

# Mosby's PATHOLOGY for Massage Therapists

## Chapter 14 Cancer

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## 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.

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2

## 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.

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3

## Cancer

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

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4

## Cancer Sites

New Cases	
Men	Women
Prostate 218,890 (29%)	Breast 178,480 (26%)
Lung and bronchus 114,760 (15%)	Lung and bronchus 98,620 (15%)
Colon and rectum 79,130 (10%)	Colon and rectum 74,630 (11%)
Urinary bladder 50,040 (7%)	Uterus 39,080 (6%)
Non-Hodgkin lymphoma 34,200 (4%)	Non-Hodgkin lymphoma 28,990 (4%)
Melanoma—skin 33,910 (4%)	Melanoma—skin 26,030 (4%)
Kidney 31,590 (4%)	Thyroid 25,480 (4%)
Leukemia 24,800 (3%)	Ovary 22,430 (3%)
Oral cavity and pharynx 24,180 (3%)	Pancreas 18,340 (3%)
Pancreas 18,830 (2%)	Urinary bladder 17,120 (3%)
<b>All sites 766,860</b>	<b>All sites 678,060</b>

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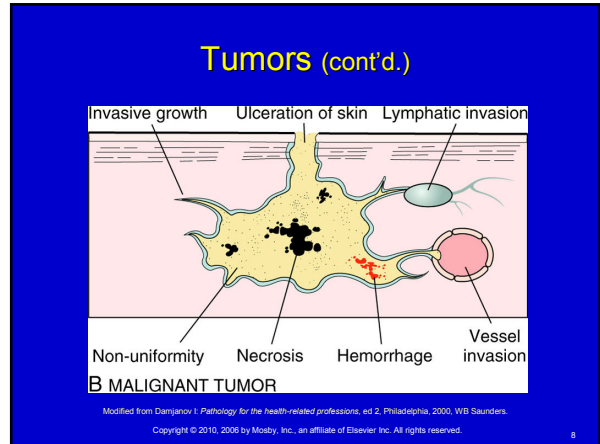
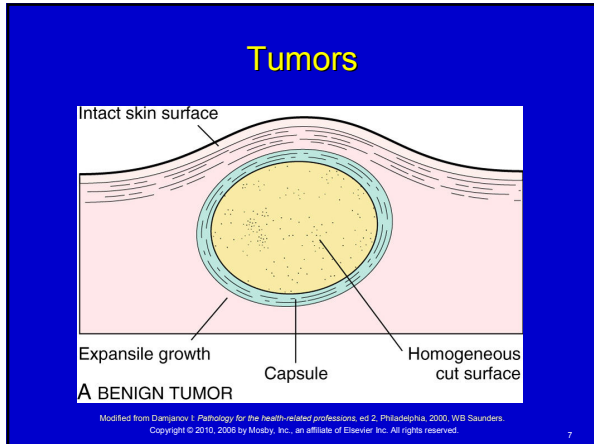
5

## Cancer Sites (cont'd)

Deaths	
Men	Women
Lung and bronchus 89,510 (31%)	Lung and bronchus 70,880 (26%)
Prostate 27,050 (9%)	Breast 40,460 (15%)
Colon and rectum 26,000 (9%)	Colon and rectum 26,180 (10%)
Pancreas 16,840 (6%)	Pancreas 16,530 (6%)
Leukemia 12,320 (4%)	Ovary 15,200 (6%)
Liver 11,280 (4%)	Leukemia 9470 (4%)
Esophagus 10,900 (4%)	Non-Hodgkin lymphoma 9060 (3%)
Non-Hodgkin lymphoma 9600 (3%)	Uterus 7400 (3%)
Urinary bladder 9630 (3%)	Brain 5590 (2%)
Kidney 8080 (3%)	Multiple myeloma 5240 (2%)
<b>All sites 289,550</b>	<b>All sites 270,100</b>

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6



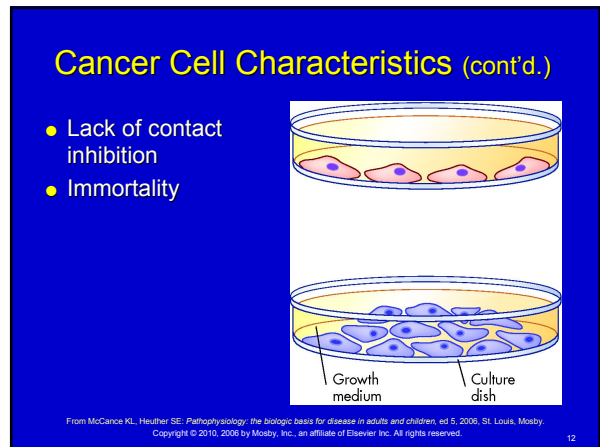
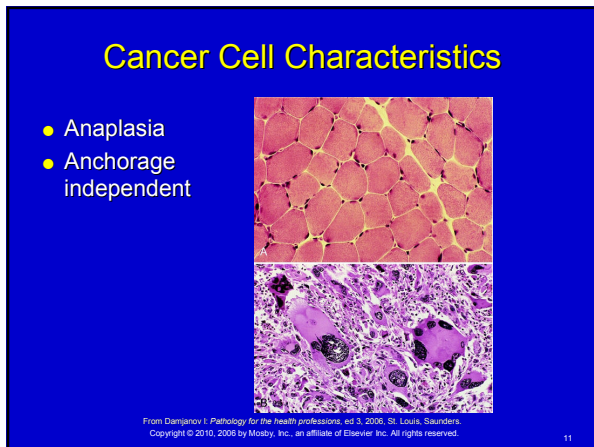
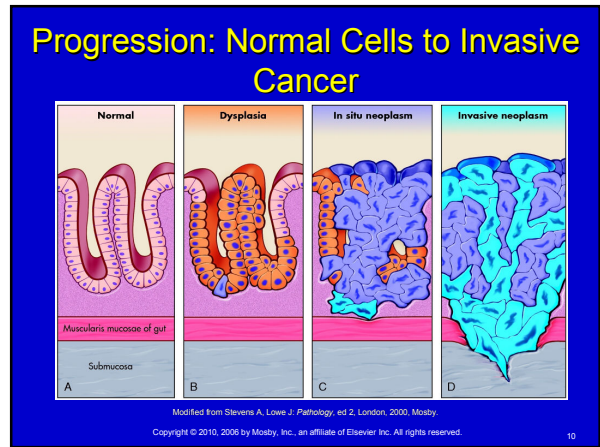
### Comparison of Tumors

Characteristics	Benign	Malignant
Mode of growth	Relatively slow growth by expansion; encapsulated, cells adhere to each other	Rapid growth; invades surrounding tissues
Cells under microscopic examination	Resemble tissue of origin; well differentiated; appears normal	Do not resemble tissue of origin; vary in size and shape; abnormal appearance and function
Spread	Remains localized	Metastasis; cancer cells carried by blood and lymphatics to one or more other locations; secondary tumors occur
Other properties	No tissue destruction; not prone to hemorrhage; may be smooth and freely movable	Ulceration or necrosis (or both); prone to hemorrhage; irregular and less movable
Recurrence	Rare after excision	A common characteristic

From Frazier MS, Dzrymkowski JB. Essentials of human diseases and conditions, ed 3, Philadelphia, 2004, WB Saunders.

From Frazier MS, Dzrymkowski JW. Essentials of human diseases and conditions, ed 3, Philadelphia, 2004, WB Saunders.

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## Cancer Cell Characteristics (cont'd.)

- Angiogenesis
- Genetic instability

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13

## 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

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14

## Tumor Nomenclature (cont'd.)

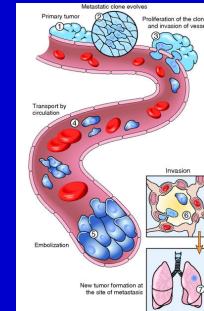
- Exceptions:
  - Leukemia: cancer of marrow and blood
  - Lymphoma: cancer of lymphoid tissue
  - Melanoma: cancer of pigmented tissue
  - Named for physician: Ewing sarcoma (bone cancer); Kaposi sarcoma (skin cancer); Hodgkin lymphoma (lymphatic cancer)

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15

## Metastasis

- Spreading of cancer cells from primary site to distant sites



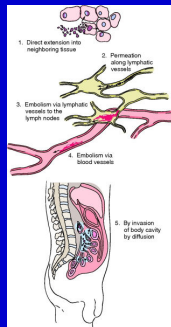
From Danjanov I. Pathology for the health professions, ed 3, 2006, St. Louis, Saunders.

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16

## Metastasis (cont'd.)

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



From Monahan FD et al: *Philo's medical-surgical nursing*, ed 8, St. Louis, 2007, Mosby.

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17

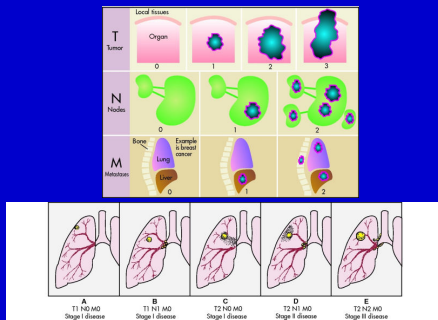
## Tumor Staging

- 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

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18

## Tumor Staging (cont'd.)



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19

## Tumor Staging (cont'd.)

TABLE 14-5 TNM Staging

PRIMARY TUMOR [T]	
T <sub>0</sub>	No evidence of primary tumor
T <sub>is</sub>	Carcinoma in situ (early cancer that has not spread to neighboring tissue)
T <sub>1-4</sub>	Ascending degrees of size and/or extent of primary tumor
T <sub>x</sub>	Primary tumor cannot be evaluated
REGIONAL LYMPH NODES [N]	
N <sub>0</sub>	No regional lymph node involvement (no cancer found in the lymph nodes)
N <sub>1-4</sub>	Ascending degrees of regional lymph nodes involvement (number and/or extent of spread)
N <sub>x</sub>	Regional lymph nodes cannot be evaluated
DISTANT METASTASES [M]	
M <sub>0</sub>	No distant metastasis (cancer has not spread to other parts of the body)
M <sub>1-4</sub>	Ascending degrees of metastasis (cancer has spread to distant parts of the body), including distant nodes
M <sub>x</sub>	Distant metastasis cannot be evaluated

Adapted from the National Cancer Institute, 2007, and Lewis SL, Heltkemper MM, Ruff Dirksen S: *Medical-surgical nursing*, ed 7, St. Louis, 2007, Elsevier Health Sciences.

Adapted from the National Cancer Institute, 2007, and Lewis SL, Heltkemper MM, Ruff Dirksen S: *Medical-surgical nursing*, ed 7, St. Louis, 2007, Elsevier Health Sciences.

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20

## 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)

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21

## Causes of Cancer

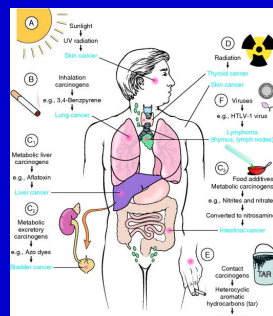
- Frequent or persistent exposure to carcinogens and internal factors
- Carcinogens:
  - Chemicals, radiation, viruses
- Internal factors:
  - Hormones, immune conditions, genetic mutation

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## Causes of Cancer (cont'd.)

- Carcinogens

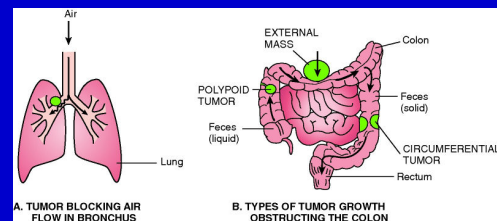


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## Signs and Symptoms

- In general, cancer lacks early S/S
- Initial S/S usually related to tumor growth



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24

## Signs and Symptoms (cont'd)

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



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25

## Warning Signals (CAUTION)

- **C**hange in bowel or bladder habits
- **A** sore that does not heal
- **U**nusual bleeding or discharge
- **T**hickening of lump in breast or elsewhere
- **I**ndigestion or difficulty in swallowing
- **O**bvious change in wart or mole
- **N**agging cough or hoarseness

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26

## 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.

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27

## 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

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28

## Cancer Treatments

- **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

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29

## 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

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30

## 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 adverse
  - 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

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37

## 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

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38

## 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

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## Guidelines: Radiation (cont'd)

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

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40

## 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

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## 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

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42

## Guidelines: Chemotherapy (cont'd)

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

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43

## Guidelines: Chemotherapy (cont'd)

- 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

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44

## Guidelines: Chemotherapy (cont'd)

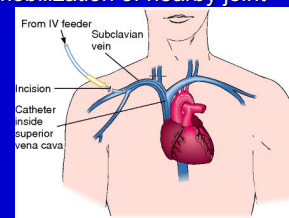
- Hair loss
  - Respect client's wishes about having the head exposed, covered, and touched
- Glove use
  - Wear gloves if thiotepa, cyclophosphamide were administered within 24 hours
  - Consult with client's health care provider if unsure about medications used

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45

## Central Venous Catheter

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



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## Guidelines: Biologic Therapy

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

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47

## 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

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48



## Guidelines: Bone Marrow Transplant

- Susceptible to infection
  - Follow guidelines under chemotherapy

## Lesson 14.3 Objective

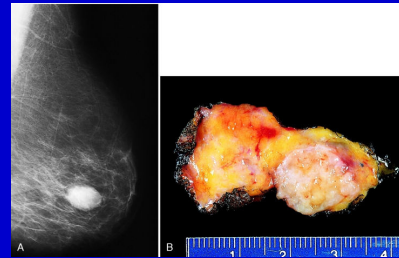
- Examine:
  - Breast cancer
  - Cancers of the digestive system
  - Cancers of the urogenital tract
  - Gynecologic cancers
  - Hematologic and lymphoid cancers
  - Bone cancers
  - Brain tumors
  - Lung cancer
  - Skin cancers
  - Cancers of the throat region

## 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

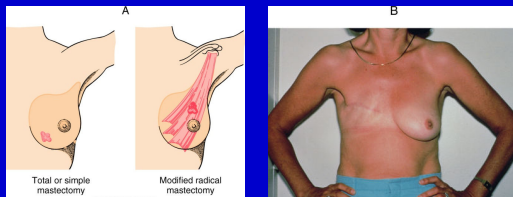
## Breast Cancer (cont'd.)

- 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)



From Damjanov I. Pathology for the health-related professions, ed 2, Philadelphia, 2000, WB Saunders.

## 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



From Damjanov I. Pathology for the health professions, ed 3, 2006, St. Louis, Saunders.

## Liver Cancer

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



From Damjanov I. Pathology for the health-related professions, ed 2, Philadelphia, 2000, WB Saunders.

## Pancreatic Cancer

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



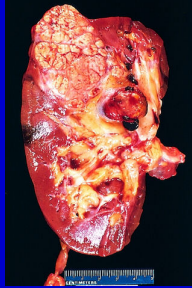
From Fletcher CDM, McKee PH. An atlas of gross pathology, London, 1987, Gower Medical Publishing.

## 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



From Kumar V, Abbas AK, Fausto N, Robbins and Cotran Pathologic Basis of Disease, ed 7, Philadelphia, 2005, Saunders.  
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61

## Bladder Cancer

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

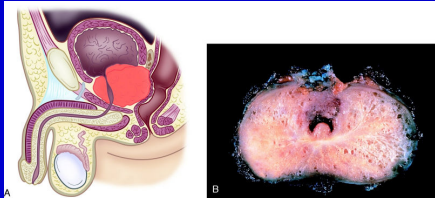


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62

## Prostate Cancer

- Malignancy of the prostate
- 2<sup>nd</sup> leading cause of cancer death in U.S. men
- Detected by prostate-specific antigen or PSA



From Sedel HM et al. Mosby's guide to physical examinations, ed 8, St. Louis, 2008, Mosby.  
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63

## Gynecologic Cancers

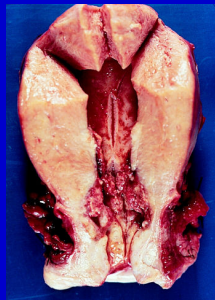
- Uterine cancer
- Cervical cancer
- Ovarian cancer

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64

## 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



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65

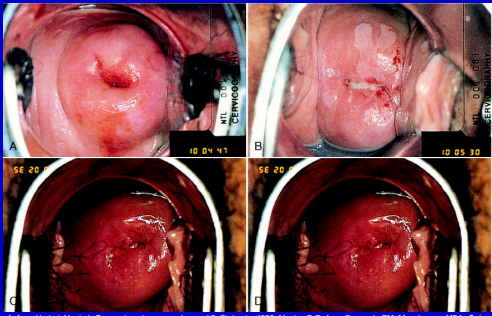
## Cervical Cancer

- 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

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66

## Cervical Cancer



A, from Herbst AL, et al. *Comprehensive gynecology*, ed 2, St. Louis, 1992, Mosby; B-D, from Symonds EM, Macpherson MBA. *Color atlas of obstetrics and gynecology*, London, 1994, Mosby-Wolfe.  
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67

## Ovarian 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



From Symonds EM, Macpherson MBA. *Color atlas of obstetrics and gynecology*, London, 1994, Mosby-Wolfe.  
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68

## Hematologic and Lymphoid Cancers

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

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69

## Leukemias

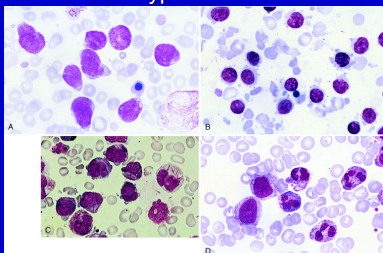
- Cancer of blood cells and blood-forming organs
- Characterized by uncontrolled accumulation of immature or dysfunctional WBCs
- Acute forms: abrupt onset, severe symptoms, rapid progression, short survival time; more common in children
- Chronic forms: gradual onset, milder symptoms, longer survival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

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70

## Leukemias (cont'd.)

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



A and B, from Danjanev I. *Pathology for the health professions*, ed 3, 2008, St. Louis, Saunders; C, from Wiernik et al. *Neoplastic disease of the blood*, ed 3, New York, 1996, Churchill Livingstone.  
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71

## Multiple Myeloma

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



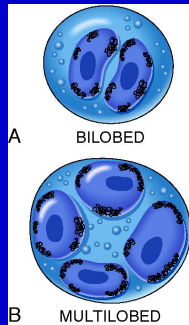
From Kumar V, Abbas AK, Fausto N. *Robbins and Cotran pathologic basis of disease*, ed 7, Philadelphia, 2005, Saunders.

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72

## Lymphoma

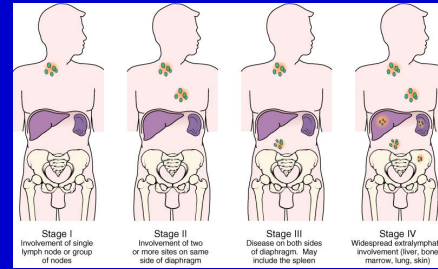
- Two main types:
  - Hodgkin lymphoma
  - Non-Hodgkin lymphoma
- Clinical manifestations similar; main difference is absence or presence of Reed-Sternberg cells (RS cells seen in HL)



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73

## Lymphoma (cont'd.)



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74

## 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



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75

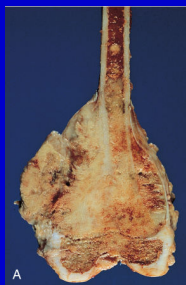
## Non-Hodgkin Lymphoma

- 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

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76

## Bone Cancer



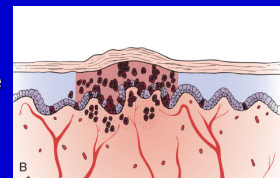
- Malignant tumors originating in bone and its marrow and cartilage
- Most due to metastatic spread
- Tumors weaken bone tissue

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77

## 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



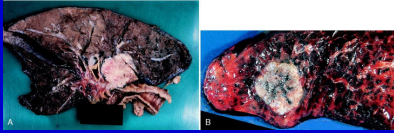
From Kumar V, Abbas AK, Fausto N, Robbins and Cotran pathologic basis of disease, ed 7, Philadelphia, 2005, Saunders.

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78

## 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



From Damjanov I. Pathology for the health professions, ed 3, 2006, St. Louis, Saunders.  
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79

## Skin Cancers

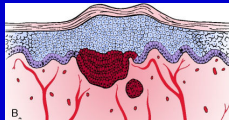
- Basal cell carcinoma
- Squamous cell carcinoma
- Malignant melanoma

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80

## 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



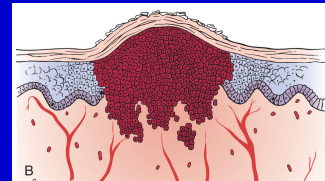
Courtesy Department of Dermatology, School of Medicine, University of Utah. In McCance KL, Heuther SE. Pathophysiology: the biologic basis for disease in adults and children, ed 5, St. Louis, 2006, Mosby.

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81

## Squamous Cell Carcinoma

- Cancer arising in skins outer epithelial layer
- More aggressive than BCC



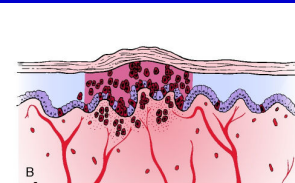
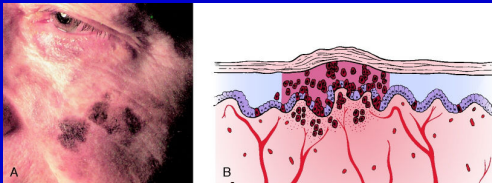
From Damjanov I. Pathology for the health-related professions, ed 2, Philadelphia, 2000, WB Saunders, and Swartz MH. Textbook of physical diagnosis, 5th Edition - History and Examination, Philadelphia, 2006, Saunders.

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82

## Malignant Melanoma

- Cancer arising from melanocytes in skins basal layer or from a benign melanocytic mole
- Most lethal skin cancer type



A. from Friedman RJ et al. Cancer of the skin, Philadelphia, 1991, Saunders, B. from Swartz MH. Textbook of physical diagnosis, 5th Edition - History and Examination, Philadelphia, 2006, Saunders.

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83

## Malignant Melanoma (cont'd.)

- ABCDE rule:
  - A = asymmetry
  - B = border irregularity
  - C = color variations
  - D = diameter > 6mm
  - E = elevation



From Courtesy of Mark Bowden. In Neville B. Oral & maxillofacial pathology, ed 2, St. Louis, 2002, Saunders.

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84

## 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

