Washington & Leaver: Principles and Practice of Radiation Therapy, 3rd Edition

Chapter 01: Cancer: An Overview

Test Bank

TRUE/FALSE

1. Cancer is contagious.

ANS: F
Although once thought to be contagious, cancer is not a communicable disease.

REF: Chapter 1, Cancer: An Overview, p. 3

2. As treatments reduce the number of tumor cells, the tumor's growth rate increases.

ANS: T
As treatments reduce the number of tumor cells, the total volume of the tumor shrinks, thus placing the remaining tumor cells in close proximity to blood and nutrient supplies and increasing the overall tumor's growth rate.

REF: Chapter 1, Cancer: An Overview, p. 5

3. The incidence of stomach cancer is higher in the United States than it is in Japan.

ANS: F
The incidence of gastric cancer is higher in Japan than in the United States. This is likely the result of dietary differences.

REF: Chapter 1, Cancer: An Overview, p. 6

4. The earlier a tumor is discovered, the lower is the chance of metastasis.

ANS: T
Early detection has been a foundational issue in reducing the mortality rate of many cancers including prostate and breast cancers. This reduction is likely the result of many things, including better technology and a decrease in the number of cancers diagnosed with metastases.

REF: Chapter 1, Cancer: An Overview, p. 7

5. Carcinoembryonic antigen (CEA) is an example of a screening examination that is both sensitive and specific.

ANS: F
Although CEA is sensitive, it is not capable of distinguishing between benign and malignant conditions and it, therefore, is not specific.

REF: Chapter 1, Cancer: An Overview, p. 7

6. The components of a cancer workup will remain the same regardless of tumor type or stage.

ANS: F
The elements and brevity of the workup will vary on the tumor type. For example, the workup for melanoma would include more diagnostic examinations than the workup for a basal cell carcinoma of the skin.

REF: Chapter 1, Cancer: An Overview, p. 8

7. Nodal staging can be performed clinically.

ANS: F
Although some elements of the TNM staging system may be determined without invasive measures, nodal involvement must be determined by surgical methods such as biopsy or resection of the nodes.

REF: Chapter 1, Cancer: An Overview, p. 9

8. Positive surgical margins means that the entire tumor was removed during the initial surgery.

ANS: F
Although it seem somewhat counterintuitive, positive surgical margins means that some of the tumor was left behind following resection. Positive margins are a negative outcome. It may be better described as, “The margin was positive for the presence of tumor cells.”

REF: Chapter 1, Cancer: An Overview, p. 11

9. Preoperative radiation therapy and chemotherapy use lower doses than postoperative doses.

ANS: T
When used as preoperative therapies, radiation therapy and chemotherapy require lower doses than if used postoperatively. There are many elements that factor into this decision, including tissue healing and patient condition.
REF: Chapter 1, Cancer: An Overview, p. 11

10. Immunotherapy suppresses the patient's immune systems to aid in other forms of treatment such as radiation therapy or chemotherapy.

ANS: F
Immunotherapy amplifies the body's nature defenses against cancer and does not suppress the immune system.

REF: Chapter 1, Cancer: An Overview, p. 17

11. A prognosis is an accurate life expectancy of a cancer patient.

ANS: F
Although a prognosis is a statement of life expectancy, it is only an estimate and should not be considered "accurate" or a definitive statement on how long the specific patient will actually live.

REF: Chapter 1, Cancer: An Overview, p. 17

12. All clinical trials are retrospective.

ANS: F
By definition, a clinical trial must be prospective.

REF: Chapter 1, Cancer: An Overview, p. 18

13. Retrospective studies cannot also be randomized studies.

ANS: T
The process of randomization is a component of prospective trials. Retrospective studies look at historical data and cannot be randomized since the treatments have already occurred.

REF: Chapter 1, Cancer: An Overview, p. 18

MULTIPLE CHOICE

1. Knowledge of cancer dates back to:
a. 1600 BC Egypt
b. 1600 AD England
c. 400 BC Greece
d. 1900 AD Germany

ANS: A
The first known observations of cancer date back to 1600 BC Egypt.
REF: Chapter 1, Cancer: An Overview, p. 3

2. Which of the following is *not* a term for genes involved in the cancer process?
a. antioncogenes
b. oncogenes
c. protooncogenes
d. somatooncogenes

ANS: D
Antioncogenes, oncogenes, and protooncogenes are all been identified as playing a part in the development of tumors. Somatooncogenes do not exist.

REF: Chapter 1, Cancer: An Overview, p. 4

3. Tumor-suppressor genes are also known as _____.
a. antioncogenes
b. oncogenes
c. protooncogenes
d. somatooncogenes

ANS: A
Although more commonly called tumor-suppressor genes, these genes are also known as antioncogenes.

REF: Chapter 1, Cancer: An Overview, p. 4

4. Which of the following is *not* a phase of the mammalian cell cycle?
a. G0
b. G1
c. G2
d. G3

ANS: D
G0 is a resting phase where cells do not enter mitosis. G1 and G2 are growth phases during the mammalian cell cycle. Although some algae species demonstrate a relatively long phase between nuclear division and cleavage of the cell termed G3, this phase is not part of the mammalian cell cycle.

REF: Chapter 1, Cancer: An Overview, p. 4

5. Which phase of the mammalian cell cycle is composed of functional cells not preparing for DNA replication?
a. G0
b. G1
c. G2
d. S
e. M

ANS: A
G0 is typically depicted outside the cell cycle because cells in this phase are not preparing for DNA synthesis.

REF: Chapter 1, Cancer: An Overview, p. 4

6. In which phase of the mammalian cell cycle does DNA synthesis occur?
a. G0
b. G1
c. G2
d. S
e. M

ANS: D
"S" is representative of synthesis and is the phase in which DNA synthesis occurs.

REF: Chapter 1, Cancer: An Overview, p. 4

7. Identify the correct order for the phases of the mammalian cell cycle.
a. G1, G2, M, S
b. G1, G2, S, M
c. G1, M, G2, S
d. G1, S, G2, M

ANS: D
The typical mammalian cell will move from G1 to S, followed by G2, and then M. Some cells will eventually pause in G0 after M.

REF: Chapter 1, Cancer: An Overview, p. 4

8. Anaplastic tumors:
a. closely resemble the cells of origin
b. maintain some resemblance of the cells of origin
c. do not resemble the cells of origin

ANS: C
Anaplastic tumors are also known as undifferentiated tumors. Undifferentiated cells do not resemble the normal cells of origin.

REF: Chapter 1, Cancer: An Overview, p. 5

9. Which of the following is true of benign tumors?
a. well differentiated

b. do not metastasize
c. encapsulated
d. all are true
ANS: D
Benign tumors typically are well differentiated, do not metastasize, and are encapsulated.

REF: Chapter 1, Cancer: An Overview, p. 5

10. Which of the following factors does *not* affect the incidence of tumor sites?
a. informational
b. environmental
c. technological
d. geographic

ANS: A
Tumor site incidence is affected by environmental factors such as sun exposure. It is also affected by technological factors such as the advent of more precise imaging modalities. Additionally, tumor site incidence is affected by geographic factors as exemplified by gastrointestinal cancers in Japan.

REF: Chapter 1, Cancer: An Overview, p. 6

11. Which department typically handles financial assistance, logistical issues, and community services?
a. radiation oncology
b. pastoral care
c. social work
d. administration

ANS: C
Although each individual healthcare setting may assign these duties to different departments or individuals, financial assistance, logistical issues, and community services typically are the responsibility of the social work department.

REF: Chapter 1, Cancer: An Overview, p. 7

12. What is defined as the "study of the cause of disease"?
a. etiology
b. etymology
c. epidemiology
d. entomology

ANS: A
Etiology is defined as the "study of the cause of disease". Etymology is the "study of word origins", epidemiology is the "study of disease incidence", and entomology is the "study of insects".

REF: Chapter 1, Cancer: An Overview, p. 7

13. What is the "study of disease incidence"?
a. etiology
b. etymology
c. epidemiology
d. entomology

ANS: B
Epidemiology is defined as the "study of disease incidence". Etiology is the "study of the cause of disease", etymology is the "study of word origins", and entomology is the "study of insects".

REF: Chapter 1, Cancer: An Overview, p. 7

14. Which of the following make for an effective screening examination?
a. specific
b. sensitive
c. cost-effective
d. accurate
e. all of the above

ANS: E
In order for a screen tool to be effective, it must be specific, sensitive, accurate, and cost effective.

REF: Chapter 1, Cancer: An Overview, p. 7

15. What is the "workup?"
a. the initial nursing visit
b. the initial physician visit
c. a series of diagnostic examinations
d. a physical assessment of the patient

ANS: C
Although the term "workup" may be used by different radiation oncology departments in various ways, the generally accepted definition of this term is a series of diagnostic examinations performed after a patient has been diagnosed with a disease or condition. This may be done at the time of the initial physician or nurse visit and may include a physical assessment but these are only a portion of the entire workup.

REF: Chapter 1, Cancer: An Overview, p. 8
16. Which of the following is *not* typically part of the workup?
a. patient demographics
b. type, location, and size of tumor

c. normal tissue invasion
d. presence of metastases

ANS: A
The workup includes information about the tumor such as type, size, and location, amount of normal tissue invasion, and presence of metastases. Typically, demographic information is collected at a time other than the workup by support staff.

REF: Chapter 1, Cancer: An Overview, p. 8

17. Which imaging modality is beneficial in distinguishing between recurrent disease and other tissue changes post treatment?
a. CT
b. PET
c. plain films
d. MR

ANS: B
Although a CT or MR scan may be used as part of the diagnostic process for ruling out recurrent disease, PET is the only imaging modality listed that can differentiate recurrence from other tissue changes.

REF: Chapter 1, Cancer: An Overview, p. 8

18. What is the most common tumor staging system?
a. AJCC
b. FIGO
c. TNM
d. UICC

ANS: C
The TNM staging system is the most commonly used system. This system has been adopted by AJCC and UICC. FIGO is the staging system used for gynecologic tumors but has no application to the majority of tumors.

REF: Chapter 1, Cancer: An Overview, p. 8

19. A $T_1N_0M_X$ tumor has how many positive lymph nodes?
a. 0
b. 1
c. 2
d. unknown

ANS: A
N_0 is an indication of no positive lymph nodes.

REF: Chapter 1, Cancer: An Overview, p. 8

20. Tumors are the result of:
a. black bile
b. necrotic tissue
c. abnormal cellular proliferation
d. traumatic injury

ANS: C
Once thought to be the result of black bile or traumatic injuries, tumors are now known to be the result of abnormal cellular proliferation. Tumor growth may result in a large central area of necrosis, but this is an effect rather than a cause.

REF: Chapter 1, Cancer: An Overview, p. 4

21. Tumor grade is a measure of _____.
i. aggressiveness
ii. differentiation
iii. spread
a. i and ii
b. i and iii
c. ii and iii
d. i, ii, and iii

ANS: A
Tumor grade is a measure of both aggressiveness and differentiation. Staging is used to describe the tumor's spread.

REF: Chapter 1, Cancer: An Overview, p. 9

22. Which of the following biopsy methods results in the removal of the entire tumor?
a. fine needle aspiration
b. core needle
c. incisional
d. excisional

ANS: D
During a fine needle aspiration, only a few cells of the tumor are removed. The same is true of core needle biopsies. Incisional biopsies remove more tumor than either fine needle aspiration or core needle biopsy, but some of the tumor remains. During an excisional biopsy, the entire tumor is removed en bloc.

REF: Chapter 1, Cancer: An Overview, p. 10

23. Which of the following biopsy methods *cannot* evaluate tumor architecture?
a. fine needle aspiration
b. core needle

c. incisional
d. excisional

ANS: A
Fine needle aspiration removes cells from a tumor but cannot retain the architecture of the tumor.

REF: Chapter 1, Cancer: An Overview, p. 10

24. Factors that may exclude a patient from having surgery include all of the following *except:*
a. preexisting medical conditions
b. tumor location
c. patient preference
d. classification

ANS: D
The invasive nature of surgical procedures for cancer removal may exclude some patients with preexisting conditions. In addition, the location of some tumors (such as base of skull lesions) may eliminate surgery as a possible treatment option. Furthermore, surgery may be excluded in an attempt to preserve function as in the treatment of anal cancers. Tumor classification alone is not a contraindication from surgery.

REF: Chapter 1, Cancer: An Overview, p. 10

25. When compared with surgery, benefits of radiation therapy include all of the following *except:*
a. instantaneous cure
b. better cosmetic results
c. preservation of function
d. noninvasive

ANS: A
Individual results will vary based on tumor type and other factors but, as a general rule, radiation therapy provides patients with better cosmetic results than surgery. In addition, radiation therapy is noninvasive and can often preserve function not possible with surgery. However, only surgery can provide an instantaneous cure via total resection.

REF: Chapter 1, Cancer: An Overview, p. 12

26. Which of the following treatment techniques uses radioactive sources?
a. external beam
b. intraoperative
c. brachytherapy
d. IMRT

ANS: C
Typically, brachytherapy treatments require a radioactive source, although recent advances in nanotechnology have resulted in some brachytherapy procedures using miniature x-ray tubes. In times past, radioactive cobalt was used in external beam radiation therapy, but this process is now antiquated.

REF: Chapter 1, Cancer: An Overview, p. 12

27. Which of the following is *not* used for brachytherapy treatments?
a. cesium
b. cobalt
c. iodine
d. iridium

ANS: B
Although there are some reports documenting the use of cobalt for brachytherapy, it is traditionally used for external beam radiation therapy.

REF: Chapter 1, Cancer: An Overview, p. 12

28. High-dose afterloading equipment is used in association with which treatment technique?
a. external beam
b. intraoperative
c. brachytherapy
d. IMRT

ANS: C
High-dose afterloading equipment is used during brachytherapy treatments to reduce staff exposure to high doses of radiation.

REF: Chapter 1, Cancer: An Overview, p. 13

29. Pancreatic cancer may be treated using which technique?
a. interluminal
b. intervascular
c. intracavitary
d. intraoperative

ANS: D
Although pancreatic cancer can be treated with radiation therapy by a number of different techniques including 3D conformal, IMRT, and IGRT, it can also be treatment using an intraoperative technique. Interluminal, intervascular, and intracavitary are brachytherapy techniques not used for the treatment of pancreatic cancer.

REF: Chapter 1, Cancer: An Overview, p. 12

30. Which of the following is a systemic treatment?
a. surgery
b. radiation therapy
c. chemotherapy
d. all of the above

ANS: C
Radiation therapy and surgery are localized treatments, while chemotherapy is a systemic treatment.

REF: Chapter 1, Cancer: An Overview, p. 13

31. Which of the following routes of administration is used when treating bladder cancer with chemotherapy?
a. oral
b. intraarterial
c. intracavitary
d. intrathecal

ANS: C
As described in the text, bladder cancer may be treated by instilling the chemotherapy agent directly into the bladder via a catheter. This process is known as intracavitary chemotherapy.

REF: Chapter 1, Cancer: An Overview, p. 13

32. Which classification of chemotherapy agents was the first to be identified as having anticancer activities?
a. alkylating agents
b. antimetabolites
c. antibiotics
d. hormonal agents
e. nitrosoureas
f. vinca alkaloids

ANS: A
The first chemotherapy agent was nitrous mustard, an alkylating agent.

REF: Chapter 1, Cancer: An Overview, p. 14

33. Which of the following are *not* cell cycle specific?
i. alkylating agents
ii. antimetabolites
iii. antibiotics
iv. hormonal agents
v. nitrosoureas
vi. vinca alkaloids

a. i and ii
b. i and iii
c. i, iii, and v
d. ii, iv, and vi
e. ii, iii, vi

ANS: C
Alkylating agents are not cell cycle specific. Neither are anticancer antibiotics (although they are more effective during certain phases) nor nitrosoureas.

REF: Chapter 1, Cancer: An Overview, pp. 14-15

34. Which classification of chemotherapy agents is derived from the periwinkle plant?
a. alkylating agents
b. antimetabolites
c. antibiotics
d. hormonal agents
e. nitrosoureas
f. vinca alkaloids

ANS: F
Periwinkle plants are part of the genus *Vinca* and sometimes called vinca. It is from these plants that vinca alkaloids are derived.

REF: Chapter 1, Cancer: An Overview, p. 15

35. Which classification of chemotherapy agents are lipid soluble and capable of crossing the blood-brain barrier?
a. alkylating agents
b. antimetabolites
c. antibiotics
d. hormonal agents
e. nitrosoureas
f. vinca alkaloids

ANS: E
Nitrosoureas are the only classification of chemotherapy agents that are both lipid soluble and capable of passing through the blood-brain barrier.

REF: Chapter 1, Cancer: An Overview, p. 15

36. Which of the following is a radiosensitizing chemotherapy agent?
a. cyclophosphamide
b. 5-fluorouracil
c. doxorubicin
d. cisplatin

ANS: C
Doxorubicin, also known as Adriamycin, acts a radiosensitizer. Cyclophosphamide, 5-fluorouracil, and cisplatin are not known to enhance the effects of radiation.

REF: Chapter 1, Cancer: An Overview, p. 16

37. Which of the following acts as a radioprotector?
a. amifostine
b. actinomycin D
c. Adriamycin
d. etoposide

ANS: A
Amifostine acts to protect normal tissue against the effects of radiation and is, therefore, considered a radioprotector. Adriamycin is a radiosensitiver. Actinomycin and etoposide are not known to be radioprotectors.

REF: Chapter 1, Cancer: An Overview, p. 16

38. Injecting monoclonal antibodies is an example of which type of treatment?
a. surgery
b. radiation therapy
c. chemotherapy
d. immunotherapy

ANS: D
Injection of monoclonal antibodies is an example of immunotherapy.

REF: Chapter 1, Cancer: An Overview, p. 17

39. Which of the following best describes tumor spread?
a. exophytic
b. multicentric
c. dissemination
d. ulceration
ANS: C
Dissemination is defined as the act of spreading or diffusion and is most closely associated with cancer spread. Exophytic is used to describe tumors that grow outward. Multicentric describes tumors with more than one focus. Ulceration is the development of an ulcer and is unassociated with cancer spread.

REF: Chapter 1, Cancer: An Overview, p. 17

40. Which of the following factors is *not* considered when determining a prognosis?
a. tumor stage

b. nodal status
c. gender
d. all are considered

ANS: D
There are many factors that are considered when a physician determines a prognosis, including tumor site, grade, stage, size, and histology; lymph node status; performance status; and the patient's age, gender, and race.

REF: Chapter 1, Cancer: An Overview, p. 18

41. Randomized studies are by definition which phase?
a. phase I
b. phase II
c. phase III
d. phase IV

ANS: C
Phase III studies are used to compare an experimental treatment to a standard treatment using a randomized sample.

REF: Chapter 1, Cancer: An Overview, p. 18

42. Which staff member is most responsible for designing the patient's treatment plan?
a. medical physicist
b. radiation oncologist
c. dosimetrist
d. radiation therapist

ANS: C
Specific duties will vary between specific departments, but as a general rule the medical dosimetrist will be responsible for designing the patient's treatment plan. This process may be overseen by the medical physicist and/or radiation oncologist. In some departments, radiation therapists will participate in the treatment planning process.

REF: Chapter 1, Cancer: An Overview, p. 19

43. Which staff member is most responsible for the quality assurance to the treatment equipment?
a. medical physicist
b. radiation oncologist
c. dosimetrist
d. radiation therapist

ANS: A

Although all members of the cancer treatment team are responsible for quality assurance and the radiation therapists and medical dosimetrists may perform some of the duties specific to treatment equipment quality assurance, the person most responsible is the medical physicist.

REF: Chapter 1, Cancer: An Overview, p. 19