

Define the terms: cancer, neoplasm, benign and malignant

- Cancer = malignant neoplasms
- Neoplasm = abnormal mass with no useful purpose; grows at the expense of the healthy organism; can be benign or malignant
- Benign = harmless unless it is occupying space (such as in the brain) or pressing on a vital structure (such as the superior vena cava)
- Malignant = harmful mass capable of invasion

Discuss the prevalence and incidence of cancer

- 1.4 million new cancer dx in 2007
- Approximately 10 million Americans are living with a history of cancer
- Increased incidence may just mean we are better at identifying it and people are living longer
- Median age of dx is 67 years
- Mortality rates decreased by 1.1% for all cancers from 1999-2002

Identify primary, secondary and tertiary prevention and care for cancer

- Primary = teaching people how to reduce cancer risk through healthy life-style choices
- Secondary = screenings, breast exam, testicular exam, colonoscopy, occult blood
- Tertiary = ongoing surveillance and early detection of secondary malignancies; goal is to reduce resultant disability and restore functionality while preventing recurrence.

State at least two risk factors for lung cancer, breast cancer, colon cancer and prostate cancer

- Lung cancer: **smoking**, occupational hazards (noxious fumes, chemicals, asbestos)
- Breast cancer: **gender**; not having children (or having them after 30), higher lifetime exposure to estrogen and progesterone, recent oral contraceptive use, post-menopausal hormone therapy.
- Colon cancer: **age**, diet (not eating fruits and veggies; eating lots of red meat), IBD, **familial adenomatous polyposis**.
- Prostate cancer: inflammation of prostate; lot of red meat or high-fat dairy products; **age**

Develop a comprehensive concept map/care plan for the adult with cancer

- *Imbalanced nutrition; less than*. Nausea, vomiting, anorexia, stomatitis and taste change are all common side effects of chemotherapy agents. Doxorubicin and Methotrexate cause stomatitis 4-5 days after injection.
 - Stomatitis
 - provide oral hygiene 3-4 x a day and rinse with baking soda
 - suck on ice while chemo drug is being injected
 - N/V prevention
 - antiemetics on a schedule rather than prn
 - encourage light meals (mostly liquid) for 3 days after chemo
 - **Reglan (metoclopramide)** can enhance gastric emptying and reduce bloating
 - Anorexia
 - allow client to make food selections
 - provide high-carb meals and supplements
 - cold foods, shakes and sandwiches are tolerated better than hot or spicy foods
 - small, frequent meals
 - monitor weight daily
 - consider TPN if pt cannot tolerate food for an extended period, but use the client's GI system as long as possible. TPN is a last resort!
- *Ineffective protection/risk for infection r/t neutropenia or leukocytosis*. Outcome = infection will be prevented or treated early as evidenced by ANC > 1000/mm, an absence of fever and no respiratory difficulty
 - Everyone washes their hands!
 - Calculate the ANC: [(neutrophil % + band cell %) x Total WBC] / 100
 - If ANC < 500, then the client should be in protective isolation and on neutropenic precautions:

neutropenic precautions:

- no live plants
- no raw fruits or veggies (banana may be OK b/c of the peel)
- daily bath with antimicrobial soap, meticulous oral hygiene, no tampons for the girls, stool softeners reduce anal fissures, clean the peri area after every poo-poo, no suppositories or rectal temps
- take temp q 4 hours and notify MD if temp > 38 degrees or lower than 36 degrees
- Give antibiotics and monitor for signs of opportunistic infections
- No invasive procedures if possible
- Give **Neupogen** (decreases risk of infection by increasing WBCs in pts who develop neutropenia secondary to chemotherapy)
- Teach pt to avoid crowds, not clean the fish tank or litter box
- *Decreased cardiac output r/t thrombocytopenia secondary to treatment or leukemia*
 - Outcome is no evidence of bleeding and a PLT count of > 20,000
 - Institute bleeding precautions!
 - soft tooth brush, no flossing, no commercial mouthwash containing alcohol
 - no blowing or picking the nose, straining to potty, douching or tampons, using razors.
 - no IMs or subQ injections
 - no rectal suppositories
 - no meds containing aspirin
 - no Foley unless absolutely necessary; if used, go with the smallest size, lube it well and insert gently
 - remove all sharps and pointy items from the environment (even just a sharp edge on furniture)
 - pressure-reducing mattress, turn pt frequently
 - avoid over-inflation of blood pressure cuff; rotate cuff to different sites; avoid prolonged use of tourniquets
 - use only paper tape, no strong-adhesives
 - Monitor pt q 4 for signs of bleeding (ecchymosis, petechiae, epistaxis, enlarged abdominal girth, changes in LOC, increased RR, decreased BP)
 - Check PLT, H&H daily. Report a Hgb < 10 and PLT < 20,000.
- *Fatigue r/t side effects of treatment, low Hgb, pain, disease process, lack of sleep, etc...*
 - Assess for anemia and other causes of fatigue
 - Administer erythropoietin or blood products
 - Consult with PT for strengthening exercises
 - Consult with OT for ways to conserve energy
 - If thrombocytopenic or has fever do not exercise!
- *Body image disturbance r/t alopecia, weight loss or gain, surgery, fatigue*
 - Inform pt about hair loss from the entire body; encourage use of scarves, hat, wigs
 - Explain that hair may be different when it grows again
 - Alopecia may be permanent with whole-brain radiation
 - Allow pt to vent feelings related to surgery (mastectomy for instance)
 - Encourage use of prosthesis if mastectomy
 - Address fatigue through diet, exercise, pacing activities
- *Knowledge deficit r/t therapeutic regimen*
 - Teach about chemotherapy
 - teach the pt about the drugs, how they are given and the side effects
 - teach pt about complications that must be reported (infection, bruising, bleeding, fever, mouth sores)
 - methotrexate and 5-FU do NOT cause hair loss
 - doxorubicin and cyclophosphamide causes complete hair loss in 2-3 weeks :-(
 - Teach about radiation therapy
 - skin care (no lotions, harsh soaps, pat dry)
 - sun protection (wear hats and long sleeves)
 - management of fatigue

- report any evidence of infection (may be neutropenic)
- monitor blood counts on a weekly basis

Distinguish between hodgkins and non-hodgkins lymphoma

Hodgkins	Non-Hodgkins (more common)
enlarged lymph nodes and Reed Sternberg Cells	similar to Hodgkins, no Reed Sternberg cells,
Risk Factors = viral (Epstein Barr), mono, young adults 26-31, more frequent in Jewish	Risk Factors = immunodeficient states, auto immune disorder (SLE, RA), infectious agents, viral cause (Herpes), H. pylori infection
S/S = painless lymphadenopathy (supraclavicular, cervical and mediastinal area), non-productive cough, mediastinal mass on CXR, pericardial effusion, JVD, unexplained weight loss, night sweats, fever of unknown origin	S/S = painless generalized lymphadenopathy, night sweats, fever, weight loss, hepatomegaly, splenomegaly
Tx = chemotherapy combo, 70-80% survival, MOPP	Tx = radiation therapy; chemo when widespread, tumor cannot be resected, risk of undetectable disease is high, tumor resistant to radiation, CHOP
	Misc: aggressive disease, needs high-dose therapy, tougher to treat, 60x more common in pts with AIDS

Correctly identify three signs and symptoms of leukemia

- Severe infections; infections that people don't get if they are otherwise healthy
- Anemia with Hgb down in 7-8 range
 - fatigue, malaise, hypoxia, bleeding
- Increased metabolic rate
- Weakness, pallor, weight loss
- Headache, disorientation
- Enlarged organs (spleen, liver)
- Hyperuricemia (kidney stones would be a manifestation of this)
- Lymphadenopathy that is painless and non-tender
 - Supraclavicular ones are problematic (indicates Hodgkins lymphoma)

Discuss the potential treatments for cancers

- Chemotherapy
 - Requires special, fancy RN to administer; drugs are highly toxic
 - Assessing for complications is super important.
 - Watch for extravasation, check patency of IV
 - Be careful when choosing veins, this patient may not have "good veins"
 - Pt is going to likely be neutropenic and susceptible to infection
 - Take care of the venous access device
 - Combo therapies do slightly different things and allow us to use smaller doses of each drug
 - CHOP is considered first-line therapy for Non-Hodgkins lymphoma
 - MOPP is a combo for Hodgkins lymphoma
- Radiation therapy
 - External radiation is delivered from a source placed at some distance to the target site. Advantages are the skin sparing effect b/c the maximum effect occurs at tumor depth and not on the skin surface. I think the skin is still affected though.

- Internal radiation involves placement of radioisotopes directly into or near the tumor (sealed), or into systemic circulation (unsealed)
 - Unsealed source: Pt needs private room and bath, all body secretions are radioactive. All surfaces in the room must be covered, foods are served on disposable plates. Trash and linens are kept in client's room and not disposed of until discharge. Bed linens are only changed if grossly soiled. Pt must flush toilet several times after use. Visitors have to wear new booties each time to prevent tracking the radioisotopes all over the hospital. If pt vomits you have to cover it with absorbent pads and call the radiation safety offer asap. Talk with the client from the doorway of the room. Pt will be confined to bed more or less and isolated.
 - Sealed source radiation (also called "brachytherapy) involves the substances being kept in place of the area of treatment. This pt requires a private room and bath b/c of risk of dislodgment of the radiation source. A shield, long-handled forces and lead-container called a pig should be in the room at all times...if the radiation source becomes dislodged, use the forceps to pick it up and put it in the "pig" right away. Call the safety person asap. You will also talk to this pt from the doorway and they will also be isolated (visitors and staff kept to a minimum).
 - In prostate therapy the radiation seeds are permanently implanted. This pt needs to wear a condom for the first weeks after the procedure. For the first 2 months after implantation this person should avoid contact of longer than 5 minutes duration with pregnant women and children under the age of 3.
- Radiation destroys a cell's ability to reproduce and also induces apoptosis. Rapidly dividing cells are more vulnerable to radiation than are slowly-dividing cells. The good news is, normal cells have a greater ability to repair sublethal DNA damage from radiation.
- Surgery
 - Surgery can be used to diagnose, treat, prevent, reconstruct or be used for palliative purposes.
- Stem cell transplant/Bone marrow transplant
 - We didn't really go into this, so I'm not going to either. Just know it's an option for treating leukemia, I think.

Explain basic pathophysiology of solid mass cancers such as lung cancer, breast cancer and prostate cancer

- Begins at molecular level
- Cells are transformed and are able to multiply and grow (this may begin with a mutation)
- There is a change from a normal cell to a neoplastic cell. This is a process that occurs over many years.
- The four stages of carcinogenesis are initiation, promotion, malignant conversion and progression.
 - Initiation = Carcinogen damages the DNA. Mutation may or may not lead to cancer.
 - Promotion = More insults lead to further damage to the cell
 - Malignant Conversion = If the insult continues, conversion occurs (lots of mutations)
 - Progression = Cells are increasingly malignant and develop into invasive cancer with metastasis to distant organs or systems.

Explain basic pathophysiology of proliferative cancers such as leukemia, lymphoma and myeloma

- Uncontrolled proliferation of leukocytes: A control factor is missing and there is uncontrolled proliferation of WBCs. They are "out of control" and do not mature. Because they are immature they don't do their job effectively. Normal bone marrow is replaced by these immature leukocytes or blast cells.
- Blast cell proliferation (recall that a blast cell is the precursor to a leukocyte). These guys are not effective in fighting disease. They can, however, take over and replace the effective WBCs and decrease RBCs at the same time. These cells literally crowd out the good cells. "Blast Crisis" is when the pt gets into this stage.
- Massive accumulation of immature nonfunctional cells or blasts leads to pancytopenia (a reduction in ALL cellular elements of the blood).