Lesson 14.1 Objectives

- Compare and contrast benign tumors with malignant tumors.
- Discuss cancer metastasis along with sites of distant metastasis.
- Contrast and compare Roman numeral staging with TNM staging.

Lesson 14.1 Objectives (cont’d.)

- Define causes and risk factors for cancer.
- List signs and symptoms of cancer and the American Cancer Society’s seven warning signals of cancer.

Cancer

Characterized by:
- Uncontrollable growth of abnormal cells
- Lack of programmed cell death
- Tumors
- Ability to invade other tissues
- Collection of over 200 diseases

Cancer Sites

<table>
<thead>
<tr>
<th>New Cases</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>219,830 (20%)</td>
<td>170,400 (28%)</td>
</tr>
<tr>
<td>Lung and bronchus</td>
<td>114,760 (13%)</td>
<td>88,640 (17%)</td>
</tr>
<tr>
<td>Colon and rectum</td>
<td>76,150 (8%)</td>
<td>74,000 (13%)</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>56,350 (7%)</td>
<td>60,600 (11%)</td>
</tr>
<tr>
<td>Rectal cancer</td>
<td>46,200 (5%)</td>
<td>38,000 (7%)</td>
</tr>
<tr>
<td>Mediastinum</td>
<td>10,010 (1%)</td>
<td>10,000 (2%)</td>
</tr>
<tr>
<td>Kidney</td>
<td>51,590 (6%)</td>
<td>55,550 (10%)</td>
</tr>
<tr>
<td>Leukemia</td>
<td>34,860 (4%)</td>
<td>25,400 (5%)</td>
</tr>
<tr>
<td>Oral cavity and pharynx</td>
<td>26,100 (3%)</td>
<td>18,340 (3%)</td>
</tr>
<tr>
<td>Pancreas</td>
<td>16,050 (2%)</td>
<td>17,100 (3%)</td>
</tr>
<tr>
<td>All sites</td>
<td>706,960</td>
<td>678,000</td>
</tr>
</tbody>
</table>

Cancer Sites (cont’d.)

<table>
<thead>
<tr>
<th>Deaths</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung and bronchus</td>
<td>89,810 (20%)</td>
<td>70,680 (20%)</td>
</tr>
<tr>
<td>Prostate</td>
<td>37,750 (8%)</td>
<td>42,460 (12%)</td>
</tr>
<tr>
<td>Colon and rectum</td>
<td>28,600 (5%)</td>
<td>28,160 (5%)</td>
</tr>
<tr>
<td>Rectal cancer</td>
<td>16,685 (3%)</td>
<td>12,000 (2%)</td>
</tr>
<tr>
<td>Liver</td>
<td>6,050 (1%)</td>
<td>6,920 (1%)</td>
</tr>
<tr>
<td>Multiple myeloma</td>
<td>6,470 (2%)</td>
<td>6,920 (1%)</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>6,900 (2%)</td>
<td>6,900 (2%)</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>1,240 (1%)</td>
<td>1,470 (1%)</td>
</tr>
<tr>
<td>Brain</td>
<td>860 (1%)</td>
<td>860 (1%)</td>
</tr>
<tr>
<td>Kidney</td>
<td>8,000 (5%)</td>
<td>8,000 (5%)</td>
</tr>
<tr>
<td>All sites</td>
<td>9,000,000</td>
<td>9,000,000</td>
</tr>
</tbody>
</table>
Tumors

A BENIGN TUMOR

Intact skin surface

Expansible growth

Capsule

Homogeneous cut surface

B MALIGNANT TUMOR

Invasive growth

Ulceration of skin

Lymphatic invasion

Non-uniformity

Necrosis

Hemorrhage

Vessel invasion

Comparison of Tumors

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Benign</th>
<th>Malignant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of growth</td>
<td>Rapidly slow growth by means of organogenesis, cells adhere to each other</td>
<td>Rapid growth invades surrounding tissues. Do not resemble tissues of origin; vary in size and shape, abnormal appearance and function</td>
</tr>
<tr>
<td>Cells under microscope examination</td>
<td>Differentiation: same as normal</td>
<td>Malignant tumor cells can invade to destroy surrounding tissue; do not respect cellular boundaries; secondary tumors occur</td>
</tr>
<tr>
<td>Spread</td>
<td>Remote localized</td>
<td>Malignant tumor cells can invade to destroy surrounding tissue; do not respect cellular boundaries; secondary tumors occur</td>
</tr>
<tr>
<td>Other properties</td>
<td>No tissue destruction; not prone to hemorrhage; may be smooth and freely movable</td>
<td>Invasion or metastasis is often seen in hemorrhage, irregular and less movable</td>
</tr>
</tbody>
</table>

Progression: Normal Cells to Invasive Cancer

Cancer Cell Characteristics

- Anaplasia
- Anchorage independent

Cancer Cell Characteristics (cont’d.)

- Lack of contact inhibition
- Immortality
Cancer Cell Characteristics

- Angiogenesis
- Genetic instability

Tumor Nomenclature

- Benign tumors
  - Adenoma: Benign glandular tumor
  - Osteoma: Benign bone tumor
  - Chondroma: Benign cartilaginous tumor

- Malignant tumors
  - Adenocarcinoma: Malignant glandular tumor
  - Osteosarcoma: Malignant bone tumor
  - Chondrosarcoma: Malignant cartilaginous tumor

Tumor Nomenclature (cont’d.)

- Exceptions:
  - Leukemia: cancer of marrow and blood
  - Lymphoma: cancer of lymphoid tissue
  - Melanoma: cancer of pigmented tissue
  - Named for physician: Ewing sarcoma (bone cancer); Kaposi sarcoma (skin cancer); Hodgkin lymphoma (lymphatic cancer)

Metastasis

- Spreading of cancer cells from primary site to distant sites

Metastasis (cont’d.)

- Routes:
  - Local spread
  - Seeding
  - Lymphatic system with invasion of lymph nodes
  - Bloodstream

Tumor Staging

- Roman numeral staging:
  - Stage 0: cancer in situ
  - Stage I: tumor limited to tissue of origin; localized tumor growth
  - Stage II: limited local spread
  - Stage III: extensive local and regional spread
  - Stage IV: cancer has metastasized to other organs or throughout body
Tumor Staging (cont'd.)


Tumor Staging (cont’d.)

<table>
<thead>
<tr>
<th>TABLE 1-4: Tumor Staging</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIMARY TUMOR (T)</td>
</tr>
<tr>
<td>T0: No evidence of primary tumor</td>
</tr>
<tr>
<td>T1: Primary tumor not more than 2 cm in its greatest dimension; no regional lymph nodes involved; no distant metastases</td>
</tr>
<tr>
<td>T2: Primary tumor more than 2 cm but not more than 5 cm in its greatest dimension; regional lymph nodes involved; no distant metastases</td>
</tr>
<tr>
<td>T3: Primary tumor more than 5 cm in its greatest dimension; regional lymph nodes involved; no distant metastases</td>
</tr>
<tr>
<td>T4: Primary tumor involvement of any lymph node(s) or distant metastasis</td>
</tr>
</tbody>
</table>

REGIONAL LYMPH NODES (N):
N0: No regional lymph nodes involved (tumor found in the lymph node(s))
N1: Regional lymph nodes involved (number and/or extent of spread)
N2: Regional lymph node(s) cannot be evaluated
N3: Regional lymph node(s) cannot be evaluated

DISTANT METASTASES (M):
M0: No distant metastases (tumor has not spread to other parts of the body)
M1: Distant metastases (tumor has spread to distant parts of the body, including distant nodes)
M2: Distant metastases cannot be evaluated


Tumor Staging (cont’d.)

Causes of Cancer

- Frequent or persistent exposure to carcinogens and internal factors
- Carcinogens:
  - Chemicals, radiation, viruses
- Internal factors:
  - Hormones, immune conditions, genetic mutation

Tumor Grading

- GX: grade cannot be assessed (undetermined grade)
- G1: well-differentiated (low grade)
- G2: moderately differentiated (intermediate grade)
- G3: poorly differentiated (high grade)
- G4: undifferentiated (high grade)

Causes of Cancer (cont’d.)

- Carcinogens

Signs and Symptoms

- In general, cancer lacks early S/S
- Initial S/S usually related to tumor growth
**Signs and Symptoms (cont’d)**

- S/S common to all advanced cancer:
  - Pain
  - Fatigue
  - Cachexia (loss of appetite, early satiety, weight loss, and anemia)

**Warning Signals (CAUTION)**

- Change in bowel or bladder habits
- A sore that does not heal
- Unusual bleeding or discharge
- Thickening of lump in breast or elsewhere
- Indigestion or difficulty in swallowing
- Obvious change in wart or mole
- Nagging cough or hoarseness

**Lesson 14.2 Objectives**

- Identify treatment methods for cancer and list appropriate massage considerations.
- Discuss massage considerations when working with a client who has a central venous catheter.
- Discuss basic treatment guidelines when working with clients who have cancer.

**Cancer Treatments**

- Surgery: Surgical removal of tumors, cancerous organs, or neighboring lymph nodes
- Radiation: Ionizing radiation used to kill or inactivate cancer
- Chemotherapy: Chemical agents used to destroy cancer

**Cancer and Massage**

- Massage provides many benefits for both giver and receiver
- When appropriate:
  - Teach caregivers how to give gentle massage to cancer patient
  - Teach self-massage to cancer patient

**Biologic therapy**: Stimulation of immune system to slow or stop cancer growth

**Hormone therapy**: Hormones or hormone-blocking substances used to slow or stop hormone-dependant cancers

**Bone marrow transplant**: Replenishes stem cells destroyed from other cancer treatments; not a cancer treatment in itself
Cancer and Massage (cont’d)
- Client intake
  - Use an intake form
  - Ask about cancer type
  - Ask about cancer treatments
  - Ask about current S/S
  - Address other medical conditions in treatment plan

Guidelines: General
- Obtain physician clearance
  - Once obtained, ask about primary and secondary tumor sites
- Educate yourself
  - Learn about client’s cancer and treatments
- Position client for comfort
  - Use side-lying position and/or special propping when needed to ensure comfort

Guidelines: General (cont’d.)
- Avoid affected areas
- Make appropriate pressure judgements
  - Avoid light stroking as it may be ticklish and therefore adversive
  - Avoid deep and vigorous massage
- Modify massage according to cancer treatment
  - Schedule massage during high-energy days/times

Guidelines: General (cont’d.)
- Note signs of fatigue
  - Reduce treatment time and pressure
- Note signs of discomfort
  - Client may not always tell therapist s/he is uncomfortable
  - Observe and adjust pressure and technique when needed

Guidelines: General (cont’d.)
- Note signs of inflammation
  - Avoid these areas
- Be accepting and reverent
  - Respect what client is going through
  - Honor when client does not want to talk or needs to talk
- Document

Massage Considerations: Cancer Treatments
- Tailor massage to side effect of cancer treatment
- Remain creative and resourceful with treatment modifications
Guidelines: Surgery

- Blood clots
  - Avoid lower extremities for 7-10 days after client is ambulatory
- Edema
  - Supervision of client’s health care provider required
  - Then, elevate area and massage proximal to affected area first; then gentle superficial strokes applied centripetally over area

Guidelines: Surgery (cont’d)

- Reduced function
  - Scar mobilization permissible after incision is fully healed; be sure to mobilize tissue toward scar to avoid overstretching
  - Massage adjacent areas to help relax muscles and improve joint movements

Guidelines: Radiation

- Skin reactions
  - Avoid irradiated areas or use only light pressure within client tolerance if health care provider approves
  - Assess condition of skin before each session

Guidelines: Radiation (cont’d)

- Fatigue
  - Reduced treatment time
  - Use lighter-than-normal pressure

Guidelines: Chemotherapy

- Susceptibility to infection
  - Massage contraindicated if client has systemic infection or if therapist or member of therapist’s household is sick
  - Schedule massage when few or no other clients are in the office to decrease risk of infection exposure

Guidelines: Chemotherapy (cont’d)

- Anemia
  - Reduced treatment time; use lighter-than-normal pressure
  - Keep client warm
  - Elevate upper body when supine and avoid prone position when client has SOB
  - Assist client off table if needed
**Guidelines: Chemotherapy (cont’d)**

- **Fever**
  - Massage is contraindicated
- **Nausea, vomiting, and diarrhea**
  - Use semireclining position
  - Avoid rocking client
  - Avoid lower abdomen if sensitive

- **Peripheral neuropathy**
  - Reduced pressure while avoiding hypersensitive areas
  - If neuropathy is in lower extremities, avoid bolster use
- **Mouth sores**
  - Avoid pressure on jaw and cheeks

**Guidelines: Chemotherapy (cont’d)**

- **Hair loss**
  - Respect client’s wishes about having the head exposed, covered, and touched
- **Glove use**
  - Wear gloves if thiotepa, cyclophosphamide were administered within 24 hours
  - Consult with client’s health care provided if unsure about medications used

**Central Venous Catheter**

- Position client for comfort
- Avoid nearby and distal areas
- Avoid mobilization of nearby joint

**Guidelines: Biologic Therapy**

- **Influenza-like symptoms (fever, nausea, fatigue)**
  - Follow guidelines under radiation therapy and chemotherapy

**Guidelines: Hormonal Therapy**

- **Heat intolerance**
  - Avoid overheating client with blankets or flannel sheets
  - Uncover arms and legs
  - Cool washcloth may be used on forehead or neck
  - Oscillating fan in treatment room
Guidelines: Bone Marrow Transplant

- Susceptible to infection
  - Follow guidelines under chemotherapy

Lesson 14.3 Objective

- Examine:
  - Breast cancer
  - Cancers of the digestive system
  - Cancers of the urogenital tract
  - Gynecologic cancers
  - Hematologic and lymphoid cancers
  - Bone cancers
  - Brain tumors
  - Lung cancer
  - Skin cancers
  - Cancers of the throat region

Breast Cancer

- Malignant tumors in breast tissue; most common form of cancer in U.S. women
- Suspicious lumps most often found by self-examination or a partner
- Rare forms:
  - Paget disease of the breast
  - Inflammatory breast cancer

Mammograms can assist in early detection.

Breast Cancer (cont’d.)

Mastectomy is a common medical treatment for breast cancer.

Digestive System Cancers

- Oral and pharyngeal cancer
- Stomach cancer
- Colorectal cancer
- Liver cancer
- Pancreatic cancer
**Oral and Pharyngeal Cancer**
- Malignant tumors on lip, oral cavity, or pharynx
- 75-90% from tobacco use
- Lesions are painless until cancer is well advanced (exempt ones on lip or tongue)

**Stomach Cancer**
- Malignant tumors in lining of stomach
- Risk factors are H. pylori bacteria and diet
- Asymptomatic in early stages

**Colorectal Cancer**
- Cancer in colon or rectum
- Most develop from polyps
- Risk factors are family history and diet
- Colonoscopy used for early detection

**Liver Cancer**
- Malignant tumors in liver
- Most due to metastatic spread
- Usually discovered accidentally during medical evaluation or exploratory surgery

**Pancreatic Cancer**
- Malignancy of the pancreas
- Usually advanced at diagnosis
- Fourth leading cause of U.S. cancer-related deaths

**Urogenital Tract Cancers**
- Kidney cancer
- Bladder cancer
- Prostate cancer
Kidney Cancer
- Malignant tumors in one or both kidneys
- Risk factors are smoking, obesity, hypertension, and prolonged exposure to toxic agents

Bladder Cancer
- Cancerous tumors in the urinary bladder; most common malignancy of the urinary tract
- Risk factors include cigarette smoking and exposure to toxins

Prostate Cancer
- Malignancy of the prostate
- 2nd leading cause of cancer death in U.S. men
- Detected by prostate-specific antigen or PSA

Gynecologic Cancers
- Uterine cancer
- Cervical cancer
- Ovarian cancer

Uterine Cancer
- Malignancy of the uterus; most common gynecologic cancer
- Many cases detected early as abnormal vaginal bleeding
- Primary risk factor is long-term or excessive exposure to estrogens

Cervical Cancer
- Malignancy of the cervix
- Curable if diagnosed early as there is a long premalignant stage
  - Often detected with routine Pap screening
- Viruses, namely HPV, HSV-2, and HIV, account for 80-90% of cases


Cervical Cancer

- Malignant tumor in the ovaries
- Lack of reliable screening and lack of early S/S hinders early diagnosis
- Advanced S/S are abdominal distension, abnormal vaginal bleeding, and palpable abdominal mass

Ovarian Cancer

Hematologic and Lymphoid Cancers

- Leukemias
- Multiple myeloma
- Lymphoma
- Hodgkin lymphoma
- Non-Hodgkin lymphoma

Leukemias

- Cancer of blood cells and blood-forming organs
- Characterized by uncontrolled accumulation of immature or dysfunctional WBCs
- Acute forms: abrupt onset, severe symptoms, rapid progression, short survival time; more common in children
- Chronic forms: gradual onset, milder symptoms, longer survival times; more common in adults

Leukemias (cont’d.)

- Types of leukemia are named by their severity and dominant cell type.

Multiple Myeloma

- Malignant disease of plasma cells occurring in multiple bone marrow sites
- Associated with bone destruction
- No major risk factors
Lymphoma

- Two main types:
  - Hodgkin lymphoma
  - Non-Hodgkin lymphoma
- Clinical manifestations similar; main difference is absence or presence of Reed-Sternberg cells (RS cells seen in HL)

Hodgkin Lymphoma

- Cancer of the lymph nodes
- Presence of Reed-Sternberg cells
- Initially involves a single lymph node, usually in neck, and then progresses to adjacent lymph nodes

Non-Hodgkin Lymphoma

- Cancer of the lymph nodes; one of the most rapidly increasing types of cancer in U.S.
- More common than Hodgkin lymphoma
- NHL is initially more widespread than HL with multiple node involvement and non-organized metastases in early stages

Bone Cancer

- Malignant tumors originating in bone and its marrow and cartilage
- Most due to metastatic spread
- Tumors weaken bone tissue

Brain Tumors

- Malignancies arising from any brain structure
- Malignant tumors of CNS differ other cancer types in that they rarely metastasize; no lymphatic channels in the CNS
**Lung Cancer**
- Malignancy of the lungs; caused primarily by smoking
- #1 cause of cancer-related death in U.S.
- Early S/S are attributed to smoking (not lung cancer), so affected person often does not seek medical attention
- Early S/S are attributed to smoking (not lung cancer), so affected person often does not seek medical attention

**Skin Cancers**
- Basal cell carcinoma
- Squamous cell carcinoma
- Malignant melanoma

**Basal Cell Carcinoma**
- Skin cancer arising in the basal, or deepest, layer of epidermis
- Most common, least dangerous, form of skin cancer
- Tends to recur

**Squamous Cell Carcinoma**
- Cancer arising in skin's outer epithelial layer
- More aggressive than BCC

**Malignant Melanoma**
- Cancer arising from melanocytes in skin's basal layer or from a benign melanocytic mole
- Most lethal skin cancer type

**Malignant Melanoma (cont’d.)**
- ABCDE rule:
  - A = asymmetry
  - B = border irregularity
  - C = color variations
  - D = diameter > 6mm
  - E = elevation
Cancers of the Throat Region

- Thyroid cancer
- Laryngeal cancer

Thyroid Cancer

- Malignancy of the thyroid gland
- Most common sign is a solitary nodule on anterior throat
- Surgery always plays a central role in treatment and may involve complete removal of the thyroid

Laryngeal Cancer

- Tumors in the structures of the larynx
- Most tumors discovered early due to changes in voice, leading to medical evaluation