

## Chapter 2: Biological Implications

### Multiple Choice

Identify the choice that best completes the statement or answers the question.

- \_\_\_ 1. A depressed client states, "I have a chemical imbalance in my brain. I have no control over my behavior. Medications are my only hope to feel normal again." Which nursing response is appropriate?
1. "Medications only address biological factors. Environmental and interpersonal factors must also be considered."
  2. "Because biological factors are the sole cause of depression, medications will improve your mood."
  3. "Environmental factors have been shown to exert the most influence in the development of depression."
  4. "Researchers have been unable to demonstrate a link between nature (biology and genetics) and nurture (environment)."
- \_\_\_ 2. A client diagnosed with major depressive disorder asks, "What part of my brain controls my emotions?" Which nursing response is appropriate?
1. "The occipital lobe governs perceptions, judging them as positive or negative."
  2. "The parietal lobe has been linked to depression."
  3. "The medulla regulates key biological and psychological activities."
  4. "The limbic system is largely responsible for one's emotional state."
- \_\_\_ 3. Which part of the nervous system should a nurse identify as playing a major role during stressful situations?
1. Peripheral nervous system
  2. Somatic nervous system
  3. Sympathetic nervous system
  4. Parasympathetic nervous system
- \_\_\_ 4. Which client statement reflects an understanding of circadian rhythms in psychopathology?
1. "When I dream about my mother's horrible train accident, I become hysterical."
  2. "I get really irritable during my menstrual cycle."
  3. "I'm a morning person. I get my best work done before noon."
  4. "Every February, I tend to experience periods of sadness."
- \_\_\_ 5. Which types of adoption studies should a nurse recognize as providing useful information for the psychiatric community?
1. Studies in which children with mentally ill biological parents are raised by adoptive parents who were mentally healthy
  2. Studies in which children with mentally healthy biological parents are raised by adoptive parents who were mentally ill
  3. Studies in which monozygotic twins from mentally ill parents were raised separately by different adoptive parents
  4. Studies in which monozygotic twins were raised together by mentally ill biological parents

5. All of the above
- \_\_\_ 6. Six months after her husband and children were killed in a car accident, a client is diagnosed with ulcerative colitis. The nurse should recognize that this situation validates which study perspective?
1. Neuroendocrinology
  2. Psychoneuroimmunology
  3. Diagnostic technology
  4. Neurophysiology
- \_\_\_ 7. A withdrawn client, diagnosed with schizophrenia, expresses little emotion and refuses to attend group therapy. What altered component of the nervous system should a nurse recognize as being responsible for this behavior?
1. Dendrites
  2. Axons
  3. Neurotransmitters
  4. Synapses
- \_\_\_ 8. An instructor is teaching nursing students about neurotransmitters. Which best explains the process of how neurotransmitters released into the synaptic cleft may return to the presynaptic neuron?
1. Regeneration
  2. Reuptake
  3. Recycling
  4. Retransmission
- \_\_\_ 9. A nurse concludes that a restless, agitated client is manifesting a fight-or-flight response. The nurse should associate this response with which neurotransmitter?
1. Acetylcholine
  2. Dopamine
  3. Serotonin
  4. Norepinephrine
- \_\_\_ 10. A client is admitted to a psychiatric unit with the diagnosis of catatonic schizophrenia. Which of the client's neurotransmitters should a nurse expect to be elevated?
1. Serotonin
  2. Dopamine
  3. Gamma-aminobutyric acid (GABA)
  4. Histamine
- \_\_\_ 11. A client's wife of 34 years dies unexpectedly. The client cries often and becomes socially isolated. The client's therapist encourages open discussion of feelings, proper nutrition, and exercise. What is the best rationale for the therapist's recommendations?
1. The therapist is using an interpersonal approach.
  2. The client has an alteration in neurotransmitters.
  3. It is routine practice to remind clients about nutrition, exercise, and rest.
  4. The client is susceptible to illness because of effects of stress on the immune system.
- \_\_\_ 12. Which mental illness should a nurse identify as being associated with an increase in prolactin hormone level?

1. Major depressive episode
  2. Schizophrenia
  3. Anorexia nervosa
  4. Alzheimer's disease
- \_\_\_\_\_ 13. Which cerebral structure should a nursing instructor describe to students as the "emotional brain"?
1. The cerebellum
  2. The limbic system
  3. The cortex
  4. The left temporal lobe
- \_\_\_\_\_ 14. A nurse understands that the abnormal secretion of growth hormone may play a role in which illness?
1. Acute mania
  2. Schizophrenia
  3. Anorexia nervosa
  4. Alzheimer's disease
- \_\_\_\_\_ 15. A client is admitted to an emergency department experiencing memory deficits and decreased motor function. What alteration in brain chemistry should a nurse correlate with the production of these symptoms?
1. Abnormal levels of serotonin
  2. Decreased levels of dopamine
  3. Increased levels of norepinephrine
  4. Decreased levels of acetylcholine
- \_\_\_\_\_ 16. A nurse should recognize that a decrease in norepinephrine levels would play a significant role in which mental illness?
1. Bipolar disorder: mania
  2. Schizophrenia spectrum disorder
  3. Generalized anxiety disorder
  4. Major depressive episode
- \_\_\_\_\_ 17. A nurse should expect that an increase in dopamine activity might play a significant role in the development of which mental illness?
1. Schizophrenia spectrum disorder
  2. Major depressive disorder
  3. Body dysmorphic disorder
  4. Parkinson's disease

### **Multiple Response**

*Identify one or more choices that best complete the statement or answer the question.*

- \_\_\_\_\_ 18. Which of the following information should a nurse include when explaining causes of anorexia nervosa to a client? (*Select all that apply.*)
1. There is a possible correlation between abnormal secretion of growth hormone and anorexia nervosa.
  2. There is a possible correlation between antidiuretic hormone levels and anorexia

nervosa.

3. There is a possible correlation between low levels of gonadotropin and anorexia nervosa.
4. There is a possible correlation between increased levels of prolactin and anorexia nervosa.
5. There is a possible correlation between altered levels of oxytocin and anorexia nervosa.

- \_\_\_\_\_ 19. Which of the following symptoms should a nurse associate with the development of decreased levels of thyroid-stimulating hormone (TSH) in a newly admitted client? (*Select all that apply.*)
1. Depression
  2. Fatigue
  3. Increased libido
  4. Mania
  5. Hyperexcitability

**Completion**

*Complete each statement.*

20. \_\_\_\_\_ is the study of the biological foundations of cognitive, emotional, and behavioral processes.

**Chapter 2: Biological Implications**  
**Answer Section**

**MULTIPLE CHOICE**

1. ANS: 1

Chapter: Chapter 2, Biological Implications

Objective: Recognize various theorized influences in the development of psychiatric disorders including brain physiology, genetics, endocrine function, immune system, and psychosocial, and environmental factors.

Page: 15–19

Headings: The Parietal Lobes, The Occipital Lobes, Limbic System, Medulla

Integrated Processes: Teaching and Learning

Client Need: Psychosocial Integrity

Cognitive Level: Analysis [Analyzing]

Concept: Mood

Difficulty: Easy

	Feedback
1	The nurse should advise the client that medications address biological factors, but there are other factors that affect mood. The nurse should educate the client on environmental and interpersonal factors that can lead to depression.
2	The statement is false because biological factors are not the sole cause of depression.
3	It is false that environmental factors have been shown to exert the most influence in the development of depression.
4	Researchers have demonstrated a link between nature and nurture.

PTS: 1

CON: Mood

2. ANS: 4

Chapter: Chapter 2, Biological Implications

Objective: Identify gross anatomical structures of the brain and describe their functions.

Page: 16

Headings: The Nervous System: An Anatomical Review > The Brain

Integrated Processes: Teaching and Learning

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Application [Applying]

Concept: Mood

Difficulty: Moderate

	Feedback
1	The occipital lobes are the area of visual reception and interpretation.
2	Somatosensory input (touch, taste, temperature, etc.) occurs in the parietal lobes.
3	The medulla contains vital centers that regulate heart rate and reflexes.
4	The nurse should explain to the client that the limbic system is largely

	responsible for one’s emotional state. This system is often called the “emotional brain” and is associated with feelings, sexuality, and social behavior.
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PTS: 1                      CON: Mood

3. ANS: 3

Chapter: Chapter 2, Biological Implications

Objective: Discuss the physiology of neurotransmission in the central nervous system.

Page: 21

Heading: Autonomic Nervous System

Integrated Processes: Nursing Process

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Comprehension [Understanding]

Concept: Mood

Difficulty: Moderate

	Feedback
1	The peripheral nervous system does not play a major role during stressful situations.
2	The somatic nervous system is part of the peripheral nervous system.
3	The nurse should identify that the sympathetic nervous system plays a major role during stressful situations. The sympathetic nervous system prepares the body for the fight-or-flight response.
4	The parasympathetic nervous system is dominant when an individual is in a nonstressful state.

PTS: 1                      CON: Mood

4. ANS: 3

Chapter: Chapter 2, Biological Implications

Objective: Discuss the physiology of neurotransmission in the central nervous system.

Page: 29–30

Heading: Circadian Rhythms

Integrated Processes: Teaching and Learning

Client Need: Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Analysis [Analyzing]

Concept: Sleep and Rest

Difficulty: Moderate

	Feedback
1	This statement does not indicate understanding of circadian rhythms.
2	The menstrual cycle is not affected by the circadian rhythm.
3	By stating, “I am a morning person,” the client demonstrates an understanding that circadian rhythms may influence a variety of regulatory functions, including the sleep-wake cycle, regulation of body temperature, and patterns of activity. Most humans follow a 24-hour cycle that is largely affected by lightness and darkness.
4	Experiencing periods of sadness is not indicative of the circadian rhythm.

PTS: 1                      CON: Sleep and Rest

5. ANS: 5

Chapter: Chapter 2, Biological Implications

Objective: Discuss the implications of psychobiological concepts to the practice of psychiatric/mental health nursing.

Page: 31

Heading: Genetics > Adoptions Studies

Client Need: Physiological Integrity: Physiological Adaptation

Concept: Evidence-based Practice

Cognitive Level: Analysis [Analyzing]

Integrated Processes: Teaching and Learning

Difficulty: Moderate

	Feedback
1	This type of adoption study can provide information on children with mentally ill biological parents who are raised by adoptive parents who are mentally healthy parents.
2	This type of adoption study can provide information on children with mentally healthy biological parents who are raised by adoptive parents who are mentally ill.
3	This type of adoption study provides important information on monozygotic twins from mentally ill parents who were raised separately by different adoptive parents.
4	This type of adoption study provides important information on monozygotic twins who were raised together by mentally ill biological parents.
5	The nurse should determine that all of the studies could possibly benefit the psychiatric community. The studies may reveal research findings relating genetic links to mental illness. Adoption studies allow comparisons to be made of the influences of the environment versus genetics.

PTS: 1                      CON: Evidence-based Practice

6. ANS: 2

Chapter: Chapter 2, Biological Implications

Objective: Discuss the influence of psychological factors on the immune system.

Page: 31

Heading: Psychoneuroimmunology > Implications of the Immune System in Psychiatric Illness

Integrated Processes: Nursing Process

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Application [Applying]

Concept: Stress

Difficulty: Moderate

	Feedback
1	Neuroendocrinology is the study of the interaction between the nervous system and the endocrine system.

2	Psychoneuroimmunology is the branch of medicine that studies the effects of social and psychological factors on the functioning of the immune system. Studies of the biological response to stress hypothesize that individuals become more susceptible to physical illness following exposure to stressful stimuli.
3	Diagnostic testing assists in diagnosing.
4	Neurophysiology is the physiology of the nervous system.

PTS: 1                      CON: Stress

7. ANS: 3

Chapter: Chapter 2, Biological Implications

Objective: Describe the role of neurotransmitters in the central nervous system.

Page: 21

Heading: The Nervous System: An Anatomical Review > Neurotransmitters

Integrated Processes: Teaching and Learning

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Comprehension [Understanding]

Concept: Mood

Difficulty: Moderate

	Feedback
1	Dendrites are processes that transmit impulses toward the cell body.
2	Axons transmit impulses away from the cell body. A junction between two neurons is a synapse.
3	The nurse should recognize that neurotransmitters play an essential function in the role of human emotion and behavior. Neurotransmitters are targeted and affected by many psychotropic medications.
4	A junction between two neurons is a synapse.

PTS: 1                      CON: Mood

8. ANS: 2

Chapter: Chapter 2, Biological Implications

Objective: Describe the role of neurotransmitters in the central nervous system.

Page: 21

Heading: The Nervous System: An Anatomical Review > Neurotransmitters

Integrated Processes: Teaching and Learning

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Comprehension [Understanding]

Concept: Mood

Difficulty: Moderate

	Feedback
1	Regeneration is incorrect wording to describe this process.
2	The nursing instructor should explain that the process by which neurotransmitters are released into the synaptic cleft and returned to the presynaptic neuron is termed <i>reuptake</i> . Reuptake is the process by which neurotransmitters are stored for reuse.

3	Recycling is incorrect wording to describe this process.
4	Retransmission is incorrect wording to describe this process.

PTS: 1                      CON: Mood

9. ANS: 4

Chapter: Chapter 2, Biological Implications

Objective: Describe the role of neurotransmitters in the central nervous system.

Page: 21

Heading: Monoamines > Norepinephrine

Integrated Processes: Nursing Process

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Comprehension [Understanding]

Concept: Mood

Difficulty: Moderate

Feedback	
1	Acetylcholine functions include pain, arousal, and pain perception.
2	Dopamine functions include regulation of movement and coordination.
3	Serotonin plays a role in sleep, libido, and appetite.
4	The nurse should associate the neurotransmitter norepinephrine with the fight-or-flight response. Norepinephrine produces activity in the sympathetic postsynaptic nerve terminal and is associated with the regulation of mood, cognition, perception, locomotion, and sleep and arousal.

PTS: 1                      CON: Mood

10. ANS: 2

Chapter: Chapter 2: Biological Implications

Objective: Describe the role of neurotransmitters in the central nervous system.

Page: 21

Heading: Monoamines > Norepinephrine

Integrated Processes: Nursing Process

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Application [Applying]

Concept: Mood

Difficulty: Moderate

Feedback	
1	Serotonin plays a role in sleep, libido, and appetite.
2	The nurse should expect that elevated dopamine levels might be an attributing factor to the client's current level of functioning. Dopamine functions include regulation of movements and coordination, emotions, and voluntary decision-making ability.
3	GABA prevents postsynaptic excitation.
4	Histamine mediates allergic and inflammatory reactions.

PTS: 1                      CON: Mood

11. ANS: 4

Chapter: Chapter 2: Biological Implications

Objective: Discuss the influence of psychological factors on the immune system.

Page: 31

Heading: Psychoneuroimmunology > Implications of the Immune System in Psychiatric Illness

Integrated Processes: Planning

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Application [Applying]

Concept: Stress

Difficulty: Moderate

	Feedback
1	This approach is not proven by evidence-based research.
2	This rationale is not proven by evidence-based research.
3	Reminding clients about nutrition, exercise and rest is routine but is not proven by evidence-based research.
4	The therapist's recommendations should be based on the knowledge that the client has been exposed to stressful stimuli and is at an increased risk to develop illness because of the effects of stress on the immune system. The study of this branch of medicine is called psychoneuroimmunology.

PTS: 1

CON: Stress

12. ANS: 2

Chapter: Chapter 2, Biological Implications

Objective: Recognize various theorized influences in the development of psychiatric disorders including brain physiology, genetics, endocrine function, immune system, and psychosocial, and environmental factors.

Page: 29

Heading: Psychoneuroimmunology > Prolactin

Integrated Processes: Teaching and Learning

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Application [Applying]

Concept: Stress

Difficulty: Moderate

	Feedback
1	There is no known correlation between increased levels of prolactin and major depressive disorder.
2	Although the exact mechanism is unknown, there may be some correlation between increased levels of the hormone prolactin and schizophrenia.
3	There is no known correlation between increased levels of prolactin and anorexia nervosa.
4	There is no known correlation between increased levels of prolactin and Alzheimer's disease.

PTS: 1

CON: Stress

13. ANS: 2  
 Chapter: Chapter 2, Biological Implications  
 Objective: Identify gross anatomical structures of the brain and describe their functions.  
 Page: 19  
 Heading: The Nervous System: An Anatomical Review > Limbic System  
 Integrated Processes: Teaching and Learning  
 Client Need: Psychosocial Integrity  
 Cognitive Level: Comprehension [Understanding]  
 Concept: Mood  
 Difficulty: Easy

	Feedback
1	The cerebellum is concerned with involuntary movement, posture, and equilibrium.
2	The limbic system is often referred to as the “emotional brain.” The limbic system is largely responsible for one’s emotional state and is associated with feelings, sexuality, and social behavior.
3	The cortex is identified by numerous folds called gyri and sulci.
4	The left temporal lobe is concerned with auditory functions.

PTS: 1                      CON: Mood

14. ANS: 3  
 Chapter: Chapter 2, Biological Implications  
 Objective: Discuss the association of endocrine functioning to the development of psychiatric disorders.  
 Page: 31  
 Heading: Psychoneuroimmunology > Growth Hormone  
 Integrated Processes: Nursing Process  
 Client Need: Physiological Integrity: Physiological Adaptation  
 Cognitive Level: Comprehension [Understanding]  
 Concept: Mood  
 Difficulty: Moderate

	Feedback
1	There is no correlation between abnormal levels of growth hormone and acute mania.
2	There is no correlation between abnormal levels of growth hormone and schizophrenia.
3	The nurse should understand that research has found a correlation between abnormal levels of growth hormone and anorexia nervosa. The growth hormone is responsible for growth in children, as well as continued protein synthesis throughout life.
4	There is no correlation between abnormal levels of growth hormone and Alzheimer’s Disease.

PTS: 1                      CON: Mood

15. ANS: 4  
 Chapter: Chapter 2, Biological Implications  
 Objective: Describe the role of neurotransmitters in human behavior.  
 Page: 31  
 Heading: Psychoneuroimmunology > Acetylcholine  
 Integrated Processes: Nursing Process  
 Client Need: Physiological Integrity: Physiological Adaptation  
 Cognitive Level: Application [Applying]  
 Concept: Mood  
 Difficulty: Moderate

	Feedback
1	Abnormal levels of serotonin do not cause memory deficits and decreased motor functions.
2	Abnormal levels of dopamine do not cause memory deficits and decreased motor functions.
3	Abnormal levels of norepinephrine do not cause memory deficits and decreased motor functions.
4	The nurse should correlate memory deficits and decreased motor function with decreased levels of acetylcholine. Acetylcholine is a major chemical effector of the autonomic nervous system. Functions of acetylcholine include sleep regulation, pain perception, the modulation and coordination of movement, and memory.

- PTS: 1                      CON: Mood
16. ANS: 4  
 Chapter: Chapter 2, Biological Implications  
 Objective: Discuss the physiology of neurotransmitters in human behavior.  
 Page: 21  
 Heading: Monoamines > Norepinephrine  
 Integrated Processes: Nursing Process  
 Client Need: Physiological Integrity: Physiological Adaptation  
 Cognitive Level: Application [Applying]  
 Concept: Mood  
 Difficulty: Moderate

	Feedback
1	A decrease in norepinephrine would not lead to mania.
2	A decrease in norepinephrine would not lead to schizophrenia.
3	A decrease in norepinephrine would not lead to generalized anxiety disorder.
4	The nurse should recognize that a decrease in norepinephrine level would play a significant role in the development of major depressive disorder. The functions of norepinephrine include the regulation of mood, cognition, perception, locomotion, cardiovascular functioning, and sleep and arousal.

PTS: 1                      CON: Mood

17. ANS: 1

Chapter: Chapter 2, Biological Implications

Objective: Discuss the physiology of neurotransmitters in human behavior.

Page: 21, 24

Heading: Psychoneuroimmunology > Dopamine

Integrated Processes: Nursing Process

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Application [Applying]

Concept: Mood

Difficulty: Moderate

	Feedback
1	The nurse should expect that an increase in dopamine activity might play a significant role in the development of schizophrenia spectrum disorder. Functions of dopamine include regulation of emotions, coordination, and voluntary decision-making ability. Increased dopamine activity is also associated with mania.
2	Increased dopamine activity is not associated with major depressive disorder.
3	Increased dopamine activity is not associated with body dysmorphic disorder.
4	Increased dopamine activity is not associated with Parkinson's disease.

PTS: 1

CON: Mood

## MULTIPLE RESPONSE

18. ANS: 1, 3

Chapter: Chapter 2, Biological Implications

Objective: Discuss the association of endocrine functioning to the development of psychiatric disorders.

Page: 29

Headings: Growth Hormone > Gonadotropic Hormones

Integrated Processes: Teaching and Learning

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Application [Applying]

Concept: Mood

Difficulty: Moderate

	Feedback
1.	The nurse should explain to the client that there is a possible correlation between anorexia nervosa and decreased levels of growth hormones.
2.	There is no correlation between anorexia nervosa and antidiuretic hormone levels.
3.	Research shows that there is possible correlation between low levels of gonadotropin and anorexia nervosa.
4.	There is no correlation between anorexia nervosa and increased prolactin levels.

5.	There is no correlation between anorexia nervosa and altered levels of oxytocin.
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PTS: 1                      CON: Mood

19. ANS: 1, 2

Chapter: Chapter 2, Biological Implications

Objective: Discuss the association of endocrine functioning to the development of psychiatric disorders.

Page: 28

Heading: Neuroendocrinology > The Anterior Pituitary (Adenohypophysis)

Integrated Processes: Teaching and Learning

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Application [Applying]

Concept: Mood

Difficulty: Moderate

	Feedback
1.	The nurse should associate depression with decreased levels of TSH.
2.	The nurse should associate fatigue with decreased levels of TSH.
3.	Decreased libido is associated with decreased levels of TSH.
4.	Mania is not associated with decreased levels of TSH.
5.	Hyperexcitability is not associated with decreased levels of TSH.

PTS: 1                      CON: Mood

## COMPLETION

20. ANS:

Psychobiology

Chapter: Chapter 2 Biological Implications

Objective: Discuss the implications of psychobiological concepts to the practice of psychiatric/mental health nursing.

Page: 15

Heading: Introduction

Integrated Processes: Teaching and Learning

Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Application [Applying]

Concept: Mood

Difficulty: Moderate

Feedback: Psychobiology is the study of the biological foundations of cognitive, emotional, and behavioral processes. In recent years, a greater emphasis has been placed on the study of the organic basis for psychiatric illness.

PTS: 1                      CON: Mood