Terms in Oncology—
Cancer and Its Causes

After studying this chapter, you will be able to:

18.1 Name the types of cancers, discuss the major pathological conditions, and list some of their possible causes
18.2 Define the combining forms and suffixes used in building words that relate to oncology
18.3 Identify the meaning of related abbreviations
18.4 Name the laboratory tests and clinical procedures used in testing and treating cancer
18.5 Describe pathological terms related to cancer
18.6 Explain the meaning of surgical terms related to cancer
18.7 List common pharmacological agents used in treating cancer

Tumors: Types and Causes

Tumors

Oncology is the study, diagnosis, and treatment of tumors. Tumors or neoplasms are growths made up of cells that reproduce abnormally. Cells in the body normally reproduce only at a rate to replace cells that have died. Cells also have a mechanism that signals them to die when they have passed a certain point of usefulness. Tumors are made up of cells that seem to be missing the mechanism that tells them either to stop reproducing or to die. The death of normal cells in a normal time cycle is called apoptosis.

Tumors can be benign (massed but containing cells that resemble the site of origin) or malignant (consisting of abnormal or mutated cells). Figure 18-1 shows a benign encapsulated tumor (a) and a malignant tumor (b). Tumors can be encapsulated (retained within a border of connective tissue) or they may reproduce in uncontrolled patterns. Most benign tumors are not life-threatening unless they grow in such a way that they damage essential organs. Malignant tumors can be life-threatening if they are not treated and they spread.

A carcinoma, the most common type of cancer, originates from epithelial tissue. Also called solid tumors, carcinomas make up about 90 percent of all tumors. Common sites are in the skin, lungs, breasts, colon, stomach, mouth, and uterus. Carcinomas spread by way of the lymphatic system.

A sarcoma, which is fairly rare, originates in muscle or connective tissue and lymph. A mixed-tissue tumor derives from tissue that is capable of
separating into either epithelial or connective tissue because it is composed of several types of cells. Such a tumor can be found in the kidneys, ovaries, or testes. Mixed-tissue tumors can be teratomas, growths containing bone, muscle, skin, and glandular tissue as well as other types of cells. There is also a class of cancers that arise from blood, lymph, or nervous system cells. Cancers such as leukemia fall into this category. As mentioned in Chapter 12, some leukemias are also sarcomas. Benign tumors are not life-threatening unless they impact organs (Figure 18-1a). They are made up of differentiated cells that reproduce abnormally but in an orderly fashion. Some benign tumors can cause pain from pressure exerted on an organ or tissue. Often, removal cures the problem.

Malignant tumors are invasive, extending beyond the tissue to infiltrate other organs (Figure 18-1b). Malignant tumors can be life-threatening. These tumors are made up of dedifferentiated cells, which lack the normal orderly arrangement of the cells from which they arise. Undifferentiated cells lack a defined mature cell structure. This loss of cell differentiation is called anaplasia.

Any abnormal tissue development is known as dysplasia or heteroplasia. The first stages of cancer development may be classified as dysplasia because they represent the beginning of abnormal tissue development. Detection of cancers at this early stage plays a vital role in treatment. The next stage may be a carcinoma in situ, a tumor in one place that affects all
layers of tissue. Finally, a malignancy occurs when the cells break loose and become invasive to surrounding tissue. The spread of a malignancy to other areas of the body is called metastasis. In earlier chapters, you learned about homeostasis, the maintaining of balance throughout the body. Metastasis is a state of imbalance, with cells spreading uncontrollably.

### Causes of Cancer

Tumors appear under a number of different circumstances or combination of circumstances. One such is the exposure to carcinogens, cancer-causing agents. Carcinogens include environmental agents, such as chemicals, radiation, and viruses. Many chemicals, environmental factors, and viruses may be carcinogens, but they have not been tested thoroughly, and may not be for years. The process of proving a link between an agent and a resulting cancer is a long and tedious process. In some localities, cancer clusters (an unusually high number of cancers in a limited area) have led researchers to classify certain chemicals as carcinogens. Other agents, such as tobacco in any form, food additives, pharmaceutical agents, asbestos, insecticides, some dyes, and certain hormones, are also known carcinogens. Figure 18-2 is a chart giving the percentages of cancer deaths from preventable factors.

Another cause of cancer is from an inherited defect transmitted from parent(s) to child in the genetic material of the cell, DNA (deoxyribonucleic acid). Figure 18-3 shows DNA in the nucleus of a cell. DNA contains coded material called genes that direct the growth of cells and the production of new proteins. When a cell divides into two cells in normal cell growth, exactly the same DNA appears in both cells. The body is constantly producing new cells. This process is called mitosis. Some genes in DNA may become defective in a process of change, called mutation. Most mutated cells either do not survive or are destroyed by the normal immune system. However, each new generation of malignant cells will increase the mutation of

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**FIGURE 18-2** Many cancer deaths could be prevented by lifestyle and environmental changes.

**FIGURE 18-3** DNA strands contain genetic information in the cell.
the cell. The longer the malignancy has been established, the more mutated. A pathologist will assess this.

Mutations that do survive are then replicated over and over again and can lead to malignancies. Mutated DNA can predispose someone to cancer through heredity. Breast cancer and ovarian cancer are examples of largely inherited cancers. People with a family history of cancers are more likely to develop cancer. That does not mean, however, that people with no family history of a certain cancer (such as breast cancer) should ignore regular checkups. Nor does it mean that if your mother had breast cancer, you and your sisters are destined to have breast cancer. The other function of DNA is to copy its code onto another molecule called RNA (ribonucleic acid). RNA carries coded messages from the nucleus to the outer material of the cell, the cytoplasm. The messages signal what proteins are needed. Viruses heighten cancer risk (such as Kaposi's sarcoma from HIV). A virus that causes cancer is known as an oncogenic agent. An oncogene is a DNA fragment that converts normal cells into malignancies.

The National Cancer Institute (www.cancer.gov) is a governmental source for information about types of cancers, treatments, research, and many other cancer topics.

VOCABULARY REVIEW

In the previous section, you learned terms relating to oncology. Before going on to the exercises, review the terms below and refer to the previous section if you have questions. Pronunciations are provided for certain terms. Sometimes information about where the word came from is included after the term. These etymologies (word histories) are for your information only. You do not need to memorize them.

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>apoptosis [ä-pōp-TŌ-sis] Greek, a dropping off</td>
<td>Normal death of cells.</td>
</tr>
<tr>
<td>benign [bē-NĪN] From Latin benignus, kind</td>
<td>Encapsulated; not malignant.</td>
</tr>
<tr>
<td>cytoplasm [SI-tō-plåzm] cyto-, cell + -plasm, formation</td>
<td>Outer portion of a cell surrounding the nucleus.</td>
</tr>
<tr>
<td>dedifferentiated [de-DĪF-ér-ēn-shē-Ā-tēd] de-, away from + differentiated</td>
<td>Lacking in normal orderly cell arrangement.</td>
</tr>
<tr>
<td>encapsulated [ēn-KĀP-sū-lā-tēd]</td>
<td>Held within a capsule; benign.</td>
</tr>
<tr>
<td>invasive [īn-VĀ-sīv]</td>
<td>Infiltrating other organs; spreading.</td>
</tr>
<tr>
<td>metastasis [mē-TĀS-tā-sis] Greek: meta-, beyond + stasis, a standing still</td>
<td>Spread of malignant cells to other parts of the body.</td>
</tr>
<tr>
<td>Term</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>mitosis [mī-TÔ-sīs]</td>
<td>From Greek mitos, thread</td>
</tr>
<tr>
<td>mutation [myū-TĂ-shūn]</td>
<td>Alteration in DNA to produce defective cells.</td>
</tr>
<tr>
<td>neoplasm [NĒ-o-plăzm]</td>
<td>Tumor; new growth.</td>
</tr>
<tr>
<td>oncogene [ŎNG-kō-jēn]</td>
<td>DNA fragment that causes malignancies.</td>
</tr>
<tr>
<td>sarcoma [sār-KÔ-mā]</td>
<td>Relatively rare tumor that originates in muscle, connective tissue, and lymph.</td>
</tr>
<tr>
<td>solid tumor</td>
<td>Carcinoma; most common type of tumor.</td>
</tr>
<tr>
<td>teratoma [tēr-ă-TÔ-mā]</td>
<td>Growth containing several types of tissue and various types of cells.</td>
</tr>
<tr>
<td>tumor [TŰ-môr]</td>
<td>Growth made up of cells that reproduce abnormally.</td>
</tr>
</tbody>
</table>

**Case Study**

**Finding a Symptom**

Alicia Alvarez is fifty years old, has no family history of cancer, and is having her annual gynecological examination. Dr. Josiah Williams is a gynecologist specializing in the care of menopausal women. He notices a grayish area on the left side of Alicia’s vulva. He recommends an immediate biopsy be taken in his office. Alicia expresses surprise and mentions that there is no cancer history in her family. Dr. Williams explains to Alicia that family history is just one factor in cancer of the female reproductive system. He also points out that a biopsy does not necessarily mean the tissue is cancerous; the discoloration may also be the result of an infection or irritation. Alicia agrees to have the biopsy.

**Critical Thinking**

1. The discoloration on Alicia’s vulva is possibly a type of skin cancer appearing on a part of the female reproductive system. Skin discolorations are usually not cancer. If you have a biopsy and the results are negative, should you still examine the skin area every few months? Why?
2. Name two cancers of the female reproductive system.

**Tumors: Types and Causes Exercises**

**Find a Match**

Write the word from this list that matches each statement.

- benign deoxyribonucleic acid anaplasia teratoma carcinogen metastasis differentiated malignant dedifferentiated invasive sarcoma oncogene

3. Lacking in normal orderly cell arrangement ____________
4. Encapsulated, not malignant ___________
5. Infiltrating other organs; spreading ___________
6. Growing uncontrollably ___________
7. Genetic material of a cell
8. DNA fragment that causes malignancies
9. Growth containing several types of tissue and various types of cells
10. Tumor that originates in muscle, connective tissue, and lymph; fairly rare
11. Spread of malignant cells
12. Cancer-causing agent

Spell It Correctly
For each of the following words, write C if the spelling is correct. If it is not correct, write the correct spelling.

13. mestastasis
14. apoptosis
15. carsinoma
16. dedifferentiated
17. deoxirebonuclaic
18. citoplasm

Match the Term
Write the letter of the meaning of the term in the space provided. These terms describe tumor appearance:

19. verrucous
20. polypoid
21. inflammatory
22. cystic
23. follicular
24. ulcerating
25. medullary
26. necrotic

a. filled with fluid
b. wartlike in appearance
c. containing glandular sacs
d. having open wounds
e. large and fleshy
f. containing dead tissue
g. containing polyps
h. having a red and swollen appearance

Combining Forms and Abbreviations
The lists below include combining forms, suffixes, and abbreviations that relate specifically to oncology. Pronunciations are provided for the examples.

<table>
<thead>
<tr>
<th>COMBINING FORM</th>
<th>MEANING</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>blast(o)</td>
<td>immature cell</td>
<td>blastoma [blās-TŌ-mā], tumor arising from an immature cell</td>
</tr>
<tr>
<td>carcin(o)</td>
<td>cancer</td>
<td>carcinogen [kār-SĬN-ō-jēn], cancer-causing agent</td>
</tr>
<tr>
<td>muta</td>
<td>genetic change</td>
<td>mutation [myū-TĀ-shūn], process of genetic change</td>
</tr>
<tr>
<td>mutagen(o)</td>
<td>genetic change</td>
<td>mutagenic [myū-tā-JĔN-ık], causing genetic change</td>
</tr>
<tr>
<td>onc(o)</td>
<td>tumor</td>
<td>oncology [ŏn-KŎL-ŏ-jē], treatment and study of tumors</td>
</tr>
<tr>
<td>radi(o)</td>
<td>radiation, X rays</td>
<td>radiation [rä-dē-Ă-shūn], process of exposure to or treatment with above-normal levels of radiation</td>
</tr>
</tbody>
</table>
### Suffix

<table>
<thead>
<tr>
<th>Suffix</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>-blast</td>
<td>immature cell</td>
<td>leukoblast [LÜ-kō-blást], immature</td>
</tr>
<tr>
<td>-oma (pl., -omata)</td>
<td>tumor</td>
<td>fibroma [fi-BRŌ-mā], benign tumor arising from connective tissue</td>
</tr>
<tr>
<td>-plasia</td>
<td>formation (as of cells)</td>
<td>dysplasia [dis-PLĀ-zhē-ā], abnormal tissue development</td>
</tr>
<tr>
<td>-plasm</td>
<td>formation (as of cells)</td>
<td>neoplasm [NÉ-o-plāsm], abnormal tissue formed by abnormal cell growth</td>
</tr>
<tr>
<td>-plastic</td>
<td>formative</td>
<td>neoplastic [nē-o-PLĀS-tīk], growing abnormally (as a neoplasm)</td>
</tr>
</tbody>
</table>

### Abbreviation

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>acute lymphocytic leukemia</td>
<td>ER</td>
<td>estrogen receptor</td>
</tr>
<tr>
<td>AML</td>
<td>acute myelogenous leukemia</td>
<td>METS, mets</td>
<td>metastases</td>
</tr>
<tr>
<td>bx</td>
<td>biopsy</td>
<td>NHL</td>
<td>non-Hodgkin’s lymphoma</td>
</tr>
<tr>
<td>CA</td>
<td>carcinoma</td>
<td>PSA</td>
<td>prostate-specific antigen</td>
</tr>
<tr>
<td>CEA</td>
<td>carcinogenic embryonic antigen</td>
<td>rad</td>
<td>radiation absorbed dose</td>
</tr>
<tr>
<td>chemo</td>
<td>chemotherapy</td>
<td>RNA</td>
<td>ribonucleic acid</td>
</tr>
<tr>
<td>CLL</td>
<td>chronic lymphocytic leukemia</td>
<td>RT</td>
<td>radiation therapy</td>
</tr>
<tr>
<td>CML</td>
<td>chronic myelogenous leukemia</td>
<td>TNM</td>
<td>tumor, nodes, metastasis</td>
</tr>
<tr>
<td>DES</td>
<td>diethylstilbestrol</td>
<td>Tx</td>
<td>treatment</td>
</tr>
<tr>
<td>DNA</td>
<td>deoxyribonucleic acid</td>
<td>XRT</td>
<td>x-ray or radiation therapy</td>
</tr>
<tr>
<td>DRE</td>
<td>digital rectal exam</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Case Study

**Being Careful**

Frightened by Alicia’s news of possible cancer, Peter Alvarez, her husband, went to Dr. John Chin, an internist, for a physical. He had not had a physical in the last five years, but felt now that he should. Peter is 50 years old and has no history of cancer. Dr. Chin had the nurse draw blood for various tests.

Dr. Chin explained that one of the tests that should be done on a yearly basis for males over the age of 45 is the PSA.

### Critical Thinking

27. What part of the body does the PSA test evaluate?

28. Peter had not had a physical in five years. Why is it important to be checked on a yearly basis for certain types of cancer when you reach certain ages?
COMBINING FORMS AND ABBREVIATIONS EXERCISES

Build Your Medical Vocabulary

Using the combining forms and suffixes in this chapter and in Chapter 3, write a term for each definition.

29. therapy using radiation _____________
30. bone tumor _____________
31. immature red blood cell _____________
32. fluid-filled glandular carcinoma _____________
33. tumor of the meninges _____________
34. cancer of the lymph system _____________

Check Your Knowledge

For each of the following cancers, name the body part involved. Refer to Chapter 3 if you need to review combining forms for body parts.

35. adenoma _____________
36. neuroblastoma _____________
37. myoma _____________
38. retinoblastoma _____________
39. lymphocytoma _____________

Find the Terms

Use the combining forms above to complete the following words.

40. tumor consisting of immature cells: _____________ oma
41. treatment of tumors: _____________ therapy
42. agent that promotes a genetic change: _____________ gen
43. impenetrable by radiation: _____________ opaque
44. destructive to cancer cells: _____________ lytic

Root Out the Meaning

Divide each of the following words into word parts. Give the definition of the whole word and of each part.

45. androblastoma _____________
46. carcinogenesis _____________
47. mutagenesis _____________
48. oncogene _____________
49. radiotherapy _____________
50. radionecrosis _____________
51. hypernephroma _____________
52. leiomyosarcoma _____________
53. adenocarcinoma _____________
54. oncologist _____________
55. oncocyte _____________
56. adenoma _____________
57. astrocytoma _____________
58. chondrosarcoma _____________
59. liposarcoma _____________
60. lymphoma _____________

Diagnostic, Procedural, and Laboratory Terms

Cancer is a general term referring to any of various diseases with uncontrolled cell growth. Researchers have developed tests to detect many cancers and, in some cases, to detect cancer at its earliest stages. Survival rates have
improved because of diagnostic techniques. The sooner cell growth can be normalized, the greater the possibility of survival.

Routine medical checkups often include tests for cancer. Adult females usually have a Pap smear, a test for cervical and uterine cancer (Figure 18-4), along with a breast examination, including palpation of the breasts for lumps. Adult males usually have a blood test called a PSA (prostate-specific antigen) that can detect prostate cancer. A digital rectal exam (DRE) is also a prostate cancer screening method. Doctors also check male testicles for any signs of tumors. Testicular cancer occurs fairly commonly.

Normal adult checkups usually include auscultation of the lungs, palpation of the abdomen, inspection of the rectum and an occult stool test (particularly if the patient has a family history of colon cancer or has some possible symptoms), and a discussion of any symptoms that may need further investigation. Some blood tests indicate a particular type of cancer. For example, patients with gastrointestinal tumors usually have carcinoembryonic antigens (CEA) in their bloodstream. An alphafetoprotein test (AFP) is given to detect the presence of liver or testicular cancer. HCG or human chorionic gonadotropin is usually present in the blood of patients with testicular cancer. CA-125 (cancer antigen 125) is a protein produced by ovarian cancer cells. Colorectal cancers can be detected by a colonoscopy.

With advances in understanding genetic markers for certain diseases, preventive measures can be offered to patients who have a genetic marker for a certain cancer. This has been used effectively, for example, in the prevention of breast cancer for people with Her-2nu genes, which indicate a high likelihood of developing breast cancer.

Imaging techniques now provide a detailed picture of various parts of the body. MRIs, CAT scans, mammograms, and the insertion of lighted instruments to view various body parts have advanced diagnostic techniques. Any tumors that are found are categorized by grade, the maturity of the tumor, and stage, the degree of spread or metastasis of the tumor. A common method for grading is the TNM (tumor, node, metastasis) system, which numbers the extent of the tumor, the extent of lymph nodes affected, and the degree of metastasis. This grading is most often done by examination under a microscope. Table 18-1 describes the grading used in the TNM system.
Tumors are also characterized by appearance under the microscope, and by observations made on visual examination. Some of the classifications of tumors are:

- **alveolar**, forming small sacs shaped like alveoli
- **anaplastic**, reverting to a more immature form
- **carcinoma in situ**, contained at a site without spreading
- **diffuse**, spreading evenly
- **dysplastic**, abnormal in cell appearance
- **epidermoid**, resembling epithelial cells
- **follicular**, containing glandlike sacs
- **hyperchromatic**, intensely colored
- **hyperplastic**, excessive in development (of cells)
- **hypoplastic**, underdeveloped as tissue
- **nodular**, formed in tight cell clusters
- **papillary**, having small papillae projecting from cells
- **pleomorphic**, having many types of cells
- **scirrhous**, made up of hard, densely packed cells
- **undifferentiated**, lacking a defined cell structure

Tumors are also described by their appearance during visual examination. Tumors can be described as:

- **cystic**, filled with fluid
- **fungating**, projecting from a surface in a mushroomlike pattern
- **inflammatory**, having an inflamed appearance (swollen and red)
- **medullary**, large and fleshy
- **necrotic**, containing dead tissue
- **polypoid**, containing polyps
- **ulcerating**, having open wounds
- **verrucous**, having wartlike, irregular growths

Once a tumor is confirmed as malignant, doctor and patient discuss and agree on a **protocol**, a course of treatment. One of the possible treatments is **radiation**, the bombarding of the tumor with rays that damage the DNA of the tumor cells. Most radiation treatment is carefully pinpointed, but some surrounding cells usually suffer damage as well. Radiation can cause many unpleasant side effects, such as hair loss, nausea, and skin damage. Some cancerous tumors will respond to radiation better than others. A **radiosensitive tumor** will absorb the damaging radiation and respond by dying or shrinking. With a **radioresistant tumor**, the radiation has little effect on the growth of the tumor. The use of a drug called a **radiosensitizer** prior to the radiation treatments will increase the radiosensitivity of the tumor. Among the other possible treatments are the use of drugs and surgery.

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**TABLE 18-1 The TNM System of Grading**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Size Indicator</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>T (tumor)</td>
<td>0–4</td>
<td>0 means no tumor; 1–4 means progressively larger tumors.</td>
</tr>
<tr>
<td>N (node)</td>
<td>0–4</td>
<td>0 means no lymph node involvement; 1–4 indicates extent to which cancer affects nodes.</td>
</tr>
<tr>
<td>M (metastasis)</td>
<td>0–3</td>
<td>0 means no metastasis. 1–3 are the stages of metastasis.</td>
</tr>
</tbody>
</table>

The Cancer Group Institute (www.cancergroup.com) is a commercial site that categorizes types of cancers.
In the previous section, you learned terms relating to oncological diagnosis, clinical procedures, and laboratory tests. Before going on to the exercises, review the terms below and refer to the previous section if you have questions. Pronunciations are provided for certain terms. Sometimes information about where the word came from is included after the term. These etymologies (word histories) are for your information only. You do not need to memorize them.

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>alveolar [ˈælvəl-ər]</td>
<td>Forming small sacs.</td>
</tr>
<tr>
<td>anaplastic [æn-ə-pləs-tık]</td>
<td>Reverting to a more immature form.</td>
</tr>
<tr>
<td>cystic [sɪs-tık]</td>
<td>Filled with fluid.</td>
</tr>
<tr>
<td>diffuse [dɪ-fyʊs]</td>
<td>Spreading evenly.</td>
</tr>
<tr>
<td>follicular [fəl-Lɪk-ˈyʊ-lər]</td>
<td>Containing glandular sacs.</td>
</tr>
<tr>
<td>grade</td>
<td>Level of maturity of a tumor.</td>
</tr>
<tr>
<td>hyperchromatic [hɪ-pər-krə-MAT-ɪk]</td>
<td>Intensely colored.</td>
</tr>
<tr>
<td>hyperplastic [hɪ-pər-PLAS-tık]</td>
<td>Excessive in development (of cells).</td>
</tr>
<tr>
<td>hypoplastic [Hɪ-pə-PLAS-tık]</td>
<td>Underdeveloped, as tissue.</td>
</tr>
<tr>
<td>inflammatory [ɪn-FLĂM-ə-tɔr-ə]</td>
<td>Having an inflamed appearance (red and swollen).</td>
</tr>
<tr>
<td>medullary [mɛd-ə-lər]</td>
<td>Large and fleshy.</td>
</tr>
<tr>
<td>necrotic [nɛk-RO-Tɪk]</td>
<td>Containing dead tissue.</td>
</tr>
<tr>
<td>nodular [nɔd-ə-lər]</td>
<td>Formed in tight clusters.</td>
</tr>
<tr>
<td>papillary [pə-pə-lər]</td>
<td>Having papillae projecting from cells.</td>
</tr>
<tr>
<td>pleomorphic [plə-ə-MOR-ˈfɪk]</td>
<td>Having many types of cells.</td>
</tr>
<tr>
<td>polypoid [pəl-ə-pɔɪd]</td>
<td>Containing polyps.</td>
</tr>
</tbody>
</table>
### Term | Meaning
--- | ---
**radiation** [RĂ-dē-Ă-shūn] | Bombarding of tumors with rays that damage the DNA of cells.
**scirrhous** [SKĪR-ūs]  
Greek *skirrhos*, hard | Hard, densely packed.
**stage** | Degree of tumor spread.
**TNM system** | Tumor, node, metastasis system of categorizing tumors.
**ulcerating** [ŬL-sēr-ă-ting] | Having open wounds.
**undifferentiated** [ŬN-dif-ĕr-ĔN-shē-ă-tĕd]  
un-, not + differentiated | Lacking a defined cell structure.
**verrucous** [vĕ-RÜ-kŏs]  
Latin *verrucosus* | Wartlike in appearance.

### CASE STUDY

**Getting a Diagnosis**

Dr. Williams sent Alicia’s biopsy to Medical Center Pathologists. He received the following report.

**Critical Thinking**

61. Does the report cite any unusual growth of cells?  
62. Have any of the cells invaded neighboring tissue?

**MICROSCOPIC:** A single slide containing sections through the submitted material is reviewed. This biopsy of skin is centrally ulcerated. The area of ulceration is surrounded by keratinizing squamous epithelium, which exhibits a full-thickness dysplasia. This dysplastic change is characterized by cells that have a vertical growth pattern, somewhat hyperchromatic nuclei, and an increased mitotic rate. Mitoses do extend to the surface. The lesion does not appear to invade the underlying and associated stroma. Mild-to-moderate dysplastic changes are seen peripherally and do extend to the surgical margins.

### Diagnostic, Procedural, and Laboratory Terms Exercises

**Find the Part**

Write the body part(s) being tested for cancer by each of the following procedures:

63. mammogram: ____________  
64. DRE: ____________  
65. PSA: ____________  
66. pap smear: ____________

**Check Your Knowledge**

Complete the sentences below by filling in the blanks.

67. A tumor filled with liquid is referred to as ____________.
68. Some melanomas are ____________, or intensely colored.
69. Chemotherapy is one _____________ for treatment of cancer.

70. Tissue that is dead is referred to as _____________.

71. Some cancers are _____________, or wartlike in appearance.

**Pathological Terms**

Cancer is a pathological term. It can affect people from the fetal stage until old age. Many advances have been made in cancer prevention and treatment, but some cancers have had no increase in cure rates for many years, and others have increased within the population, which may be due in part to an increase in detection. Table 18-2 lists some common cancers. Figure 18-5 shows one of those cancers (Burkitt’s lymphoma).


**TABLE 18-2 Common Cancers**

<table>
<thead>
<tr>
<th>Type of Cancer</th>
<th>Where Cancer Starts</th>
<th>Common Sites in the Body</th>
<th>Specific Risk Groups (most cancers can affect anyone)</th>
<th>Prevention and Early Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>adenocarcinoma</td>
<td>gland</td>
<td>colon, stomach</td>
<td>high fiber diet; colonoscopy</td>
<td></td>
</tr>
<tr>
<td>adenoma</td>
<td>glandular epithelium</td>
<td>pituitary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>astrocytoma</td>
<td>neuroglia</td>
<td>brain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>basal cell carcinoma</td>
<td>skin</td>
<td>skin</td>
<td>avoiding sun exposure; examination of skin</td>
<td></td>
</tr>
<tr>
<td>Burkitt’s lymphoma</td>
<td>lymph</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>carcinoma</td>
<td>epithelial tissue</td>
<td>glands, lungs, kidney, breast</td>
<td>avoidance of carcinogens such as tobacco, asbestos; early checkups</td>
<td></td>
</tr>
<tr>
<td>carcinoma in situ</td>
<td>encapsulated tumor</td>
<td>breast, cervix</td>
<td>self-examination; mammography</td>
<td></td>
</tr>
<tr>
<td>chondrosarcoma</td>
<td>cartilage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ewing’s sarcoma</td>
<td>connective tissue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fibrosarcoma</td>
<td>connective tissue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>glioblastoma</td>
<td>neurological tissue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>glioma</td>
<td>neurological</td>
<td>brain</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued)
### TABLE 18-2 Common Cancers (cont.)

<table>
<thead>
<tr>
<th>Type of Cancer</th>
<th>Where Cancer Starts</th>
<th>Common Sites in the Body</th>
<th>Specific Risk Groups (most cancers can affect anyone)</th>
<th>Prevention and Early Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hodgkin’s disease</td>
<td>lymph system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hypernephroma</td>
<td>kidneys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaposi’s sarcoma</td>
<td>first seen in skin of AIDS patient, then other organs</td>
<td></td>
<td>patients with HIV</td>
<td>preventative measures (such as safe sex)</td>
</tr>
<tr>
<td>leiomyosarcoma</td>
<td>smooth muscle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>leukemia</td>
<td>stem cells</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>leukoplakia</td>
<td>tongue or cheeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>liposarcoma</td>
<td>fat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lymphoma</td>
<td>lymph system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>medulloblastoma</td>
<td>brain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>melanoma</td>
<td>skin</td>
<td></td>
<td></td>
<td>avoidance of sun; skin examination</td>
</tr>
<tr>
<td>nephrosarcoma</td>
<td>kidney</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>neuroblastoma</td>
<td>adrenal glands</td>
<td>adrenal glands of infants and children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>non-Hodgkin’s lymphoma</td>
<td>lymph tissue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>osteosarcoma</td>
<td>bone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>retinoblastoma</td>
<td>retina</td>
<td>eye</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rhabdomyosarcoma</td>
<td>striated muscle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sarcoma</td>
<td>connective tissue</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CASE STUDY

**Seeing a Specialist**

Alicia’s cancer is a carcinoma in situ. Dr. Williams refers Alicia to a surgical oncologist who performs the surgery to remove the tumor. The surgeon, Dr. Wilma Grant, examines surrounding tissue during the surgery and decides that Alicia does not need further treatment. The surgeon cautioned Alicia to make sure she has regular six-month checkups.

### Critical Thinking

72. Why did the doctor recommend six-month checkups?

73. Dr. Grant did not recommend radiation or chemotherapy. Does that mean that Alicia’s cancer has metastasized?
Find the Disease
Using Table 18-2, write at least one type of cancer for each location.

74. breast _____________
75. colon _____________
76. kidney _____________
77. skin _____________
78. brain _____________
79. stem cells _____________
80. lymph system _____________
81. bone _____________
82. fat _____________
83. neurological tissue _____________
84. neuroglia _____________

Preventing and Detecting Cancers
Answer the following questions.

85. Using Table 18-2 as a guide, write a brief paragraph about how you can minimize the risk of contracting certain cancers.

86. What two types of cancer are detectable by self-examination at an early stage? _____________ and _____________

Spell It Correctly
For each of the following words, write C if the spelling is correct. If it is not, write the correct spelling.

87. aveolar _____________
88. follicular _____________
89. displastic _____________
90. medulary _____________
91. pleomorphic _____________

Surgical Terms
Many cancers can be diagnosed and treated with surgery. First, however, tissue is usually examined in a biopsy, the removal of a small amount of living tissue for diagnosis (under a microscope in most cases). There are many types of biopsies depending on the type of cancer suspected. Some common ones are:

- An incisional biopsy is the removal of a part of a tumor for examination.
- An excisional biopsy is one in which the tumor is removed and surrounding tissue is examined for spread of the tumor.
- A brush biopsy is the passing of a catheter with bristles on it into the ureter or other areas to remove cells for examination.
A needle biopsy is any biopsy in which cells are aspirated through a needle.

An exfoliative biopsy is one in which cells are scraped off of the skin for examination.

If a tumor is found to be malignant, the tumor is usually removed to an established surgical margin or to the point where it abuts normal tissue. A localized tumor can be removed in a lumpectomy or tylectomy. Some surgeries involve resectioning, removal of the tumor and a large amount of the surrounding tissue, including lymph nodes; others involve exenteration, removal of an organ, tumor, and surrounding tissue. Other surgical procedures are cryosurgery, destruction by freezing; electrocauterization, destruction by burning; or fulguration, destruction by high-frequency electrical current.

VOCABULARY REVIEW

In the previous section, you learned terms relating to surgery. Before going on to the exercises, review the terms below and refer to the previous section if you have questions. Pronunciations are provided for certain terms. Sometimes information about where the word came from is included after the term. These etymologies (word histories) are for your information only. You do not need to memorize them.

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>brush biopsy</td>
<td>The passing of a catheter with bristles into the ureter to gather cells for examination.</td>
</tr>
<tr>
<td>exfoliative [ēx-FŌ-lē-ā-rīv] biopsy</td>
<td>The scraping of skin cells from the skin surface for examination.</td>
</tr>
<tr>
<td>fulguration [fūl-gū-RĀ-shūn]</td>
<td>Destruction by high-frequency current.</td>
</tr>
<tr>
<td>needle biopsy</td>
<td>Removal of cells for examination by aspirating them with a needle.</td>
</tr>
<tr>
<td>resectioning [rē-SĒK-shūn-īng]</td>
<td>Removal of a tumor and a large amount of surrounding tissue.</td>
</tr>
</tbody>
</table>

Greek τῆς, lump + -ectomy
SURGICAL TERMS EXERCISES

Find a Match
Match the correct term in the right-hand column with its definition in the left-hand column

92. ___ removal of part of a tumor for examination
   a. fulguration
93. ___ removal of a tumor and surrounding tissue for examination
   b. cryosurgery
94. ___ form of surgery using freezing
   c. electrocauterization
95. ___ form of surgery using burning
   d. incisional biopsy
96. ___ form of surgery using high-frequency current
   e. excisional biopsy

CASE STUDY

Getting Information
Alicia was concerned about the possibility of a recurrence of cancer. She asked Dr. Williams for a copy of the pathologist’s report. Alicia did not understand some of the language in it, so she asked Dr. Williams for an explanation.

Critical Thinking
97. How might Dr. Williams explain “The lesion does not appear to invade the underlying and associated . . .”?

98. The dysplastic changes extend to the surgical margin, which is the outline out to which the removal of the cancer will take place. What determines the surgical margin?

Pharmacological Terms

Aside from surgery and radiation, cancer treatment includes three other modalities (methods)—chemotherapy, use of drugs to treat cancer, biological therapy, use of agents that enhance the body’s own immune response in fighting tumor growth, and gene therapy, the use of cells from a laboratory to change the course of a disease (much of this is still experimental). Both chemotherapy and biological therapy have side effects, such as hair loss, nausea, and so on. Gene therapy is just in its beginning stages and long-term results are not known yet. The other four cancer treatments may be used together or separately during the course of a protocol. There are many researchers working on new cancer therapies, such as the inhibition of angiogenesis, the process in the body of supplying blood to tumors.

Radiation and chemotherapy must be specifically directed so as not to harm healthy cells while destroying unhealthy ones. Biological therapy targets cells that are receptive to the substances being injected.

For more information on gene therapy, go to the Human Genome Project Web site (http://www.ornl.gov/sci/techresources/Human_Genome/medicine/genetherapy.shtml).
MORE ABOUT . . .

Angiogenesis Inhibitor Therapy

Angiogenesis is the formation of new blood vessels controlled by chemicals produced in the body. Because tumors cannot grow or spread without the formation of new blood vessels and a blood supply, scientists are trying to find ways to stop angiogenesis. Angiogenesis is not a frequent process in adults, but it does occur in women each month as new vessels form in the lining of the uterus during the menstrual cycle. In addition, angiogenesis is necessary for the regeneration of tissue during wound healing. Unfortunately new blood vessel generation can provide cancer cells with oxygen and nutrients, allowing these cells to grow and spread to other parts of the body.

The objective of angiogenesis inhibitor therapy in cancer treatment is to arrest and/or block the chemicals responsible for beginning the new blood vessel formation process. Some drugs block vascular endothelial cell production directly or by obstructing the endothelial cells’ ability to break down the extracellular matrix, allowing cancer cells to migrate. Researchers have answered many questions about angiogenesis, but many questions still remain. Studies continue trying to determine if inhibiting angiogenesis can be a long-term solution to slowing down or preventing the growth and spread of cancer in humans. Currently, new drugs being tested are in clinical trials and a few drugs have been approved by the U.S. Food and Drug Administration (FDA) for use on certain types of cancers.

VOCABULARY REVIEW

In the previous section, you learned terms relating to pharmacology. Before going on to the exercises, review the terms below and refer to the previous section if you have any questions. Pronunciations are provided for certain terms. Sometimes information about where the word came from is included after the term. The etymologies (word histories) are for your information only. You do not need to memorize them.

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>biological therapy</td>
<td>Treatment of cancer with agents from the body that increase immune response.</td>
</tr>
<tr>
<td>chemo-, chemical + therapy</td>
<td></td>
</tr>
<tr>
<td>gene therapy</td>
<td>Method of treatment using genetically changed cells to cure or lessen the symptoms of disease.</td>
</tr>
</tbody>
</table>
A male patient has a blood test. It indicates there is an unusually high PSA level. His doctor recommends a biopsy to see if he has cancer. What type of cancer does the doctor suspect might be present.

A female patient has a normal Pap smear. If it had been abnormal, what type of cancer would be suspected?

Name the most virulent type of skin cancer. What type of cancer is most often caused by smoking?

Go to the American Cancer Society’s Web site (www.cancer.org) and write a paragraph about cancer prevention. Also, list three types of treatment for cancer discussed at that site.

Finding Another Cancer

Alicia went for a six-month gynecological checkup. Her pap smear was normal. She encouraged her sister, Margo, to see Dr. Williams. Margo is 15 years younger than Alicia. Margo goes to the gynecologist only when she has a problem. She has never had a mammogram. Dr. Williams shows Margo how to do breast self-examination and tells her that he feels a small lump on the side of her breast. This was confirmed with a mammogram and a biopsy. After a lumpectomy, Margo was told that the cancer had spread to one lymph node, which was also removed. Chemotherapy is recommended, along with biological therapy in the form of a weekly injection.

Critical Thinking

99. Why did the surgeon recommend chemotherapy?

100. How might the biological therapy help Margo?

Terminology in Action

A male patient has a blood test. It indicates there is an unusually high PSA level. His doctor recommends a biopsy to see if he has cancer. What type of cancer does the doctor suspect might be present. A female patient has a normal Pap smear. If it had been abnormal, what type of cancer would be suspected? Name the most virulent type of skin cancer. What type of cancer is most often caused by smoking?

Using the Internet

Go to the American Cancer Society’s Web site (www.cancer.org) and write a paragraph about cancer prevention. Also, list three types of treatment for cancer discussed at that site.
CHAPTER REVIEW

The material that follows is to help you review this chapter.

Complete the Sentence
Circle the term that best describes the italicized description of the correct answer.

101. The patient was treated with a bombarding of tumors with rays that damage the DNA of cells and had positive result after the treatment was completed. (chemotherapy, protocol, radiation)

102. The physician remarked that the lesion appeared to be formed in tight clusters and was found to be abnormal. (necrotic, nodular, verrucous)

103. A biopsy revealed that the tumor was hard and densely packed just as the pathologist suspected. (scirrhous, papillary, pleomorphic)

104. Dr. Jacobs noted that the dysplastic lesion appeared intensely colored and this concern warranted further evaluation. (hyperplastic, hypoplastic, hyperchromatic)

105. One of the purposes of the TNM system of categorizing tumors is to determine the degree of tumor spread within the body. (carcinoma in situ, stage, grade)

Root Out the Meaning
Separate the following terms into word parts and define each word as well as each word part.

106. carcinogenic
107. carcinolytic
108. carcinoma
109. carcinophobia
110. mutagen
111. oncogenesis
112. oncogenic
113. oncogenous
114. oncofetal
115. oncology
116. oncolysis
117. oncosis
118. radioactive
119. radiodiagnosis
120. radiograph
121. radiographer
122. radiographic
123. radiogram
124. radiography
125. radiology
126. radiologist
127. radiometer
128. radiopaque
129. radiopathology
130. radioreistant
131. radiopharmaceutical
132. radiosensitive
133. radiotoxiemia
134. genoblast
135. glioblastoma
136. glioma
137. fibrosarcoma
138. medulloblastoma
139. melanoma
140. nephrosarcoma
141. neuroblastoma
142. osteosarcoma
143. retinoblastoma
144. rhabdomyosarcoma
145. sarcoma
**Complete the Sentence**

Circle the term that best describes the *italicized* description of the correct answer.

146. Timothy Clemons' physician indicated that the skin cancer on his forehead would be removed by *fulguration*. (destruction by burning tissue, destruction by freezing tissue, destruction by high-frequency current)

147. Karen Smartley has to make a decision about how her breast tumor will be removed before she has surgery. Her physician is recommending the *surgical removal of a localized tumor*. (resectioning, excisional biopsy, lumpectomy)

148. The tumor was found to be *growing uncontrollably* through out the body. (encapsulating, metastasizing, mutating)

149. The medical term for *abnormal tissue growth* is _____________. (anaplasia, apoptosis, dysplasia)

**Check Your Spelling**

For each of the following terms, place a C if the spelling is correct. If it is not, write the correct spelling in the space provided.

150. chondocarcinoma ____________ 153. rhabdomyosarcoma ____________
151. milanocytoma ____________ 154. neuroblastoma ____________
152. astrocytoma ____________ 155. inflammatory ____________

**Definitions**

Define the following terms, combining forms and suffixes. Review the chapter before starting. Make sure you know how to pronounce each term as you define it.

<table>
<thead>
<tr>
<th>Term</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>alveolar [àl-VE-ô-lâr]</td>
<td>cytoplasm [SÎ-tô-plâzm]</td>
</tr>
<tr>
<td>apoptosis [â-pôp-TÔ-sis]</td>
<td>diffuse [ďi-FYÜS]</td>
</tr>
<tr>
<td>benign [bê-NÎN]</td>
<td>dysplasia [ďiS-PLÂ-zhê-ă]</td>
</tr>
<tr>
<td>biological therapy</td>
<td>dysplastic [ďiS-PLÂS-tîk]</td>
</tr>
<tr>
<td>blast(o)</td>
<td>electrocauterization [ĕ-LÊK-trô-CĂW-têr-i-ZA-shûn]</td>
</tr>
<tr>
<td>-blast</td>
<td>encapsulated [ĕn-KÂP-sû-lâ-têd]</td>
</tr>
<tr>
<td>brush biopsy</td>
<td>epidermoid [ĕp-i-DËR-möyd]</td>
</tr>
<tr>
<td>carcin(o)</td>
<td>excisional biopsy [ĕk-SÎZH-shûn-l BÎ-op-sê]</td>
</tr>
<tr>
<td>carcinoma in situ [kâr-si-NÔ-mâ in SÎ-tû]</td>
<td>exenteration [ĕk-ĕn-têr-Ă-shûn]</td>
</tr>
<tr>
<td>cryosurgery [krî-ô-SÉR-jêr-ĕ]</td>
<td>follicular [fôl-LÎK-yû-lâr]</td>
</tr>
<tr>
<td>cystic [SÎS-tîk]</td>
<td>fulguration [fûl-gû-RÂ-shûn]</td>
</tr>
</tbody>
</table>
| homocytoma ____________ 154. neuroblastoma ____________
| infiltrating ____________ 155. inflammatory ____________

Chapter 18  Terms in Oncology—Cancer and Its Causes  589
### Abbreviations

Write the full meaning of each abbreviation.

<table>
<thead>
<tr>
<th>ABBREVIATION</th>
<th>MEANING</th>
<th>ABBREVIATION</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>Acute lymphoblastic leukemia</td>
<td>AML</td>
<td>Acute myeloid leukemia</td>
</tr>
<tr>
<td>bx</td>
<td>Biopsy sample</td>
<td>CA</td>
<td>Cancer antigen</td>
</tr>
<tr>
<td>CEA</td>
<td>Carcinoembryonic antigen</td>
<td>chemo</td>
<td>Chemotherapy</td>
</tr>
<tr>
<td>CLL</td>
<td>Chronic lymphocytic leukemia</td>
<td>DNA</td>
<td>Deoxyribonucleic acid</td>
</tr>
<tr>
<td>DRE</td>
<td>Digital rectal examination</td>
<td>ER</td>
<td>Estrogen receptor</td>
</tr>
<tr>
<td>DES</td>
<td>Dienestrol</td>
<td>METS, mets</td>
<td>Metastasis, metastases</td>
</tr>
<tr>
<td>NHL</td>
<td>Non-Hodgkin’s lymphoma</td>
<td>PSA</td>
<td>Prostate-specific antigen</td>
</tr>
<tr>
<td>RT</td>
<td>Radiation therapy</td>
<td>TNM</td>
<td>Tumor-node-metastasis</td>
</tr>
<tr>
<td>T&lt;sub&gt;X&lt;/sub&gt;</td>
<td></td>
<td>XRT</td>
<td>X-ray therapy</td>
</tr>
</tbody>
</table>
Answers to Chapter Exercises

1. Yes. Early detection is important; and skin changes can occur fairly rapidly.

2. breast and uterine, cervical, or ovarian

3. dedifferentiated

4. benign

5. invasive

6. malignant

7. deoxyribonucleic acid (DNA)

8. oncogene

9. teratoma

10. sarcoma

11. metastasis

12. carcinogen

13. metastasis

14. C

15. carcinoma

16. C

17. deoxyribonucleic cytoplasm

18. b

19. g

20. h

21. astr(o), star shaped

22. a

23. c

24. d

25. e

26. f

27. prostate

28. Early detection improves the chances of survival.

29. radiotherapy

30. osteoma

31. erythroblast

32. cystadenocarcinoma

33. meningioma

34. lymphoma

35. gland

36. immature nerve cell

37. muscle tissue

38. retina (eye)

39. lymph cells

40. blast

41. onco

42. muta

43. radi

44. carcino

45. andr(o), masculine + blast(o), immature cell (testicular) + oma, tumor

46. carcin(o), cancer + -genesis, production of

47. mut(a), genetic change + -genesis, production of

48. onc(o), tumor + -gene, element that controls inherited traits

49. radi(o)- x-rays + -therapy, treatment

50. radi(o), x-ray + -necr(o), death + -osis abnormal condition

51. hyper-, above normal + nephro(o), kidney + -oma, tumor

52. lei(o), smooth + my(o), muscle + sarco(o), connective tissue + -oma, tumor

53. aden(o), gland + carmin(o), cancer + -oma, tumor

54. onc(o), tumor + -logist, one who practices

55. onc(o), tumor + -cyte, cell

56. aden(o), gland + -oma, tumor

57. astr(o), star shaped + cyt(o), cell + -oma, tumor

58. chondr(o), cartilage + sarco(o), connective tissue + -oma

59. lip(o), fatty + sarco(o), connective tissue + -oma

60. lymph(o), lymph + -oma, tumor

61. yes, dysplasia

62. no, carcinoma in situ

63. breast

64. prostate

65. prostate

66. uterus and cervix

67. cystic

68. hyperchromatic

69. protocol

70. necrotic

71. verrucous

72. to find further cancer early

73. no, because metastasized cancer needs aggressive treatment

74. carcinoma in situ, carcinoma

75. adenocarcinoma

76. nephrosarcoma

77. basal cell carcinoma or melanoma

78. medulloblastoma, glioma, astrocytoma

79. leukemia

80. lymphoma, Burkitt’s lymphoma, Hodgkin’s disease, non-Hodgkin’s lymphoma

81. osteosarcoma

82. liposarcoma

83. glioblastoma

84. astrocytoma

85. Self-examination, regular check-ups, colonoscopy, mammogram, and avoidance of carcinogens should be in each student’s paragraph.

86. breast, skin

87. alveolar

88. C

89. dysplastic

90. medullary

91. C

92. d

93. e

94. b

95. c

96. a

97. This means the cancer has not spread.

98. how far the cancer extends out to healthy tissue

99. Margo’s cancer had metastasized. There was no guarantee that all the cancer was removed.

100. Increased immune responses might attack cancer cells.

101. radiation

102. nodular

103. scirrhouss

104. hyperchromatic

105. stage

106. carcin(o), cancer + -gen, producing + -ic, pertaining to

107. carcin(o), cancer + -lytic, destroying

108. carcino(o), cancer + -oma, tumor

109. carcino(o), cancer + -phobia, fear of

110. mut(a), genetic change + -gen, producing

111. onc(o), tumor + -genesis, production of

112. onc(o), tumor + -gen, producing + -ics, pertaining to

113. onc(o), tumor + -gen, producing + -ous, pertaining to

114. onc(o), tumor + -fetal, pertaining to fetal tissue

115. onc(o), tumor + -logy, study of

116. onc(o), tumor + -lysis, destruction of
117. **onc(o)**, tumor + -osis, condition, state, process
118. **radi(o)**, x-ray + -active, emitting alpha, gamma, or beta
119. **radi(o)**, x-ray + -diagnosis, determination of condition
120. **radi(o)**, x-ray + -graph, recording instrument
121. **radi(o)**, x-ray + -grapher, a technologist trained to take
122. **radi(o)**, x-ray + graph, instrument + -ic pertaining to
123. **radi(o)**, x-ray + -gram, a recording
124. **radi(o)**, x-ray + -graphy, process of recording
125. **radi(o)**, x-ray + -logy, study of
126. **radi(o)**, x-ray + -logist, one who practices
127. **radi(o)**, x-ray + -meter, instrument used to measure
128. **radi(o)**, x-ray + -opaque, inability to be penetrated
129. **radi(o)**, x-ray + -path(o), disease + -logy,
130. **radi(o)**, x-ray + -resistant, less affected by
131. **radi(o)**, x-ray + -pharmaceutical, drug
132. **radi(o)**, x-ray + -sensitive, receptive to
133. **radi(o)**, x-ray + -toxi(o), poisoning + -emia, blood
134. **gen(o)**, producing + -blast, immature cell (ovum)
135. **gli(o)**, neuroglia + blast(o), immature cell + -oma, tumor
136. **gli(o)**, neuroglia + -oma, tumor
137. **fibr(o)**, fibrous + sarc(o), connective tissue + -oma
138. **medull(o)**, medulla + blast(o), immature cell + -oma, tumor
139. **melan(o)**, black + -oma, tumor
140. **nephrr(o)**, kidney + sarc(o), connective tissue + -oma
141. **neur(o)**, nerve + blast(o), immature cell + -oma
142. **oste(o)**, bone + sarc(o), connective tissue + -oma
143. **retin(o)**, retina + blast(o), immature cell + -oma
144. **rhabd(o)**, rod shaped + my(o), muscle + sarc(o), connective tissue + -oma
145. **sarc(o)**, connective tissue + -oma
146. destruction by high-frequency current
147. lumpectomy
148. metastasizing
149. dysplasia
150. chondrosarcoma
151. melanocytoma
152. C
153. rhabdomyosarcoma
154. C
155. inflammatory
156–251. Answers are available in the vocabulary reviews in this chapter.