

## **Chapter 06: Neoplasia**

1. Which of the following characteristics could apply to healthy somatic cells rather than cancerous cells?

- A) A high rate of mutation exists in the cells.
- B) The cells have a reduced tendency to cluster together.
- C) They remain viable and multiply without attachments to other cells and the extracellular matrix.
- D) The cells are unable to proliferate except by mitotic division.

Ans: D

Feedback:

Mitotic division is the normal method of division that exists in the body. High rates of mutation, reduced adhesion, and loss of anchorage dependence are associated with cancer cells.

2. Following a biopsy, a 54-year-old man has been diagnosed as having a benign neoplastic tumor. Which of the following characteristics most likely applies to his tumor?

- A) The tumor is poorly approximated and has the potential to break loose.
- B) The tumor may secrete hormones or cytokines.
- C) The well-differentiated, neoplastic cells are clustered together in a single mass.
- D) It has a rapid rate of growth and can induce ischemia.

Ans: C

Feedback:

Benign tumors are composed of well-differentiated, neoplastic cells that resemble the cells of the tissues of origin and are characterized by a slow, progressive rate of growth that may come to a standstill or regress. They tend to exist in a single mass. Malignant tumors tend to be poorly differentiated, grow rapidly, secrete hormones or cytokines, and have the potential to break loose.

3. A 77-year-old male client with a diagnosis of stomach cancer has been found to have metastases in his liver. The client and his family are surprised at this turn of events, stating that they do not see how he could have developed cancer in his liver. Which of the following facts would underlie the reply that the care team provides?

- A) The parenchymal tissue of the liver is particularly susceptible to secondary malignancies.
- B) The portal circulatory system brings venous blood from the GI tract into the liver.
- C) Hepatic stromal tissue shares characteristics with cancerous cells, including lack of anchorage dependence.

D) The proximity of the liver to the stomach allows for direct spread of cancerous cells due to a lack of contact inhibition.

Ans: B

Feedback:

Portal circulation brings venous blood into the portal vein of the liver, facilitating hematologic spread. The parenchyma of the liver possesses no particular susceptibility to cancer, and hepatic tissue does not share traits of cancerous cells such as low contact inhibition or a lack of anchorage dependence.

4. A 41-year-old female with a family history of breast cancer has had a baseline mammogram. She states that she performs monthly self-breast exams but really has a hard time evaluating her lumps since she has numerous cysts. At her annual mammogram, the technician views a suspicious area and refers her to the radiologist. She asks the nurse in the office, "How can a lump appear so quickly?" The nurse's response is based on which of the following principles?

A) A tumor is undetectable until it has doubled 30 times and contains at least 1 billion cells.

B) Many tumor cells never leave the M-phase of the cell cycle.

C) Cancer cells are undifferentiated and come in various shapes and sizes.

D) If the breast has a lot of cysts, then the fluid within those sacs makes it difficult to feel the hard lumps of a cancer.

Ans: A

Feedback:

The ratio of dividing cells to resting cells in a tissue mass is called the growth fraction. The doubling time is the length of time it takes for the total mass of cells in a tumor to double. Tumors do not stay in the M-phase of the cell cycle. Undifferentiated cancer cells do come in various shapes and sizes, but this has nothing to do with the detection of the tumor by palpation. Breast cysts are fluid-filled sacs but are usually not cancerous.

5. Unbeknownst to her or her care team, a 51-year-old woman's breast cancer has an etiology rooted in the fact that tumor-suppressing genes are present but have been silenced. Consequently, she has not synthesized normal cancer-suppressing proteins, and neoplasia has resulted. What process has accounted for the woman's cancer?

A) Chromosomal translocation

B) The "two-hit" hypothesis of carcinogenesis

C) Epigenetic mechanisms

D) A DNA repair defect

Ans: C

Feedback:

Epigenetic mechanisms may silence genes, such as tumor suppressor genes, so that even though the gene is present, it is not expressed and a cancer-suppressing protein is not made. This process does not involve defects in DNA repair or chromosomal translocation, and while it may form a half of the "two-hit" hypothesis, this is not synonymous with epigenetic mechanisms.

6. Which of the following patients of a primary care physician would not require extra screening for cancer?

- A) A 51-year-old woman whose grandmother died of breast cancer
- B) A 48-year-old man who takes immunosuppressant drugs following a kidney transplant
- C) A 50-year-old male who is obese and has a low-fiber, high-fat diet
- D) A 38-year-old female with Down syndrome and congenital scoliosis

Ans: D

Feedback:

While a family history of cancer, immunosuppression, and poor diet are all associated with cancer, congenital and chromosomal abnormalities are not noted to represent an increased risk for cancer.

7. Blood-borne cancerous cells have recently spread from a woman's primary tumor in her pancreas to her bones. Which of the following components of the woman's immune system are likely to be directly involved in the attempt to eradicate the potential metastasis? Select all that apply.

- A) T lymphocytes
- B) Macrophages
- C) Natural killer (NK) cells
- D) B cells
- E) Mast cells

Ans: A, B, C, D

Feedback:

Virtually all of the components of the immune system have the potential for eradicating cancer cells, including T lymphocytes, B lymphocytes, antibodies, macrophages, and natural killer (NK) cells. Although best known for their role in allergy and anaphylaxis, mast cells play an important protective role as well, being intimately involved in wound healing and defense against pathogens.

8. A woman is surprised to read on the Internet that certain infections can cause cancer and has sought clarification from her family physician during an office visit. How can the physician best respond to the woman's query?

- A) "Though it's not particularly common, it's true that certain bacteria and viruses can lead to cancer."
- B) "Most cancers that cannot be attributed to family history or lifestyle are in fact associated with viruses."
- C) "There are many viruses, but only a very few of them have been shown to cause cancer in humans."
- D) "This is true; for example, HIV has been shown to cause cancer in some patients."

Ans: C

Feedback:

Four DNA viruses have been implicated in human cancers: the human papillomavirus (HPV), Epstein-Barr virus (EBV), hepatitis B virus (HBV), and human herpesvirus-8 (HHV-8). Bacteria have not been linked with cancer, and viruses do not account for a large proportion of cancer cases. HIV is associated with an increased risk of cancer caused by HHV-8, but HIV itself does not cause cancer.

9. The family of a 68-year-old man who is in the end stages of small cell lung cancer are distraught at his visible body wasting that has worsened in recent weeks. Which of the following phenomena best accounts for the client's anorexia and cachexia?

- A) Inadequate cellular metabolism of glucose results from tumor factors.
- B) High fat losses coupled with preservation of muscle mass exaggerate the appearance of wasting.
- C) Products of the tumor itself as well as a hypermetabolic state cause cachexia.
- D) Inadequate food intake due to symptoms and treatment results in loss of both muscle and fat.

Ans: C

Feedback:

The mechanisms of anorexia–cachexia in cancer patients are multifactorial, involving factors that include a hypermetabolic state and the production of specific cytokines and catabolic factors by the tumor. Glucose metabolism itself is not noted to be affected by tumors, and muscle mass is lost in large amounts. The phenomenon is not necessarily attributable to the decrease in food intake.

10. The nurse caring for a lung cancer patient with metastasis to the brain suspects the patient has developed a paraneoplastic syndrome known as syndrome of inappropriate antidiuretic hormone (SIADH) secretion. Which laboratory result in this patient who has gained 3 lb in a day would alert the nurse to the possibility of SIADH?

- A) Serum potassium of 5.0 mmol/L
- B) Serum sodium of 115 mmol/L
- C) BUN of 8 mg/dL
- D) Hematocrit of 40%

Ans: B

Feedback:

SIADH is the principal cause of hyponatremia in malignant disease. It may be caused by oat cell carcinoma of the lung and certain other malignant tumors or be due to the tumor producing vasopressin. The other lab values, K<sup>+</sup>, BUN, and hematocrit are all within normal adult ranges.

11. A 60-year-old man has presented to a clinic and is requesting screening for tumor markers after reading about them in a magazine. What can the clinician most accurately tell the man about the clinical use of tumor markers?

- A) "Tumor markers are a very useful screening tool, but they only exist for a very few types of cancer."
- B) "Tests for the presence of tumor markers are limited by the fact that they are only accurate in the very early stages of cancer."
- C) "Tumor markers are an excellent screening tool, but it's only practical to test for those cancers that you're at risk of."
- D) "Tumor markers alone aren't enough to confirm whether you have cancer or not, so they're not a very useful screening tool."

Ans: D

Feedback:

As diagnostic tools, tumor markers have limitations. Nearly all markers can be elevated in benign conditions, and most are not elevated in the early stages of malignancy. Hence, tumor markers have limited value as screening tests. Furthermore, they are not in themselves specific enough to permit a diagnosis of a malignancy.

12. A 51-year-old female has been found to have a metastatic lesion in her lung, and her oncologist is unsure of the site of the primary tumor. Which of the following procedures is most likely to aid in this determination?

- A) Immunohistochemistry
- B) Tumor markers
- C) Microarray technology
- D) Tissue biopsy

Ans: A

Feedback:

Immunohistochemistry can be used to determine the site of origin of metastatic tumors. In cases in which the origin of the metastasis is obscure, immunochemical detection of tissue-specific or organ-specific antigens can often help to identify the tumor source. Tumor markers, microarray technology, and biopsy are less likely to aid in identifying the primary source.

13. Which target of both chemotherapy and radiation treatment accounts for adverse as well as therapeutic effects?

- A) Cell surface receptors
- B) Circulating hormone levels
- C) Blood vessels
- D) Rapidly proliferating cells

Ans: D

Feedback:

Chemotherapy and radiation treatment both preferentially affect rapidly proliferating cells that include some normal body cells, such as epithelial and hair follicle cells, as well as cancer cells.

14. Upon entering the room of a 74-year-old client receiving brachytherapy for cervical cancer, you find the radiation implant and the position-holding device in the client's bed. What is the nurse's first best action?

- A) Assess the client's mental status.
- B) Use tongs to place the implant in the radiation container.
- C) Notify the physician and move the client to a different room.
- D) Don gloves and attempt to reposition the implant and positioning device.

Ans: B

Feedback:

To minimize staff radiation exposure, the rules of time, distance, and shielding come into play. If a radioactive device dislodges, there should be a lead container and tongs in the room, so the device can be safely stored until the radiology department can dispose of it safely.

15. A cancer patient has been prescribed 5-fluorouracil, an antimetabolite chemotherapy agent. This medication stops normal development and division by interrupting the S-phase of the cell cycle. When teaching this patient, the nurse explains that during the S-phase of the cell cycle,

- A) the cell is in a prolonged resting state and only leaves this state when cellular destruction is occurring.
- B) the DNA synthesis stops, but RNA synthesis continues.
- C) nuclear division occurs.
- D) the synthesis of DNA occurs, causing two separate sets of chromosomes to develop.

Ans: D

Feedback:

During the S-phase, DNA synthesis occurs, causing two separate sets of chromosomes to develop. Antimetabolites can cause abnormal timing of DNA synthesis. Because of their S-phase specificity, the antimetabolites are more effective when given as a prolonged infusion.

16. A 61-year-old male client is scheduled to begin chemotherapy for the treatment of his bone cancer shortly. Staff at the cancer center have educated the man and his wife about the goals, course, and expectations of his treatment. Which of the following medications and treatments might the man anticipate needing during and after his course of treatment?

- A) Analgesia and corticosteroids
- B) Antiemetics and packed red blood cell (PRBC) transfusions
- C) Whole blood transfusion and antiplatelet aggregators
- D) Diuretics and selective serotonin reuptake inhibitors (SSRIs)

Ans: B

Feedback:

Nausea and anemia are common side effects of chemotherapy and may be addressed with antiemetics and PRBCs. There is no noted indication with chemotherapy for corticosteroids, antiplatelet aggregators, diuretics, or SSRIs.

17. A patient with malignant melanoma has been prescribed alpha interferon, a biologic response modifier. Since this drug prolongs the cell cycle, increasing the percentage of cells in the G0 phase, and stimulates NK cells and T-lymphocyte killer cells, the nurse can anticipate that he may experience which of the following common side effects?

- A) Fever, chills, and fatigue
- B) Nausea, vomiting, and diarrhea
- C) Opportunistic infections like Candida
- D) Renal damage with an increased creatinine level

Ans: A

Feedback:

Interferon is a biologic response modifier that changes a person's own immune response to cancer. This medication is given by injection, usually every other day. Because of stimulation of the body's natural immune response, the patient experiences extreme flulike symptoms.

18. An oncology nurse who has worked for many years providing care for children with cancer has taken a job on an adult oncology unit of a hospital. What differences might the nurse anticipate in this new job?

- A) There will be a greater number of cancers that are epithelial in origin.

- B) A greater proportion of the clients will have cancer that involves the hematopoietic system.
- C) The nurse will be working with more clients who have blastomas.
- D) More clients will be receiving treatment for leukemia.

Ans: A

Feedback:

Epithelial cancers are more common in adults, while “blastomas” and cancers of the hematopoietic system such as leukemia are more common in children.

19. A 26-year-old man who survived childhood acute lymphocytic leukemia (ALL), one of the most common childhood cancers, now complains of weakness, fatigue, and shortness of breath. His treatment for ALL likely included anthracyclines. What is the most likely cause of his symptoms?

- A) Recurrence of ALL
- B) CNS problems resulting from childhood chemotherapy
- C) Heart failure resulting from childhood chemotherapy
- D) Hormonal dysfunction resulting from childhood chemotherapy

Ans: C

Feedback:

The patient's symptoms resemble those of congestive heart failure. The anthracyclines, such as doxorubicin and daunorubicin, are associated with the risk for developing cardiomyopathy and heart failure.

20. The mother of an 18-month-old child is concerned that her child is lethargic and is not eating foods that he normally enjoys. She takes him to the pediatrician for a check-up. Which of the following clinical manifestations would lead the health care provider to suspect the child may have a neuroblastoma? Select all that apply.

- A) Large protruding abdomen
- B) Excessive burping
- C) Weight loss
- D) Large amount of pale urine
- E) Crying when position is changed

Ans: A, C, E

Feedback:

Neuroblastomas are the second most common solid malignancy in childhood after brain tumors. Clinical manifestations vary with the primary site (usually the adrenal glands) and include large abdominal masses, fever, and possibly weight loss. Bone pain suggests metastatic disease.