend "me—not me."

Between birth and 2 years of age, the infant is aware of separation through object loss and separation anxiety. This deprivation is an early form of experiencing separation as something synonymous with death. Children 3 and 4 years of age believe that all things think, feel, and experience things as they do. Thus they think that a toy feels pain when it is broken and that it must feel hurt when it is repaired. Also, they consider death as another form of life. At 4 and 5 years of age, they believe that death is a cessation of movement but that the dead person or animal continues to experience feelings. Cross-cultural studies have identified many primitive peoples who conceptualize death on this level, since many of them place food, drink, and other objects at the grave or in the tomb of the deceased. Our custom of placing flowers and other adornments on graves may, in part, be a remnant of this level of conceptualizing death. Children at this age are also apt to associate death with retaliation or punishment, which may lead them to fear, anger, and aggression toward others. Physicians must be aware of this possible interpretation of the 5- and 6-year-old child as a reaction to death, especially in the child's own family.

At 5 or 6 years of age children are apt to feel that death can be avoided and that they are not responsible for another person's death. They also begin to realize that their own significant others can die, and this can lead to notable uncertainties and insecurities. Children at 7 to 9 years of age begin to accept the inevitability of death for all living things, but believe that somehow it is external to oneself. By 10 or 12 years of age, death begins to be accepted as a biologic finality and understood in relation to natural laws, rather than being perceived as the result of aggression or trauma. Children at this age can see illness and accidents as causative agents and also that death originates within us and is not just external to us. No longer does the child feel that the dead person continues to live and feel in the grave. Adolescents spend much time in abstract thought about death and try to integrate the past, present, and future experiences into a philosophy of life. They still find it difficult to accept the concept of nonexistence, and this difficulty may extend into adulthood or even old age.

257–260. The answers are 257-d, 258-a, 259-c, 260-b. *(Schuster, pp 194–195.)* The development of both gross and fine motor skills has been clearly observed and scientifically documented for various ages and stages of development. At the age of 18 months, a child can run, climb, throw a small ball, drink from a cup without much spilling, turn several pages of a

book together, unzip a large zipper, scribble with a pencil, and build a tower of four or five blocks.

At 2 years of age, a child can try to jump, can turn doorknobs that can be reached, can drink from a small cup using only one hand, turn pages of a book one at a time, unbutton large buttons, and build a tower of six or seven blocks.

At 3 years of age, a child can peddle a tricycle, jump from a low step, begin to use blunt scissors, copy a circle, wash hands and brush teeth (but not adequately), and imitate a bridge made of three blocks.

At age 4, a child can hop forward on one foot, walk backward, cut around pictures with scissors, copy a square, button side buttons, and may bathe with assistance.

At 5 years of age, a child can jump rope, stand up without using hands, may be able to print own name, copy a triangle, dress without assistance, eat with a fork, and put toys away neatly.

261–263. The answers are 261-c, 262-a, 263-e. *(Taylor, pp 451–458, 487–493.)* A person's developmental level directly affects cognitive, social, emotional, and behavioral factors in illness. Chronologic age is of less value to the health professional in assessing and anticipating problems in treatment and prevention. Persons with mental or physical disabilities can be particularly difficult to assess and predict.

Preschool children generally view being sick as the result of some external agent (e.g., germs). They believe that getting well depends on strict adherence to rigid health rules. They are also more apt to view hospitalization as a punishment for bad behavior. This makes preparatory procedures especially important prior to and during hospitalization in order to deal with anxiety and stress. Because of close ties between the preschool child and parents, separation from parents can be an extreme source of stress for both the child and the family.

In adolescence, the complexities of illness and health and the more sophisticated interaction of internal and external factors become more prominent. The long-range consequences of an illness are not apparent, however, and the adolescent views himself or herself as indestructible or immortal. Peer group activities are of extreme importance. Adolescents will deny or neglect their medical care or health so as not to appear different. Diabetes provides special difficulties. Peer pressures to drink or smoke can also undermine present or future health.

A major concern of the elderly is the possibility of developing a debilitating illness. The fear is that they might lose control of their mental and physical abilities and become dependent on or rejected by significant others. Other concerns are possible disfigurement or handicap, impending death, extended pain, chronic hospitalization, and invalid status.

Communication and Interaction

Questions

DIRECTIONS: Each item below contains a question or incomplete statement followed by suggested responses. Select the **one best** response to each question.

264. A husband and wife, both in their mid-thirties, have been patients of yours for over 10 years. In the past, the husband has unsuccessfully been treated for alcohol abuse. The wife has asked that the two of them be seen together to discuss what might be of help with any of their related health problems. In the discussion of individual and family stress, the husband asked if medicine had anything to offer for his condition. As you are explaining the benefits and risks of disulfiram (Antabuse), the wife explains that her husband now drinks even more than before. At this point, the husband becomes angry and shouts, "I don't need Antabuse, Alcoholics Anonymous, or anything else! I know I may have a drinking problem, but I can handle it myself without anybody's help!" In the above scenario, the husband is demonstrating

a. Displacement
b. Denial
c. Projection
d. Rationalization
e. Reaction formation

265. A 15-year-old male high school student has an appointment with the family's primary care physician because of intermittent abdominal pain over the past month. The primary concern in the patient's mind is likely to be

a. Confidentiality
b. Reassurance that the illness is not serious
c. Competency of the physician
d. Whether the doctor will understand
e. How to explain an illness to peers

266. It has been proposed that the health belief model can be used to predict the extent to which a patient will comply and adhere to treatment. The most important factor in predicting treatment compliance is the

a. Extent to which the patient evaluates the negative aspects of the side effects, unpleasantness, and disruptiveness that may occur in the treatment regimen
b. Doctor's perception and persuasion of the severity of the disease and the consequences of nonadherence
c. Patient's own estimate of the benefits of following the treatment versus the costs of nonadherence to the treatment
d. Patient's perception of the severity of the disease and the consequences of nonadherence to treatment
e. Personal theory of the patient as to what is wrong and how he or she can best get well

267. Which of the following kinds of communication has the greatest impact on a message?

a. Verbal
b. Vocal
c. Intonation
d. Facial
e. Eye contact

268. A 55-year-old man who has recently developed occasional angina has become your patient. A variety of lifestyle and dietary changes are required for optimal care as well as frequent monitoring of the patient's cardiovascular status. The most critical element to assure compliance behavior in a physician-patient relationship is

a. The exchange of accurate information and facts
b. The congruence of expectations of physician and patient
c. Similarity of physician's and patient's age
d. Recognition and downplaying of social class differences between physician and patient
e. Allowing for the patient to be rewarded in some way for compliance

269. The type of information that is most effective in helping patients cope with anticipated surgery is information about

a. Procedures to expect
b. Complications that can occur
c. Sensory experiences to expect
d. Other patients' experiences
e. Medications before and after surgery

270. The first reaction of most patients when told they have cancer is

a. The question "Why me?"
b. An appeal to God or a higher power
c. Anger at oneself or doctor
d. Disbelief
e. Depression

271. Pretest counseling for the antibody test that diagnoses HIV infection is primarily directed at

a. Identifying the source of transmission to help others face the seriousness of the problem
b. Securing an extensive history for posttest follow-up and advice
c. Persuading both partners to seek help and treatment
d. Helping the patient to change his or her high-risk behavior
e. Recognizing and treating pre- and posttest stress

272. Your new patient is a 45-year-old, recently divorced woman. She has just told you that her 25-year-old son returned home three days ago with AIDS, and that she has experienced severe chest pains when she thinks about it. She starts to tell you about some other disturbing symptoms, begins to cry, and looks away. Of the following, which would be the most appropriate immediate response to facilitate the interview?

a. Silence
b. "I know how you feel"
c. "Don't worry, it'll be OK"
d. "Why are you so upset? You know you can tell me anything"
e. "Are you thinking that you may have AIDS?"

273. A 50-year-old woman has learned that she has diabetes and will require insulin injections and blood glucose monitoring for adequate control. The highest patient compliance with the regimen required can be achieved by

a. Communication that is technically accurate and authoritative
b. The patient's belief that his or her health is influenced by internal control
c. The patient's belief that his or her health is influenced by external control
d. Careful explanations of need for prophylactic medicine
e. Assurance that continuing access to the doctor's care will exist

274. You are asked to see a middle-aged male patient who is complaining of frequent chest pains. As you enter the examining room, the patient is sobbing and blurts out, "My father died just like this two years ago." Your next step should be to

a. Reassure him that his pain is not related to his father's illness
b. Get more information on how his father's pain manifested itself
c. Order an emergency electrocardiogram
d. Introduce yourself and inquire about family history of heart disease
e. Ask a sufficient number of direct medical questions to establish a tentative diagnosis and plan for workup

275. A 45-year-old woman is hospitalized for a cholecystectomy. She appears to be anxious and worried about the surgery. Which type or types of information provided to the patient will be most effective in reducing stress?

a. Sensory information
b. Procedural information
c. Coping information
d. Sensory and procedural information
e. Sensory and coping information

276. The intervention style that is most effective in relieving the stress of surgery and enhancing the outcome is to provide the patient with

a. Problem-focused information
b. Emotion-focused information
c. A match between personality factors and treatment style
d. Maximum family support
e. As much preparatory medical information as can be understood

277. Which of the following is considered the most powerful nonverbal communication?

a. Touch
b. Gesture and posture
c. Dress and grooming
d. Physical distance
e. Facial expression

278. In informing a patient or a patient's relative of the patient's serious illness, it is important to

a. Establish clearly that you would prefer to talk about it only after you have all the facts, tests, and other relevant information
b. Find out what the person thinks or knows about the illness
c. Find out what the person is most concerned about
d. Give honest answers in such a way as to leave the person with some realistic hope
e. Determine the person's understanding of what you have discussed

279. Patients who are ill are most likely to use denial when

a. They view their social roles and expectations to be threatened
b. They have detected symptoms that they fear to be potentially serious and life-threatening
c. Their fears are not matched by their capacities to take meaningful action
d. There is increased opportunity for secondary gain
e. They view their personal desires to be threatened

280. In opening an initial interview with a patient, the least important thing to do is

a. Ask the patient why he or she has come
b. State what you already know concerning the problem
c. Refrain from duplicating questions already gathered in the chart
d. Ask open-ended questions
e. Project an image of authority

281. Physicians and patients both make observations and decisions in the health care process, based on many influences. Which of these statements is least likely to characterize the difference between physicians and patients in this regard?

a. Physicians tend to focus on symptoms that have serious implications for future health
b. Physicians usually focus on symptoms according to visibility or recognizability
c. Patients often focus on symptoms that interfere with usual activities or routines
d. Patients tend to focus on the degree of discomfort rather than the amount or degree of tissue damage
e. Patients tend to deny symptoms they fear may be related to a severe illness

282. Which statement is most likely to characterize responses to a cancer patient from individuals in the patient's support system?

a. Frequency and quality of time spent with the patient is likely to increase
b. Friends and family will discuss the disease with the patient in a direct manner
c. If the patient knows that the prognosis is poor, individuals in the support system will acknowledge this
d. Fear that discussion of the disease will upset the patient leads to a cheerful and superficial tone of dialogue
e. A desire to "set things right" leads to a discussion of negative feelings or events with the patient

DIRECTIONS: Each group of questions below consists of lettered headings followed by a set of numbered items. For each numbered item select the **one** lettered heading with which it is **most** closely associated. Each lettered heading may be used once, more than once, or not at all.

Questions 283–286

Match the body language behaviors below with the correct interpretation.

a. Not willing to enter into a communicative interaction
b. Angry, hostile, or upset
c. "I'm interested in you. Notice me"
d. Assertive and domineering
e. Submissive and fearful

283. Lower the eyebrows

284. Visually notice someone but then quickly withdraw visual contact

285. Cross arms and press knees together

286. Reach up and touch one's own throat

287. A young physician watches and imitates the behavior of an experienced physician who is interviewing a patient. This learning mechanism is referred to as

a. Operant conditioning
b. Modeling
c. Stimulus control
d. Biofeedback
e. Positive reinforcement

288. A patient is able to modify his or her own heart rate and blood pressure by monitoring the readings from the blood pressure cuff. This learning mechanism is referred to as

a. Operant conditioning
b. Modeling
c. Stimulus control
d. Biofeedback
e. Positive reinforcement

Questions 289–291

Match the statements or descriptions below with the appropriate forms of nonverbal communication.

a. Facial expressions
b. Emblems or symbols
c. Illustrators
d. Self-manipulators
e. Display rules

289. Movements involving one part of the body doing something to another part of the body

290. Body movements that transmit a highly specific message

291. Sex difference in recognition and use

Communication and Interaction

Answers

264. The answer is b. *(Sierles, pp 292–296. Wedding, pp 260–265.)* The husband in the question is using a strong denial mechanism of defense. In the early stages of alcohol abuse denial often involves not recognizing the obvious problem. It soon becomes a major defense reaction, especially as the person begins to recognize within himself that his own attempts to control or resolve the alcohol problem are woefully inadequate, nor can he control some of the underlying psychosocial problems. Initial rationalization soon turns into strong denial. It is somewhat analogous to smoking addiction when a smoker rationalizes that she can quit any time she wants, and then begins to realize she can't. Unfortunately in cases of alcohol abuse, the spouse usually waits an average of seven years after gross evidence of alcoholic behavior before seeking help. This puts the physician tremendously behind in attempting to help the patient, the family, or the community. In many medical schools very little is taught about substance abuse. Consider the denial being exercised in the medical school setting. While only 5% of medical students smoke cigarettes, 80% use alcohol at least twice weekly, and 16% consume an average of more than six drinks each time, also known as binge drinking.

Other options in the question include rationalization (unacceptable feelings or facts become more tolerable by explaining them away), projection (attributing your own unacceptable thoughts or feelings to someone else), displacement (redirecting an emotion from the original object to another one), and reaction formation (adopting an attitude or behavior that is the opposite of your own unconscious feelings).

265. The answer is a. *(Fauci, pp 35–36.)* Confidentiality is the most prominent concern of an adolescent during a medical visit. This is especially important if the adolescent knows that most of the patients are adults. Confidentiality of information and discussions are so important that a transition interview might be considered to establish rapport and confidence. All interviews and examinations should be done in private. Family

guidance and the limits of support the physician and patient can expect should be discussed openly. The primary concern may not be initially disclosed, if at all, in the first interview. "How can I be of most help to you?" is usually the most productive attitude a physician can take. In pursuing questions about drugs, sex, and other sensitive areas, it can be helpful to ask about the patient's risk-taking behaviors and their frequency and intensity to understand how the adolescent identifies and reacts to risks. The adolescent also will be concerned with the other options in the question—reassurance, competency, understanding, and peer perception—but the first and primary concern is confidentiality.

266. The answer is d. *(Baum, pp 255–257.)* The most effective factor to predict treatment adherence is to understand the patient's own perception of the severity of the disease and the consequences of not adhering to the treatment. Next in usefulness is the patient's own evaluation of the extent of side effects, disruptiveness, and unpleasantness of the treatment. The patient's own estimate of the benefits of following the treatment (e.g., less pain, ability to go back to work, feeling better) is less reliable, but useful. The doctor's perception and persuasions will usually be listened to, but are not often effective in predicting compliance. Many patients have their own theory, inappropriately called "naive theory," as to how they became ill and the kind of treatment that was successful in the past and may work again. Naive theory has not been thoroughly tested. Physicians are well advised to try to understand what the patient thinks about his illness and treatment to help in understanding the existing barriers to patient compliance.

267. The answer is d. *(Hughes, pp 76–80.)* Verbal symbols may be only the tip of the communication iceberg. Nonverbal communications are used constantly but often are not consciously regarded as being central to the communication. One study found that the total impact of a message is 7% verbal, 38% vocal, and 55% facial. Another study demonstrated that no more than 30 to 35% of a conversation's social meaning, or interaction, is conveyed by its words. In a purely social setting, eye contact precedes verbal contact. Holding another person's gaze, looking away, and looking back quickly once or twice gains the person's attention. This may be followed by a sudden smile (flirt sign), then quickly turning away. There are different interpretations of nonverbal communications. For example, holding eye contact with a stranger on an elevator is considered threatening rather than

attention-getting. It is impolite to stare at a person you know unless the two of you are talking, and if you are talking it is disrespectful not to look at the person who is speaking. In other cultures interpretation of facial communication may be very different than in the United States. Latin and Asian cultures consider eye contact with someone of authority to be rude, disrespectful behavior. Knowledge of ethnic concepts is very important for physicians to be able to understand a patient's message, intention, and feelings. Physicians must learn to listen and read these very important nonverbal forms of communication, as well as being aware that the patient is reading the nonverbal messages that the physician is sending.

Important nonverbal communication systems include body language (preening behavior such as hair stroking and rearranging clothes), paralanguage (voice pitch, volume, pacing of speech, sighs, nasal "hm-hm" or "huh," and, especially important, silence), proxemics (personal space, front row versus back row versus aisle), touch (stroking), greeting behavior, artifacts (types of clothing, makeup, perfume, jewelry), gestures (thumbs up, talking with hand movements), and facial expressions (glares of threat and intimidation, surprise, disgust, fear, anger, sadness, and happiness). Some of these nonverbal communications have universal meanings whether in Africa, Asia, or the United States.

268. The answer is b. *(Baum, pp 249–261.)* Low rates of compliance appear to result from defective relationships between patients and health care providers. The most crucial element in the physician-patient relationship is the nature of role expectations that each has and the congruence and mutuality of such expectations. The exchange of information and facts, similarity of ages, social class differences, and patient rewards are relevant at times but are usually of less importance than the congruence of expectations between the physician and the patient.

269. The answer is c. *(Taylor, pp 331–333.)* Significant behavioral interventions have been devised to help moderate a patient's anxiety and distress over anticipated surgery or other threatening medical procedures. In addition to the patient's concern about the disruption of his or her normal routine, travel to the hospital, time off from work, child care arrangements, and so on, there are very real worries about the surgical procedures themselves and their outcome. Information about the procedures to expect, complications that can occur, other patients' experiences, and medications

that may be necessary are usually important and helpful to the patient, but studies have demonstrated that information about the sensory experiences that will be or can be associated with the procedure is the most helpful. This allows patients to evaluate the threats realistically so that they are not overwhelmed by unexplained and unfamiliar feelings and sensations that might be misinterpreted by the patient as dangerous sensory signals.

270. The answer is d. *(Sierles, pp 169–170. Baum, pp 108–134.)* When patients are told that they have cancer, the first reaction of most is disbelief and denial. This is the initial reaction described by E. Kübler-Ross and also A. D. Weisman, who maintain that shock and disbelief are followed by a more existential conception of one's own vulnerability and such questions as "What does it mean?" and "What can be done?" In Kübler-Ross's scheme, other reactions follow: anger, bargaining, depression, and acceptance. According to Weisman, mitigation and accommodation, convalescence with the resumption of activities as much as possible, and recognition of decline and deterioration are the stages. As denial becomes increasingly more difficult to maintain, "preterminality" and "terminality" occur, where only palliation helps; this is accompanied by a "death watch" stage. Weisman's more existential analysis deals with the concept of an appropriate death with emphasis on care, control, composure, communication, continuity, and closure.

271. The answer is e. *(Sierles, pp 12–13. Wedding, pp 366–377.)* Counseling and psychotherapy regarding HIV infection is a communication skill that every physician should have to help manage the major problem of stress and reduce suffering. The skill is similar to that required for patients with cancer or other life-threatening and terminal diseases. In HIV pretest counseling, the physician should be able to explain the meaning of the test and assess the patient's physical, emotional, social, and mental strengths so that the patient and the physician will be able to anticipate the patient's emotional responses and reactions in the event the test is positive. In posttest counseling, the physician should review the meaning of the test, reduce immediate distress, encourage open responses, reinforce strategies of behavioral change (whether the results are seronegative or seropositive), and review medical and psychosocial potential. Subsequent concerns will include deciding whom to tell; establishing a support network; building on the coping skills, attitudes, and perceptions of the patient; and engaging in appropriate stress-reduction training.

272. The answer is a. *(Sierles, pp 182–184. Wedding, pp 184–199.)* There are a number of ways a physician can facilitate an interview, but in this case momentary silence would be most appropriate; i.e., you should continue to listen and perhaps offer a tissue, a nod, or a simple affirmation of understanding her import, such as "I see." This would do more to support her by letting her express her feelings and not interrupt her flow of thoughts with another question or statement. Studies show that doctors tend to interrupt a patient after about 18 seconds and that crying is very upsetting to many doctors, who then feel compelled to say something—anything. Statements such as "I know how you feel" are usually inappropriate because most doctors do not know how a patient feels (unless they have had a son come home with AIDS). "Don't worry, it'll be OK" is a shallow response and does not support or help the patient, as the patient realizes that the doctor does not know that the patient will be fine. The question "Why are you so upset" is often interpreted as an accusation or inability to understand or express empathy. Saying "You know you can tell me anything" may be an attempt to reassure the patient, but it is inappropriate in a new patient who does not know that you can be told everything at this point in the relationship. The question "Are you thinking you may have AIDS?" is an inappropriate interruption and a very unlikely guess as to what may be upsetting the patient. It could be appropriate later in the interview, but only after exploring many other physical and psychological factors.

273. The answer is b. *(Sierles, pp 94–104. Baum, pp 227–262.)* Some studies have shown that about 50% of patients fail to follow advice or treatment prescribed. The lowest rates for adherence (compliance) are found in situations where prophylactic medication or advice is prescribed, especially for patients with chronic diseases. Significant levels of nonadherence occur where the symptoms are not seen or felt by the patient and there are no immediate adverse consequences experienced, e.g., in glaucoma, lung cancer, diabetes, or hypertension. The quality of the patient-physician communication is one of the most important factors; the higher adherence occurs when the communication is more open and shared with sufficient opportunities to discuss ideas and concerns. Adherence is low when the information presented is extensive, complicated, technical, and easily forgotten or misunderstood. Another important factor is patients' perceived control of their own health matters (locus of control). There is less adherence if patients feel that they have almost no control and that their health

is primarily influenced by external factors, powerful others, or chance. Adherence is higher if patients believe that they have a high degree of internal control and can take responsibility for their own health.

274. The answer is d. *(Sierles, pp 181–184. Wedding, pp 184–199.)* In an initial interview with a patient it is important to give a high priority to establishing a good doctor-patient relationship to facilitate good communication. With this patient it is important to introduce yourself, as this can have a calming effect on an emotionally upset patient if it is done in a reassuring and confident tone of voice. Since this patient is upset and has already told you that his father died with similar symptoms only two years ago, it is probably best to calmly inquire about family history of heart disease. Usually, such a patient will begin to calm down, will address your question, and you will have begun to establish a good, cooperative doctor-patient relationship with positive communication. Immediately attempting to reassure the patient that his pain is not related to his father's illness is apt to be aggravating, since he will surmise that you don't really know that. Inquiring about his father's pain is not immediately helpful in reaching your diagnosis, and ordering an emergency electrocardiogram is premature at this point. Asking a number of direct medical questions is also premature for an excited patient until you have established a more stable communication.

275. The answer is e. *(Baum, pp 230–234.)* Sensory information alone (what one can expect to feel) has been found to be the most effective type of information. Coping information (e.g., teaching coping skills, ways to relieve pain and discomfort) is the next most effective because it provides the patient with some sense of control. Procedural information (what procedures will be done) makes the surgery more predictable, but does not address the sensations one should expect. The most effective reduction of stress is achieved by combining sensory and coping information so that the patient is able to predict when pain will occur, how it will feel, and how to cope with it. Studies confirm that it is important for the patient to be able to establish or retain some sense of control.

276. The answer is c. *(Baum, pp 230–238.)* Attempts to match a patient's personality style and treatment or health care style have been found to be most effective in minimizing the stressful situation of surgery and maximizing favorable medical outcomes. Patients are individuals, each with different

personality dimensions and needs and with different coping styles. Extensive problem-focused information (informing about surgical procedures and sensations) will be helpful to certain patients but anxiety-producing to others. Likewise, some will respond favorably to emotion-focused information or technical medical information, but others will become anxious, confused, or upset. Family support is usually helpful, but again, it can become overwhelming. Listening to a patient and understanding a patient's personality and coping style will help the communication in this very complex process.

277. The answer is a. *(Hughes, pp 78–80.)* All channels of communication between persons other than the literal meaning of words spoken are designated as nonverbal communication. All the following can be considered as nonverbal communication: gesture and posture; touch; dress and grooming; physical distance; facial expression; skin color (e.g., pale, blushing); body hygiene; and even voice inflection, tone, and volume. Nonverbal communications convey more emotions and feelings than other types of information, and they are important in placing verbal communication into a context. Physicians must be especially sensitive to nonverbal communication to secure the maximum communication, information, feelings, and context. It is also important to recognize that differences in cultural and ethnic backgrounds are often expressed in different nonverbal communication patterns. Touch is considered to be the most powerful of the many forms of nonverbal communication as it can communicate such messages as caring, support, and intensity of feelings. It is also regarded as having significant curing power in its own right. Furthermore, touching can communicate valuable information to the physician about the patient, such as tension, temperature, anxiety, and muscle tone.

278. The answer is b. *(Sierles, pp 169–175. Wedding, pp 184–199.)* Asking a patient "What do you think?" and then correcting or qualifying the answer is an important part of informing a patient or helping the patient to understand the illness and the prospects for the future. It is most important to find out what the patient or relative thinks or knows or wants to know about the illness and to give honest answers that will leave the patient or relative with a realistic hope. It is also important to determine the patient's or relative's understanding of what you have discussed and to leave the communication channel open for further questions. A frequent error is for physicians to avoid giving any information or discussing the illness, espe-

cially the diagnosis or prognosis, by stating that they prefer not to talk about it until they have all the facts, tests, and so on. Many times the physician is fearful that he or she will only raise the patient's fear or anxiety or appear not to know what the illness is, or perhaps look bad in the patient's eyes by discussing the illness before all the data are in. Yet, the patient and family most often have a whole series of rational and irrational ideas about the illness and its prognosis that should be explored by the physician. The patient must know that the physician will be supportive, regardless of what he or she will be going through.

279. The answer is d. *(Baum, pp 255–256, 261, 376–377. Wedding, pp 378–390.)* What patients know, believe, and think about their illness affects the symptoms they think to be important, what they see as serious, and what they think they should do. Their social roles and personal desires often lead them to deny an illness. They often ignore symptoms for a long period before taking action. Fear about particular illnesses that may be life-threatening often causes them to deny the existence of the symptoms or their seriousness. Also, when patients' level of fear exceeds their capacity to cope, denial is a very likely result. The psychological process of secondary gain will also produce a postponement of action but is not usually associated with denial. Health educators need to help people bypass the usual hypothesis-testing of the cause of symptoms and help them take action by consulting a physician.

280. The answer is e. *(Baum, pp 261–270.)* The opening statement in initiating an interview with a patient is important and sets the tone as well as direction of the interview. It is important to learn directly from the patient why he or she has come and to state what you know in a frank and honest manner, recognizing the information the patient has given and encouraging a forthright relationship. The temptation to play the role of an authority may actually inhibit the exchange of information and encourage a dependency role. In general, one must look for interactions that facilitate rather than restrict the interview. Therefore, open-ended rather than yes-or-no questions will usually help the patient to speak more freely, provide more information, and put the patient more at ease.

281. The answer is b. *(Wallace, p 811–816.)* People evaluate and make decisions with respect to their symptoms according to a wide variety of

influences. In general, two types of variables define a person's estimate of the impact of these symptoms: perceived seriousness and extent of disruptiveness. Physicians ordinarily focus most on symptoms that have serious implications for the patient's future health status. Patients more often focus on symptoms that tend to interfere in some obvious way with usual activities and routines and on the degree of discomfort rather than the amount or degree of tissue damage.

282. The answer is d. *(Taylor, pp 570–572.)* Cancer patients generally receive ambivalent responses from others in their own social support networks. Feelings are likely to be negative toward cancer patients and to arouse fear and feelings of their own vulnerability and the possibility they might catch the disease. People are often strongly motivated to protect themselves by attributing the disease to the patient's undesirable characteristics or past behavior. They also fear that any discussion about cancer or death or their negative feelings will make the patient uncomfortable. Therefore, they avoid discussing their feelings and try to assume a cheerful role. Under these circumstances, the frequency and quality of the time spent with the patient are most apt to decrease and a certain amount of anxiety is likely to be evoked. Because most people avoid discussing cancer, they will shy away from discussing a hopeless prognosis and will fall back into cheerful but irrelevant chatter that represents a tragic waste of what could be meaningful and quality time for both the patient and the family.

283–286. The answers are 283-d, 284-a, 285-b, 286-e. *(Hughes, pp 76–80.)* A man may straighten his hair or adjust his clothes if he wants to signal "I'm interested in you" or "notice me." Likewise, a woman may stroke her hair, adjust her clothes, check her makeup, or push her hair away from her face. These are called preening behaviors. If we feel positive toward a person we are more apt to lean toward them, stand closer to them, and look them more directly in the eyes. By looking a stranger in the eyes once or twice, we signal that we are willing to enter into some sort of communicative interaction. If we notice someone, look at them, but then quickly withdraw visual contact, we signal that we are emitting a negative signal that we do not wish to establish a communicative interaction. This has been called civil inattention.

We also perceive the lowering of brows as an assertive and domineering signal and the raising of brows as receptive and submissive.

The closed body position—holding in the elbows, crossing arms, pressing knees together—is a frequent signal emitted by persons who are apt to be angry, hostile, upset, or nonreceptive. In an open body position the elbows are held away from the body, hands and arms are extended outward, legs are stretched out, and one ankle is crossed over the other knee.

Submission and fear are also communicated by body language. The submissive role tends to be represented by such actions as crouching slightly, assuming self-protective stances, reaching up and touching one's own throat, standing pigeon-toed, or not sitting until the dominant person sits.

Physicians must be able to decipher a patient's body language in order to get the full message. Nonverbal patterns signal inner attitudes and feelings, and many researchers conclude that nonverbal cues provide a more salient and valid message than verbal cues.

287–288. The answers are 287-b, 288-d. *(Sierles, pp 75–79. Baum, pp 306–310.)* Modeling—observation and imitation—is a very effective method of learning the practice of medicine and most other skills. We observe the behavior of another person, note specific aspects or details of the behavior, and then try to imitate the behavior. In learning to interview, physically examine patients, or perform therapeutic procedures, we practice and integrate our knowledge, as well as our observations of others, to learn and improve our skills. Modeling can also be used to help overcome a child's fear of surgery or to treat phobias. It can be used to produce negative results, as in advertising in which the macho aspects of smoking or violence are glorified. Positive uses of modeling might include observing another person with high status who demonstrates how to say no to peer pressure or how to find a nonviolent way to resolve a conflict or respond to an insult.

In the past it was assumed that people could not voluntarily influence their autonomic visceral functions. We now know that visceral functions can be conditioned. Continuous monitoring of visceral or muscular functions, e.g., with the use of blood pressure readings, the electromyelogram (EMG), or the electroencephalogram (EEG), will allow some patients to voluntarily influence (control) a visceral function, such as blood pressure and heart rate. This is called biofeedback because by watching the electronic data on the screen (feedback of a physical function), the person can complete the feedback loop by "willing" the increase or decrease of the function, watching it change, and maintaining the change. Biofeedback can be en-

hanced by combining it with such techniques as muscle relaxation. Contraction (tension) headaches can be relieved by using EMG feedback to relax forehead and temporal muscles; anxiety states associated with stress can be relieved by using skin temperature or perspiration measures and relaxation techniques. Also, blood circulation can be increased in the fingers through biofeedback and relaxation to relieve the symptoms of Raynaud's phenomenon. While biofeedback can be used to lower blood pressure, it is not as effective over the long term as relaxation, which can be used clinically for some patients with borderline or mild hypertension and without the need for antihypertensive medication.

Operant conditioning (also called instrumental conditioning) is a learning mechanism for increasing the probability of a response by introducing a reward or reinforcement.

Stimulus control is a clinical approach used in behavioral medicine and is based on manipulation of environmental stimuli responsible for initiating problem behaviors. In obesity, it may be necessary to remove snack treats, which can act as a stimulus to eat.

Positive reinforcement is the awarding or conveying of a positive reinforcer (e.g., peer approval or a special treat) to promote or ensure the continuation of a desired behavior. Modeling can also be enhanced (reinforced) if the teacher or peer provides approving comments or evaluations.

289–291. The answers are 289-d, 290-b, 291-a. *(Cockerham, pp 173–186. Hughes, pp 76–80.)* The ability to read and interpret nonverbal expressions is of critical importance to physicians, since such expressions reveal both intentional and unintentional feelings.

Illustrators are movements that amplify or emphasize words as they are being spoken. These can be movements of the hands to illustrate or emphasize the emotion (e.g., easy or flowing versus jerky or rapid) or they can be facial movements, called speech illustrators, which usually involve the brow, forehead, and eyelids to accent, emphasize, or supply emotion to words being spoken. The type of illustrator used is often related to a person's ethnic background or culture. Clinically depressed patients have a low use of illustrators; as their depression lifts, their use of illustrators increases. Other observations include the following: there is a decrease in use of illustrators when a patient is attempting to hide his or her feelings; as illustrators decrease, the average voice pitch level increases; and, in general, people who show a high rate of illustrators are regarded by others to be outgoing, sociable, and expressive.