

ASAP VI Oncology Practice Test (Sample)

Study Guide



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SAMPLE

Questions

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- 1. Which of the following drugs is a monoclonal antibody?**
 - A. Rituximab (Rituxan)**
 - B. Goserelin (Zoladex)**
 - C. Fulvestrant (Faslodex)**
 - D. Anastrozole (Arimidex)**
- 2. What type of medication is Anastrozole?**
 - A. Selective estrogen receptor modulator (SERM)**
 - B. Aromatase inhibitor**
 - C. Monoclonal antibody**
 - D. Growth factor receptor inhibitor**
- 3. Which therapy is indicated as a preventive measure for mucositis in chemotherapy treatments?**
 - A. Hydration therapy**
 - B. Oral care**
 - C. Topical anesthetics**
 - D. All of the above**
- 4. Which alkylating agent is commonly associated with the treatment of certain types of cancer?**
 - A. Busulfan**
 - B. Temozolomide**
 - C. Cyclophosphamide**
 - D. Dacarbazine**
- 5. What is a folate analog and an antimetabolite commonly used in oncology?**
 - A. Methotrexate**
 - B. Cytarabine**
 - C. 5-Fluorouracil**
 - D. Gemcitabine**

- 6. Which checkpoint allows progression to the M phase if DNA replication is undamaged?**
- A. G1 checkpoint**
 - B. S checkpoint**
 - C. G2 checkpoint**
 - D. M checkpoint**
- 7. What can be given to replace lost white blood cells (WBCs)?**
- A. Granulocyte colony-stimulating factors (G-CSFs)**
 - B. Erythropoietin**
 - C. Cytokine inhibitors**
 - D. Interferons**
- 8. Which of the following correctly identifies an adverse effect of cisplatin?**
- A. Seizures**
 - B. Nephrotoxicity**
 - C. Encephalopathy**
 - D. Pulmonary fibrosis**
- 9. Which patient case would most likely require a liquid biopsy?**
- A. A patient undergoing surgery for a benign tumor**
 - B. A patient needing routine blood tests**
 - C. A patient with suspected cancer in need of a non-invasive test**
 - D. A patient receiving physical therapy**
- 10. What is "survivorship care" in the context of oncology?**
- A. Occasional follow-ups after treatment**
 - B. Ongoing health care and support for cancer survivors after treatment**
 - C. End-of-life planning for terminal patients**
 - D. A specialized treatment for recurrent cancer**

Answers

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- 1. A**
- 2. B**
- 3. D**
- 4. A**
- 5. A**
- 6. C**
- 7. A**
- 8. B**
- 9. C**
- 10. B**

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Explanations

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1. Which of the following drugs is a monoclonal antibody?

- A. Rituximab (Rituxan)**
- B. Goserelin (Zoladex)**
- C. Fulvestrant (Faslodex)**
- D. Anastrozole (Arimidex)**

Rituximab (Rituxan) is indeed a monoclonal antibody, and this classification is crucial in understanding its mechanism of action in oncology. Monoclonal antibodies are laboratory-made molecules engineered to mimic the immune system's ability to fight off harmful pathogens such as bacteria and viruses. In the case of Rituximab, it specifically targets the CD20 protein found on the surface of B-cells, which plays a pivotal role in certain types of blood cancers such as non-Hodgkin lymphoma and chronic lymphocytic leukemia. The design of monoclonal antibodies allows for targeted therapy, which can lead to fewer side effects compared to traditional chemotherapy. By specifically identifying and binding to CD20, Rituximab helps to destroy cancerous B-cells and can enhance the immune response against the tumor. In contrast, Goserelin (Zoladex) is a synthetic hormone that acts as a gonadotropin-releasing hormone (GnRH) agonist, primarily used in hormone-sensitive cancers like prostate and breast cancer. Fulvestrant (Faslodex) is a selective estrogen receptor downregulator used to treat hormone receptor-positive breast cancer. Anastrozole (Arimidex) is

2. What type of medication is Anastrozole?

- A. Selective estrogen receptor modulator (SERM)**
- B. Aromatase inhibitor**
- C. Monoclonal antibody**
- D. Growth factor receptor inhibitor**

Anastrozole is classified as an aromatase inhibitor, which is a type of medication that works by decreasing the amount of estrogen the body makes. It is particularly used in the treatment of hormone receptor-positive breast cancer in postmenopausal women. The mechanism of action involves inhibiting the aromatase enzyme, responsible for converting androgens into estrogens in peripheral tissues, leading to reduced estrogen levels. This is beneficial in breast cancer treatment as many cancers grow in response to estrogen. While other classifications like selective estrogen receptor modulators (SERMs) or monoclonal antibodies exist, they function differently and are used in various contexts and types of cancer. Growth factor receptor inhibitors also target specific pathways unrelated to the mechanism of action of Anastrozole. Therefore, the designation of Anastrozole as an aromatase inhibitor accurately reflects its function and use in clinical practice.

3. Which therapy is indicated as a preventive measure for mucositis in chemotherapy treatments?

- A. Hydration therapy**
- B. Oral care**
- C. Topical anesthetics**
- D. All of the above**

Mucositis, commonly occurring as a side effect of chemotherapy, can significantly impact a patient's quality of life and ability to continue treatment. Preventive measures for mucositis are essential in managing its symptoms and implications. The most effective approach involves a combination of therapies to help maintain oral health and minimize discomfort. Hydration therapy plays a crucial role in keeping mucosal tissues moist, which can reduce irritation that leads to mucositis. Proper hydration can also assist in flushing out harmful substances from the body that contribute to tissue damage. Oral care is fundamental as it maintains hygiene and can help prevent infections in the oral cavity, which may exacerbate mucositis. This includes regular brushing, flossing, and possibly using mouthwashes that are designed to reduce the risk of mucositis or manage its symptoms. Topical anesthetics can provide symptom relief by numbing the area, making it more comfortable for the patient to eat and speak. This can be particularly useful once mucositis has developed, but it also plays a role in prevention by mitigating pain that could discourage proper oral hygiene practices. Given that each of these therapies addresses different aspects of oral health and mucositis prevention, their combined use represents a comprehensive strategy. Therefore, the inclusion

4. Which alkylating agent is commonly associated with the treatment of certain types of cancer?

- A. Busulfan**
- B. Temozolomide**
- C. Cyclophosphamide**
- D. Dacarbazine**

Busulfan is indeed an alkylating agent used primarily in the treatment of certain hematological malignancies, particularly chronic myeloid leukemia (CML) and as part of preparative regimens for stem cell transplants. However, it is important to recognize that other alkylating agents are also widely used in oncology. Temozolomide is commonly utilized in the treatment of brain tumors, particularly glioblastoma multiforme, and is an alkylating agent that adds significant value to chemotherapy regimens. Cyclophosphamide is a highly versatile alkylating agent employed in various cancers, including lymphomas, breast cancer, and some leukemias, and acts as a cornerstone in many combination chemotherapy protocols. Dacarbazine, another alkylating agent, is mainly used in the treatment of melanoma and Hodgkin's lymphoma. While Busulfan has its place in oncology, other agents such as Cyclophosphamide and Temozolomide are often highlighted for their broad application in treating other malignancies. Each of these agents has unique mechanisms of action, efficacy profiles, and indications that make them valuable in the oncologist's arsenal.

5. What is a folate analog and an antimetabolite commonly used in oncology?

- A. Methotrexate**
- B. Cytarabine**
- C. 5-Fluorouracil**
- D. Gemcitabine**

The correct answer is methotrexate, which is a folate analog and an antimetabolite widely used in oncology. Methotrexate works by inhibiting the enzyme dihydrofolate reductase, which plays a crucial role in the synthesis of DNA, RNA, and proteins by blocking the conversion of dihydrofolate to tetrahydrofolate. This action disrupts the cell cycle, particularly affecting rapidly dividing cancer cells that rely heavily on folate for proliferation. Due to its mechanism, methotrexate is effective in treating various cancers, including leukemia, lymphoma, and certain solid tumors, as well as being used in lower doses for autoimmune diseases like rheumatoid arthritis. Its classification as a folate analog is critical because it mimics natural folate, allowing it to be incorporated in metabolic pathways where folate is normally utilized. In contrast, the other options listed do not serve as folate analogs. Cytarabine is a cytidine analog that primarily inhibits DNA synthesis and is used for hematologic malignancies. 5-Fluorouracil is a pyrimidine analog that interferes with RNA and DNA synthesis by disrupting the synthesis of thymidine. Gemcitabine is also a nucleos

6. Which checkpoint allows progression to the M phase if DNA replication is undamaged?

- A. G1 checkpoint**
- B. S checkpoint**
- C. G2 checkpoint**
- D. M checkpoint**

The G2 checkpoint is a critical control point in the cell cycle that specifically assesses whether DNA replication has been completed accurately and without damage before the cell proceeds to enter the M phase (mitosis). If the DNA is intact and properly duplicated, cell cycle regulatory mechanisms allow progression into mitosis. This checkpoint functions to prevent the division of cells that have damaged or incompletely replicated DNA, thereby maintaining genomic stability. In contrast, the other checkpoints serve different purposes. The G1 checkpoint assesses cell size, nutrient availability, and overall cellular health before allowing progression into the S phase, where DNA replication occurs. The S checkpoint monitors the integrity of DNA during replication itself. The M checkpoint, on the other hand, ensures that all chromosomes are properly attached to the mitotic spindle before the cell divides, rather than checking the status of DNA replication. Thus, the G2 checkpoint plays a pivotal role in ensuring that only cells with undamaged and fully replicated DNA move into the M phase, supporting the proper progression of the cell cycle.

7. What can be given to replace lost white blood cells (WBCs)?

- A. Granulocyte colony-stimulating factors (G-CSFs)**
- B. Erythropoietin**
- C. Cytokine inhibitors**
- D. Interferons**

Granulocyte colony-stimulating factors (G-CSFs) are specifically designed to stimulate the production of white blood cells in the bone marrow. When patients experience low white blood cell counts, often due to chemotherapy or certain medical conditions, G-CSFs can be administered to promote the recovery of neutrophils. This is crucial as neutrophils play a vital role in the body's immune response, particularly in fighting infections. In contrast, erythropoietin is primarily used to stimulate red blood cell production and is not effective for increasing white blood cell counts. Cytokine inhibitors work by blocking the action of certain cytokines involved in inflammation and immune responses, but they do not aid in the replacement or boost of white blood cells. Interferons have antiviral properties and can modulate the immune response, but they do not specifically enhance white blood cell production. Therefore, G-CSFs are the appropriate choice for replacing lost white blood cells.

8. Which of the following correctly identifies an adverse effect of cisplatin?

- A. Seizures**
- B. Nephrotoxicity**
- C. Encephalopathy**
- D. Pulmonary fibrosis**

Cisplatin is a platinum-based chemotherapeutic agent widely used in the treatment of various cancers such as testicular, bladder, and lung cancer. One of the well-documented adverse effects of cisplatin is nephrotoxicity, which refers to its potential to cause damage to the kidneys. This toxicity occurs because the kidneys are involved in filtering out the drug from the bloodstream, leading to increased exposure of renal tissues to cisplatin. Renal impairment can manifest as electrolyte imbalances, changes in serum creatinine levels, and in severe instances, may lead to acute kidney injury. Clinicians monitor renal function closely in patients receiving cisplatin, and hydration protocols are often employed to reduce the risk of nephrotoxic effects. While the other options presented include various neurological and pulmonary complications, they are not commonly associated with cisplatin. For example, seizures and encephalopathy are more often linked to other chemotherapeutic agents or underlying malignancies rather than cisplatin itself. Pulmonary fibrosis is primarily related to agents such as bleomycin. Thus, among the choices given, nephrotoxicity stands out as a significant and recognized adverse effect of cisplatin treatment.

9. Which patient case would most likely require a liquid biopsy?

- A. A patient undergoing surgery for a benign tumor**
- B. A patient needing routine blood tests**
- C. A patient with suspected cancer in need of a non-invasive test**
- D. A patient receiving physical therapy**

The patient case most likely to require a liquid biopsy involves having a suspected cancer and needing a non-invasive test. Liquid biopsies are blood tests that can detect cancer-related biomarkers, such as circulating tumor cells, cell-free DNA, or other substances shed by tumors into the bloodstream. This approach allows for the identification of cancer without the need for more invasive procedures like surgery or tissue biopsies. In scenarios where a patient is under suspicion for cancer but confirmation is needed, a liquid biopsy can provide essential insights regarding tumor presence, characteristics, and even genetic mutations that may influence treatment decisions. This non-invasive method offers a convenient and often quicker way to gain crucial information about cancer management, making it particularly relevant for cases where cancer is suspected. In contrast, the other situations, such as surgery for a benign tumor or receiving physical therapy, do not typically involve the need for cancer detection or evaluation, and routine blood tests are generally not specific for cancer diagnostics. Thus, these cases do not convey the same necessity for liquid biopsy as that of a patient with suspected cancer.

10. What is "survivorship care" in the context of oncology?

- A. Occasional follow-ups after treatment**
- B. Ongoing health care and support for cancer survivors after treatment**
- C. End-of-life planning for terminal patients**
- D. A specialized treatment for recurrent cancer**

Survivorship care refers to the ongoing health care and support provided to individuals who have completed cancer treatment. This approach encompasses a variety of services aimed at addressing the unique needs of cancer survivors, including monitoring for recurrence, managing long-term side effects, and improving overall quality of life. It recognizes that after treatment, survivors may face psychological, emotional, and physical challenges that require continued attention and support. This can involve regular follow-up appointments, lifestyle modifications, and psychosocial support to help survivors transition into life after cancer. The other options represent concepts that do not fully capture the comprehensive nature of survivorship care. Occasional follow-ups are part of the overall care but do not encompass the full spectrum of support offered. End-of-life planning is relevant for those in terminal stages of illness and is not focused on survivorship. A specialized treatment for recurrent cancer pertains specifically to managing a return of the disease rather than supporting those who have completed treatment. Thus, B emphasizes the holistic approach that survivorship care embodies, making it the correct answer.