

rev 10/10

**CHATTANOOGA STATE COMMUNITY COLLEGE
CHATTANOOGA, TENNESSEE
NURSING/ALLIED HEALTH DIVISION**

RADIATION THERAPY TECHNOLOGY PROGRAM

COURSE SYLLABUS

HS 233 RADIATION ONCOLOGY II

INSTRUCTORS: Lisa Legg	Cheryl Turner
OFFICE: HPF Suite 135 Office 174	HPF Suite 135 Office 178
PHONE: 423-697-3336	423-697-3337
FAX: 423-697-3324	423-697-3324
EMAIL: lisa.legg@chattanoogaastate.edu	cheryl.turner@chattanoogaastate.edu

SEMESTER: summer **CREDIT HOURS:** 3 **CLASS HOURS:** 3 **LAB HOURS:** 0
DATES: EVERY OTHER THURSDAY AND FRIDAY **TIME:** TBA **LOCATION:** OMNI 175

COURSE DESCRIPTION: The second of a two-course sequence in radiation oncology. The complete sequence presents the concepts of disease, types of growths, causative factors and biological behavior of neoplastic disease. Staging procedures are introduced. The student is presented with an introduction to the specific malignant disease entities by site of occurrence. Disease processes and the treatment planning philosophy are discussed as well as the inter-relating of treatment planning with clinical radiation therapy.

PREREQUISITE: HS 123, HS 172, HS 214, HS 220, HS 223, HS 224, HS 230

COREQUISITES: HS 243, HS 240

REQUIRED TEXTBOOK(S) (R) AND OTHER SUGGESTED (S) REFERENCE MATERIAL BASIC TO COURSE:

1. American Cancer Society Textbook of Clinical Oncology. Lenhard, Osteen, and Gansler, 2001.
2. Taber's Cyclopedic Medical Dictionary. Thomas, 1989.
3. Radiation Therapy Planning. Gunilla C. Bentel, 1996.
4. Principles and Practice of Radiation Oncology. Washington Charles and Leaver, Dennis. 2003. OR Practical Applications. Washington, Charles and Leaver, Dennis. 1997.
5. eLearn Course site, Legg, Lisa, CSTCC, 2009.

CLASS SCHEDULE: See 'Program Schedule' for specific class dates.

PROGRAM STUDENT LEARNING OUTCOMES: This program and its curricula are designed to prepare the graduates to attain and master the knowledge, skills, and affect needed to enter the field of radiation therapy. The following goals:

PSLO1: Prepare graduates to possess the knowledge, skill, and affect to meet the demands of an entry-level position in radiation therapy technology by ensuring that graduates:

- (a) demonstrate clinical competence appropriate for an entry-level radiation therapist;
- (b) demonstrate satisfactory oral and written communication skills;
- (c) demonstrate satisfactory critical thinking/problem solving skills; and
- (d) demonstrate an understanding of the importance of professional development and lifelong learning.

PSLO2: Provide the regional medical community with qualified individuals who can function as competent entry-level radiation therapists by ensuring that graduates:

- (a) complete the program in a timely manner;
- (b) pass the American Registry of Radiologic Technologists certification examination;
- (c) receive jobs upon graduation;
- (d) are satisfied with the education they received from the program; and
- (e) meet the expectations of employers.

COURSE STUDENT LEARNING OUTCOMES: The student will demonstrate the required level of performance relative to the following areas:

CSLO-A: Given a particular body system, demonstrate knowledge of the anatomy of the area. (PSLO1a, PSLO1b, PSLO1c, PSLO1d, PSLO2b)

CSLO -B: Given a particular malignant disease process, recall its associated epidemiology and etiology factors. (PSLO1a, PSLO1b, PSLO1c, PSLO1d, PSLO2b)

CSLO -C: Given a particular malignant disease process, discuss the associated clinical detection (symptoms), diagnosis, and staging. (PSLO1a, PSLO1b, PSLO1c, PSLO1d, PSLO2b)

CSLO -D: Describe the classification and staging of a given malignant disease. (PSLO1a, PSLO1b, PSLO1c, PSLO1d, PSLO2b)

CSLO -E: Describe the natural growth and spread of a given malignant disease. (PSLO1a, PSLO1b, PSLO1c, PSLO1d, PSLO2b)

CSLO -F: Given a particular malignant disease, describe the possible treatment options and the associated treatment planning procedure. (PSLO1a, PSLO1b, PSLO1c, PSLO1d, PSLO2b)

CSLO -G: Given a particular malignant disease, state its prognosis. (PSLO1a, PSLO1b, PSLO1c, PSLO1d, PSLO2b)

TOPIC SCHEDULE / COURSE CONTENT / INSTRUCTIONAL COMPETENCIES:

Meeting / Unit / Topic

1 / 1 / Breast Cancer (CSLO-A, CSLO-B, CSLO-C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

Reading Assignment: Lenhard: Chapter 10

Bentel: Chapter 11 (breast and chest wall)

Washington: Chapter 38

- I. Anatomy
 - A. Location
 - B. Structure and Function
 - C. Methods of Tumor Localization
 - 1. Quadrants
 - 2. Clock Numerical System
- II. Epidemiology
 - A. Statistical Information
 - B. Historical Information
 - C. Pathological Information
 - 1. Doubling Time
- III. Etiology
 - A. Risk Factors
 - 1. Uncontrollable Factors
 - 2. Modifiable Factors
 - 3. Unrelated Factors
 - B. Protective Factors
 - C. Factors Not Associated
- IV. Clinical Presentation
 - A. Symptoms
 - B. Warning Signs
 - C. Conditions That Simulate Breast Cancer
- V. Diagnosis
 - A. Breast Self Examination
 - B. Physical (Clinical) Examination
 - C. Imaging Techniques
 - 1. Mammography
 - 2. Ultrasound
 - 3. Nuclear Medicine
 - 4. MRI
 - 5. CT
 - 6. Diaphanography
 - 7. Thermography
 - D. Biopsy Techniques
 - 1. Fine Needle Aspiration
 - 2. Surgical Methods
 - 3. Stereotactic Method
 - 4. US Guided
 - 5. Associated Terms
 - E. Pathology
 - 1. Frozen vs. Permanent Section
 - 2. Hormone Receptors
 - 3. Flow Cytometry
 - F. Evaluation of Metastatic Disease
- VI. Staging/Grading
 - A. Rationale
 - B. TNM System
 - C. Grading

- VII. Patterns of Spread
 - A. Lymphatic System
 - 1. Nodal Groups
 - a. Auxillary Nodes
 - b. Supraclavicular Nodes
 - c. Internal Mammary Nodes
 - d. Other
 - 2. Lymphatic Mapping/Sentinel Node Biopsy
 - B. Hematogenous System
 - C. Local Recurrence
 - D. Complications of Metastatic Disease (distant spread)
- VIII. Histopathology
 - A. In Situ
 - B. Ductal
 - 1. Papillary
 - 2. Medullary
 - 3. Inflammatory
 - C. Lobular
 - D. Paget's Disease
 - E. Other
- IX. Treatment Options
 - A. Surgery
 - 1. Lumpectomy
 - 2. Quadrantectomy
 - 3. Mastectomy
 - a. Subcutaneous
 - b. Total or Simple
 - c. Radical
 - d. Modified-Radical
 - e. Super-Radical
 - 4. Lymph Node Dissection
 - 5. Associated Complications
 - 6. Results of Surgery
 - 7. Reconstruction
 - a. Purpose
 - b. Procedure
 - c. Complications
 - B. Chemotherapy
 - 1. Use
 - 2. Agents Used
 - 3. Combination Regimens
 - C. Hormonal Therapy
 - 1. Principle
 - 2. Agents Used
 - 3. Prevention
 - D. Radiation Therapy
 - 1. Type
 - a. Definitive

- b. Post-operative
 2. Defining Treatment Fields
 3. Simulation Procedure
 4. Field Arrangements
 - a. Tangents
 1. borders
 2. dose
 3. energy
 - b. Chest Wall (Post-operative)
 1. indications
 2. dose
 3. energy
 4. border changes
 - c. Supraclavicular Field
 1. borders
 2. dose
 3. energy
 4. table tow
 - d. Internal Mammary Field
 1. indications
 2. borders
 3. dose
 4. energy
 - e. Posterior Axillary Boost
 1. indications
 2. borders
 3. dose
 4. energy
 - f. Scar Boosts
 1. indications
 2. borders
 3. dose
 4. energy
 5. Side Effects
 6. Mammosite Technique
 - a. Rationale
 - b. Procedure
- X. Prognosis
- XI. Male Breast Cancer
 - A. Statistics
 - B. Occurrence
 - C. Treatment Options
- XII. Pregnancy and Breast Cancer

Instructional Indicators: Breast Cancer (CSLO-A, CSLO-B, CSLO-C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

The student will:

1. Discuss the structure and function of the adult, female breast.
2. Describe the breast in terms of quadrants and clock numerals.

3. State the methods used to verbally indicate the location of a tumor within the breast.
4. State the percentages of breast cancer occurrence associated with the quadrants of the breast.
5. Explain the function of Cooper's ligaments.
6. Define the Tail of Spence.
7. State the regions of the world where there is an increase of breast cancer occurrence.
8. State the leading cause of death among women between the ages of 40 – 55.
9. State the leading cause of death among women of all ages.
10. Discuss the psychological impact associated with breast cancer.
11. Discuss the role that each of the following has on the risk of developing breast cancer:

a. heredity	g. nulliparity / nulligravida
b. age	h. obesity
c. history of cancer	i. alcohol
d. ionizing radiation	j. smoking
e. menarche	k. estrogen
f. menopause	l. benign breast disease
12. Indicate the breast cancer risk factors which are considered to be controllable.
13. Indicate the breast cancer risk factors which are considered to be modifiable.
14. Describe the tumor markers currently being used in association with genetic testing for breast cancer.
15. Define atypical ductal hyperplasia.
16. List the factors that are considered to have no relation to the development of breast cancer.
17. Discuss those factors that are thought to be "protective" factors relating to the development of breast disease.
18. Explain the concept of doubling time as it related to the growth of breast tumors.
19. Discuss fibrocystic breast changes.
20. State the symptoms of breast cancer, indicating the most common.
21. Define the presenting symptom of lobular carcinoma of the breast.
22. Discuss the changes in the breast skin and nipple that may indicate malignancy.
23. List three conditions that are often mistaken as breast cancer.
24. Differentiate between the methods of detecting breast cancer.
25. Discuss the importance of performing monthly breast self-examination.
26. Describe the proper method of performing a monthly breast self examination.
27. Compare and contrast the different imaging techniques used to demonstrate breast lesions.
28. State the proposed schedule for having a mammogram.
29. Relate the risk of radiation from having a mammogram.
30. Differentiate between circumscribed lesions and stellate lesions as identified on a mammogram.
31. Indicate several conditions that might appear as a circumscribed lesion on a mammogram.
32. Describe the appearance and significance of calcifications on a mammogram.
33. Discuss the use of ultrasonography in the diagnosis of breast cancer.
34. Discuss the use of nuclear medicine in the diagnosis of breast cancer.
35. Discuss the different biopsy techniques used to diagnose breast cancer.
36. Differentiate between the terms frozen section and permanent section.
37. Discuss the importance of testing a breast lesion for the presence of hormone receptor sites.
38. Discuss the use of flow cytometry in evaluating breast pathology.
39. State the TNM staging for breast cancer.
40. In order, identify the most common routes of spread associated with breast cancer.

41. State the anatomical location and approximate depth of the following nodal regions:
 - a. axillary
 - b. supraclavicular
 - c. internal mammary
42. State the possible location of a breast tumor that has caused involvement of the internal mammary nodes.
43. Discuss the importance of and procedure for mapping lymphatic involvement associated with breast tumors.
44. List five areas that might be affected by metastatic breast cancer.
45. Discuss the possible complications of metastatic breast cancer.
46. Briefly describe the process of evaluating metastatic breast cancer.
47. Discuss the histopathology of breast cancer.
48. Describe an 'in situ' breast tumor.
49. Describe an inflammatory breast tumor.
50. Compare and contrast the methods of treating breast cancer.
51. Discuss how the appropriate treatment is selected.
52. Define the following breast surgeries:
 - a. lumpectomy
 - b. quadrantectomy
 - c. subcutaneous mastectomy
 - d. total mastectomy
 - e. radical mastectomy
 - f. modified radical mastectomy
 - g. super radical mastectomy
 - h. axillary dissection
53. Discuss possible post-surgical complications associated with breast surgery.
54. Discuss the rationale of reconstructive surgery associated with breast cancer.
55. Identify the common chemotherapy agents and combinations associated with breast cancer.
56. Discuss the use of hormonal therapy as a means of treating breast cancer.
57. Identify the common hormonal agents used in the treatment of breast cancer.
58. Differentiate between definitive radiation therapy and post-operative radiation therapy.
59. Identify the radiation therapy treatment fields used to treat the lymph node groups associated with breast cancer.
60. When talking about tangential radiation breast treatment, identify the following:
 - a. simulation procedure
 - b. fields and their associated borders
 - c. normal dose ranges
 - d. energy selection
61. List the indications associated with post-operative radiation therapy to the breast.
62. When talking about post-operative radiation breast treatment, identify the following:
 - a. simulation procedure
 - b. fields and their associated borders
 - c. normal dose ranges
 - d. energy selection
63. Discuss the acute and chronic side effects associated with radiation treatment of the breast.
64. Indicate the prognosis of breast cancer
65. Discuss male breast cancer.

2 / -- / Complete: Mock Registry #1

3 / -- / Test #1: Breast Cancer

3 / 2 / Skin Cancer (CSLO-A, CSLO-B, CSLO-C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

Reading Assignment: Lenhard: Chapter 24

Washington: Chapter 40

- I. Anatomy
 - A. General Information
 - B. Layers
 - 1. Epidermis
 - 2. Dermis
 - 3. Subcutaneous
 - C. Mitosis
 - D. Keratin
 - E. Pigmentation
 - F. Appendages
 - 1. Hair
 - 2. Sensory receptors
 - a. Messiner's
 - b. Pacinian
 - 3. Glands
 - a. Sweat
 - b. Oil
 - 4. Nails
 - G. Functions
- II. Basal Cell Carcinoma
 - A. Epidemiology
 - 1. Statistical Information
 - 2. Historical Information
 - 3. Pathological Information
 - 4. Growth Pattern
 - B. Etiology
 - 1. Environmental Risk Factors
 - 2. Other Risk Factors
 - C. Detection
 - 1. Description
 - 2. General Appearance
- III. Squamous Cell Carcinoma
 - A. Epidemiology
 - 1. Statistical Information
 - 2. Historical Information
 - 3. Pathological Information
 - B. Etiology
 - 1. Environmental Risk Factors
 - 2. Other Risk Factors

- C. Detection
 - 1. Description
 - 2. General Appearance
- IV. Prevention
- V. Diagnosis
- VI. Staging
- VII. Treatment
 - A. Curettage and Electrodissection
 - 1. Indications
 - 2. Procedure
 - 3. Information
 - B. Mohs' Microscopic Surgery
 - 1. Indications
 - 2. Procedure
 - 3. Information
 - C. Excision
 - 1. Indications
 - 2. Procedure
 - 3. Information
 - D. Cryosurgery
 - 1. Indications
 - 2. Procedure
 - 3. Information
 - E. Lasers
 - 1. Indications
 - 2. Procedure
 - 3. Information
 - F. Interferon
 - 1. Indications
 - 2. Procedure
 - 3. Information
 - G. Retinoids
 - 1. Indications
 - 2. Procedure
 - 3. Information
 - H. Chemotherapy
 - 1. Indications
 - 2. Agents Used
 - 3. Administration
 - 4. Adjuvant Therapy
 - I. Photodynamic Therapy
 - 1. Indications
 - 2. Procedure
 - 3. Information
 - J. 5FU/Epinephrine Gel
 - 1. Indications
 - 2. Procedure
 - 3. Information

- K. Electrochemotherapy
 - 1. Indications
 - 2. Procedure
 - 3. Information
- L. Radiation Therapy
 - 1. Indications
 - 2. Method of Delivery
 - 3. Simulation Procedure
 - 4. Special Equipment
 - 5. Doses/Energy Selection
 - 6. Complications
 - 7. Survival Rate
 - 8. Grafts
 - 9. Follow-up Treatment
- VIII. Other Skin Conditions
 - A. Tumors of the Sweat and/or Oil Glands
 - 1. Epidemiology
 - 2. Treatment
 - B. Mycosis Fungoides
 - 1. Epidemiology
 - 2. Treatment
 - C. Sezary's Syndrome
 - D. Kaposi's Sarcoma
 - 1. Epidemiology
 - 2. Treatment
 - E. Merkel Cell Carcinoma
 - 1. Epidemiology
 - 2. Treatment
 - F. Bowan's Disease
 - 1. Epidemiology
 - 2. Treatment
 - G. Erythroplasia of Queyrat
 - 1. Epidemiology
 - 2. Treatment
- IX. Malignant Melanoma
 - A. Epidemiology
 - B. Etiology
 - 1. Environmental Risk Factors
 - 2. Genetics
 - 3. Other Skin Disorders
 - C. Appearance
 - D. Symptoms (signs)
 - E. Diagnosis
 - F. Staging
 - G. Spread
 - 1. Radial Growth vs Vertical Growth
 - 2. Metastasis
 - H. Histopathology

1. Superficial Spreading
2. Acral lentiginous
3. Lentigo Maligna
4. Nodular
- I. Treatment
 1. Surgery
 2. Chemotherapy
 3. Radiation Therapy
- J. Prognosis

Instructional Indicators: Skin Cancer (CSLO-A, CSLO-B, CSLO -C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

The student will:

1. Describe the structure of the various tissue layers of the skin.
2. Given a diagram of the skin, label it correctly.
3. List the general function of each layer of the skin.
4. Identify and describe the sub-divisions of the epidermis.
5. Define dermal papillae.
6. Discuss mitosis as it relates to skin cells.
7. Describe the sensory receptors associated with the skin and identify the function of each.
8. Describe the glands associated with the skin and identify the function of each.
9. Explain the functions of the skin.
10. Discuss the importance of keratin.
11. Discuss the determination of skin color.
12. Compare and contrast Basal Cell Carcinoma and Squamous Cell Carcinoma in relation to:
 - a. epidemiology
 - b. etiology
 - c. detection/appearance
 - d. patterns of spread
 - e. staging
 - f. treatment options
13. Identify the most common histopathology of skin cancer.
14. Describe the growth patterns associated with basal cell carcinoma.
15. Differentiate between UVA and UVB radiation.
16. Define xeroderma pigmentosa and lupus.
17. Discuss possible methods of preventing the development of skin cancer.
18. Discuss the rationale for performing biopsies of suspicious looking skin growths.
19. Recall the staging of skin cancer as it relates to size of the lesion.
20. Compare and contrast the following skin cancer treatment techniques:
 - a. curettage and electrodissection
 - b. Mohs' micrographic surgery
 - c. excision
 - d. cryosurgery
 - e. lasers
 - f. interferon
 - g. retinoids
 - h. chemotherapy
 - i. photodynamic therapy
 - j. 5FU/epinephrine gel

- k. electrochemotherapy
- 21. Discuss the indications for using radiation therapy in the treatment of skin cancer.
- 22. List methods of delivering radiation therapy to skin lesions.
- 23. Recall general radiation therapy treatment regimens (doses/fractionation) associated with skin cancer.
- 24. Briefly describe the simulation procedure associated with skin lesions, including any special equipment needed.
- 25. Discuss the rationale for utilizing bolus on skin lesions during radiation therapy treatments.
- 26. Define the possible complications of radiation therapy to the skin.
- 27. State the survival rate for skin cancer.
- 28. Discuss the rationale for performing skin grafts in relation to skin cancer treatment.
- 29. Briefly discuss the following:
 - a. tumors of the sweat and oil glands
 - b. mycosis fungoides
 - c. Sezary's syndrome
 - d. Kaposi's sarcoma
 - e. Merkel cell carcinoma
 - f. Bowan's disease
 - g. Erythoplasia of Queyrat
- 30. Discuss the epidemiology of malignant melanoma.
- 31. State risk factors associated with malignant melanoma.
- 32. Discuss the "ABCD" method for describing changes in existing moles.
- 33. State the staging for malignant melanoma.
- 34. Describe the spread of malignant melanoma.
- 35. Differentiate between the following types of malignant melanoma.
 - a. superficial spreading
 - b. acral lentiginous
 - c. lentigo maligna
 - d. nodular
- 36. Discuss the importance of performing a metastatic survey prior to the treatment of malignant melanoma.
- 37. Discuss the treatment options for malignant melanoma.
- 38. State the prognosis of malignant melanoma.

4 / -- / Review: Mock Registry #1
Complete: Mock Registry #2

5 / -- / Test #2: Skin Cancer

5 / 3 / Malignant Lymphomas (CSLO-A, CSLO-B, CSLO -C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

Reading Assignment: Lenhard: Chapter 20-21

Bentel: Chapter 14 (Hodgkin's disease)

Washington: Chapter 29

- I. Introduction to Malignant Lymphomas
 - A. Definition

- B. Anatomical Involvement
 - C. Epidemiology
 - D. Common Types
 - E. Common Symptoms
 - F. Anatomical Review
 - 1. Lymphatic System
 - 2. Lymph Node Structure
 - 3. Lymph Node Groups
 - 4. Other Lymphatic Organs
 - a. Thymus
 - b. Spleen
 - G. Lymphadenopathy Pathology
 - 1. Benign
 - 2. Malignant
- II. Hodgkin's Disease
- A. Epidemiology
 - 1. History of the Disease
 - 2. Age Distribution
 - 3. Other
 - B. Etiology
 - 1. Social Environment
 - 2. Epstein-Barr Virus
 - 3. Genetics
 - 4. Other
 - C. Clinical Presentations (Symptoms)
 - 1. Lymphadenopathy
 - 2. Reed-Sternberg Cell
 - 3. Disease Classification
 - a. "A" Disease
 - b. "B" Disease
 - D. Diagnosis
 - 1. Physical Examination
 - 2. Lymph Node Biopsy
 - 3. Laboratory Studies
 - a. CBC
 - b. Blood Chemistry
 - c. Bone Marrow Biopsy
 - 4. Imaging Studies
 - 5. Staging Laparotomy
 - E. Histopathology
 - 1. Lymphocytic Predominance
 - 2. Classical Hodgkin's Lymphoma
 - a. Nodular Sclerosing
 - b. Lymphocyte-rich
 - c. Mixed Cellularity
 - d. Lymphocyte Depletion
 - F. Spread
 - G. Staging

1. Staging Work-up
2. Ann Arbor System
- H. Treatment
 1. Surgery
 2. Radiation Therapy
 - a. Indications
 - b. Treatment Fields
 1. Mantle
 - position
 - borders
 - areas blocked
 - nodes included
 2. Waldeyer's Ring
 - position
 - borders
 - nodes included
 3. Para-aortic
 - position
 - borders
 - areas blocked
 - nodes included
 4. Pelvic
 - position
 - borders
 - areas blocked
 - nodes included
 - c. Treatment Field Combinations
 1. Inverted Y
 2. Sub-total Nodal Irradiation
 3. Total Nodal Irradiation
 - d. Doses
 1. Clinically Positive Areas
 2. Clinically Negative Areas
 3. Dose Rate
 - e. Treatment Planning
 1. Field Sizes
 2. Treatment Distances
 3. Blocking
 4. Sloping Body Contour
 - methods for correcting
 5. Gap Calculations
 - f. Patient Monitoring
 1. Port Films
 2. Blood Counts
 - g. Complications
 3. Chemotherapy
 - a. Indications
 - b. Regimens Used

- c. Length of Treatment
 - d. Complications
- III. Non-Hodgkin's Lymphoma
 - A. Epidemiology
 - 1. History of the Disease
 - 2. Incidence Rate
 - 3. Age Distribution
 - 4. Other
 - B. Etiology
 - 1. Viral Infections
 - 2. Immunosuppression
 - 3. Radiation / Chemotherapy
 - 4. Genetics
 - 5. Infectious Agents
 - 6. Others
 - C. Clinical Presentation (Symptoms)
 - 1. Asymptomatic
 - 2. Symptomatic
 - a. Adenopathy / Masses
 - b. Pain
 - c. Others
 - D. Diagnosis
 - 1. Physical Examination
 - 2. Lymph Node Biopsy
 - 3. Blood Counts / Chemistries
 - 4. Imaging Studies
 - 5. Bone Marrow Biopsy
 - 6. Staging Laparotomy
 - E. Histopathology
 - 1. Follicular
 - 2. Diffuse
 - F. Staging
 - G. Spread
 - H. Treatment
 - 1. Surgery
 - a. Indications
 - 2. Radiation Therapy
 - a. Indications
 - b. Goal
 - c. Treatment Fields
 - 1. Specific Area
 - 2. Total Body Irradiation
 - d. Doses
 - e. Complications
 - f. Palliation
 - 3. Chemotherapy
 - a. Indications
 - b. Regimen Used

- 4. Bone Marrow Transplantation
- I. Prognosis
- IV. Malignant Myeloma
 - A. Epidemiology
 - 1. Definition of Disease
 - 2. History of the Disease
 - 3. Age Distribution
 - 4. Race Distribution
 - B. Etiology
 - 1. Radiation Exposure
 - 2. Benzene / Asbestos
 - 3. Virus
 - 4. Environmental
 - C. Clinical Presentation (Symptoms)
 - 1. Asymptomatic
 - 2. Symptomatic
 - a. Back Pain
 - b. Plasmacytosis
 - c. Anemia
 - d. Bence-Jones Protein
 - e. Repeated Bacterial Infections
 - f. Abnormal Bleeding
 - g. Renal Failure
 - h. Neurological Changes
 - i. Others
 - D. Diagnosis
 - 1. Imaging Studies
 - 2. Bone Marrow Aspiration
 - 3. Blood Counts
 - 4. Urinalysis
 - E. Histopathology
 - 1. Smoldering Multiple Myeloma
 - 2. Non-Secretory Myeloma
 - 3. Osteosclerotic Myeloma
 - 4. Plasmacytoma
 - 5. Extramedullary Plasmacytoma
 - F. Treatment
 - 1. Chemotherapy
 - a. Indications
 - b. Agents Used
 - 2. Radiation Therapy
 - a. Indications
 - b. Dose
 - 3. Surgery
 - 4. Bone Marrow Transplantation
 - G. Treatment Side Effects
 - H. Prognosis

Learning Indicators: Malignant Lymphomas (CSLO-A, CSLO-B, CSLO -C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

The student will:

1. Discuss the advancements in the treatment of malignant lymphomas.
2. Discuss the origins of malignant lymphoma.
3. State the two common categories of malignant lymphomas.
4. Given a diagram of the lymphatic system, label it correctly.
5. Given a diagram of a lymph node, label it correctly.
6. Discuss the function of a lymph node.
7. Identify the nodal groups which form Waldeyer's ring.
8. Differentiate between malignant and benign lymphadenopathy.
9. Define Hodgkin's Disease.
10. Discuss the bi-modal age distribution associated with Hodgkin's Disease.
11. Discuss the etiologic factors associated with Hodgkin's Disease.
12. Discuss the relationship of Epstein-Barr virus to Hodgkin's Disease.
13. State the most common presenting symptom of Hodgkin's Disease and recall the most common location of the symptom.
14. Describe the Reed-Sternberg cell.
15. Compare and contrast "A" disease and "B" disease, relating to Hodgkin's Disease.
16. Recall and discuss the procedures associated with the diagnosis of Hodgkin's Disease.
17. Discuss the procedure for performing a lymph node biopsy in the diagnosis of Hodgkin's Disease.
18. State the staging of Hodgkin's Disease.
19. Compare and contrast the following histopathologies of Hodgkin's Disease:
 - a. Lymphocytic Predominance
 - b. Classical Hodgkin's Lymphoma
 - Nodular Sclerosing
 - Lymphocyte-rich
 - Mixed Cellularity
 - Lymphocyte Depletion
20. Describe the spread of Hodgkin's Disease.
21. Discuss the procedure(s) involved with the staging of Hodgkin's Disease.
22. Discuss the goal of treating Hodgkin's Disease.
23. Discuss the importance of surgery in the treatment of Hodgkin's Disease.
24. Recall the stages of Hodgkin's Disease most appropriately treated with radiation therapy.
25. Describe the following radiation therapy treatment fields associated with Hodgkin's Disease, recalling the field borders, areas blocked, and the lymph nodes that are included in each:
 - a. mantle
 - b. inverted Y
 - c. PAN
 - d. pelvic ports
26. Define subtotal nodal irradiation (STNI) and total nodal irradiation (TNI).
27. Describe the means of accomplishing STNI and TNI.
28. Discuss the radiation doses associated with the treatment of Hodgkin's Disease.
29. Differentiate between the radiation doses administered to clinically positive areas and clinically negative areas.
30. Discuss the importance of radiation dose rates when treating Hodgkin's Disease.
31. When planning radiation therapy for the treatment of Hodgkin's Disease, state the importance of the following:
 - a. field sizes
 - b. treatment distances
 - c. blocking
 - d. patient contour

32. Discuss ways of correcting the variance in the sloping patient contours.
33. Discuss the importance of regular port films of Hodgkin's Disease treatment fields.
34. Discuss the importance of monitoring a Hodgkin's Disease patient's blood count during treatment.
35. Discuss the following complications of radiation therapy associated with the treatment of Hodgkin's Disease, recalling the corresponding radiation dose:

a. skin reactions	h. transverse myelitis
b. xerostomia	i. intestinal damage
c. epilation	j. kidney / liver damage
d. bone marrow suppression	k. sterility
e. radiation pneumonitis	l. second malignancy
f. pericarditis	m. Lhermitte's syndrome
g. hypothyroidism	
36. Recall the indications of chemotherapy as a treatment for Hodgkin's Disease.
37. Describe the common chemotherapy regimens used to treat Hodgkin's Disease.
38. Discuss the side effects associated with the use of chemotherapy in the treatment of Hodgkin's Disease.
39. In general, state the prognosis of Hodgkin's Disease.
40. Compare and contrast the epidemiology of Hodgkin's Disease and non-Hodgkin's lymphoma.
41. Discuss the etiologic factors associated with non-Hodgkin's lymphoma.
42. Discuss the presentations associated with non-Hodgkin's lymphoma.
43. State and discuss the procedures associated with the diagnosis of non-Hodgkin's lymphoma.
44. Describe the spread of non-Hodgkin's lymphoma.
45. List the indications of surgery in the treatment of non-Hodgkin's lymphoma.
46. Discuss the goal of radiation therapy in the treatment of non-Hodgkin's lymphoma.
47. Describe the radiation therapy treatment fields used in the treatment of non-Hodgkin's lymphoma.
48. Recall the radiation doses associated with the treatment of non-Hodgkin's lymphoma.
49. State the rationale for treating the "total" body of a non-Hodgkin's lymphoma patient.
50. Discuss the radiation dose/fractionation associated with total body irradiation.
51. Discuss the use of palliative radiation in the treatment of non-Hodgkin's lymphoma.
52. Discuss the use of chemotherapy in the treatment of non-Hodgkin's lymphoma.
53. Recall the chemotherapy regimen used most often in the treatment of non-Hodgkin's lymphoma.
54. Discuss the prognosis of non-Hodgkin's lymphoma.
55. Define plasma cell dyscrasia.
56. Identify the locations in which plasma cells are abundant.
57. Discuss the age distribution of multiple myeloma.
58. Discuss the etiologic factors associated with multiple myeloma.
59. Discuss the clinical presentations associated with multiple myeloma.
60. Discuss the procedures involved in the diagnosis of multiple myeloma.
61. Describe the histopathologies of multiple myeloma.
62. Discuss the use of chemotherapy in the treatment of multiple myeloma.
63. Discuss the use of radiation therapy in the treatment of multiple myeloma.
64. Recall the radiation doses used to treat multiple myeloma and plasmacytoma.
65. Discuss the potential side effect associated with the use of chemotherapy in the treatment of multiple myeloma.
66. State the prognosis of multiple myeloma.

6 / -- / Review: Mock Registry #2
Complete: Mock Registry #3

7 / -- / Test #3: Malignant Lymphomas

7 / 4 / Soft Tissue and Bone Malignancies (CSLO-A, CSLO-B, CSLO -C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

Reading Assignment: Lenhard: Chapter 26

Bentel: Chapter 14 (extremities)

Washington: Chapter 28

- I. Soft Tissue Sarcoma
 - A. Anatomical Review
 1. Muscle
 2. Tendons
 3. Fat
 4. Fibrous Tissue
 5. Synovial Tissue
 - B. Epidemiology
 - C. Etiology
 1. Genetic Factors
 2. Radiation Exposure
 3. Trauma
 4. Chemical Exposure
 5. Lymphadema
 6. Other Tumors
 7. Other Factors
 - D. Clinical Presentations
 1. Extremities
 2. Other Areas
 - E. Diagnosis
 1. Biopsy
 2. Radiographic/Metastatic work-up
 - a. Radiographs
 - b. CT
 - c. MRI
 - d. Nuclear Medicine
 - e. PET
 - F. Classification
 1. Histopathology
 - a. Chondrosarcoma
 - b. Osteosarcoma
 - c. Fibrosarcoma
 - d. Liposarcoma
 - e. Rhabdomyosarcoma
 - f. Synovial sarcoma
 - g. Angiosarcoma
 - h. Leiomyosarcoma

- i. Parosteal osteosarcoma
 - j. Malignant schwannoma
 - k. Hemangiosarcoma
 - l. Lymphangiosarcoma
 - 2. Site of occurrence
 - a. Extremities / Head and Neck
 - b. Retroperitoneum
 - c. Nerve Sheath
 - F. Staging
 - 1. Grade
 - 2. Size
 - 3. Nodal involvement
 - 4. Presence of metastasis
 - G. Patterns of Spread
 - 1. Local spread
 - 2. Distant spread
 - H. Treatment
 - 1. Extremity primaries
 - a. Surgery
 - b. Radiation
 - i. margins
 - ii. technique
 - iii. doses
 - iv. brachytherapy
 - c. Chemotherapy
 - 2. Intra-abdominal primaries
 - a. Surgery
 - b. Radiation
 - i. types
 - ii. doses
 - c. Chemotherapy
 - I. Prognosis
 - 1. Tumor grade
 - 2. Factors that adversely affect prognosis
- II. Malignant Tumors of the Bone
- A. General Information
 - 1. Anatomical Review
 - 2. Epidemiology
 - 3. Etiology
 - 4. Clinical Detection
 - a. Pain
 - b. Mass
 - c. Others
 - 5. Diagnosis
 - a. Radiographic Examination
 - i. Blastic Lesions
 - ii. Lytic Lesions
 - b. CT

- c. MRI
 - d. Nuclear Medicine
 - e. Biopsy
 - f. Metastatic work-up
 - 6. Classification
 - a. Osteosarcoma
 - b. Ewing's Sarcoma
 - c. Chondrosarcoma
 - d. Lymphoma
 - e. Others
 - 7. Staging
 - 8. Spread
 - 9. Treatment
 - a. Surgery
 - b. Radiation
 - c. Reconstruction
 - 10. Prognosis
- B. Osteosarcoma
 - 1. Anatomical Review
 - 2. Epidemiology
 - 3. Etiology
 - 4. Clinical Detection
 - 5. Diagnosis
 - 6. Spread
 - 7. Treatment
 - 8. Prognosis
- C. Ewing's Sarcoma
 - 1. Anatomical Review
 - 2. Epidemiology
 - 3. Etiology
 - 4. Clinical Detection
 - 5. Diagnosis
 - 6. Spread
 - 7. Treatment
 - 8. Prognosis
- D. Lymphoma
 - 1. Anatomical Review
 - 2. Epidemiology
 - 3. Etiology
 - 4. Clinical Detection
 - 5. Diagnosis
 - 6. Spread
 - 7. Treatment
 - 8. Prognosis
- E. Chondrosarcoma
 - 1. Anatomical Review
 - 2. Epidemiology
 - 3. Etiology

- 4. Clinical Detection
 - 5. Diagnosis
 - 6. Spread
 - 7. Treatment
 - 8. Prognosis
 - 9. Other Classification
 - a. Clear Cell
 - b. Mesenchymal
- F. Others
- 1. Parosteal Osteosarcoma
 - a. Epidemiology
 - b. Clinical Detection
 - c. Diagnosis
 - d. Treatment
 - e. Prognosis
 - 2. Periosteal Osteosarcoma
 - a. Area of Involvement
 - b. Treatment
 - c. Prognosis
- III. Metastatic Bone Tumors
- A. Associated Cancers
 - 1. Breast
 - 2. Prostate
 - 3. Kidney
 - 4. Thyroid
 - 5. Lung
 - B. Symptoms
 - C. Treatment
 - 1. Medication
 - 2. Radiation Therapy
 - a. Field Placement
 - b. Dose
 - 3. Surgery
 - 4. Nuclear Medicine

Instructional Indicators: Soft Tissue and Bone Malignancies (CSLO-A, CSLO-B, CSLO -C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

The student will:

- 1. List the specific types of tissue most often affected by soft tissue sarcomas.
- 2. Recall the age and sex predominance associated with soft tissue sarcomas.
- 3. Recall the locations on the body in which soft tissue sarcomas might arise.
- 4. Discuss the method of naming soft tissue sarcomas.
- 5. List the possible etiologic factors associated with soft tissue sarcomas.
- 6. Discuss the role of trauma in the formation of soft tissue sarcomas.
- 7. Describe the general, clinical presentations of soft tissue sarcomas which occur in the extremities.
- 8. Discuss the method of *diagnosing* soft tissue sarcomas.
- 9. Discuss the techniques used to image soft tissue sarcomas and to evaluate

- metastatic disease.
10. For each of the following, identify the involved tissue:

a. chondrosarcoma	g. angiosarcoma
b. osteosarcoma	h. leiomyosarcoma
c. fibrosarcoma	i. parosteal osteosarcoma
d. liposarcoma	j. malignant schwannoma
e. rhabdomyosarcoma	k. hemangiosarcoma
f. synovial sarcoma	l. lymphangiosarcoma
 11. Given the following locations, state the associated type of soft tissue sarcoma:
 - a. extremities/head and neck
 - b. retroperitoneum
 - c. nerve sheath
 12. Describe the method of staging soft tissue sarcomas.
 13. Discuss the patterns of spread associated with soft tissue sarcomas.
 14. Recall the common sites of metastasis associated with soft tissue sarcomas.
 15. Generally speaking, discuss the management of soft tissue sarcomas.
 16. Discuss the use of surgery in the treatment of soft tissue sarcomas occurring on the extremities.
 17. Discuss the use of radiation in the treatment of soft tissue sarcomas occurring on the extremities
 18. Describe a 'shrinking field' radiation therapy technique.
 19. Discuss the use of brachytherapy in the treatment of soft tissue
 20. State the importance of leaving a margin of skin on radiation fields covering the extremities.
 21. Discuss the use of surgery in the treatment of soft tissue sarcomas occurring in the abdomen.
 22. Discuss the use of radiation in the treatment of soft tissue sarcomas occurring in the abdomen.
 23. Discuss the role of chemotherapy in the treatment of soft tissue sarcomas.
 24. Recall the most important prognostic factor associated with soft tissue sarcomas.
 25. Recall the factors which can adversely affect the prognosis of a soft tissue sarcoma.
 26. Given a diagram of a long bone, identify its parts correctly.
 27. Compare and contrast primary tumors of the bone and metastatic bone cancer.
 28. Discuss the possible causes of primary bone tumors.
 29. List and describe conditions that may simulate increased bone metabolism.
 30. Recall the primary clinical presentations associated with primary bone tumors.
 31. Differentiate between blastic bone lesions and lytic bone lesions.
 32. Discuss the role of radiograph imaging techniques in the diagnosis of bone tumors.
 33. During diagnosis or surgical treatment of primary bone tumors, discuss the importance of incision placement.
 34. Discuss the staging of primary bone tumors.
 35. Discuss the pattern of spread associated with primary bone lesions.
 36. In general, state the prognosis of primary bone tumors.
 37. For each of the following primary bone tumors, discuss (a) anatomical review, (b) epidemiology, (c) etiology, (d) clinical detection, (e) diagnosis, (f) spread, (g) treatment, (h) prognosis:

a. osteosarcoma	c. chondrosarcoma
b. Ewing's sarcoma	d. lymphoma

38. Compare and contrast Parosteal Osteosarcoma and Periosteal Osteosarcoma.
39. Discuss the problems that metastatic bone tumors may cause.
40. List the primary cancers most likely to metastasize to the bone.
41. Describe the symptoms associated with metastatic bone lesions.
42. Describe the treatment options available for metastatic bone lesions.
43. When treating metastatic bone lesion in the spine with radiation, indicate the field placement and dose.
44. List the indications of surgery in the treatment of metastatic bone lesions.
45. Discuss the role of nuclear medicine in the diagnosis and treatment of metastatic bone lesions.

8 / -- / Review: Mock Registry #3
Complete: Mock Registry #4

9 / -- / Test #4: Soft Tissue Sarcoma and Bone Malignancies

9 / 5 / Pediatric Oncology (CSLO-A, CSLO-B, CSLO -C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

Reading Assignment: Lenhard: Chapter 25

Washington: Chapter 39

- I. General Information
 - A. Epidemiology
 - B. Etiology
 1. Prenatal Factors
 2. Heredity
 3. Environment
 - a. Radiation
 - b. Chemicals
 - c. Virus/Pathogens
 - C. Diagnosis
 - D. Treatment
 - E. Supportive Care
- II. Pediatric Solid Tumors
 - A. Non-Hodgkin's Lymphoma
 1. Epidemiology
 2. Pathology/Classification
 3. Presentation
 4. Diagnosis
 5. Treatment
 6. Prognosis
 - B. Hodgkin's Disease
 1. Epidemiology
 2. Pathology/Classification
 3. Presentation
 4. Diagnosis
 5. Treatment

- 6. Prognosis
- C. Neuroblastoma
 - 1. Epidemiology
 - 2. Pathology/Classification
 - 3. Presentation/Diagnosis
 - 4. Treatment
 - 5. Prognosis
- D. Wilm's Tumor
 - 1. Epidemiology
 - 2. Pathology/Classification
 - 3. Presentation
 - 4. Diagnosis
 - 5. Treatment
 - 6. Prognosis
- E. Rhabdomyosarcoma
 - 1. Epidemiology
 - 2. Pathology/Classification
 - 3. Presentation
 - 4. Diagnosis
 - 5. Treatment
 - 6. Prognosis
- F. Retinoblastoma
 - 1. Epidemiology
 - 2. Pathology/Classification
 - 3. Presentation
 - 4. Diagnosis
 - 5. Treatment
 - 6. Prognosis
- III. Other Pediatric Cancers
 - A. Leukemia
 - 1. Epidemiology
 - 2. Etiology
 - 3. Presentation
 - 4. Prognosis
 - 5. Treatment
 - B. Primary Brain Tumors
 - 1. Histological types
 - a. Medulloblastoma
 - epidemiology
 - pathology/classification
 - treatment
 - prognosis
 - b. Astrocytoma
 - c. Brainstem Glioma
 - d. Ependymoma
 - 2. General Symptoms

Instructional Indicators: Pediatric Oncology (CSLO-A, CSLO-B, CSLO -C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

The student will:

1. Discuss the incidence of childhood cancers.
2. Discuss, in general, the differences between cancers occurring in adults and children.
3. Discuss the possible late effects of aggressively treating childhood cancer.
4. Recall the overall survival rate of childhood cancers.
5. Recall the etiological factors associated with pediatric oncology, such as prenatal, heredity, environmental, and virus/pathogen exposure.
6. Describe the process and important steps associated with diagnosing pediatric cancers.
7. In general, discuss the treatment/management of pediatric oncology.
8. For each of the following, discuss (1) epidemiology, (2) pathology/classification, (3) clinical presentation, (4) diagnosis, (5) treatment, and (6) prognosis:
 - a. non-Hodgkin's lymphoma
 - b. Hodgkin's disease
 - c. neuroblastoma
 - d. Wilm's tumor
 - e. rhabdomyosarcoma
 - f. retinoblastoma
 - g. leukemia
 - h. medulloblastoma

10 /-- / Review: Mock Registry #4
Complete: Mock Registry #5

11 / -- / Test #5: Pediatric Oncology

11 / 6 / Leukemias (CSLO-A, CSLO-B, CSLO -C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

Reading Assignment: Lenhard: Chapter 22

Washington: Chapter 30

- I. General Information
 - A. Epidemiology
 - B. Blood Review
 1. Leukocyte
 - a. Definition
 - b. Types
 - c. Function
 - d. Normal Value
 - e. Critical Value
 2. Erthrocyte
 - a. Definition
 - b. Function
 - c. Normal Values
 3. Thrombocyte
 - a. Definition

- b. Function
 - c. Normal Value
 - d. Critical Value
 - 4. Hematocrit
 - a. Definition
 - b. Normal Values
 - 5. Hemoglobin
 - a. Definition
 - b. Function
 - c. Normal Values
 - d. Critical Value
 - 6. Associated Terms
 - a. anemia
 - b. antibodies
 - c. antigens
 - d. embolus
 - e. pernicious anemia
 - f. plasma
 - g. sickle cell anemia
- C. Categories of Leukemia
 - 1. Acute vs. Chronic
 - 2. Lymphocytic vs. Myelogenous
- D. Types of Leukemia
 - 1. Acute Myelogenous Leukemia (AML) or Nonlymphocytic Leukemia (ANLL)
 - 2. Acute Lymphoblastic Leukemia (ALL)
 - 3. Chronic Myelogenous Leukemia (CML)
 - 4. Chronic Lymphocytic Leukemia (CLL)
- E. Epidemiology
- F. Etiology
 - 1. Genetics
 - 2. Radiation
 - 3. Environment
 - 4. Viral Infections
- G. Signs and Symptoms
- H. Diagnosis
- I. Spread
- J. Treatment Options
 - 1. Chemotherapy
 - 2. Radiation Therapy
 - a. Techniques
 - i. Total Body
 - ii. Meninges Field
 - iii. Craniospinal Axis
 - iv. Testicular Field
 - b. Side Effects
 - 3. Bone Marrow Transplantation
 - a. Indications

- b. Sources of Marrow
 - i. Syngeneic
 - ii. Allogeneic
 - Human-Leukocyte Antigens (HLA) Matching
 - iii. Autologous
 - c. Transplant Process
 - i. Preparation
 - ii. Bone Marrow Harvest
 - iii. Marrow Infusion
 - d. Complications
 - i. Graft vs Host Disease
 - ii. Veno-Occlusive Disease
 - iii. Bleeding
 - iv. Infection
 - v. Renal Insufficiency
 - vi. Gastrointestinal Effects
 - vii. Long term Effects
- II. Myelodysplastic Syndrome
 - A. Definition
 - B. Etiology
 - C. Diagnosis
 - D. Treatment
- III. Acute Myelogenous (AML) or Nonlymphocytic Leukemia (ANLL)
 - A. Incidence/Epidemiology
 - B. Etiology
 - C. Detection/Diagnosis
 - D. Symptoms
 - E. Classification
 - F. Treatment
 - 1. Radiation Therapy
 - 2. Chemotherapy
 - 3. Bone Marrow Transplantation
 - G. Complications
 - H. Prognosis
- IV. Acute Lymphocytic Leukemia (ALL)
 - A. Incidence/Epidemiology
 - B. Etiology
 - C. Symptoms
 - D. Detection/Diagnosis
 - E. Classification
 - F. Treatment
 - 1. Chemotherapy
 - 2. Radiation Therapy
 - 3. Bone Marrow Transplantation
 - G. Prognosis
- V. Chronic Myelogenous Leukemia (CML)
 - A. Incidence/Epidemiology
 - B. Etiology

- C. Progression / Symptoms
 - 1. Stable/Chronic Phase
 - 2. Accelerated Phase
 - 3. Acute Phase/Blast Crisis
- D. Detection/Diagnosis
- E. Treatment
 - 1. Chemotherapy
 - 2. Radiation Therapy
 - 3. Bone Marrow Transplantation
 - 4. Others
 - a. Interferon
 - b. Leukopheresis
- F. Prognosis
- VI. Chronic Lymphocytic Leukemia (CLL)
 - A. Incidence/Epidemiology
 - B. Etiology
 - C. Symptoms
 - D. Detection/Diagnosis
 - E. Staging/Classification
 - F. Treatment
 - 1. Chemotherapy
 - 2. Radiation Therapy
 - 3. Surgery
 - G. Prognosis
- VII. Hairy Cell Leukemia

Instructional Indicators: Leukemias (CSLO-A, CSLO-B, CSLO -C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)

The student will:

1. In general, discuss the disease process associated with leukemia.
2. List the areas of the body most often affected by leukemia.
3. For each of the following, indicate the function and the normal value(s):

a. red blood cells	d. hematocrit
b. white blood cells	e. hemoglobin
c. platelets	
4. For each of the following, provide the values at which treatment will be stopped:

a. white blood cells	c. hemoglobin
b. platelets	
5. Differentiate between the terms granulocytes and agranulocytes as they relate to leukocytes.
6. Name the least sensitive component of circulating blood.
7. Recall the blood types referred to as the 'universal donor' and 'universal recipient'.
8. Compare and contrast the acute and chronic classifications of leukemia.
9. Compare and contract the lymphocytic and myelogenous classifications of leukemia.
10. Recall the four categories of leukemia.
11. Discuss the general etiologic factors associated with leukemia.
12. Identify the chemical that has been closely associated with the induction of several types of leukemia.

13. Recall the only 'definitive' test for diagnosing leukemia.
14. Discuss the spread of leukemia.
15. Describe the two stages of treatment associated with chemotherapy.
16. Recall the radiation doses associated with the following treatment arrangements:
 - a. total body
 - b. meninges
 - c. craniospinal axis
 - d. testicular
17. Discuss the possible side effects associated with whole body irradiation.
18. List the medical indications for bone marrow transplantation.
19. Differentiate between the following sources of bone marrow:
 - a. syngeneic
 - b. allogeneic
 - c. autologous
20. Discuss the importance of Human-Leukocyte Antigens and their role in bone marrow transplantation.
21. Identify the ideal donor for a bone marrow transplantation.
22. Identify the percentage of people who lack a suitably matched sibling bone marrow donor.
23. Discuss the patient preparation associated with a bone marrow transplant.
24. Describe the process in which bone marrow is harvested from the donor.
25. Describe the bone marrow infusion process.
26. List and describe the possible complications associated with bone marrow transplantation.
27. Discuss the potential long term effects of bone marrow transplantation.
28. Describe Myelodysplastic Syndrome.
29. Discuss the diagnosis and treatment of preleukemia.
30. For each of the four classifications of leukemia, provide information relating to (1) incidence/epidemiology, (2) etiology, (3) symptoms, (4) treatment options, and (5) prognosis.
31. Describe the M2 and M7 French-American-British (FAB) classifications associated with Acute Myelogenous Leukemia.
32. Describe the L1, L2, and L3 French-American-British (FAB) classifications associated with Acute Lymphocytic Leukemia.
34. Define leukapheresis.
35. Describe the microscopic appearance of Hairy Cell Leukemia.

12 / -- / Review: Mock Registry #5
Complete: Mock Registry #6

12 / -- / Test #6: Leukemia (take home exam)

13 / -- / Comprehensive Final Exam and Case Study Presentations

INSTRUCTIONAL ACTIVITIES:

- **Pre-lecture quizzes:** These quizzes are designed to stimulate learning by testing the student after reading the assigned materials but prior to the lecture presentation. These quizzes are not graded. (CSLO-A, CSLO-B, CSLO-C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)
- **Post-lecture quizzes:** These quizzes are designed as critical thinking evaluation tools to test the students after lecture delivery. The quizzes are posted on eLearn the week after the lecture. They are graded and are used in grade calculation for the course. (CSLO-A, CSLO-B, CSLO-C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)
- **Pediatric Case Studies:** Each student is assigned a pediatric case study from St. Jude Hospital. They are to read the case and be prepared to share the information with the class during the pediatric lecture. These case studies supplement the lecture material. Some of the case studies serve as classroom presentation/discussion for obscure or difficult to obtain clinical competencies (ie craniospinal axis). (CSLO-A, CSLO-B, CSLO-C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)
- **Leukemia Presentation:** Students work together in small groups to research a classification of leukemia or a topic relating to leukemia (bone marrow transplantation, etc). They prepare a PowerPoint presentation or activity that must adequately cover their assigned topic. Each group prepares a written handout to accompany their presentation/activity. Presentations are made near the end of the semester. (CSLO-A, CSLO-B, CSLO-C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)
- **Mock Registry Exams and Review:** These exams are designed to test the students' abilities to recall knowledge learned over the course of the program and to apply it in a variety of situations. These exams are meant to 'simulate' the national certification examination in radiation therapy and are used as preparatory mechanisms. (CSLO-A, CSLO-B, CSLO-C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)
- **Case Study:** Students select a patient at the beginning of the semester and follow that patient through their entire course of treatment. They complete a packet of patient information data sheets. A PowerPoint presentation is prepared reflecting their patient's histopathology. This presentation must include the following topics: anatomical review, epidemiology, etiology, clinical detection (symptoms), diagnosis, classification/staging/grading, spread, treatment, prognosis, and prevention. All information is presented at the end of the semester. (CSLO-A, CSLO-B, CSLO-C, CSLO-D, CSLO-E, CSLO-F, CSLO-G)
- **Unit/Final Exams:** Each unit will be covered by a corresponding unit exam. The final exam is comprehensive.

CSLO/Assessment Alignment: See above for descriptions

CSLO:	CSLO-A	CSLO-B	CSLO-C	CSLO-D
Assessments:	<ul style="list-style-type: none"> • <i>Pre-lect quiz</i> • <i>Post-lect quiz</i> • <i>Peds case studies</i> • <i>Leuk pres</i> • <i>Mock reg</i> • <i>Case study</i> • <i>Unit exams: breast, skin, mal lymph, sts/bone, peds, leuk</i> • <i>Final exam</i> 	<ul style="list-style-type: none"> • <i>Pre-lect quiz</i> • <i>Post-lect quiz</i> • <i>Peds case studies</i> • <i>Leuk pres</i> • <i>Mock reg</i> • <i>Case study</i> • <i>Unit exams: breast, skin, mal lymph, sts/bone, peds, leuk</i> • <i>Final exam</i> 	<ul style="list-style-type: none"> • <i>Pre-lect quiz</i> • <i>Post-lect quiz</i> • <i>Peds case studies</i> • <i>Leuk pres</i> • <i>Mock reg</i> • <i>Case study</i> • <i>Unit exams: breast, skin, mal lymph, sts/bone, peds, leuk</i> • <i>Final exam</i> 	<ul style="list-style-type: none"> • <i>Pre-lect quiz</i> • <i>Post-lect quiz</i> • <i>Peds case studies</i> • <i>Leuk pres</i> • <i>Mock reg</i> • <i>Case study</i> • <i>Unit exams: breast, skin, mal lymph, sts/bone, peds, leuk</i> • <i>Final exam</i>
CSLO:	CSLO-E	CSLO-F	CSLO-G	
Assessments:	<ul style="list-style-type: none"> • <i>Pre-lect quiz</i> • <i>Post-lect quiz</i> • <i>Peds case studies</i> • <i>Leuk pres</i> • <i>Mock reg</i> • <i>Case study</i> • <i>Unit exams: breast, skin, mal lymph, sts/bone, peds, leuk</i> • <i>Final exam</i> 	<ul style="list-style-type: none"> • <i>Pre-lect quiz</i> • <i>Post-lect quiz</i> • <i>Peds case studies</i> • <i>Leuk pres</i> • <i>Mock reg</i> • <i>Case study</i> • <i>Unit exams: breast, skin, mal lymph, sts/bone, peds, leuk</i> • <i>Final exam</i> 	<ul style="list-style-type: none"> • <i>Pre-lect quiz</i> • <i>Post-lect quiz</i> • <i>Peds case studies</i> • <i>Leuk pres</i> • <i>Mock reg</i> • <i>Case study</i> • <i>Unit exams: breast, skin, mal lymph, sts/bone, peds, leuk</i> • <i>Final exam</i> 	

COURSE DELIVERY FORMAT:

This format is the traditional format and may use an online format to provide access to “static” materials which include the syllabus, course material, contact information, and presentations. Faculty must make available when requested a copy of syllabus and any other instructor provided course materials, including their contact information. Faculty may require on-line

TEACHING / LEARNING METHODS:

- Lectures / Demonstrations
- Reading / Quizzes / Homework Assignments
- Clinical Assignments
- Online Discussions

EVALUATION GUIDELINES:

Course grade will be derived as follows:

50% Unit examinations	15% Homework/Quizzes
15% Patient Case Study**	20% Final Exam

Late assignments will only receive a maximum of 75% of the grade assigned.

GRADING POLICY:

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
59 – below	F

Note: An average of 75% must be achieved in order to pass this course.

COLLEGE POLICIES:

This class is governed by the policies and procedures stated in the current Chattanooga State Student Handbook. Additional or more specific guidelines may apply.

ADA STATEMENT:

Students who have educational, psychological, and/or physical disabilities may be eligible for accommodations that provide equal access to educational programs and activities at Chattanooga State. These students should notify the instructor immediately, and should contact Disabilities Support Services within the first two weeks of the semester in order to discuss individual needs. The student must provide documentation of the disability so that reasonable accommodations can be requested in a timely manner. All students are expected to fulfill essential course requirements in order to receive a passing grade in a class, with or without reasonable accommodations.

DISRUPTIVE STUDENTS:

The term “classroom disruption” means – student behavior that a reasonable person would view as substantially or repeatedly interfering with the activities of a class. A student who persists in disrupting a class will be directed by the faculty member to leave the classroom for the remainder of the class period. The student will be told the reason(s) for such action and given an opportunity to discuss the matter with the faculty member as soon as practical. The faculty member will promptly consult with the division dean and the college judicial officer. If a disruption is serious, and other reasonable measures have failed, the class may be adjourned, and the campus police summoned. Unauthorized use of any electronic device constitutes a disturbance. Also, if a student is concerned about the conduct of another student, he or she should please see the teacher, department head, or division dean.

AFFIRMATIVE ACTION:

Students who feel that he or she has not received equal access to educational programming should contact the college affirmative action officer.

ACADEMIC INTEGRITY/ACADEMIC HONESTY:

In their academic activities, students are expected to maintain high standards of honesty and integrity. Academic dishonesty is prohibited. Such conduct includes, but is not limited to, an attempt by one or more students to use unauthorized information in the taking of an exam, to submit as one's own work, themes, reports, drawings, laboratory notes, computer programs, or other products prepared by another person, or to knowingly assist another student in obtaining or using unauthorized materials. Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions, which may be imposed through the regular institutional procedures as a result of academic misconduct, the instructor has the authority to assign an "F" or zero for an activity or to assign an "F" for the course.

The instructor reserves the right to modify this syllabus, in writing, anytime during the course of the semester.

Revised 10/10/ldl