Comprehensive Review of Patient Care in Radiation Oncology

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Ethical and Legal Aspects
Patient Bill of Rights

- Developed in 1973 by the American Hospital Association
- Confidentiality and privacy
- HIPAA
- Goals of care
- Access to information
- Access to palliative and hospice care
- Ability to participate in research
- Clean, safe environment
Informed Consent

Informed Consent

- Physician provides the information so that the patient can make an informed decision about treatment

Patient must be informed of:

- The nature of the procedure, treatment or disease
- The expectations of the recommended treatment and the likelihood of success
- Reasonable alternative available and the probable outcome in the absence of treatment
- The particular known risks that are material to the informed decision about whether to accept or reject medical recommendations
Informed Consent

- Pt must be competent
- Pt must be $> 18$ years old unless mentally impaired, married, legally emancipated or serving in uniformed services
- Pt cannot be medicated/sedated
- Needs to be explained fully by a physician
- Need signature of witness
- Never influence decision
- Must be secured in writing
- Verbal consent must be followed up with written confirmation
Patient Rights

- Living Will-written legal document stating the medical tx or life sustaining treatment the patient wants in the event of serious illness
- Durable Power of Attorney-states whom you have chosen to make health care decisions for you. Becomes active any time you are unconscious or unable to make decisions
Common Legal Terms

- **Tort law** - personal injury law
- **Assault** - the threat of touching in an injurious way
- **Battery** - touching a person without permission
- **Libel** - written defamation of character
- **Slander** - oral defamation of character
- **Negligence** - neglect or omission of reasonable care
- **Invasion of privacy** - confidentiality has not been maintained or body parts exposed
- **HIPAA violation** - sharing information inappropriately or obtaining information on someone you are not caring for
Legal Doctrines

- Doctrine of respondeat superior-holds an employer liable for negligent acts of employees that occur while they are carrying out orders or serving the interest of the employer.

- Doctrine of Res Ipsa Loquitur-requiring the medical defendant to explain the events and convince the court that negligence was not involved.
Code of Ethics

- Serves 2 major functions:
  - Education
  - Regulation
- Describe values held by profession
- Impose obligations on practitioners to accept the values and practices included within the code
- Hold professionals liable for adherence to those obligations with possible penalties for nonconformance
- [https://mdcb.org/about-mdcb/ethical-standards](https://mdcb.org/about-mdcb/ethical-standards)  
Interpersonal Communications
Communication

• The basic element of human interactions that allows people to establish, maintain, and improve contacts with others
• Communication is verbal and non-verbal
• Interchange of thoughts, opinions, or information by speech, writing, or signs.”
• Communication is a critical component of healthcare practice
Effective Communication Includes the following:

- Be clear and brief
- Vocabulary
- Timing and relevance
- Solidifying trust between yourself and the patient
- Allow patient to ask questions
- Show compassion
- Provide care that is free of gender, race, or religious bias.
- Provide handouts, videos, brochures, books
Patient Education

- Clear verbal explanation of treatment
- Clear communication regarding treatment compliance (positioning, tattoos, etc)
- Communication about available resources (support programs, social work, hospice, clergy etc)
- Assess patient readiness to learn, literacy level, physical impairments, age
Challenges in Communications with Patients

- Language barriers
- Cultural differences and beliefs
- Physical or sensory impairment
- Age
- Emotional status and level of acceptance about dx
Physical Assistance
Body Mechanics

- Maintain stable center of gravity
- Keep your back straight
- Bend at knees and hips
- Use leg muscles for lifting
- Avoid twisting or turning
- Avoid bending at the waist
Care of Patients with Tubes

- NG tube (nasogastric tube)
  Enteral nutrition – tube from nose to stomach
- Peg tube
  Percutaneous endoscopic gastrostomy – tube inserted into stomach
- Jejunostomy tube
  Tube inserted into small intestines for feeding

Purpose:
- Maintain GI tract digestion and absorption (nutrition)
- Assists in maintaining GI mobility
NG Tube
PEG TUBE
Jejunostomy Tube
Tubes

- Tube selection
  - Based on duration of therapy
  - History of abdominal procedures
  - GI function
  - Level of debilitation in GI tract
  - Discharge plan

- Type of nutritional feedings
  - Bolus
  - Gravity
  - Continuous feeding over 10-12 hours
Tubes

- Complaints
  - Thirst
  - Taste deprivation
  - Inability to satisfy the appetite
    - Some patients can still eat soft bland food or fluids
- Complications
  - N/V
  - Diarrhea
  - Abdominal cramps
  - Distention
  - Aspiration
Tubes

Complications:

- Mechanical irritation
- Aspiration pneumonia  (tube feeding should be off x 1 hour prior to laying flat)
- Dehydration
- High Blood Sugar
Tracheostomy Tube

Purpose - to maintain an open airway compromised from tumor, obstruction or trauma
- Trach tray and suction machine are needed at bedside
- Inflated cuff keeps trach in place
- Complications
  - Dislodged trachs
  - Plugged trachs due to mucous
Chest Tube

- **Purpose**
  - Drain air - pneumothorax
  - Drain fluid - pleural effusion

- **Always keep upright**
- **Keep lower than insertion site**
- **If dislodged, apply vaseline gauze to site immediately and contact physician**
Chest Tube
Urinary Catheters

Purpose:
- Urinary incontinence
- Urinary retention
- Measure intake and output
- Pt unable to control urination

Indications:
- blocked urine flow due to bladder or kidney stones, blood clots, or severe enlargement of the prostate gland
- surgery in the pelvis
- injury to the nerves of the bladder
- Spinal cord injury
- a condition that impairs mental function, such as dementia
- medications that impair the ability of the bladder muscles to contract
Types of Urinary Catheters

- Catheter insertions are a sterile procedure
- Foley catheter-indwelling catheter for male or females. May be left in for 30 days.
- Texas catheter (condom catheter)-males only, non-invasive, short-term use
- Straight catheterization- inserting a catheter to obtain urine than immediate removal.
Ostomies

- **Ileostomy**
  Opening into small intestine to abdomen for elimination of stool into a collection bag

- **Colostomy**
  Opening into colon through abdomen for stool collection

- **Urostomy**
  Surgically cutting ureters and connecting them to a stoma that opens through abdomen
  Urine collects into bag
Intravenous Catheter

- Peripheral IV – used to administer fluids, medications and blood products
- Considerations:
  - Use patients non-denominate hand when possible
  - Avoid points of flexion
  - Avoid using arm on patient that had a node dissection, or skin infection
  - Do not use arm post CVA due to poor circulation and lack of sensation to detect infiltration or infection
Infusaport

- Inserted surgically under skin for chemotherapy, medications, fluids, blood draws and blood products
- Must be accessed with a Huber needle
- Must be flushed monthly
PICC Line

Peripherally inserted central catheter
• Used similar to peripheral IV
• Should be flushed every 12 hours
• Used short term (30 days or less)
Hickman Catheter

- Surgically inserted
- Used to administer medication, fluids, blood products and draw blood
- Common choice for children
- Flush every 12 hours
A-line (Arterial line)

- Usually inserted in radial artery for critical care patients
- Used to monitor BP, draw blood and blood gases
- Precautions
  - Check circulation in extremity
  - Never infuse meds into A-line
  - If dislodged, apply 5 minutes of pressure
Pacemaker

- A pacemaker is a small device that's placed in the chest or abdomen to help control abnormal heart rhythms.
- This device uses low-energy electrical pulses to prompt the heart to beat at a normal rate.
- Pacemakers are used to treat arrhythmias. Arrhythmias are problems with the rate or rhythm of the heartbeat.
Pacemaker
Implanted Cardiac Defibrillator

An implantable cardioverter-defibrillator (ICD) or automated implantable cardioverter defibrillator (AICD) is a device implantable inside the body, able to perform cardioversion, defibrillation, and (in modern versions) pacing of the heart.
Implanted Cardiac Devices

• Exposing the device to direct or scattered radiation may cause electrical reset, errors in device functionality, errors in diagnostic data, partial loss of diagnostic data or complete loss of diagnostic data.
• The use of photon beams less than or equal to 10 MV will greatly reduce the neutron flux and, consequently, the probability of any of these errors occurring.
Implanted Cardiac Devices

1. Consult with Cardiology prior to radiation.
2. Assume a 2 Gy cumulative absorbed dose tolerance.
3. Keep, if possible, a 3 cm margin from the radiation field edge.
4. Consider TLD or diode measurement on day one of radiation therapy.
5. Do low-level cardiac monitoring if < 2 Gy cumulative dose.
6. Do high-level monitoring if > 2 Gy or pacemaker-dependent patient.
7. If cumulative dose > 10 Gy, consider repositioning the pacemaker.
Surgical Markers/Clips/Devices

- Most surgical clips are currently made of titanium, and as many as 30 to 40 clips may be used during a single surgical procedure.
- They remain inside the patient's body after the wounds are healed.
- Rods, plates and screws are often utilized to reconstruct a joint.
Surgical Markers/Clips/Devices
Tissue Expanders

- A breast tissue expander is an inflatable breast implant designed to stretch the skin and muscle to make room for a future, permanent implant.
- The expander has a port (a metal or plastic plug, valve, or coil) that allows the surgeon to add increasing amounts of liquid (a salt water solution) over time (between 2 to 6 months) until the skin gradually is stretched enough to accommodate the implant.
- Make sure the port is plastic not metal prior to radiation.
Tissue Expanders
Emergencies

• Always check where emergency equipment is located:
  • Code cart
  • Emergency box
  • Oxygen source
  • Ambu bag
  • Suction equipment
Types of Emergencies

Cardiac arrest
- Sudden loss of cardiac function
- Initiate CPR (know ABCs)

Stroke/CVA
- Sudden confusion or difficulty speaking
- Sudden, unilateral numbness or weakness of the body
- Loss of balance or Vision
- Headache
Types of Emergencies

- Anaphylactic Shock
  - Severe, life threatening allergic reaction causing bronchial constriction
  - Difficulty breathing
  - Swollen face
  - Drop in BP
  - Metallic taste in mouth
  - Hives
  - Dizziness
  - Nausea
  - Tx: epinephrine, steroid, antihistamine
Types of Emergencies

Seizure
- Support the pt’s head
- Create a safe environment
- Turn on side if on the ground or assist to ground if sitting or standing
- DO NOT hold the patient’s tongue
- DO NOT attempt to restrain the patient
- DO NOT put anything in the patients mouth
Oxygen Administration

- Purpose - increase $O_2$ entering lungs
- Monitor patient by checking:
  - Respiratory rate
  - Color and appearance of skin
  - $O_2$ saturation between 95-100%
  - Arterial blood gases/ MD’s order
- Administration
  - Most common is nasal cannula @ 1-6 Liters
  - Ambu bag delivers 100% $O_2$
Infection Control
Center for Disease Control (CDC)

• CDC has established standards and guidelines for health care facilities re: infection control
• Policies and guidelines have influenced federal and state laws
• CDC assists health care facilities to investigate epidemics
Infection Control Terminology

- **Infection**: reproduction of microorganisms in the human body
- **Disease**: collective term used to describe clinical signs and symptoms associated with infectious agent or unknown etiology
- **Sub-clinical Infection**:
  - Person develops the infection but displays no signs or symptoms
  - The immune system does not initiate a response
Infection Control Terminology

Colonization:
- Another form of infection that does not invoke an immune response
- Reproduction of infectious organism without symptoms

Carrier
- Person who is colonized with infection but has no symptoms
- Carrier may transfer the disease without knowing

Contamination: presence of microorganisms on the body or inanimate
Infection Cycle

- Infectious disease cannot occur without the presence of an infectious agent or pathogen
  - Bacteria, viruses, fungi, protozoa, algae etc
  - Bacteria and viruses most common cause of HAIs
- Pathogenicity: the ability of an infectious agent (pathogens) to cause clinical disease
- Virulence: severity of clinical disease/infection
- Infective Dose: when there are enough microorganisms present to cause infection
Infection Cycle

All microorganisms require a source and a reservoir
• Reservoir: where the microorganism lives and reproduces (ex. Humans, animals)
• Source: Place where microorganism comes from
• Host: The person who the infectious agent is passed to

Example: Hepatitis A
• Reservoir is the person handling food
• Source is the food
• Host is the people who eats the food and is exposed to the infection
• But……does the host always develop signs and symptoms of infection????
The Host

- The host may or may not develop disease

- If the host **does** develop the disease, the host goes through 3 distinct phases of the disease
  - Incubation
  - Clinical disease
  - Convalescence
Disease Phases

• **Incubation**: time between exposure and appearance of the first symptom
• **Clinical disease**: patient exhibits clinical signs and symptoms
• **Convalescence**: the stage of recovery from the illness
  • A person may be contagious during any or all of these stages
  • A person may be a chronic carrier of a disease in which the person is well but can transmit the disease, eg. Hepatitis B
How is the disease passed?

Portal of Exit
- Skin
- Respiratory tract
- GI tract
- Blood
Transmission

- Transmission—the movement of infectious agent from SOURCE to HOST
- Entrance Portal (similar to exit portals)
  - Needle stick
  - Urinary tract
  - Eyes
- Can occur with equipment (scopes, catheters)
Modes of Transmission

Contact:
• Can be direct or indirect; the most frequent transmission route is **direct**
• Physical contact (direct contact) is made with the source of the infection; touching, kissing etc
• Indirect—an intervening object is contaminated and then infects another person eg. Needle stick, door knob, telephone

Droplet Contact:
• rapid transfer of the infectious agent through the air over short distances
• Droplets are heavy and eventually drop to the floor
• Ex: Coughing or sneezing into someone’s face
Modes of Transmission

Common vehicle spread:
- Involves a contaminated inanimate vehicle called a fomite
- Fomites include food, water, medications, medical equipment and supplies
- The number of people infected distinguishes it from indirect contact
- Common vehicle spread involves infection of multiple people
- Examples: HIV contaminated blood in the 1980s
Modes of Transmission

Airborne Transmission:
- Spread that involves infectious agent using the air as its means of dissemination and involves a long distance (typically 6 ft. or greater)
- Occurs when infectious agents are so small they do not fall to the ground and are eventually inhaled
- Differ from droplets in that droplets are too heavy to remain suspended
- Ex: TB
Modes of Transmission

**Vectorborne transmission:**
- Involves a vector that transports an infectious agent to a host.
- Ex. Mosquito that carries malaria, zika virus
  Tick carrying Lymes Disease
Figure 10-2. Diagram of the infection cycle. To stop disease, the cycle can be broken at any point.

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Asepsis

• Free from biologic contaminants
• Medical asepsis: keeping the working environment clean
• Surgical asepsis: keeping surgical tools and fields sterile
Sterile Techniques

- Always open sterile packages away from the body
- Always pull flaps away from tools/gloves etc.
- Always maintain a safe distance from open sterile tools
- Sterile gloving
- Never recap a needle when tattooing
The HIV pandemic in the 1980s changed the way HCWs practiced infection control. For the first time, focus was on blood and body fluids. This concept of infection control is now known as universal precautions (UP). All human blood and certain body fluids are to be treated as though they are known to be infectious for HIV, hepatitis B virus, or other blood-borne pathogens. In 1999, OSHA published mandates on policies and procedures to ensure uniform inspection procedures concerning blood-borne pathogens.
Prevention and Protection

- Hand washing—#1 way to reduce HAI
- Wash hands before and after direct patient care
- Alcohol based hand rubs may be utilized in certain situations
- Fingernails should be natural, short and neat
- Handle equipment carefully and disinfect
- Handle soiled linen with care
- Know who to call with environmental spills and what to do until help arrives
- Gloves must always be changed between patients and NEVER reused
Prevention and Protection

Use of Personal Protective Equipment

• Gloving
• Masks, eye protection and face shield
• Gowns and protective apparel
Types of Isolation in the Health care setting

- Airborne precautions
- Droplet precautions
- Contact precautions
- Enteric precautions
Airborne Precautions

- Respirators must be worn by staff when entering the room
- Pt wears mask when leaving the room
- Private room with negative pressure
- Doors must be kept closed
- Ex: TB, SARS, Avian FLU, Chicken pox (varicella), Herpes Zoster
Droplet Precautions

- Wear a regular surgical mask with close contact
- Mask is one time use only!
- Droplets are heavier than airborne contaminants therefore ventilation is not a concern
- Private room is required

Ex: Flu, Bacterial meningitis, RSV
Contact Precautions

- Spread by close or direct contact
- Private room
- Wear mask if close contact
- Gown if contamination is likely
- Gloves if touching

Ex: MRSA skin infection, C-diff colitis, E-Coli
Enteric Precautions

- Enteric precautions are necessary in infections transmitted by direct or indirect contact with fecal material
- Gowns needed if patient is incontinent and you may come in contact with feces
- Always wear gloves
- Must wash hands.....hand rub not effective

Ex: C-Diff Infectious diarrhea, gastroenteritis, salmonella, hepatitis A
Neutropenic Precautions (Reverse Isolation)

- Patient had dangerously low neutrophil count placing him/her at risk for infection
- No one with an infection may be with the patient
- No fresh fruits, vegetables, live plants or flowers
- Patient should be in a private room
- Hospital staff must wear a gown and mask when entering the room
- Patient must wear a mask when leaving the room
Patient Assessment and Management
Detection and Diagnosis

• Cancer survival has increased due to multiple factors including early detection and diagnosis
• 5 year survival rate of all cancers from 2003-2009 was 68% (48% increased compared to the 1970’s)
• Survival rates vary based on the type of cancer
Detection and Diagnosis

Detection and Dx heavily rely on 2 branches of medicine:

Radiology
- Many advances have been made including computer technology.
- Ex: PET/CT, mammogram with tomosynthesis, MRI Brain with perfusion

Pathology
History and Physical Exam

- Crucial part of cancer detection and recurrence
- Important for health prevention and health maintenance
- American Cancer Society Definitions:
  - Prevention: strategies and measures that stop cancer from developing
  - Screening: selecting appropriate tests and studies to check for disease

- Early detection = better outcomes
  - Cancers that have specific recommendations for screening and detection have a survival rate > 81%.
How to Obtain an Objective Dx

History and Physical:
- Acquisition of data by talking to the patient
- Review records
- Physical exam
- List of chief complaints
Medical Record and History

- Documents past medical history
- Format may differ at institutions
- Inpt/Outpt, clinic/ER, paper/eChart
- Record contains history, lab test and procedure results
- XRT chart is not included
- HIPAA (Health Insurance Portability and Accountability Act of 1996) allows for communication of records between health care providers
Demographics

Include:

• Age
• Race
• Gender
• Marital status
• Occupation

• Provide an overview of the patient
• Certain diseases are more prevalent in different groups, gender, age, race and national origin
Medical History

• Provides a snapshot of patient’s past medical problems
• Establishes risk factors
• **Premalignant**—physiologic characteristics or predisposing factors that may lead to malignancy
• **Paraneoplastic syndrome**—symptoms that occur because of hormones or substances produced by the tumor.
Family History

- Certain cancers appear to repeat in families due to genetic mutation, which place individuals at increased risk
- Genetic mutations only account for 10% of all cancers
- Examples of familial genetic mutations
  - BRCA 1 and 2 mutation
  - TP53 gene mutation
  - Over 50 hereditary cancer syndromes have been identified
  - Molecular biology continues to identify more!
Personal History & Social History

• Patient’s lifestyle; past and present
• Diet
• Exercise
• Alcohol
• Cigarette
• Drug habits
• Sexual activity
• Sexual preference
• Occupation
• Asbestos exposure
• Other carcinogen exposure
Medical Imaging/Studies

- ECG—electrical conductivity of heart muscle
- EEG—(electroencephalogram) brain wave activity
- EMG—(electromyogram) electrical conductivity of muscle; aids in neuromuscular disorders
- CT Scans
- PET Scans
- MRI
- Endoscopy
Prevention

Cancer reduction:

- Avoid smoking and exposure to second hand smoke
- Wear sunscreen and limit exposure to the sun
- Limit radiation exposure
- Low fat diet
- Limit alcohol intake
- Avoid over use of hormones

Screening

• Testing individuals who are asymptomatic for abnormalities and disease
• Screening has shown reduction in morbidity and mortality in certain cancers (breast, colon, prostate, uterus, cervix)
• Purpose of Screening
  • Prevention: devoted to maintaining good health through education which may encourage lifestyle changes
  • Early detection: includes screening which is the cornerstone of diagnosis and management
Screening

- Screening is also done for pts who are symptomatic, undergoing treatment or being followed up
- Screening aimed at detection of cancer in its earliest stage which results in better outcomes
- Grouped into 2 major categories
  - Lab studies
  - Medical Imaging
Breast Cancer Screening

- Can detect lesions before they can be palpated
- High quality mammography is the most effective method for detection (3D)
- Other imaging may be used to assist mammograms such as ultrasound, MRI or Breast specific gamma imaging (BSGI)

- **Breast density** compares the amount of fat to the amount of tissue on a mammogram. Dense breasts contain more glandular and fibrous tissue than fatty tissue.
- Women who have dense breasts are 4-5x more likely to develop breast cancer than women with low breast density
- It is now mandated that breast density must be reported on mammogram
Breast Cancer Screening

American Cancer Society recently updated screening guidelines in 2015

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Screening Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 - 44</td>
<td>Women in this age group should have the choice to start annual screening with mammograms if they wish to do so. The risks of screening as well as the potential benefits should be considered.</td>
</tr>
<tr>
<td>45 - 54</td>
<td>Yearly</td>
</tr>
<tr>
<td>55 and over</td>
<td>Every 2 years; women should also have the chance to continue yearly screening if they choose to. Screening mammograms should continue as long as a woman is in good health and is expected to live at least 10 more years.</td>
</tr>
</tbody>
</table>
Breast Cancer Diagnosis

- Biopsy is the only definitive way to diagnose
- Types of Biopsy (Bx):
  - Fine needle aspiration
  - Core needle biopsy
  - Stereotactic core biopsy (incisional bx)
  - Image guided biopsy
  - Excisional biopsy
Breast Biopsy

Core needle biopsy

Breast lump
Needle
Syringe

Cross section

Mammotome Stereotactic Breast Biopsy System
Breast Cancer Diagnosis

- Sentinel Node Biopsy
  - Secondary screening tool
  - Used to find nodes that tumors are draining into
  - Dye injected near the tumor to observe where the fluid flows next
Lung Screening

• Overall survival benefit over the years has not been demonstrated with lung cancer screening
• Annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years.
Lung Cancer Biopsy and Diagnosis

- **Needle biopsy:** After a local anesthetic is given, the doctor uses a needle that is guided through the chest wall into a suspicious area with CT to obtain a tissue sample.

- **Transbronchial biopsy:** This type of biopsy is performed through a fiberoptic bronchoscope.

- **Thoracoscopic biopsy:** After a general anesthetic is given, an endoscope is inserted through the chest wall into the chest cavity. This procedure may be referred to as video-assisted thoracic surgery (VATS) biopsy.

- **Open biopsy:** After a general anesthetic is given, the doctor makes an incision in the skin on the chest and surgically removes a piece of lung tissue.
Prostate Screening

- One of the leading causes of death among men > 50
- Two common methods
  - DRE and PSA
- Consensus still lacking on whom to screen and when
- PSA may result in false negative and false positive
- High risk population include African-Americans and 1st degree relative with prostate cancer
American Cancer Society Guidelines for Prostate Cancer Screening

50 and over (average risk)
Discussion at age 50 for men with at least a 10-year life expectancy and then periodically. If PSA is 2.5 ng/ml or greater, testing should be repeated yearly. Men with a PSA of less than 2.5 ng/ml may be tested every other year.

45 and over (high risk**)
Discussion at age 45 for men with at least a 10-year life expectancy and then periodically. If PSA is 2.5 ng/ml or greater, testing should be repeated yearly. Men with a PSA of less than 2.5 ng/ml may be tested every other year.****
Prostate Cancer Diagnosis

Transrectal ultrasound guided biopsy
Colon Cancer Screening

- Begin screening after 45 unless high risk
- Annual FOBT (fecal occult blood test) or FIT (fecal immunochemical testing)
- Flexible sigmoidoscopy every 5 years
- Annual FOBT or FIT plus flex. Sig. every 5 years
- Double Contrast Barium Enema every (DCBE) every 5 years
- Colonoscopy every 10 years
- CT colonography every 5 years
High Risk Factors for Colorectal Cancer
Screening before 45

(1) a personal history of colorectal cancer or adenomatous polyps
(2) a personal history of inflammatory bowel disease (ulcerative colitis or Crohn disease)
(3) a strong family history of colorectal cancer or polyps
(4) a known family history of a hereditary colorectal cancer syndrome such as familial adenomatous polyposis or hereditary nonpolyposis colon cancer
Cervical Cancer Screening

- All women should begin cervical cancer testing (screening) at age 21. Women aged 21 to 29, should have a Pap test every 3 years. HPV testing should not be used for screening in this age group (it may be used as a part of follow-up for an abnormal Pap test).
- Beginning at age 30, the preferred way to screen is with a Pap test combined with an HPV test every 5 years. This is called co-testing and should continue until age 65.
- Women who are at high risk of cervical cancer because of a suppressed immune system (for example from HIV infection, organ transplant, or long-term steroid use) or because they were exposed to DES in utero may need to be screened more often
- Women over 65 years of age who have had regular screening in the previous 10 years should stop cervical cancer screening as long as they haven’t had any serious pre-cancers
- PAP smear-exfoliative cytology (scraping cells) from the cervix
Screening and Dx of Blood Cancers

- Cancers of the blood include Lymphoma, Leukemia and Multiple Myeloma
- First test is Complete Blood Count (CBC)
- If abnormal, may proceed to bone marrow biopsy
Vital Signs

• Perform a general assessment simply by looking at the patient.
• Do they appear ill? In distress?

Vital Signs
  Temperature
  Pulse
  Respiratory Rate
  Blood pressure
  Pain
Temperature

Normal Values:

• Oral 96.8-98.6 degrees F
• Rectal 99.6 degrees F
• Axillary 97.6 degrees F

• Look at the pattern of temperature, not just the value given at one point in time
Low Temperature

- Improper technique
- Broken thermometer
- Hypothermia from exposure to cold
- Shock/Sepsis
- Dying
- Patient drank or ate something
Fever

- Bodies response to virus or bacteria
- Tumor fever/necrosis
- Response to drugs or blood products
- Septic shock
- Heat exhaustion/heat stroke
- Low WBC count
- Patient recently drank or ate something hot
Pulse/Heart Rate

- Normal = 60-100 beats/minute
- Common sites to check pulse:
  - Radial artery (wrist)
  - Femoral artery (groin)
  - Carotid artery (neck)
Pulse

Tachycardia
- Fever
- Stress
- Dehydration
- Pain
- Heart disease
- Hypoxia

Bradycardia
- Medication
- Heart disease
- Athletes
- Increased intracranial pressure
Respirations

12-20 breaths/minute is normal rate

Rate less than 10 (bradypnea):
• Narcotic or drug overdose
• Respiratory fatigue
• Death

Rate over 24 (tachypnea)
• Anxiety
• Fear
• Asthma/COPD
• Blood clot
Blood Pressure

- 120/80 mm Hg = normal
- Systole is maximum pressure exerted against the artery walls when the heart contracts
  100-140 mm Hg = normal systolic BP
- Diastole is the pressure exerted against artery walls during relaxation of the heart muscle
  60-90 mm Hg = normal diastolic BP
Hypotension

Causes:
- Dehydration
- Medication
- Bleeding
- Anaphylaxis
- Diabetes
- Infection
- Sepsis
- Anemia

Symptoms:
- Dizziness
- Weakness
- Lightheaded
- Weak

Treatment:
- Tx the cause
# Hypertension

**Possible causes:**

<table>
<thead>
<tr>
<th>Stroke</th>
<th>Pain</th>
<th>Brain tumor</th>
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<tbody>
<tr>
<td>Heart failure</td>
<td>Stress</td>
<td>Adrenal gland tumor</td>
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<tr>
<td>Kidney Failure</td>
<td>Anxiety</td>
<td></td>
</tr>
</tbody>
</table>

**Treatment:**

- Exercise
- Weight loss
- Low salt diet
- Medications
Pain Assessment

- The 5th Vital Sign!
- Various scales can be used to measure
  - Numeric-rate pain level on scale 1-10
  - Visual-used in pediatrics and non-English speaking patients.
Lab Values

- Myelosuppression is reduction of blood cells produced in the bone marrow due to the disease, radiation or chemotherapy.

- Cells produced in the bone marrow
  - WBCs (Leukocytes)
  - RBCs (Erythrocytes)
  - Platelets (Thrombocytes)
White Blood Cells

- Function: fight infection, aid in repairing damaged cells
- Normal count – 4,000-10,000
- Leukopenia is decreased WBC
Types of WBCs

- neutrophils
- monocytes
- lymphocytes
- eosinophils
- basophils
Red Blood Cells (erythrocytes)

- Carry oxygen from the lungs
- Carry carbon dioxide back to the lungs
- Normally live 120 days
- Contains the protein hemoglobin
- Made from iron, folic acid, vitamin B12
- Made in the bone marrow
RBC’s

- Normal = 4.1-5.1
- Low RBC count is indication of anemia
- Symptoms
  - Fatigue
  - Weakness
  - Dizzy
  - Shortness of breath
  - Pounding headache
  - Tinnitus
Hemoglobin

- Function: carries oxygen on the RBC
- Hgb (abbreviation)
- 12-16 for women
- 14-18 for men
- Broken down in the liver
Hematocrit

- Ratio of the packed red cells to the total blood volume
- Hct (abbreviation)
- 36-47 = women
- 38-54 = men
RBC’s

- Patient teaching for Anemia
  - Rest
  - Conserve energy
  - Move slowly especially with change in position
  - Diet to include foods rich in iron
    - Dark green leafy vegetable
    - Grains
    - Liver
- Treatment
  - Erythropoiesis stimulating agent
  - Blood transfusions
Platelets

- Function: clotting mechanism
- Normal count = 150,000 – 500,000
- < 50,000 is severely low
- Thrombocytopenia: decreased platelets
- Symptoms:
  - Nosebleeds
  - Easy bruising
  - Petechiae
Platelets

- Patient teaching for low platelet count
  - Do not take aspirin
  - Do not floss teeth
  - Use soft tooth brush
  - Shave with electric razor
  - Blow nose gently
  - Be careful of sharp objects
Acute radiation damage is most prominent in tissues with rapidly proliferating cells such as epithelial cells of the skin and GI tract.

Radiation causes direct effects locally to only the area that is being radiated.

Side effects to be discussed include the following:
- Skin reaction
- Esophagitis
- Xerostomia
- Nausea & Vomiting
- Mucositis
- Diarrhea
Radiation Dermatitis

- Skin response to radiation is dependent on the dose of radiation prescribed
- Skin reactions may be acute or late
- Extent of skin reactions are influenced by treatment related factors and patient related factors

- Radiation dermatitis reflects changes in the cellular components of the epidermis, dermis, and vasculature
Patient Related Factors

- Skin folds in the treatment area (ex. axilla, inframammary fold, groin, and perineum)
- Uneven skin distribution in tx field (ex. Breast)
- Poor nutrition
- Co-morbidities
- Advanced age
Radiation Dermatitis

- Radiation factors include:
  - type of energy and beam used
  - fractionation
  - size of the tx field
Radiation Treatment Factors

- Accelerated radiation therapy consisting of multiple treatments per day increases the chance of acute skin reactions

- Skin reactions peak one week earlier in patients receiving radiation tx BID vs Qday
Other treatment related factors

- Concurrent or sequential chemotherapy provides an additive effect resulting in decreased tissue tolerance
- Radiation recall is recurrent skin reaction in the treatment field after treatment is complete
- Radiation dermatitis is “recalled” after receiving chemotherapy
- Antibiotic chemo drugs (ex. Adriamycin) and 5-FU are common triggers
- Radiation recall can occur months to years after radiation is complete
Acute skin effects of radiation

- Erythema
- Hyperpigmentation
- Alopecia
- Moist desquamation
- Dry desquamation
Hyperpigmentation

- Radiation of melanocytes in the skin causes an increased production of melanin
- As a result, hyperpigmentation may occur in the treatment area
- Hyperpigmentation most often fades within 12 months after tx is complete
- Hyperpigmentation may be an acute and/or chronic skin change
Alopecia

- Hair loss within the tx field often occurs within 1 to 2 weeks of treatment
- Temporary and partial hair loss occurs at doses of approximately 30 Gy
- Complete and permanent hair loss can occur at doses 55 Gy and higher
- Hair growth usually resumes 8-9 weeks after completion of radiation tx and continues for approximately 1 year
Management of Erythema and Dry Desquamation

- Tx with topical applications of lotions, ointments or creams
- Avoid products that contain alcohol, menthol, metals or perfume in the active ingredients
- No definitive data showing superiority of topical agents
- No definitive guidelines
- Vary from clinician to clinician
- Ex.) Aloe vera, Aquaphor, Calendula cream
- OTC Hydrocortisone cream may be given if pruritus (itching) is present
- Treatment area must be free of creams/ointments/dressings
Xerostomia

- Occurs when the salivary glands are affected by irradiation
- Presents an increased risk for dental caries, periodontal disease, disturbed oral sensations, and altered taste
- Xerostomia can occur as early as 1 week into radiation tx
- Severity peaks towards the end of tx and continues to be a problem for 9 months or longer after tx is complete
Signs and Symptoms of Xerostomia

- Dry mouth or cotton mouth
- Funny taste in mouth
- Tenderness or pain
- Difficulty placing dentures
- Difficulty speaking
- Increased teeth sensitivity
- Oral cavity appears dry and dull
- Secretions appear thick and ropy
- Cracked lips
- Fissures in mouth
- Bad breath
Mucositis

- Pain
- Ulceration and fissures
- Moderate to patchy erythema
- Confluent patchy yellow membrane may form
- Can cause poor nutritional intake
- Leads to poor oral hygiene
- Predisposes patients to infections
Treatment of Mucositis

- Dental consultation before and after tx
- Good oral hygiene
- Saline rinses, Baking soda rinses
- Magic mouthwash or viscous lidocaine
- Coconut or olive oil
- Soft, bland diet
- Increase oral intake
- Pain control
Nausea and Vomiting

- Nausea can be an acute response to radiation treatment and may occur during actual administration of the radiation treatment to the abdominal area.
- Patients receiving abdominal radiation therapy often are prescribed anti-emetics around the clock.
- Recommend all patients receiving tx to the abdomen to take anti-nausea medication 1 hour prior to radiation treatment.
Diarrhea

- Diarrhea due to enteritis is a common side effect of radiation to the lower abdomen and pelvis
- Diarrhea often occurs after approximately 8 gray and often persists until tx is complete
- Pts report loose stool up to 8-10x day above baseline
- Concurrent chemotherapy often exacerbates radiation induced diarrhea
- Tx includes OTC anti-diarrhea (Imodium) or Rx (Lomotil)
- Sandostatin injections may be used for severe diarrhea causing dehydration and hospitalization