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## Learning Objectives for Rotations in Radiation Oncology Year 3 Basic Clerkship

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### Preamble

Cancer is the second leading cause of death in our society. The leading cause of death is ischemic heart disease. Whilst cardiac disease will be taught by surgical and medical cardiologists, cancer is a large heterogenous cluster of diseases that possess similar patterns of behavior and complex interdisciplinary approaches to management. The medical student therefore will gain knowledge, skills and the behaviors necessary to effectively assist with cancer patients through undergraduate studies ranging from molecular biology to clinical disciplines and social sciences. Students will have acquired the spectrum of experience to cover what is listed below by the time of graduation. These objectives remind the student that cancer-related illnesses are best reviewed throughout the many clinical attachments in the last two years of training. Most of these will be encountered during the 'Surgical Block'. Students wishing more details on oncology training can approach the Undergraduate Coordinator in Radiation Oncology for assistance.

### SECTION 1

The following foundational knowledge is assumed from previous undergraduate years:

- Discuss normal and aberrant cell behaviour
- Define neoplasia, cancer, benign, malignant, preinvasive and premalignant
- Discuss apoptosis and its importance in cancer processes
- Describe the steps that occur in the growth, invasion and metastasis of cancer
- List the major causes of cancer morbidity and mortality in Canada

### SECTION 2

The following are fundamental to the surgical objectives and are reviewed in seminars:

- What percentage of cancers are preventable and what are the major ways to reduce the risk of cancer?
- Screening is of proven benefit for which cancers?
- Define what screening means, what is the goal?
- Have knowledge of where to seek the current guidelines for screening programs
- Be familiar with the concepts and definitions of the statistical (epidemiological) terms underlying screening
- What are the effects of the primary tumor, and the associated symptoms and signs?
- What are the routes of metastases and common sites of spread?
- Define staging and the purpose of staging
- Understand the role of local, regional and systemic disease management
- Define curative, adjuvant and palliative intents of treatment
- Understand QOL as a primary endpoint of care

- Discuss the principles of effective pain management
- Describe your approach to breaking bad news
- Understand the place of anticancer treatment in incurable cancer and the transition to supportive care
- Awareness of the type of oncologic emergencies and how to approach them

## SECTION 3

The following are site-specific objectives for the clinical years:

### Breast:

- Identify at least 6 risk factors for breast cancer, the magnitude of these risks and their interrelationships
- Discuss the role of breast self-examination and identify the correct method
- Describe the findings of locally advanced breast cancer
- Discuss the use of needle aspiration and excisional biopsy, and the advantages and disadvantages of each technique
- What is the likelihood that a breast lump is cancer in a young woman with no family history?
- Be able to perform a physical examination of the breasts and describe the features of a lump
- Be able to perform a physical examination of the lymph nodes
- What is the role of mammography when a breast lump is present?
- Know how to proceed when a breast mass is found and the mammogram is negative
- Discuss the biopsy techniques that may be employed, and the risks and benefits of each
- Discuss the major histologic types of breast cancer
- What is meant by "receptor status"?
- When might one use chemotherapy or hormonal therapy?
- What is the role of radiotherapy and how does this relate to the surgical approach
- Knowledge of the symptoms that suggest metastatic disease

### Lung and mediastinum:

- Discuss the differential diagnosis of pulmonary nodules and masses
- Describe the goals in evaluating the patient with a solitary pulmonary nodule
- Describe the specific methods used to determine the nature of a solitary pulmonary nodule i.e. imaging, cytology, blood laboratory work
- Discuss the biopsy procedures available, their likely yield, their relative risks and benefits
- What is the most likely diagnosis when multiple nodules are present, and what is the differential diagnosis
- Discuss the major histologic types of lung cancer
- Describe how you would go about staging a patient with lung cancer
- Discuss the roles of surgery, radiotherapy and chemotherapy in small cell and non-small cell lung cancer
- Describe the anatomy of the mediastinum
- What is the differential diagnosis of masses in the three mediastinal "compartments"?

### Prostate:

- Describe the age at which digital rectal examination of the prostate should be instituted and the frequency with which an examination is required

- Explain the relationship between age and the incidence of prostatic cancer and that between latent carcinoma discovered at autopsy and the clinically apparent disease
- Discuss the utility and limitation of serum PSA in screening and in the diagnosis of prostate cancer
- Demonstrate awareness of the options, risks and benefits of observation, prostatectomy, brachytherapy, radiotherapy and hormonal treatment in prostate cancer
- Classify the types of hormonal treatment and describe their modes of action
- Discuss the symptoms of early prostate cancer, including locally advanced prostate cancer
- What is the common histological type of prostate cancer?
- Describe the typical routes of spread
- How would you obtain a tissue diagnosis of prostate cancer?
- Demonstrate awareness of the options - observation, prostatectomy, brachytherapy, radiotherapy and hormonal treatment in prostate cancer

#### Bladder:

- What is the commonest presenting feature of bladder cancer?
- Identify the symptoms that should lead to the workup for bladder cancer
- Discuss the role of cigarette smoking in bladder cancer
- In the Western world what is the usual pathological type?

#### Testis:

- Describe the management of a painless testicular mass
- What are the appropriate laboratory and imaging tests?
- Discuss the epidemiology of testicular cancer
- Classify the pathological types of testicular cancer
- Be able to perform a testicular examination

#### Colorectal:

- Identify the early symptoms of colorectal cancer
- Discuss dietary factors that may play a role in colon cancer
- Identify the importance of family history as a risk factor for colon cancer
- Discuss what dietary advice is considered prudent in preventing colon cancer
- Discuss the relative roles of genetics (including specific syndromes), inflammatory bowel disease and diet in the etiology of colorectal cancer
- Knowledge of the common pathological types of precursor lesions and invasive carcinomas
- Discuss the principles of management of colorectal cancer
- What is the role of chemotherapy and radiotherapy?

#### Skin:

- Discuss the risk factors and preventative measures for melanoma and skin cancers
- Outline the ABCDE rules for screening melanocytic lesions
- Be able to recognize the typical appearance of basal cell and squamous cell carcinomas
- Outline the roles of surgery, systemic therapy and radiotherapy in melanoma
- Outline the roles of surgery, and radiotherapy in non-melanomatous skin cancer

### Endometrium:

- Discuss the use of estrogens in postmenopausal women and methods for reducing the risk of endometrial cancer in patients receiving estrogens
- Identify the common symptoms of early endometrial cancer
- What is the role of Pap smears in endometrial cancer

### Cervix:

- Discuss the screening techniques for early cancer including the age to begin screening
- Identify 4 social factors associated with increased risk of cervix cancer
- Discuss the symptoms of early cancer of the cervix

### Lymphoma:

- Discuss the differential diagnosis of focal and generalized lymphadenopathy
- Classify the pathological types of lymphomas
- Describe the Ann Arbor staging system
- What is meant by B symptoms?

### CNS:

- Describe the clinical manifestations of primary brain tumors under the headings of focal deficits, raised intracranial pressure, and seizures
- Discuss the pathogenesis and anatomy of epidural cord compression
- What are the cardinal symptoms and signs of epidural cord compression
- What are the most pertinent immediate imaging studies to be undertaken
- What are the appropriate next steps in management?
- What are the common cancers producing brain metastases
- Describe the symptoms and signs as well as the imaging findings
- What is the role of corticosteroids for cord compression and brain metastases - and what are the risks and benefits?
- Discuss the roles of surgery, radiotherapy and chemotherapy in the management of brain metastases

### Head and neck:

- Discuss the relative importance of cigarettes, cigars, and pipe smoking as well as tobacco chewing in head and neck cancer
- Discuss the interaction of alcohol and smoking as risk factors
- Describe the appearance of premalignant lesions of the upper aerodigestive tract
- Identify common symptoms of early head and neck cancer
- Describe the technique of examination of the head and neck in patients with symptoms suggesting head and neck cancer
- Describe the most common histologic type of head and neck malignancy
- Describe the role of the TNM system and how you would proceed in staging a patient with head and neck cancer
- Discuss the relevance of followup care in patients who have been treated for head and neck cancers

### **Pain:**

- Be able to take a thorough pain history, evaluating the type and intensity of pain
- Be able to determine the cause of pain and apply specific treatment when possible
- Allow the patient to control the dispensing of analgesics when possible
- Have knowledge of the misconceptions about opioid addiction, tolerance and toxicity
- Understand basic opioid pharmacology
- Understanding of the WHO pain ladder
- Understand the concept of global pain
- Be able to initiate opioid therapy selecting appropriate dosages, frequency and routes of delivery
- Be familiar with the common side effects of analgesic therapy and how to prevent or treat them

### **Other issues:**

- Be able to advise on a graduated plan of management for constipation
- Be able to assess the person at risk of inadequate hydration and feeding
- Be familiar with the causes of nausea and vomiting in the cancer patient
- Understand the physiology of nausea and vomiting and how this relates to appropriate choices in therapy
- Be familiar with the range of management options for obstruction of a viscus in advanced cancer
- Describe the care of the patient with brisk bleeding from advanced cancer
- Be aware of the need for effective doctor-patient communication in cancer care
- Be capable of professional collaboration and communication in patient care