Chapter 2: Cellular Injury, Adaptations, and Maladaptive Changes

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

____ 1. How does oxidative stress occur?
   1. In cells that undergo transient ischemia and subsequent resumption of circulation
   2. When estrogen stimulation results in mitotic division of breast gland cells
   3. When a blood clot that obstructs a coronary artery causes cardiac muscle ischemia
   4. When a cell's environment cannot support its metabolic requirements

____ 2. A client is diagnosed with a condition in which the brain cells cannot withstand low oxygen delivery long enough for cell reversible changes to happen. Identify the condition.
   1. Organelle disruption
   2. Hypoxia
   3. Xanthelasma
   4. Ischemic-reperfusion injury

____ 3. What is the process whereby newly growing cells acquire the specialized structure and function of the cells they replace?
   1. Apoptosis
   2. Differentiation
   3. Oxidative phosphorylation
   4. Atherosclerosis

____ 4. What is kwashiorkor?
   1. A condition seen in individuals suffering from severe protein starvation
   2. A condition where blood pressure within the aorta and systemic arterial circulation is elevated
   3. A condition where prostate gland cells increase in number because of testosterone stimulation
   4. A condition that causes defective cholesterol metabolism

____ 5. What are the unique histological findings that represent distinct disease processes?
   1. Histology
   2. Biopsy
   3. Autopsy
   4. None of the above

____ 6. A client is diagnosed with failure of the thyroid gland due to increase in apoptotic cell death. Which condition is the client most likely to have?
   1. Xanthomas
   2. Hashimoto's thyroiditis
   3. Peptic ulcer
   4. Anthracosis

____ 7. Which field involves harvesting of embryonic stem cells and performing nuclear transfer on these cells?
   1. Reproductive cloning
   2. Restoration with stem cells
   3. Transplantation
   4. Therapeutic cloning

____ 8. A nurse observes that a client has developed a foul odor in the spots where necrosis of tissue has developed. What organism causes the emission of this foul odor?
1. *Streptococcus*
2. *Helicobacter pylori*
3. *Clostridium perfringens*
4. Human papilloma virus

____ 9. A client is diagnosed with cellular apoptosis. Which disease can this condition lead to?
1. Cancer
2. Degenerative neurological diseases
3. Necrosis
4. Infarction

____ 10. A client is suffering from prolonged ischemia and tissue death. Which term can be used to refer to such tissue death?
1. Gangrene
2. Infarction
3. Necrosis
4. Apoptosis

____ 11. A client comes in with persistently uncontrolled hypertension. The nurse informs the client's spouse that one of the consequences of prolonged raised blood pressure is a weakened area in the wall of the cerebral artery, located on the Circle of Willis. What is this condition known as?
1. Xanthelasma
2. Infarction
3. Berry aneurysm
4. Ischemia

____ 12. While conducting an endoscopic examination on a client, it is found that the client has acid reflex. Which condition is associated with the gastroesophageal reflux disease (GERD) in which cell injury is reversible?
1. Parkinson's disease
2. Myocardial infarction
3. Barrett's esophagus
4. Hashimoto's thyroiditis

____ 13. Which body part contains pluripotent stem cells?
1. Umbilical cord
2. Skeletal muscle
3. Cardiac muscle
4. None of the above

____ 14. A client has an abnormal thickening of the lining of the uterus due to an increase in estrogen levels. How can such a condition be reversed?
1. Restoration of blood circulation
2. Hormone therapy to counteract the effects of excessive estrogen
3. Surgical removal
4. Acid suppression treatment

____ 15. Which organ is most susceptible to damage and death due to prolonged ischemia?
1. Brain
2. Skeletal muscles
3. Heart
4. None of the above

____ 16. A genetically programmed cell death is a process that can destroy cells that are no longer needed. What is the best method to do this?
1. Necrosis
2. Apoptosis
3. Infarction
4. Gangrene

____ 17. Which is the most prevalent method to replace permanently injured tissues and organs?
1. Stem cell restoration
2. Therapeutic cloning
3. Reproductive cloning
4. Transplantation

____ 18. Arteriosclerosis is the thickening and hardening of arterial walls. Which condition acts as an initiator of arteriosclerosis?
1. Apoptosis
2. Endothelial cell injury
3. Necrosis
4. Infarction

____ 19. What is the weakened area in an arterial wall called?
1. Neoplasia
2. Aneurysm
3. Hypertrophy
4. Metaplasia

____ 20. The increase in size of a weightlifter's muscles is due to muscular
1. Hypertrophy
2. Metaplasia
3. Atrophy
4. Dysplasia

____ 21. A client reports an itchy, bumpy scar around an old wound that is identified as a keloid. This occurs due to the increase in the number of cells in a tissue or organ. Which term best describes this condition?
1. Neoplasia
2. Hyperplasia
3. Dysplasia
4. Metaplasia

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

____ 22. Which vitamins are fat-soluble? *Select all that apply.*
1. Vitamin A
2. Vitamin C
3. Vitamin D
4. Vitamin K
5. Vitamin B6

____ 23. When does physiological apoptosis occur? *Select all that apply*.
1. During the embryonic development of the hand

2. During menopause in female adult ovaries
3. When cells die because of stressors
4. When cells have completed their function and need elimination
5. When the liver gets exposed to excessive amounts of alcohol

____ 24. Which components of the serum level should be measured to confirm myocardial infarction? *Select all that apply*.
1. Epinephrine
2. Troponin
3. Lysosomal enzyme
4. Acetylcholine
5. CPKmb

____ 25. A client is suffering from atherosclerosis. What are directly detrimental to the client's condition? *Select all that apply*.
1. Depletion of endothelial nitric oxide
2. *Helicobacter pylori* infection
3. Low-density lipoprotein (LDL) deposition
4. Inflammatory changes of the endothelium
5. Acid reflux

Chapter 2: Cellular Injury, Adaptations, and Maladaptive Changes
Answer Section

MULTIPLE CHOICE

1. ANS: 1
   Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
   Page: 18
   Objective: N/A
   Difficulty: Moderate
   Heading: Free Radical Injury
   Integrated Processes: Nursing Process
   Client Need: Health Promotion and Maintenance
   Cognitive Level: Application [Applying]
   Concept: Cellular Regulation

	Feedback
1	Oxidative stress is a form of cell injury that occurs when free radical generation exceeds the mechanisms of removal. Oxidative stress commonly occurs in cells that undergo transient ischemia and subsequent resumption of circulation.
2	Hormonal stimulation of hyperplasia occurs in pregnancy. It occurs when estrogen stimulation results in mitotic division of breast gland cells.
3	Ischemic reperfusion injury occurs when a blood clot obstructs a coronary artery and results in cardiac muscle ischemia.
4	Atrophy occurs when a cell's environment cannot support its metabolic requirements. The smaller size of the cells allows for less metabolic demand and more efficient functioning that is compatible with survival.

   PTS: 1 CON: Cellular Regulation

2. ANS: 2
   Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
   Page: 17
   Objective: N/A
   Difficulty: Moderate
   Heading: Hypertension Hypoxic Cell Injury
   Integrated Processes: Nursing Process
   Client Need: Health Promotion and Maintenance
   Cognitive Level: Applying [Application]
   Concept: Oxygenation

	Feedback
1	Organelles are a number of specialized structures within a living cell. Prolonged stress can cause irreversible cell damage resulting in organelle disruption.
2	Hypoxia is a condition in which the body or a part of the body is deprived of adequate oxygen. Brain cells cannot withstand hypoxia for more than 6 minutes, whereas skeletal muscle can tolerate hypoxia for prolonged periods.
3	Xanthelasma are raised skin lesions that develop because of intracellular accretion of excess cholesterol within epithelial cells.
4	Ischemic-reperfusion injury is tissue damage. It occurs when the blood supply returns

	to the tissue after a period of ischemia or lack of oxygen.

PTS: 1 CON: Cellular Regulation

3. ANS: 2
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 15
Objective: N/A
Difficulty: Easy
Heading: Neoplasia
Integrated Processes: Nursing Process
Client Need: Health Promotion and Maintenance
Cognitive Level: Comprehension [Understanding]
Concept: Cellular Regulation

	Feedback
1	Apoptosis is an organized process that eliminates unnecessary or damaged cells without causing inflammation or any adverse effects on surrounding tissue.
2	Differentiation is the process whereby newly growing cells acquire the specialized structure and function of the cells that are replaced.
3	Oxidative phosphorylation is a process through which cells generate energy in the mitochondria.
4	Atherosclerosis is the change in metabolic processes associated with diabetes mellitus.

PTS: 1 CON: Cellular Regulation

4. ANS: 1
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 19
Objective: N/A
Difficulty: Easy
Heading: Nutritional Imbalances
Integrated Processes: Nursing Process
Client Need: Health Promotion and Maintenance
Cognitive Level: Knowledge [Remembering]
Concept: Nutrition

	Feedback
1	Kwashiorkor is a form of malnutrition caused by protein deficiency in the diet.
2	Hypertension is a condition in which blood pressure within the aorta and systemic arterial circulation is elevated.
3	Benign prostatic hyperplasia is a condition in which prostate gland cells increase in number because of testosterone stimulation.
4	Hypercholesterolemia is a condition that is caused by an excess of cholesterol in the bloodstream.

PTS: 1 CON: Cellular Regulation

5. ANS: 4
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 11-12
Objective: N/A

Difficulty: Easy
Heading: Basic Concepts of Cellular Adaptations and Maladaptive Changes
Integrated Processes: Nursing Process
Client Need: Health Promotion and Maintenance
Cognitive Level: Knowledge [Remembering]
Concept: Cellular Regulation

	Feedback
1	Histology is the microscopic study of tissues and cells, and it yields important diagnostic information for the clinician.
2	Biopsy extracts a cell sample from an organ or mass of tissue to allow for histological examination.
3	Autopsy is an examination of the tissues and organs of a deceased individual that allows for a study of the cause of death.
4	The unique histological findings that represent distinct disease processes are referred to as pathognomonic changes. For instance, an inflamed, craterlike breach in the gastrointestinal mucosa is pathognomonic for peptic ulcer disease.

PTS: 1 CON: Cellular Regulation

6. ANS: 2
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 22
Objective: N/A
Difficulty: Moderate
Heading: Apoptosis
Integrated Processes: Nursing Process
Client Need: Health Promotion and Maintenance
Cognitive Level: Applying [Application]
Concept: Cellular Regulation

	Feedback
1	Xanthomas are yellow, raised skin lesions that develop due to intracellular accumulation of excess cholesterol within epithelial cells.
2	Hashimoto's thyroiditis is a common autoimmune disease that causes gradual failure of the thyroid gland because of increased apoptotic cell death.
3	Peptic ulcers are caused by Helicobacter pylori, which is a bacterium that erodes the gastric mucosa.
4	Anthracosis is a benign deposition of coal dust within the lungs from inhalation of sooty air.

PTS: 1 CON: Cellular Regulation

7. ANS: 4
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 24
Objective: N/A
Difficulty: Easy
Heading: Interventions to Treat Permanent Cell Injury
Integrated Processes: Nursing Process
Client Need: Health Promotion and Maintenance
Cognitive Level: Comprehension [Understanding]

Concept: Cellular Regulation

	Feedback
1	Reproductive cloning is the deliberate production of genetically identical individuals and it involves the production of a genetic duplicate of an existing organism.
2	The regeneration of the cells that are incapable of regeneration, such as brain, neuron, and heart muscle cells, are referred to as restoration with stem cells.
3	Transplantation is the most prevalent method to replace permanently injured tissues or organs.
4	Therapeutic cloning is a field that involves harvesting of embryonic stem cells and performing nuclear transfer on these cells.

PTS: 1 CON: Cellular Regulation

8. ANS: 3
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 22-23
Objective: N/A
Difficulty: Medium
Heading: Gangrene
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Application [Applying]
Concept: Cellular Regulation

	Feedback
1	Streptococcus bacteria distinctly alter cells. They cause inflammation and swelling. For example, the etiology of sore throats is usually streptococcus bacteria.
2	Helicobacter pylori is a bacterium that erodes the mucosal lining of the gastrointestinal tract. It causes gastric acids to damage the stomach lining and leads to peptic ulcers.
3	Clostridium perfringens is an anaerobic bacterium that multiplies in exposed necrotic tissue. This bacterium produces gas that becomes trapped in the infected tissue and emits a distinct foul odor related to gangrene.
4	Human papilloma virus (HPV) is a virus that is sexually transmitted. It can cause cancerous cell changes within the cervix.

PTS: 1 CON: Cellular Regulation

9. ANS: 1
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 22
Objective: N/A
Difficulty: Moderate
Heading: Cell Degeneration and Death
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Knowledge [Remembering]
Concept: Cellular Regulation

	Feedback
1	Certain cancers arise when cells lose the ability to program their own destruction, a process known as apoptosis, and go on to have an abnormally prolonged life span.

	These cells begin to divide uncontrollably and invade other tissues.
2	Degenerative neurological diseases are caused when the cells, due to dysfunctional apoptosis, die excessively and prematurely. For example, spinal muscular atrophy develops when nerve cells undergo increased apoptotic rates and die prematurely.
3	Necrosis is the death of cells in a tissue or organ through injury or disease. It is irreversible.
4	Infarction is the death of tissue due to prolonged restriction of blood flow to it.

PTS: 1 CON: Cellular Regulation

10. ANS: 2
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 22
Objective: N/A
Difficulty: Moderate
Heading: Cell Degeneration and Death
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Comprehension [Understanding]
Concept: Cellular Regulation

	Feedback
1	Gangrene is a condition that occurs when tissues endure prolonged ischemia, experience infarction and necrosis, and then are exposed to bacteria such as Clostridium perfringens that proliferate in the decaying tissue.
2	Infarction is the death of tissue due to prolonged insufficient blood supply (ischemia).
3	Necrosis is the death of cells in a tissue or organ through injury or disease. It is irreversible.
4	Apoptosis is the cell's genetically programmed degeneration.

PTS: 1 CON: Cellular Regulation

11. ANS: 3
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 20
Objective: N/A
Difficulty: Difficult
Heading: Significance of Endothelial Cell Injury
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Analysis [Analyzing]
Concept: Cellular Regulation

	Feedback
1	Xanthelasma is a yellowish deposit of cholesterol underneath the skin cells, commonly on or around the eyelids.
2	Infarction is tissue death due to prolonged obstruction of blood supply to the tissue.
3	Berry aneurysm is a small berry-like bulge that is caused by a weakened area in the wall of the cerebral artery at or near the Circle of Willis in the brain.
4	Ischemia is the lack of sufficient blood flow to tissues that leads to cell injury. Prolonged ischemia leads to infarction or death of tissue.

PTS: 1 CON: Cellular Regulation

12. ANS: 3
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 14
Objective: N/A
Difficulty: Difficult
Heading: Clinical Interventions to Reverse Cell Injury
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Application [Applying]
Concept: Cellular Regulation

	Feedback
1	Parkinson's disease causes gradual, progressive neurological deterioration where specific brain cells undergo degeneration and die. It is irreversible.
2	Myocardial infarction is the irreversible damage caused by prolonged lack of blood supply to the myocardial muscle.
3	Barrett's esophagus is a serious complication of gastroesophageal reflux disease. In GERD, the lower esophageal squamous epithelial cells can undergo a metaplastic change into columnar stomach-like cells. This condition develops into Barrett's esophagus.
4	Hashimoto's thyroiditis is an autoimmune disorder in which the body's immune system attacks the thyroid gland. This causes cell injury that is irreversible.

PTS: 1 CON: Cellular Regulation

13. ANS: 1
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 24
Objective: N/A
Difficulty: Easy
Heading: Interventions to Treat Permanent Cell Injury
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Knowledge [Remembering]
Concept: Cellular Regulation

	Feedback
1	Stem cells obtained from the umbilical cord during the birthing process are capable of developing into other cell types and are, therefore, referred to as pluripotent stem cells.
2	Skeletal muscle stem cells are adult stem cells that are capable of generating only new skeletal muscle tissue.
3	Cardiac muscle stem cells are adult stem cells that are capable of regeneration of only the host tissue or cardiac muscle tissue.
4	Umbilical cord stem cells are pluripotent, which means that they are capable of developing into any tissue in the body.

PTS: 1 CON: Cellular Regulation

14. ANS: 2
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes

Page: 23
Objective: N/A
Difficulty: Moderate
Heading: Clinical Interventions to Reverse Cell Injury
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Application [Applying]
Concept: Cellular Regulation

	Feedback
1	Restoration of blood circulation has no bearing on hyperplasia of the uterine endometrium. This is because hyperplasia of the uterine endometrium is caused by an increase in the uterine endometrial cells brought on by excessive estrogen.
2	Hyperplasia of the uterine endometrium is caused by an overproduction of estrogen. Hormone therapy to counter the effects of excessive estrogen helps reverse the condition.
3	Surgical removal of the hyperplastic uterine endometrium is an irreversible treatment option.
4	Acid suppression treatment can resolve the metaplasia of Barrett's esophagus.

PTS: 1 CON: Cellular Regulation

15. ANS: 1
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 22
Objective: N/A
Difficulty: Moderate
Heading: Cell Degeneration and Death
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Application [Applying]
Concept: Cellular Regulation

	Feedback
1	The brain is the organ that is most sensitive to reduction in its blood supply. The brain undergoes infarction and cell death within minutes.
2	Skeletal muscles can tolerate lack of blood circulation for a few hours.
3	Cardiac ischemia occurs when the heart muscle or myocardium receives insufficient blood flow. In such condition, cell death can occur within minutes but generally not as quickly as the brain.
4	The brain is the organ that is most susceptible to damage and death due to prolonged ischemia.

PTS: 1 CON: Cellular Regulation

16. ANS: 2
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 21
Objective: N/A
Difficulty: Moderate
Heading: Cell Degeneration and Death
Integrated Processes: Nursing Process

Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Application [Applying]
Concept: Cellular Regulation

	Feedback
1	Necrosis is the death of living tissue due to ischemia, physical injury, radiation, or chemicals. It is not reversible.
2	In multicellular organisms, cells that are no longer needed or are a threat to the organism are destroyed by a programmed cell death called apoptosis. An example of this process is when an embryonic, paddle-shaped hand forms indentations to shape the individual fingers.
3	Infarction is the death of tissue as a result of continued disruption of blood supply. For example, when there is a lack of adequate coronary artery blood supply to the myocardial muscle, ischemic necrosis occurs.
4	Gangrene is a potentially life-threatening condition that can occur when tissues suffer prolonged ischemia and undergo necrosis. *Clostridium perfringens* thrives on the decaying necrotic tissue and causes gangrene.

PTS: 1 CON: Cellular Regulation

17. ANS: 4
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 24
Objective: N/A
Difficulty: Easy
Heading: Interventions to Treat Permanent Cell Injury
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Knowledge [Remembering]
Concept: Cellular Regulation

	Feedback
1	Stem cells are capable of developing into any specialized tissue and organ and are, therefore, used to treat and regenerate injured tissues and cells. However, it is not the most prevalent method.
2	Therapeutic cloning involves harvesting of embryonic stem cells and performing nuclear transfer on these cells. With this method, it could be theoretically possible for individuals in need of organ transplant to obtain exact tissue matches of their organs. However, this is still a nascent technology with extensive ongoing research.
3	Reproductive cloning is the creation of a genetic duplicate of an existing organism. Currently, reproductive cloning is performed among livestock and other animals like cats, mice, rabbits, and mules.
4	Transplantation is the most prevalent method to replace permanently injured tissues or organs, such as kidneys. It is a complex process involving many stages that include solicitation of donors, harvesting of organs, matching of donor organs and recipients, surgical implantation, and interventions to avoid organ rejection.

PTS: 1 CON: Cellular Regulation

18. ANS: 2
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 20

Objective: N/A
Difficulty: Moderate
Heading: Significance of Endothelial Cell Injury
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Comprehension [Understanding]
Concept: Cellular Regulation

	Feedback
1	Apoptosis is also known as programmed cell death. In multicellular organisms, cells that are unwanted or a threat to the organism are eliminated through a programmed sequence of events. Too little or too much apoptosis is dangerous.
2	Endothelial cell injury acts as an initiator of arteriosclerosis. The most significant injurious agents of the endothelial cells are hypertension, diabetic hyperglycemia, free radicals, persistent secretion of angiotensin II, and low-density lipoprotein cholesterol.
3	Necrosis is cell death caused by ischemia, physical injury, chemicals, or radiation, which is irreversible and may adversely affect neighboring tissues or the organ as a whole.
4	Infarction is the death of tissue due to a lack of oxygen or absence of blood supply to tissues.

PTS: 1 CON: Cellular Regulation

19. ANS: 2
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 20
Objective: N/A
Difficulty: Easy
Heading: Hypertension
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Knowledge [Remembering]
Concept: Cellular Regulation

	Feedback
1	Neoplasia means new growth and usually refers to disorganized, uncoordinated, uncontrolled proliferative cell growth that can be cancerous or benign.
2	Aneurysm is referred to as a weakened area in an arterial wall.
3	Hypertrophy is an increase in individual cell size, resulting in an enlargement of functioning tissue mass.
4	Metaplasia is the replacement of one cell type by another cell type.

PTS: 1 CON: Cellular Regulation

20. ANS: 1
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 12
Objective: N/A
Difficulty: Moderate
Heading: Basic Concepts of Cellular Adaptations and Maladaptive Changes
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation

Cognitive Level: Application [Applying]
Concept: Cellular Regulation

	Feedback
1	Hypertrophy is the increase in size of an organ or tissue due to the enlargement of its component cells. Muscle growth is due to physiological hypertrophy, which is caused by angiogenesis.
2	Metaplasia is the replacement of one cell type by another cell type. It could be due to a cell's genetic programming because of a change in environment, or more commonly it could be in response to chronic inflammation.
3	Atrophy is a wasting or decrease in size of a body organ, tissue, or part due to disease, injury, or lack of use.
4	Dysplasia is abnormal cellular growth within a specific tissue, often as a result of chronic inflammation or a precancerous condition.

PTS: 1 CON: Cellular Regulation

21. ANS: 2
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 13
Objective: N/A
Difficulty: Difficult
Heading: Basic Concepts of Cellular Adaptations and Maladaptive Changes
Integrated Processes: Nursing Process
Client Need: Safe and Effective Care Environment: Management of Care
Cognitive Level: Evaluation [Evaluating]
Concept: Critical Thinking

	Feedback
1	Neoplasia means new growth and usually refers to disorganized, uncoordinated, uncontrolled proliferative cell growth that can be cancerous or benign.
2	Hyperplasia is the increase in the number of cells in a tissue or organ, which only occurs in tissues such as the epithelium and glandular tissue.
3	Dysplasia is abnormal cellular growth within a specific tissue, often as a result of chronic inflammation or a precancerous condition.
4	Metaplasia is the replacement of one cell type by another cell type.

PTS: 1 CON: Critical Thinking

MULTIPLE RESPONSE

22. ANS: 1, 3, 4
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 19-20
Objective: N/A
Difficulty: Easy
Heading: Nutritional Imbalances
Integrated Processes: Nursing Process
Client Need: Health Promotion and Maintenance
Cognitive Level: Knowledge [Remembering]

Concept: Cellular Regulation

	Feedback
1.	This is correct. Fat-soluble vitamins are vitamins A, D, E, and K. Fat is necessary for storage of these vitamins in the body.
2.	This is incorrect. Individuals can counteract free radical injury through consumption of antioxidants such as vitamin C.
3.	This is correct. Fat-soluble vitamins are vitamins A, D, E, and K. Fat is necessary for storage of these vitamins in the body.
4.	This is correct. Fat-soluble vitamins are vitamins A, D, E, and K. Fat is necessary for storage of these vitamins in the body.
5.	This is incorrect. Individuals can counteract free radical injury through consumption of antioxidants such as vitamin E and beta-carotene.

PTS: 1 CON: Cellular Regulation

23. ANS: 1, 2, 4
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 21
Objective: N/A
Difficulty: Moderate
Heading: Apoptosis
Integrated Processes: Nursing Process
Client Need: Health Promotion and Maintenance
Cognitive Level: Application [Applying]
Concept: Cellular Regulation

	Feedback
1.	This is correct. Apoptosis of select cells occurs within the paddle-shaped hand plate to form indentations to shape the individual fingers. The apoptotic cells disintegrate in a stepwise manner without disrupting other cells.
2.	This is correct. Physiological apoptosis also occurs in female adult ovaries during menopause.
3.	This is incorrect. Cell necrosis occurs when cells die because of stressors or insults that overwhelm the cell's ability to survive.
4.	This is correct. Cells such as the white blood cells undergo apoptosis when they become exhausted after participation in immune reactions.
5.	This is incorrect. Intracellular accumulation can occur in the liver when exposed to excessive amounts of alcohol.

PTS: 1 CON: Cellular Regulation

24. ANS: 2, 3, 5
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 22
Objective: N/A
Difficulty: Moderate
Heading: Cell Necrosis
Integrated Processes: Nursing Process
Client Need: Health Promotion and Maintenance
Cognitive Level: Application [Applying]
Concept: Cellular Regulation

	Feedback
1.	This is incorrect. Blood constituents such as norepinephrine and epinephrine are produced by the adrenal glands, and each constituent affects the vasculature's function differently and may have detrimental effects.
2.	This is correct. Blood levels of CPKmb and troponin are measured to confirm myocardial infarction.
3.	This is correct. Blood level of the lysosomal enzyme is measured to confirm myocardial infarction.
4.	This is incorrect. Acetylcholineare is a vasodilating substance produced by the endothelial cells and may have detrimental effects.
5.	This is correct. Blood level of the lysosomal enzyme, CPKmb, is measured to confirm myocardial infarction.

PTS: 1 CON: Cellular Regulation

25. ANS: 1, 3, 4
Chapter: Chapter 2, Cellular Injury, Adaptations, and Maladaptive Changes
Page: 21
Objective: N/A
Difficulty: Moderate
Heading: Significance of Endothelial Cell Injury
Integrated Processes: Nursing Process
Client Need: Physiological Integrity: Physiological Adaptation
Cognitive Level: Application [Applying]
Concept: Cellular Regulation

	Feedback
1.	This is correct. Depletion of endothelial nitric oxide can impede the dilatory capacity of arteries, thus affecting blood flow. Restriction of coronary artery blood flow to the heart can have a serious negative effect on cardiac health.
2.	This is incorrect. Helicobacter pylori is a bacterium that causes peptic ulcers in the gastrointestinal system.
3.	This is correct. LDL cholesterol accumulates to form atherosclerotic plaque along the artery walls and directly impacts cardiac health.
4.	This is correct. Endothelial injury causes inflammation, which in turn causes diminished vasodilatory capacity of the artery. This results in LDL cholesterol deposition and clot formation in coronary arteries, resulting in a detrimental effect on cardiac health.
5.	This is incorrect. Acid reflux irritates the lower esophageal cells, causing inflammation of the esophagus. Prolonged irritation and lack of treatment could lead to a condition known as Barrett's esophagus.

PTS: 1 CON: Cellular Regulation