

Caring for Clients With Cancer

CHAPTER 18

Timby, B. & Smith, N. (2007). *Introductory medical-surgical nursing* (10th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.



Pathophysiology

- Oncology
- Cancer develops on the cellular level.
- Abnormal changes in the cell occur for many reasons.
- Abnormal cells do not have the regulatory mechanisms to control growth. As a result, abnormal cell growth proliferates in an uncontrolled and unrestricted way.



Pathophysiology

- Neoplasms: New growth of abnormal tissue
- Benign: Growth that is non-invasive or spreading
- Malignant: Invasive or capable of spreading
- Metastasis: Spread of cancer

Pathophysiology

- Four main tumor Classification
 - Carcinomas-epithelial cells
 - Adenocarcinomas-ductal or glandular epithelium
 - Lymphomas-organs that fight infection
 - Leukemia-organs that form blood
 - Sarcomas-connective tissue

Pathophysiology

- Benign tumors
 - Remain at original site of development
 - Cell resembles the cell of tissue origin
 - Slow growing but potentially large
 - Less profuse blood supply
 - Rarely fatal
 - Edges are smooth, easily defined and movable
 - Usually remain encapsulated

Pathophysiology



- Malignant tumors
 - Likely to spread throughout body unless completely removed before undergoing *metastasis*
 - How?
 - Rapid growing, can be unpredictable
 - Rarely encapsulated
 - Irregular borders and immobile
 - Greater than normal blood supply
 - Cells are difficult to identify as to the tissue origin

Pathophysiology



- Carcinogenesis
 - Initiation-carcinogens
 - Promotion-production of mutant cells
 - Progression-metastasize

Etiology



- Carcinogens
 - Chemical agents
 - Environmental factors
 - Diet
 - Viruses
 - Defective genes
 - Medically prescribed intervention

Etiology



- Immune system
 - The immune system is a major factor in the prevention or development of cancer.

Warning Signals of Cancer

1. Change in bowel or bladder habits
2. Sores that do not heal
3. Unusual bleeding or discharge
4. Thickening or lump in breast or elsewhere
5. Indigestion or difficulty swallowing
6. Obvious change in wart or mole
7. Nagging cough or hoarseness

American Cancer Society 

<http://www.cancer.org/docroot/home/index.asp>

- ACS recommends annual checkups for cancer
- Beginning at the age of 50, both male and female should have these testing schedules
 - Yearly FOBT or FIT
 - Flexible sigmoidoscopy every five years
 - Colonoscopy every 10 years

ACS 

- **Women:**
 - Women should begin cervical screening about 3 years after starting vaginal intercourse or by the age of 21
 - Women should have CBE every 3 years in the 20's & 30's, and every year after the age of 40
 - Monthly BSE should start for women in their 20's
 - Women starting at the age of 40 should have annual mammograms

 **ACS**

- **Men**
- **Prostate**
 - At the age of 50 men should have both a PSA and a digital rectal examination annually
 - Those at risk should start by the age of 45 or 40 for those who have multiple 1st degree relatives with prostate cancer
 - Hormonal or androgen deprivation therapy
 - Men should do monthly testicular exams

http://www.cancer.org/docroot/MED/content/MED_2_1x_Hormonal_Therapy_for_Prostate_Cancer_in_CA.asp



Diagnosis



- **Laboratory testing**
- **Tumor markers**
- **Radiologic testing** – CT, MRI, x-ray, radioisotope studies, US
- **Other**-biopsy, frozen section, endoscopy, cytology

Radiologic and Imaging Tests

- X-rays
- Computed tomography (CT)
- Nuclear Medicine imaging
- Magnetic resonance imaging (MRI)
- Positron Emission Tomography (PET)
- Radioimmunoconjugates
- Ultrasound
- Fluoroscopy



Other Studies



- Biopsy
 - Tissue is examined under a microscope
- Frozen section
 - The tumor or tissue that is surgically removed is quickly frozen and sliced into very thin slices for immediate examination under a microscope
- Endoscopy
 - Fiber optic instrument (optic fiber allowing light to travel)
- Cytology
 - Microscopic view of the cells

Tumor Staging



TNM Classification

- **T**-size of tumor
- **N**-involvement of regional lymph nodes
- **M**-presence of metastasis

Staging of Tumors



- Stage 1
 - Malignant cells are confined to the tissue of origin
- Stage 2
 - Spread of cancer is limited to the local area, usually the lymph nodes
- Stage 3
 - Tumor is larger, probably has invaded surrounding tissue or both
- Stage 4
 - Cancer has metastasized to other parts of the body

Medical Management

- Surgery
 - Curative-primary
 - Debulking
 - Salvage
 - Prophylactic
 - Palliative
 - Reconstructive/Plastic



Medical Management

- External Radiation Therapy
- Internal Radiation Therapy (brachytherapy)
- Sometimes done before surgery to reduce the tumor if tumor is too large



Medical Management

- External Radiation Therapy
 - Regional/area specific
 - Patient / Family teaching

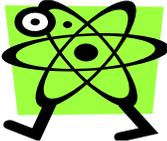


Medical Management

- Internal Radiation Therapy (Brachytherapy)
 - Short distance therapy
 - Most common methods are interstitial implants, intracavitary implants, and systemic therapy
 - May be used alone or in combination with surgery, chemotherapy or external radiation
 - Advantage: delivers higher doses to the tumor site, with less radiation to adjacent tissue

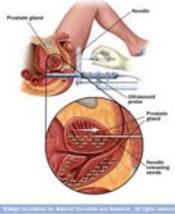
Types of Brachytherapy

- Sealed sources
 - Interstitial and intracavitary implants
- Unsealed source
 - Radiation in a suspension or solution, or radiopharmaceutical therapy



Brachytherapy

- Sealed Sources:
 - Interstitial and intracavitary implants
 - Needles, seeds, wires, and catheters that contain a radioactive source are implanted directly into the tumor
 - When implants are removed, no radiation is left in the body
 - When implants are left in they decay overtime
 - Institutions should have policies and procedures as well as a radiation safety person



Brachytherapy

- Unsealed sources:
 - Radiation is in a suspension or solution or radiopharmaceutical therapy
 - Administered orally, intravenous or into a body cavity
 - Various parts of the body take up enough to treat cancer
 - Has systemic effects and is excreted primarily through the urine

Unsealed sources



To reduce exposure instruct patients to:

1. Wash hands after using BR
2. Flush toilet several times after use
3. Use separate eating utensil and towels
4. Wash laundry separately
5. Drink plenty of fluid
6. Avoid kissing or sexual contact



Safety Measure



- Private room
- Standardized sign on door
- Anyone entering the room must have knowledge of precautions
- No children under the age of 18 or pregnant women
- Limit time and distance from source of radiation
- Notify physician and RSP if sealed source becomes dislodged
- Wear gloves at all times for clients with unsealed sourced
- Specific policies must be in place



Managing Clients Receiving Radiation Therapy

- Adverse affects
- Patient teaching

Radiation-Induced Oral Mucositis, Infection and Treatment
(RT) Radiation therapy

Source: TUGDM
One week post RT Source: TUGDM
Two weeks post RT Source: TUGDM
Three weeks post RT

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Side Effects of Radiation

- Erythema
- Alopecia
- Desquamation (shedding of epidermis)
- Stomatitis (inflammation of mouth)
- Xerostomia (dryness of the mouth)
- Anorexia
- Nausea and Vomiting
- Diarrhea
- Cystitis
- Pneumonitis
- Fatigue
- Myelosuppression (depression of bone marrow function)
 - Anemia (decrease in RBC, hemoglobin or vol. of PRBC)
 - Leukopenia(decreased WBC)
 - Thrombocytopenia (decreased platelets)

Three Safety Principles

- Radioisotope Therapy
 - Time
 - Distance
 - Shielding

Chemotherapy

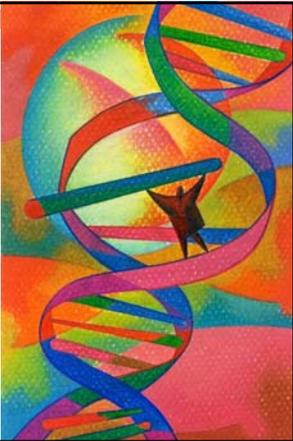


- Use of antineoplastic agents to treat cancer cells locally or systemically.
- May be used alone or with other types of therapy.
- Used to cure cancer, prevent metastasizing, slow growth, destroy tumors cells that have metastasized, and to relieve symptoms.

Antineoplastics

- Interfere with cellular function and reproduction
- Classified according to the relationship to cell division and reproduction.
- Cancer cells, like normal cells follow a cell-cycle pattern.

Phases



- G1 phase-RNA and protein synthesis
- S phase-RNA synthesis is complete, DNA synthesis occurs
- G2 phase-DNA complete, and cell mitosis begins
- M phase-mitosis or cell division takes place
- G0 phase-resting phase

Cell Cycle-Specific Drugs

- Most effective when cell division is occurring
- Used to tx rapidly growing tumors because they attack the cancer cell when they enter a specific phase of cell reproduction
- Administered in multiple repeated doses to produce a greater cell kill and halt the growth of tumor cells

Cell Cycle-Nonspecific Drugs

- Effective during any phase of the cell cycle
- Treat large, slow growing tumors
- Amount of drug is more important than the frequency
- Have a prolonged affect on the cell, causing cell damage and destruction

Routes of Administration

- IV
- PO
- IM
- Intraperitoneally
- Intraarterially
- Intrapleurally
- Topically
- Intrathecally
- Directly in to body cavity



Vascular Devices

- PIC
- PICC
- Hickman Catheters
- Broviac catheters
- IVAC or infusaport



Hickman Catheter



Infusaports



IV Chemo Administration

- Extravasation
 - When fluids (drug) leak into the surrounding tissue
 - Can cause irritation, blistering and necrosis
 - Stop infusion if patient complains of pain or burning
- Vesicants
 - Agent that cause tissue necrosis of underlying tendons, nerves, and blood vessels
 - Can cause sloughing a ulceration of the skin that is so bad it will need skin grafts.



Treatment of Extravasation

- Stop drug
- Leave needle in
- Aspirate residual blood and fluid into tubing or needles
- Inject the neutralizing agent for the specific vesicant
- Apply compresses as dictated by the vesicant

Safety Measures



- Prepare in a designated biologic area
- Use glove when handling
- Wear disposable sleeves when preparing or administering
- Use luer-lok fitting on IV tubing uses in delivering chemotherapy
- Dispose of equipment used in preparation and administration in a designated container
- Dispose of all chemotherapy waste as hazardous materials

Chemotherapy Side Effects

- Nausea/Vomiting
- Myelosuppression
- Alopecia
- Stomatitis/mouth sores
- Fatigue

What do you do for these Side Effects?
Nsg Guidelines 18-2

Myelosuppression

- Inhibition to produce red and white blood cells and platelets.
 - Anemia
 - Leukopenia
 - Neutropenia
 - Thrombocytopenia
 - NADIR - lowest point blood count has been depressed due to chemotherapy

Managing Clients Receiving Chemotherapy

- Nrsng Guidelines 18-2, p. 224
 - Monitor for signs of anaphylactic reactions & toxicity
 - Prevent extravasation
 - Increase fluids
 - Access for bleeding & infection
 - Antiemetics for nausea
 - Dietary modifications
 - Assess oral mucosa
- Client & Family Teaching 18-2
- Box 18-9

Bone Marrow Transplantation (BMT)

- Cancers that are very sensitive to high doses of chemotherapy and radiation may be treated with BMT
- Survival after BMT is approx. 50%
- Three sources of BMT
 - Autologous-client's own
 - Syngeneic-identical twin
 - Allogeneic-compatible unrelated donor

Stem Cell Transplantation

- Obtained from a procedure called peripheral blood stem cell transplant (PBSCT)
- Collected by a process called apheresis
- Stem cells are reinfused after the patient receives ablative chemotherapy and possible radiation therapy

Autologous

- Collect stem cells from the client and store them a frozen state
- Client receive ablative chemo and radiation to eliminate any remain tumor
- The stem cells may also be treated to kill any malignant cells prior to infusion.
- Before bone marrow is established (engraftment) client is at a high risk for infection
- Do not require immunosuppressant therapy

Allogeneic

- Primarily done for those who have bone marrow cancer
- Bone marrow obtained from a compatible donor (same leukocyte antigens)
- Client receive ablative chemo and often has whole body irradiation
- 2-4 weeks for infused transplanted marrow to establish itself and produce blood cells
- Client receives immunosuppressant drugs

Syngeneic

- Client receives the bone marrow from an identical twin
- Same as allogeneic
- May need fewer immunosuppressant drugs

Nursing Management

- Evaluates patient physical condition, nutritional status, blood work, organ function, and past hx of antigen exposure.
- Ablative chemo and radiation will cause nausea, vomiting, diarrhea, stomatitis.
- Before bone marrow starts to produce blood cells, the client has no means of fighting infection.
- At risk for renal problems, liver damage, and bleeding.
- Psychological status

Medical Management

- Immunotherapy
- Hyperthermia
- Photodynamic Therapy
- Gene Therapy
- Complimentary and alternative therapy

Immunotherapy

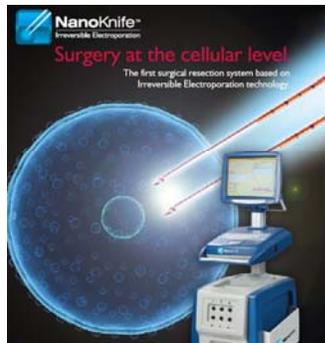
- Uses BRMs to stimulate the natural immune system to restrict and destroy cancer cells.
- Research has discovered that the body's immune system has a process of surveillance, recognition, and attach on foreign cells or cancer cells.

Hyperthermia

- Uses high temperatures ($\uparrow 106.7^{\circ}\text{F}$)
- Methods
- Tumor cells more sensitive to heat
- Combined with other therapies
- Side effects
- Cancer Treatment Kills Tumors by 'Cooking': New Laser Approach Attacks Remote Brain Tumors Once Unreachable With Surgery (ABC News, 2/19/09)
- <http://abcnews.go.com/video/playerIndex?id=6916434>

Irreversible Electroporation

- http://www.baptist-health.com/health_resources/video/detail.asp?id=138
- [NanoKnife at Baptist Health](#) (11/09)



Photodynamic Therapy

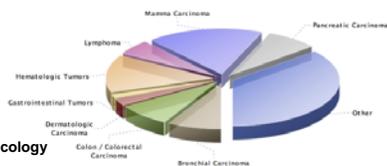
- Photoactive drug is administered IV, and is stored at higher concentration in the malignant tissue
- Several days later laser light is applied to the tumor activates the drug and destroys the tumor with minimal damage to healthy cells.
- Patient will have to protect eyes and skin from high indoor light or sunlight.

Gene Therapy

- Theory that many cancer are a result of defective genes
- Premise it that replacing altered genes with correct genes will inhibit defective genes and introducing substances that destroy genes or cancer cells

Additional Therapies

- Apoptosis - theory that a drug that inhibits the anti-cell-death molecule would facilitate the death of cancer cells
- Clinical trials provide methods to test new treatment for cancer.



Complementary And Alternative Therapy

- Imagery
- Medicinal
- Special diets
- Mystic and spiritual approaches
- Hydrogen peroxide therapy
- Essiac tea



Nursing Management: Pain

- Sources of pain
- Pain management
- Non-pharmacologic measures



Pretence and the definition of pain
<http://witgensteinforum.wordpress.com/2008/07/>

Nursing Management: Fatigue

- Fatigue is often experienced
- Often a side effect of cancer that does not respond to rest.
- Nurses must address issues that contribute to fatigue such as pain, nausea, fear, and lack of adequate support



Nursing Management: Infection

- Factors that predispose a patient to infection:
 1. Impaired skin and mucous membranes
 2. Chemotherapy and radiation therapy
 3. The malignancy
 4. Malnutrition
 5. Medication
 6. Invasive catheters and IV lines
 7. Contaminated equipment
 8. Age
 9. Chronic illness
 10. Prolong hospitalization
- Know S/S of infection



Nursing Management

- Bleeding
- Impaired skin integrity
- Hair loss
- Alteration of body images
- Changes in psychological and mental status
- Grieving



Nursing Management

- Psychological Support
 - The diagnosis of cancer is frightening and overwhelming
 - There is a variety of reaction
 - Patients have the right to know their diagnosis, treatment plan, and prognosis (Patient's Bill of Rights)
 - With adequate information and support psychologically, they will be more likely to accept their diagnosis.
 - Family and significant other support



Nursing Management: Teaching

- Medication, treatment, and procedure
- Adverse effects
- Possible changes in body image
- Resources of support
- Follow up care



Nutrition

- Nutritionally & calorically dense foods
- Small frequent meals
- Low-fat and dry food,
- NPO 1-2 hours before & after chemo
- High protein diet
- Avoid activity before meals
- Encourage high fluid intake to promote excretion of chemo drugs
- Avoid empty calories
- No highly seasoned or acidic foods

For those receiving palliative care do not force feed, weigh, or use nutritional support



Pharmacology



- Monitor for gout
 - Elevated uric acid level, joint pain, edema
 - Allopurinol
 - Increase fluid intake up to 2000ml/day
- Anemia
 - Report fatigue, dyspnea, and orthostatic hypotension
- Infection
 - Avoid crowds, those with colds or flu, and anyone with an infectious disease

Pharmacology

- Antineoplastic drugs are teratogenic
 - Females should not get pregnant
- Stomatitis
 - May need analgesic or topical agents, especially before eating
- Bone marrow depression
 - Observe for fever, sore throat, chills, and bleeding.
- Treat side effects



Nursing Care Plan 18-1

Know the Nursing Care Plan
on pg. 230-231



Terminally ill patient

- Help maintain their dignity
- Provide both physical and emotional support





You can make a difference
