OCN Review Course

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About the audience...

- When will you take the exam?
  - Now anytime- 3 months post the sign up
- Is anyone in the group, just contemplating taking the test?
- Anyone in here to get CEU’s?
- The goal of the OCN test is to validate that you are a well rounded oncology nurse

Disclosures

- I am on a couple speakers bureaus, but this will not impact anything I teach today
  - Onyx/Amgen
  - Genentech
- It is possible for me to discuss some off label information
- There will be a lot of info and to be efficient with your time, it is likely the breaks are not enough for appropriate adult learning theory

Plan for the day

- Goal of this course is to do snapshot review
  - For those taking it soon- validate what you know
  - For those considering, shows what you need to focus on
- I will question you to see what you know and maybe show you where you need to focus attention
- Stay on track!!
  - This may take some work for me/you
  - With an open question/answer, sometimes time gets away
- Get through all material
- Get done ON TIME!!!!!!!!!!!!
Testing in the US/Canada
February 1 - December 31
(No application deadline date)

ONS/PHCN Member $295
Nonmember $495
ONS/PHCN Member: Age 65+ $215
Nonmember: Age 65+ $305

- Candidates who apply after September 1 may be accommodated or may be accommodated in a later period of their test date.
- Candidates who accept an eliminated text window may have limited choices of test dates and locations.

Related Resources
- ONCC Website
- OCN
- Other
- Do as many as you can
- Core Curriculum: outdated but still recommended by those who take the test
- ONS standards of professional practice
- ONCC practice tests
- Guidelines for practice from ONS
- Other textbooks

Do as many of the free tests as you can!!!
Do both versions of OCN, CBCN, BMTCN, AOCNS

ONS.ORG

Resources to use
- ONCC Website
  - 50 free questions- OCN
  - Other- do as many as you can
- Core Curriculum- outdated but still recommended by those who take the test
- ONS standards of professional practice
- ONCC practice tests
- Guidelines for practice from ONS
- Other textbooks
Books I Know...

These are new editions this year

<table>
<thead>
<tr>
<th>Title</th>
<th>Price</th>
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<tbody>
<tr>
<td>Core Curriculum for Oncology Nursing</td>
<td>$56.05 Amazon</td>
</tr>
<tr>
<td>Core Curriculum for Oncology Nursing Nursing Review</td>
<td>$65-80</td>
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$90.26 Amazon

These books are still relevant...

<table>
<thead>
<tr>
<th>Title</th>
<th>Price</th>
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</thead>
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<tr>
<td>Core Curriculum for Oncology Nursing</td>
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<tr>
<td>Core Curriculum for Oncology Nursing Nursing Review</td>
<td>$35.46 Amazon</td>
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More Books- Not sure of??

This is a reference for practice

Blueprint last updated 2013: Based on role delineation study conducted 2012

- Health promotion/Screening/early detect: 6% of test
- Treatment Modalities: 16% of test
- Scientific basis including research: 9% of test
- Symptom management: 22% of test
  - Including sexuality
- Psychosocial dimensions of care: 8% of test
- Palliative care/End of life: 11% of test
- Survivorship: 8% of test
- Oncologic Emergencies: 12% of test
- Professional Performance: 8% of test

Check out the position papers in oncology


Which of the following about nursing certification is true?

- It validates an RN's qualifications and knowledge for practice in a specific clinical area
- It is a way to guarantee to the public that an RN is able to practice independently
- It is granted by an agency of the federal government
- It confirms that clinical competency has been attained
Health promotion/screening and early detection/scientific basis

- Health Promotion; screening, early detection—6%
  - Epidemiology (e.g., at-risk populations including A. cultures; socioeconomic status; age; occupations)
  - Prevention (e.g., high risk behaviors; preventive health practices)

- Scientific Basis for Practice including Research—9%
  - Carcinogenesis
  - Immunology
  - Genetics
  - Common metastatic sites.
  - Specific cancers (pathophysiology, diagnostic measures, prognosis)
  - Classification (tumors, staging, grading)
  - Research protocols and clinical trials

Cancer Incidence

- 1,685,210 (1,658,370) people will be diagnosed with cancer in 2016
- 595,690 (589,430) will die in 2016

Overall male/female distribution?
List the top cancer incidences
List diseases that are more common in men than women (non gender driven)
List diseases more common in women than men

Cancer Facts & Figures 2014

Leading Sites of New Cancer Cases and Deaths – 2015 Estimates

<table>
<thead>
<tr>
<th>Estimated New Cases</th>
<th>Estimated/Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td><strong>Female</strong></td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>249,900 (29%)</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>113,480 (14%)</td>
</tr>
<tr>
<td>Prostate</td>
<td>29,260 (3%)</td>
</tr>
<tr>
<td>Breast</td>
<td>28,650 (3%)</td>
</tr>
<tr>
<td>Lung &amp; bronchus (22,520, 9%)</td>
<td>23,220 (9%)</td>
</tr>
<tr>
<td>Colon &amp; rectum (21,220, 8%)</td>
<td>21,500 (8%)</td>
</tr>
<tr>
<td>Melanoma of the skin (20,830, 8%)</td>
<td>20,750 (8%)</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma (20,250, 8%)</td>
<td>20,350 (8%)</td>
</tr>
<tr>
<td>Kidney &amp; ureter (20,250, 8%)</td>
<td>20,350 (8%)</td>
</tr>
<tr>
<td>Leukemia</td>
<td>20,000 (8%)</td>
</tr>
<tr>
<td>Uterus</td>
<td>20,000 (8%)</td>
</tr>
<tr>
<td>Liver &amp; intrahepatic bile duct (12,460, 5%)</td>
<td>12,460 (5%)</td>
</tr>
<tr>
<td>Stomach</td>
<td>12,460 (5%)</td>
</tr>
<tr>
<td>Pancreas</td>
<td>10,950 (3%)</td>
</tr>
<tr>
<td>Colon &amp; rectum (10,820, 4%)</td>
<td>10,820 (4%)</td>
</tr>
<tr>
<td>Melanoma of the skin (10,380, 4%)</td>
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What do these terms mean?

- Plasia: this suffix means “formation”
  - anaplasia
  - dysplasia
  - hyperplasia

- Carcinoma
- Sarcoma
- Germ Cell
- Carcinoma in situ

What is the difference between malignant and benign?
**Terminology (con’t)**

- Adenocarcinoma
- Squamous cells
- Differentiation
- Metastasis
- Angiogenesis
- Apoptosis

**Name those targets**

- EGFR
- T Cells
- Antigen Presenting Cells
  - Dendritic Cells
  - Can be used for vaccine therapy
- Cytotoxic Immunity
- Humoral Immunity
- B Cells
  - Used in MAB formation

**Checkpoint inhibitors**

**Epidemiological Indicators**

- **Incidence**: The number of cancers that develop in a population during a defined period (e.g., one year) ACS data
- **Prevalence**: The actual number of cancers that exist in a defined population at a given time #/100,000 people...
- **Mortality**: The number of people who die of a particular cancer during a defined period

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A patient asks a nurse, “How can you claim cancer is not contagious when you keep saying that viruses cause it?” The nurse’s response should be based on knowledge that:

- There is no reliable information that viruses cause cancer in humans
- The viruses that may cause cancer are not communicable
- The virus theory of cancer causation has been superseded by the oncogene theory
- Viruses can initiate cancer but cell transformation requires additional factors
Data Bases and Organizations that Monitor Cancer

- NCI: National Cancer Institute
- ACS: American Cancer Society
- The Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute gathers cancer incidence data from 11 geographic areas, covering approximately 14% of the U.S. population. These population-based data of long duration (1973–present) are a unique and important resource in monitoring stage-related survival.

Cancer Prevention- Can we prevent cancer

- 188,000 of the 595,000 deaths caused by smoking
- 20% of all cancers r/t obesity, poor diet, inactivity and alcohol excess

Give examples of the following:

- Primary Prevention:
- Secondary Prevention:
- Tertiary Prevention:

What type of prevention is the HPV vaccine?

What ethical theory is being enacted when approving the injection that gives the greatest good for the most people? Util

Which of the following statements about bladder cancer is true?

- The age-adjusted rate in African-American men is almost twice that of white men.
- Bladder cancer is one of the most common forms of cancer in the United States.
- Only 10% of bladder cancer is localized at the time of diagnosis.
- The incidence is four times greater in men than in women.

A nurse involved in smoking cessation programs is participating in what type of prevention activity?

Answers

- Secondary
- Tertiary
- Indirect
- Primary

Researchers estimate that if everything known about cancer prevention were applied, which of the following would likely be true?

Answers

- Cancer would be eradicated.
- Few cancers would be affected.
- Childhood cancer incidence rates would decrease dramatically.
- Approximately two thirds of cancers would not occur.
Cancer Risk Terms

- **Relative risk** = probability of getting cancer based on the risks
  - 20 yr women's study
- **Absolute risk** = cancer incidence or mortality
  - Hazard ratio/odds ratio

Risk Terms

- **Attributable risk** = the amount of disease in a population that could be avoided by reducing or eliminating risks
  - if no children ever started smoking, we could decrease lung cancer by??%)
- **Cumulative risk** = the total amount of risk of developing a disease over time
  - 1 in 4 men will develop prostate cancer in their life
  - 1 in 8 women will develop breast cancer

Develop an education plan for the following

- For kids to prevent them from starting to smoke
  - What age should you start?
  - How should you make the plan?
- A program to increase African American access to Mammograms
  - Give me a few objectives for the program
  - How would you target this audience to get buy in?

Education process

- **Pt/family** - ensure 6th grade reading level
- **Community**
  - What education program would you develop to try to impact cancer incidences
- **Staff**
  - You just went to a conference and need to do an inservice “to give back since your travel was paid for”
    - What would you do to ensure the staff got something out of it?

Which of the following actions must be performed first when developing an educational program?

A. Formulate criteria for evaluation
B. Select educational methods
C. Assess learning needs
D. Determine educational objectives

Which of the following statements about transformed (cancerous) cells is true?

- Cancer cells exhibit minimal changes in cell surface antigens.
- Cancer cells nuclei are smaller than that of a normal cell.
- Cancer cells exhibit alterations in growth such as loss of cell-cycle control and reduced apoptosis.
- Cancer cells have contact inhibition.

Rationale:
Cancer cells differ from normal cells in many ways. General properties of transformed cells include cytological changes such as increased size of the nucleus and increased nuclear-to-cytoplasmic ratio; altered cell growth due to loss of cell-cycle control and reduced apoptosis; changes in the cell membrane such as the expression of new surface antigens and cell surface glycoproteins, and loss of contact inhibition (i.e., the ability to stop growing when the cell comes in contact with another cell).
Carcinogenesis is a process in which cancer results from:

- changes in the cell's protein structure that result in malignant transformation.
- multiple genetic alterations that occur over several months through three stages: initiation, promotion, and progression.
- multiple genetic alterations that occur over several years through three stages: initiation, promotion, and progression.
- multiple genetic alterations that simultaneously occur in several target cells.

Rationale:
Carcinogenesis is a process involving genetic alterations resulting in malignant transformation and involving exposure of cellular DNA to carcinogens. Carcinogenesis is believed to occur in three stages: initiation, promotion, and progression. The timeframe for carcinogenesis is years versus months, and occurs in a single initiated cell that undergoes clonal expansion. Protein structure alterations are not involved in carcinogenesis. Cancer cells are often unable to perform designated functions and usually form in an uncontrolled manner.

One mechanism for overexpression of oncogenes is amplification, when the number of copies of a gene increases. A new therapy for breast cancer, trastuzumab, blocks the overexpression of which gene?

Answers
- EGFR
- P53
- RAS
- HER2NEU

Questions you should know
- Which cancers are genetically derived?
- Which cancers are hereditary?
- Which cancers are caused by smoking?
- Which cancer is caused by poor diet?
- Which cancers are caused by alcohol?
- Which cancers are caused by viruses?
- Which drugs are a cancer risk for patients?

The answers are on the next slides in your packet (hidden)- FYI

Carcinogenesis (con’t)

- Environment
  - sun tanning beds:  Melanoma
  - Radon- lung cancer
  - Radiation from the earth/getting scans/ electromagnetic fields:
- Viral
  - HBV/ HCV:  Hepatoma
  - HPV:  Cervical Cancer, rectal and oral cancers
  - EBV:  Burkitt’s Lymphoma
  - HIV:  Lymphoma, Kaposi’s sarcoma
- Iatrogenic
  - Immune Suppression: Multiple types of cancer
  - Hormone replacement- breast
  - Radiation and chemotherapy- blood cancer, bone cancer, lymphoma

Specific Gene mutations/Family syndromes Known
- BRCA 1 and 2:  Breast, ovarian
- Her 2:  Breast, Ovarian, GI
- HNPPC (lynch syndrome): GI, liver, upper urinary, brain, skin, ovary, endometrial
- FAP (APC gene): Colon, desmoid tumors
- Dysplastic Devi:  Melanoma
- von hippel landau:  cancer in fluid filled sacs throughout the body and hemangiomas
- Others …
Information You Should know About Screening

- When should a woman get her first PAP smear?
- When should a man be screened for prostate cancer AND what is the screening?
- What is the screening recommended for colon cancer AND at what age?
- What is the screening for ovarian cancer?
- What is the screening for lung cancer?
- What type of prevention is all of this?

The screening recommendations are on the next slide.

Screening for Cancer

- PAP smears
  - yearly starting at age 18/21 or have been sexually active- may go to q 3 yrs if last 3 have been normal
- Mammogram
  - yearly after age 40
  - monthly SHI age 20, CBE every 3 yrs age 20-39 then yearly
- Colon Cancer Screening
  - >50 FOBT yearly and with flex sig every 5 yrs
  - Colonoscopy q 10yrs
- Prostate
  - Men >50 PSA annually
- Physical exam
  - age 20-39 and asymptomatic check up q 3 yrs
  - >40 yearly exam

Of the classes of chemotherapy, which class has the strongest potential for carcinogenic activity?

- Alkylating agents
- Antibiotics
- Antimetabolites
- Plant Alkaloids

Know drugs in each class as they may ask you the class of drug instead of specific drug.

Blueprint

- Treatment Modalities
  - Surgery
  - Blood and marrow transplant
  - Radiation therapy
  - Chemotherapy
  - Targeted therapies
  - Biotherapy

16% of test

Diagnosis of Cancer

- Breast Cancer
  - How is the disease diagnosed?
  - What are the tumor markers?
  - What treatment modalities are used?
    - What chemo regimens might be used?
- Name tumor markers for:
  - Testicular cancer
  - Liver cancer
  - Colon Cancer
  - Ovarian Cancer
  - Lymphocytic cancers
  - Pancreatic cancer

Resources for breast cancer: Y-Me; Konam, National Breast Ca Coalition; Living beyond Breast Ca; young survivor coalition

The International TNM Staging System

What stage is this cancer?

What stage and what is for this stage?

What stage and when is for this stage?

What stage and what for this stage?

When would you do this?
A diagnosis of invasive breast cancer implies that the tumor:

- Is greater than 1 cm
- Involves at least two regional lymph nodes
- Has penetrated and grown into adjacent tissue
- Has metastasized

What would histology be used for?

Prior to consenting to a modified radical mastectomy, a patient seeks information about breast reconstruction. In counseling the patient, the nurse should be aware that:

- Surgery on the contralateral breast may be necessary to achieve symmetry.
- Reconstruction is contraindicated in women with multicentric breast disease.
- A woman should be free of disease for 2 years before having reconstructive surgery.
- Reconstruction is rarely covered by medical insurance because it is viewed as cosmetic.

What is the sentinel lymph node?

Lymphedema

- Difference in circumference of affected limb of greater than 1.5 cm compared with unaffected limb and related to impaired lymphatic flow

Causes
- Diseases with invasion into lymphatics
  - Lymphoma
  - Breast cancer
  - Melanoma
  - Others
- Scarring from radiation therapy
- Metastatic disease impinging lymph flow
- Prevention of/treatment for...

A patient has undergone a modified radical mastectomy. The most appropriate arm exercise for her to perform on the first day after surgery would be:

- Pendulum swings of the arm
- Full range-of-motion swings of the arm
- Overhead arm raises
- Forearm flexes

A 76 year old female is to begin chemotherapy for breast cancer. Which of the following would provide the most accurate measurement of protein status?

- Serum creatinine
- Serum albumin
- Urine protein
- Serum prealbumin

Prealbumin (not to be confused with albumin) is an important marker for assessing protein deficiency. Prealbumin is produced in the liver, but is not affected by liver function unless function is extremely impaired. Biochemically, prealbumin has the function of transporting thyroid hormones. In addition, prealbumin also binds to retinol-binding protein (RBP), the main transport protein for free vitamin A.

In adults, prealbumin screening has been useful in assessing protein status in AIDS- or cancer-related cachexia, as well as nutritional status in nursing home residents.

During counseling, a patient with breast cancer asks the nurse, “Now that I have finished my chemotherapy, how long do I have to wait to become pregnant?”

The best answer is:

- “No delay is necessary, since pregnancy will not change your prognosis.”
- “You will not be able to get pregnant due to the chemotherapy effects.”
- “You should wait at least a year before becoming pregnant.”
- “Are you aware that pregnancy increases your risk of recurrence?”
Lung Cancer

- Two major different classifications
  - Difference between the two
  - Common metastatic sites
- Symptoms seen in lung cancer and its treatment

Resources: Lungevity; American lung association

A patient has resectable lung cancer. The tumor is 6cm. Lymph node dissection was done revealing hilar nodes involved. PET scan shows disease in the lung, carinal and mediastinal lymph nodes.

- T.N.M.0
- T.N.M.1
- T.N.M.2
- T.N.M.3

What treatments are used in lung cancer? Chemo used?

Lung cancer is more difficult to treat/cure than other cancers for this reason

- Because of the complex anatomy of the lung
- Because there is no early detection for lung cancer
- Because it is more malignant and aggressive than other cancers
- There are no effective treatments for lung cancer.

Dyspnea


Diseases/Treatment/Side effects

- Bladder cancer
  - Treatment used?
  - Common metastatic sites
  - Immediate side effects from treatment vs. late?

- Prostate Cancer
  - Treatments used?
  - Common metastatic site
  - Immediate side effects of the treatment vs. late?

Resources: Man to man; Malecare

A patient with bladder cancer has just had a complete cystectomy with creation of a continent ileal reservoir. Discharge instructions should focus primarily on:

- The catheterization technique
- The external-pouch application
- Fluid-restriction guidelines
- Anticipation of bowel incontinence
A radiotherapy technique in which an applicator, such as an acrylic mold of an area to be irradiated, is placed in or on the patient and then loaded from a safe source with a high-activity radioisotope. The applicator contains grooves for the insertion of nylon tubes into which the radioactive material can be introduced. Remote afterloading is used in the treatment of head, neck, vaginal, and cervical, prostate tumors.

A technique in which an unloaded applicator or needle is placed within a patient at the time of an operative procedure and subsequently loaded with a radioactive source. The loading is done under controlled conditions in which healthcare personnel are protected against radiation exposure.

A patient is scheduled for brachytherapy. When asked what this means, the nurse’s best response to the patient would be that brachytherapy involves the:

- Placement of a radioactive source in or near the tumor site
- Use of a split course of external-beam irradiation aimed at the tumor site
- Instillation of a radioactive substance for purposes of palliation
- Use of both irradiation and chemotherapy for inaccessible tumors

Reproductive System

- Sexuality
  - Issues with intimacy
  - Issues of sexual function
    - male
    - female
    - menopausal changes (lack of estrogen)
  - Fertility
    - Note age and situation of person
    - Offer resources prior to treatment
    - Recommend the ACS booklets
Cancer Treatment

• Melanoma
  – Treatment used?
  – Common sites of spread
  – Side effects to the treatment?
    • Mohs procedure
      is microscopically controlled surgery used to treat common types of melanoma. It is one of the many methods of obtaining complete margin control during removal of a skin cancer lesion - complete circumferential peripheral and deep margin assessment using frozen section histology.

• Cervical Cancer
  – Treatment used?
  – Immediate Side effects to treatment vs. Late?

(65) Which of the following therapies is associated with increased vascular permeability?

• IL-2
• GCSF
• Interferon alfa
• Levamisole

The 2 most difficult to manage side effects of interferon therapy are:

• Fatigue and diarrhea
• Flulike syndrome and headache
• Fatigue and central nervous system (CNS) alterations
• Skin reactions and flulike syndromes

Lymphoma

• 2 different types
  – Treatment used?
  – Common sites of spread
  – Immediate Side effects vs. Late?

• HD has itching 1 year after completion of treatment
• Early stage supravacuolar LN, ed on side effects of radiation?

Leukemia/lymphoma society

Disease/Treatment/Symptoms

• 23 year old with Hodgkin Lymphoma
  – What treatment would you expect?
  – First cycle of ABVD and has a peripheral IV, has a red streak up the vein after the first 10ml of doxorubicin- what is this and what do you do?
  – How likely would this patient be infertile
  – Which cell cycle phase is least responsive to chemotherapy
  – What if this patient relapses?

What do you do if the chemotherapy extravasates?

• Name vesicants
  – Treatment for anthracyclines
  – Treatment for vinca alkaloids

• How is it recommended that Vincristine be given based on a national patient safety standard?
  – You need to make a policy, what organizations help guide your practice?
Your patient is getting doxorubicin/bleomycin/vinblastine/dacarbazine. Which of the following results would necessitate a change in the proposed regimen?

- An LDH of 135
- A multiple gated acquisition of 30%
- A CA 125 of 35
- A Hct of 34%

Your patient is 14 weeks pregnant and in for chemotherapy, what would you expect for her chemotherapy plan?

- Give full dose as she is past the first trimester.
- Decrease the dose as full dose would be dangerous to the unborn child
- She should not get chemotherapy as it is unethical and you should refer this case to the ethics council
- Suggest a therapeutic abortion to save the mother’s life then proceed with planned chemotherapy

Your patient had rectal cancer and had a lower anterior resection, what post op education would you expect?

- Care of the colostomy
- Discussion of the need to monitor bowel movements
  - APR- abdominal peritoneal repair
    - always has a permanent colostomy
  - LAR- lower anterior resection
    - Doesn’t always have a colostomy

Individuals undergoing pelvic radiotherapy for rectal cancer might experience which of the following secondary side effects?

- Hypokalemia
- Hypocalcemia
- Hyperphosphatemia
- Hypermagnesemia
  - What other treatment for GI cancers might cause this?
  - What MAB(s) used for colorectal cancer depletes magnesium?
A patient with an ileostomy has minimal fecal output and states that he has been nauseated. He has also noticed occasional forceful liquid spurts into his appliance. These symptoms are most likely due to:

- Gas
- Diarrhea
- Obstruction
- Constipation

**Disease/Treatment/symptoms**

- Head and neck cancer
  - Treatments used?
  - Symptoms from disease
  - Common sites of metastasis
  - Symptoms from treatment

**Nutrition**

- Enteral Nutrition
  - Complications seen
- Parenteral Nutrition
  - Complications seen
- Refeeding syndrome - what is this??

**Anorexia/Cachexia**

- Causes
  - Cytokines from cancer and cancer treatment
  - Real physiologic mechanism
  - Results in poor outcomes
- How do we measure
  - Protein stores
  - Weight
  - Patient/family report
- Treatment (marinol, dexamethasone, megestrol)

(134) A pt is receiving enteral nutrition therapy. The home-care nurse can most easily determine whether the pt’s caloric and fluid needs are being met by assessing:

- Serial weights
- Intake and output
- Weekly serum glucose levels
- Abdominal girth measurements

Your patient has Medicare only, what does this mean? What is the difference between Medicare and Medicaid?
Mucositis and Xerostomia

• Mucositis- What is this??
  – Causes?
  – Treatment?

• Xerostomia- What is this?
  – Causes
  – Treatment

Ms. J is receiving amifostine and cisplatin (CDDP) for treatment of her head and neck cancer. Amifostine is

• An alkylating chemotherapy agent
• A chemoprotective agent
• Adjuvant chemotherapy
• An alternative/complementary therapy

What two electrolytes are depleted with cisplatin (CDDP)?

The immediate educational priority for the client who has had a total laryngectomy is

• A referral for speech therapy
• A referral to a counselor to help with emotional adaptation
• Appropriate nutritional instruction that addresses adequate wound healing and the functional impact on the client’s ability to swallow
• Appropriate safety measures for life with a stoma

A patient being treated for head and neck cancer has developed severe dysphagia and is aspirating while eating. The nurse should first:

• Consult with the speech therapist to assess and teach swallowing techniques
• consult the surgeon about placement of a gastrostomy tube
• obtain an order to begin total parenteral nutrition
• monitor daily weight and intake

Which of the following conditions is likely to cause long-term alterations in a patient’s sense of taste after radiation therapy for a tumor of the neck?

• Severe mucositis
• decreased saliva production
• proliferation of taste buds
• suppression of tumor by-products

Who should we call in to help us?

A patient undergoes a total laryngectomy for a diagnosis of laryngeal cancer. Postoperative nursing interventions will include:

• providing humidification by a tracheostomy collar.
• preventing aspiration once oral intake is resumed.
• teaching the patient sterile technique for tracheostomy care.
• insisting that the patient perform self-care activities independently.
**Diseases/Treatment/Symptoms**

- Pancreatic Cancer
  - Treatments used
  - Common sites of metastasis
  - Symptoms seen

Resources: PanCan

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**Pancreatic cancer patient in for hook up of 5FU and gets concurrent chemo/radiation**

What is causing this?

Should he continue with treatment?

What ethical principle is this?

- NMF

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**Types of radiation therapy and sources of radiation used**

- **External Beam**
  - IMRT is short for Intensity Modulated Radiation Therapy. It can be changed during treatment to spare more adjoining normal tissue than is spared during conventional beam therapy. IMRT has an extended range of possibilities in radiation due to the use of IMRT, the intensity-modulated radiation therapy is a type of conformal radiation, a high dose radiation beam to closely approximate the shape of the tumor.

- **IGRT**
  - IGRT is the process of frequent two and three-dimensional imaging, during a course of radiation treatment, used for direct radiation therapy, offering the imaging coordinates of the actual radiation treatment plan. The patient is localized in the treatment center in the same position as planned from the reference imaging dataset. An example of IGRT is the IGRT would include localization of an extended field IGRT (XRT) with the planning computed tomography (CT) dataset from planning.

- **Internal (implants)**
  - Brachytherapy
    - Afterloading is the placement of the brachytherapy source. The Remote Afterloader automatically places the radioactive source at predetermined positions within the applicator and stores the source between treatments.
    - Gamma Knife
    - Cyberknife
    - Fractionation

---

**Issues with External Beam Radiation**

Define the terms used in Rad/Onc

- Simulation
- Trismus - treatment?
- Vaginal stenosis - treatment
- Oophoplexi - why done?
- Fraction

---

**At what dose of radiation will there likely be irreversible damage to healthy tissue (i.e. hair; gonads)?**

- 4000mg
- 4000cGy
- 4Gy
- 3500milicuri

---

**Your patient now has liver mets - what can be done??**

- **Radiofrequency ablation**
  - RFA is performed to treat tumors in lung, liver, bone and even (rarely) in other body organs. Once the diagnosis of tumor is confirmed a needle-like RFA probe is placed inside the tumor. The radiofrequency waves passing through the probe increase the temperature which results in destruction of the tumor. Generally, RFA is used in cases where multiple small tumors that start within the organ itself.

- **Cryosurgery**
  - Cryosurgery is a technique for freezing and killing (ablation) tissue. It is used to treat some kinds of cancer and some precancerous, or noncancerous conditions, and can be used both inside the body and on the skin.
  - Cryosurgery is an alternative to surgery, for example, the organ that has not spread, or cancer that has spread to the liver and is not readily accessible by surgery. Cryosurgery can provide cryosurgery for patients with cancer, cardiovascular disease, or diabetes.
  - Cryosurgery may have fewer side effects than other types of treatments, and it is less expensive and improves survival rates

The technique is still under study, and its long-term effectiveness is not known.
Repeated paracentesis for malignant ascites can lead to:

- Severe protein depletion
- Decreased risk of infection
- Fluid overload
- Cardiogenic shock

GI Dysmotility

- Constipation
  - What drugs/treatments/conditions cause constipation?
  - What is the treatment for constipation?
- Diarrhea
  - What drugs/treatments/conditions cause diarrhea?
  - What is the treatment for diarrhea

Mr. Jones is a 48 year old with esophageal cancer who presents for carboplatin/paclitaxel that is being given concurrent with radiation. He sits down in the chair and starts throwing up.

- What could be the cause of the vomiting?
  - There are at least 5 different reasons
- What antiemetics would you expect to be a part of this chemo regimen?
  - What other premeds would you expect?
- You give palonosetron prior to treatment
  - 2 hours later he starts feeling very nauseated, what would you offer based on your knowledge of emetogenic pathways?
  - What might you suggest be added to his next treatment given that he is feeling really sick with each treatment?

Nausea and Vomiting

- Emetic Pathways
  - Vagal afferents - chemical change in upper GI tract
  - Pharyngeal afferents (glossopharyngeal nerve) - excessive coughing resulting in gagging or emesis
  - Midbrain afferent - increased ICP
  - Vestibular system - inner ear leads to motion sickness
  - Chemoreceptor trigger zone (CTZ) - near fourth ventricle of brain
  - Cerebral Cortex (memory center)
  - Neurotransmitters
    - Dopamine
    - 5HT3
    - Prostaglandin
    - Other
    - Bowel obstruction

The physician orders prochlorperazine and droperidol to be given together before chemotherapy. The nurses primary concern should be whether:

- These medications should also be given following chemotherapy
- Both medications should be administered, due to concerns about extrapyramidal symptoms
- Cardiac monitoring should be initiated because these medications can interact to cause arrhythmias
- The cost of the drugs would indicate use of a single agent such as ondansetron

More diseases and treatments

- A patient with Leukemia
  - List difference between leukemias
  - Diagnosed by?
  - Is treated with?
  - The side effects to treatment are?
- Name common treatment modalities for multiple myeloma
  - What are some of the complications associated with multiple myeloma?
Mr. J completed treatment for B-cell NHL 3 wks ago with ibritumomab tiuxetan. He presents to the clinic today with complaints of increasing fatigue, dyspnea on exertion, and increasing bruising. His current symptoms are likely related to:

- Tumor lysis syndrome
- Pulmonary embolism
- Disease progression
- Myelosuppressive effects of therapy

You draw a CBC and note the following:
WBC- 1.8 with 43% neutrophils; H/H 8.5/25; Plt 22,000

- What education would you give this patient regarding his WBC and platelets?
  - What growth factors can be given and timing
- Other than the effects of chemo, what are other causes for anemia in patients with cancer?
  - Recent patient with breast cancer only on herceptin every 3 weeks who is also a vegetarian. Hgb dropping from 10.8.3.
  - What could be the cause?
  - Treatments?

Thrombocytopenia

- Platelet count < 100,000
- Approximately 15% of circulating platelets are consumed in normal daily intravascular coagulation
- Certain medications can alter platelet function (ASA, Ibuprofen, NSAIDS)
- Thrombocytopenia is more common with
  - higher intensive regimens
  - excessive pretreatment
- Increased risk of bleeding with procedures when platelets are < 50,000
- Risk of spontaneous bleeding increases when platelet count 10,000-20,000

Management of Anemia

- Patient education
  - energy conservation
  - adequate nutrition
    - iron, B-12 and folate rich foods
- Prevent anemia or progression of anemia
  - administer growth factor
    - Procrit
    - Epogen
    - Aranesp
  - monitor for response
    - may need to increase dose
    - may need to add iron supplementation

Special Situations with the Neutropenic Patient

- Common pathogens/antimicrobials
  - Bacterial: staph, e-coli, strep, klebsiella
  - Viral: Herpes, CMV
  - Fungal: candida, aspergillus
- Evidenced based preventive measures
  - strict handwashing
  - Vaccinations
  - Antibiotics
  - Growth factors

(45) A patient has a fever of 102, 7 days after receiving 200mg cisplatin, 80mg methotrexate, and 8mg vinblastine. The patient’s lab results are as follows:
WBC-1000; Plt-50K; Neutrophils 15%; Hb 10.3; Hct 31.2%; BUN- 45; creatinine- 2.8

The nurse should anticipate an order for which of the following medication’s

- Interferon alfa
- Monoclonal antibodies
- Granulocyte colony stimulating factor
- Erythropoietin
You have a patient who is admitted and has a paper explaining that they had received Tositumomab, Iodine 131 as an outpatient

• What does this mean?
• Who you gonna call?
• What are the risks?

Radiopharmaceuticals

• Used for lymphoma
  • Y90 (ibritumomab tiuxetan)
  • I131 (Tositumomab, Iodine I 131)
  • Side effects?
• Used for pain control
  • Strontium 89, samarium 153
  • Side effects?

Treatment for compression fractures

• What diseases are at risk for compression fracture?
• Kyphoplasty- balloon/cement
• Vertebroplasty- cement

Changes in mental status in a pt with multiple myeloma most likely are an initial sign of

• Renal insufficiency
• Hypercalcemia
• Hypocalcemia
• Septic Shock

A bit of info about BMT/SCT

• What is an autologous transplant?
  • Diseases treated
What is an allogeneic transplant?
  • Diseases treated
What is GVHD(Graft vs. Host Disease)?
  • Acute- less than 3 months(90-100 days)
  • Chronic beyond 90-100 days
What is the major side effect to BMT?

Which two are sources of Hematopoetic Stem Cells?

• Brain tissue
• Umbilical cord
• Aborted fetus
• Bone marrow

A person who has been exposed to radiation and now has bone marrow failure- needs a stem cell transplant

What ethical principle assures that we do what is needed for this patient?

Ben
Your patient is 90 days post allogeneic stem cell transplant and is complaining of itching in the eyes, what is the best explanation for this symptom?

- Acute GVHD
- Herpes, varcella Zoster
- Cataracts from the TBI
- Chronic GVHD

Target organs of acute GVHD are

- Skin, liver GI tract
- vagina, heart, spleen
- skin, pancreas, brain
- GI tract, eyes, mouth

The purpose of the conditioning regimen in the hematopoietic stem cell transplantation (HSCT) process is to:

- Prevent GVHD
- Eradicate malignant cells and prevent graft rejection
- Reduce the adverse effects of HSCT
- Mobilize HSCT cells from the bone marrow to the peripheral blood

CAM = Complementary and/or Alternative Therapy

- Complementary therapy is?
  - Examples for:
    - Hot flashes
    - Nausea
    - Peripheral neuropathy
    - Immune regeneration
    - Depression
  - Issues/concerns?
- Alternative therapy is?
  - Examples?
  - Issues/concerns?

A client undergoing hormonal therapy with tamoxifen calls and inquires whether the oncologist would recommend any specific nutritional or dietary supplements. The nurse would be most concerned if the client stated:

- “My husband is on a big soy kick and wants us to give up meat and eat tofu instead?”
- “My neighbor says she swears by high-dose vitamin C to prevent colds and suggested I try it this winter.”
- “I read a magazine article about eating fruits and vegetables from various color families and wasn’t sure if what it said was true.”
- “My mother-in-law has a book on macrobiotics and thought I might like to read it.”

A pt with anticipatory nausea cannot tolerate lorazepam. The complimentary therapy that you suggest might be helpful is:

- Massage
- Music therapy
- St Johns Wort
- Relaxation therapy
Define the treatment terms...

- Patient with a large lung lesion wrapped around the aorta receives carboplatin/paclitaxel q3wk x 4 followed by lung resection
- Patient with melanoma who has surgical resection of the tumor on scalp followed by interferon IV/SQ
- Head and neck cancer patient who receives cisplatin/ cetuximab with radiation
  - What is the role of chemotherapy here?

Terms continued

- A patient with breast cancer gets doxorubicin/cyclophosphamide/docitaxel then gets irradiation after the completion.
  - Why is the radiation after the treatment?
- Cyclophosphamide/Doxorubicin given every 2 weeks instead of every 3 weeks as is typical.

Phases of Clinical Trials

<table>
<thead>
<tr>
<th>Phase</th>
<th>Primary Goals</th>
<th>Characteristics</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>Establish MTD &amp; dosing schedule</td>
<td>Relapsed/refractory disease</td>
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<tr>
<td></td>
<td>Evaluate toxicity</td>
<td>Small number of patients</td>
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<tr>
<td></td>
<td>Determine pharmacokinetics</td>
<td>Dose-escalating cohorts</td>
</tr>
<tr>
<td>II</td>
<td>Determine efficacy</td>
<td>Groups of patients</td>
</tr>
<tr>
<td></td>
<td>Evaluate toxicity</td>
<td>Measurable disease to assess response rates</td>
</tr>
<tr>
<td>III</td>
<td>Establish efficacy by assessing survival</td>
<td>Randomization between experimental tx &amp; standard tx &amp;/or control group</td>
</tr>
<tr>
<td></td>
<td>Obtain QOL data</td>
<td>Large number of patients</td>
</tr>
<tr>
<td>IV</td>
<td>Expand “off-label” use</td>
<td>Postmarketing trials of commercially available drugs</td>
</tr>
<tr>
<td></td>
<td>Further assess toxicity data</td>
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</tr>
</tbody>
</table>

As a member of the ethics committee, the nurse applies the principle of autonomy when recommending a course of action based on a desire to:

- Respect the self-command of the patient
- Act in the best interest of the patient
- Do no harm to the patient
- Give what is due to the patient

Research

- What is the nurses role in research?
- One of the NP’s in your practice contacts you and asks you if they should come over and teach the nurses how to draw labs because they keep “messing up the PTT’s” when drawing them from a CVC.
  - Given what you know about the evidence for this issue, what would your response be?
  - If you were concerned about the staff practice, how could you ensure that the staff was actually following the practice?
A cognitively impaired client who is unable to participate in his/her medical decision making can rely on appropriate medical care by having a

- Legal will
- Insurance policy
- Durable power of attorney and advance directive
- Organ and tissue donation

Oncologic Emergencies

12% of test

Emergent conditions related to cancer or the treatment of cancer

- Disseminated Intravascular Coagulation
- Tumor Lysis Syndrome
- Anaphylaxis
- Hypercalcemia of Malignancy
- Syndrome of Inappropriate Antidiuretic Hormone
- Spinal cord Compression
- Superior Vena Cava Syndrome
- Cardiac Tamponade
- Sepsis
- Pulmonary Embolism
- Typhilitis
- Fulminant Hepatic Failure
- Pathologic fractures
- Extravasation
- Others

Oncologic emergencies can happen at any time during the course of an Oncologic diagnosis

As nurses, our overall goals is to:

- Prevent, reverse or minimize life-threatening complication
- Identify patients at risk and assess each interaction
- Educate patients and family members regarding risk and how/when to manage the complications
- Follow the physicians orders only

Your patient with AML has the following lab values: WBC=86,000, H/H=8.6/25.1, Plt=22,000, Cr=1.8, Na=132, K=4.8, Phos=7.2, LDH=954, Uric Acid=9.5

Based on this information, what medication would you expect to be given prior to chemotherapy?

- Ondansetron
- Allopurinol
- Dexamethasone
- Rasburicase

Etiology of TLS

Patients at risk?

Allopurinol and Rasburicase
Which of the following is an electrolyte abnormality associated with TLS?

- Hypokalemia
- Hypercalcemia
- Hyperuricemia
- Hypophosphatemia

What labs might be included in TLS labs?

Ms. Jones has breast cancer. She has been lethargic, complaining of abdominal pain and bloating. Labs were drawn: Creat=1.7, calcium=12.1. What would the initial treatment be to correct this disorder?

- Alendronate
- 1 liter of NS
- Zoledronic acid
- Gallium Nitrate

What lab affects calcium level in the blood chemistry?

What does this patient likely have? Why?

– What other treatment is available?

In a patient with bone metastases, which of the following symptoms should alert the nurse to the presence of hypercalcemia?

- Muscle Cramps
- Edema
- Dyspnea
- Polyuria

A person at risk for developing hypercalcemia should be encouraged to maintain mobility because weight-bearing movement

- Increases resorption of calcium
- Stimulates osteoclastic activity
- Increases urine acidity
- Results in osteoblastic activity*

What lab affects calcium level in the blood chemistry?

Hypercalcemia

- Metabolic disorder that, in cancer, results from bone resorption (is the process by which osteoclasts break down bone and release the minerals, resulting in a transfer of calcium from bone fluid to the blood)
  - tumors may produce PTHrP
  - osteolytic prostaglandins of the E series
  - associated with the existence of osteoclast-activating factors

- Patients at risk?

  - Signs and Symptoms
    - bradycardia
    - lethargy, confusion
    - arrhythmias
    - nausea/vomiting/constipation
    - fatigue, weakness, apathy

What is this?
A patient receiving treatment for lymphoma reports experiencing numbness and tingling in the feet, weakness when ambulating and dribbling of the urine. The nurse should suspect:

- Development of diabetes mellitus
- Peripheral neuropathy
- Development of spinal cord compression
- Production of ectopic hormone

Spinal Cord Compression

- Definition/Pathophysiology
  - Tumor invasion compressing cord
  - Vertebral collapse pinching off spinal cord
- What diseases put patients at risk for spinal cord compression?

Signs and Symptoms of Cord Compression

- Pain
- Motor defects
  - weakness, heaviness, stiffness in extremities
  - ataxia
  - loss of coordination/gait changes
  - paralysis
- Sensory defects
  - decreased sensation
  - paresthesia
  - numbness, tingling
  - bowel and bladder dysfunction
  - sexual dysfunction

Interventions: Cord Compression

- What is the immediate treatment for spinal cord compression?
- What other treatments are needed?
- What other disciplines could be of assistance in the treatment of spinal cord compression?

Syndrome of Inappropriate Antidiuretic Hormone

- Definition/Pathophysiology
  - Paraneoplastic syndrome in which the tumor ectopically produces vasopressin
  - Will exhibit SxS of fluid retention, inability to excrete urine, and dilutional hyponatremia
- Disease(s) most likely to cause SIADH?

SIADH

Figure 1. Effect of Osmolality on a Cell Membrane
SIADH

• Signs and symptoms of the disease (SxS of hyponatremia)
  – Nausea, anorexia
  – Fatigue, weakness
  – Altered mental status (confusion)
  – Muscle cramps

• Lab Values seen
  – decreased sodium
  – decreased serum osmolality
  – increased urine sodium
  – increased urine osmolality

Treatment of SIADH

• What treatment would you expect for someone with SIADH?

(40) A pt with lymphoma was treated with CVP. The patient has had increased shortness of breath and a cough during the past 2 weeks. Her face looks somewhat puffy, and she says that her blouses are too tight around the neck. The most likely explanation of these symptoms is:

• Tumor lysis syndrome
• Lymphangitic pulmonary disease
• Treatment-related cardiotoxicity
• Superior vena cava syndrome

Superior Vena Cava Syndrome

• Definition / Pathophysiology
  – An obstruction of the blood flow returning to the heart from the head, neck, upper thorax and upper extremities
  – Any obstruction of SVC leads to venous congestion, reduced cardiac output, edema of surrounding structures and hypoxia

• Diseases at risk for developing SVC?

Interventions for SVC syndrome

• What is the biggest risk for this syndrome to become an emergency vs. the body compensating?

• What is the treatment for SVC syndrome?

Which of the following blood test results are evident in patients with DIC?

• Increased partial thromboplastin time and increased hemoglobin level
• Increased partial prothrombin and increased prothrombin times
• Decreased platelet count and decreased prothrombin time
• Decreased fibrinogen and decreased fibrin split products levels
**Disseminated Intravascular Coagulation**

- When you think of DIC, what is the first symptom you would expect the patient to be doing?

**Pt’s at highest risk of DIC are those diagnosed with:**

- NHL
- Astrocytoma
- Renal cell carcinoma
- Acute Promyelocytic leukemia

- What labs would you expect to see elevated?
- What labs would you expect to see decreased?

**DIC (Con’t)**

- Assessment
  - Identify those at risk
  - Specific labs
    - D-Dimer > 500mcg/L caused by the formation and breakdown of clots
    - FDP > 40mcg/ml caused by fibrinolyis
    - PT prolonged > 12.5 seconds caused by increase of fibrin split products consumption of vitamin K-depndant factors
    - PTT prolonged > 30 sec caused by consumption of clotting factors
    - Plt decreased due to platelet consumption
    - H/H decreased due to bleeding
    - Fibrinogen decreased < 150mg/dl due to consumption and fibrinogenolysis
    - Antithrombin III decreased < 80% due to consumption of clotting factors

**DIC (Con’t)**

- Medical interventions
  - Treat the underlying disease
  - Heparin
  - Aminocaproic acid
  - Replacement of blood and clotting factors
    - FFP
    - Platelets
    - PRBC
    - Cryoprecipitate
  - Nursing actions
    - Vital signs and temperature
    - Monitor for bleeding/ clotting/ bruising abnormal and uncontrollable

**Complications of Blood Component Therapy**

- Allergic reactions
- Transfusion associated lung injury
- Hemolytic reactions
- Bacterial contamination
- Volume overload
- Hypothermia
- Air embolism
- Transmission of viruses

**Your patient has an A WBC count of 1.2 and 20% neutrophils. She is somewhat lethargic and has a blood pressure of 88/50, her heart rate is 119**

- Is she neutropenic?
  - When does neutropenia occur post chemo?
  - What is the term describing this time frame?
- What could be going on?
- What should be done?
- What are the risks?
- What are the labs/procedures needing to be done?
**Formula for calculating ANC**

1. \[ \text{Segs + Bands} \times \frac{\text{WBC}}{100} = \text{ANC} \]

2. \[ (\% \text{ bands} + \% \text{ segs}) \times \text{WBC} = \text{ANC} \]

**The most common cause of sepsis is:**

- Fungi
- Viruses
- Gm-positive bacteria
- Gm-negative bacteria

**What is the single most important risk factor for the development of sepsis**

- Fever
- Diabetes
- Inadequate nutritional intake
- Duration of granulocytopenia

**Mr. Smith is receiving his 8th cycle of FOLFOX. You started the oxaliplatin 15 minutes ago and now the patient starts turning red and itching all over. What should you do?**

- Slow the infusion, as this is a side effect if the drug is run too fast.
- Give a dose of diphenhydramine as he is having an histamine release from the drug
- Stop the infusion and treat the symptoms prior to resuming the infusion
- Do nothing as this is a minor reaction and will pass.

**Hypersensitivity Reactions**

- List drugs at risk for HSR
- List risk factors that place a patient at risk for HSR
- What drugs do we use to treat the reactions?
- Which drugs have a recommended test dose?
- Which drugs have recommended premedication?
- What is desensitization?

**Cardiac Tamponade**

**What might cause cardiac tamponade?**
Which of the following statements about cardiac tamponade are accurate?

- Results from pericardial effusion
- Most commonly due to lung cancer
- Can be acute onset or develop over time
- Retrosternal chest pain is a symptom
- All of the above

What testing would you expect for someone who has tamponade?

- EKG
- Troponin
- CXR
- ECHO
- All of the above

What treatment would you expect?

Cardiac Toxicity

- Drugs that cause cardiac toxicity?
  - Max cumulative dose of doxorubicin
  - Cardioprotective agent used
- Hyper/hypotension
  - MAB causing hypertension
- Radiation to the chest wall
  - Monitoring post chest wall - risks to vessels
- Other reasons for cardiac complications?

Which statement is not true regarding malignant pleural effusion:

- May be an initial sign of cancer
- An accumulation of fluid in the pericardial space
- May be a sign of advanced disease
- Happens in about 50% of all cancer patients sometime in the course of their disease

Which of the following statements regarding pulmonary emboli is false?

- May be due to air, fat, as well as a clot
- One of the most difficult diagnoses to make
- CXR is not generally diagnostic
- Is often preceded by hypoxia leading to increased anxiety or change in mental status

A nurse is providing discharge instructions to a pt who has developed deep vein thrombosis in the left leg following radical hysterectomy. The pt takes warfarin sodium. Which of the following pt outcomes would indicate a need for additional teaching?

- Using an electric razor for shaving her legs
- Eating a diet low in fiber
- Avoiding eating a diet high in green leafy vegetables
- Avoiding crossing her legs while sitting
When infusing chemotherapy agents through a CVC, you should verify a blood return

- Before the infusion
- Before, during and after the administration
- At the completion of the infusion
- It is not necessary to verify blood return because this is a central line

Quality of life

- Easily interpretable, so be careful!
- End of life/palliation
- Survivorship

Palliative Care

Curative Focus:
Disease-Specific Treatment

Palliative Focus:
Comfort/Supportive Treatments

Bereavement Support

Alopecia

- Which treatments cause alopecia?
- What is the timing for the alopecia to occur?
- When will it likely come back?
- You have a 76 year old male with NHL who will be receiving RCHOP. He wonders about hair loss.
  - Do you think he will care about hair loss?
  - How will you discuss this with him to decrease his concerns about hair loss?
  - He asks you if there is treatment/prevention for the hair loss. He asks you about a cold cap he read something about.
- Refer to ACS for financial assistance with wigs and for Look Good, Feel Better

Sleep Disorder

- List reasons for poor sleep in cancer patients
- What are some interventions that have evidence related to poor sleep in cancer patients
Causes of Cancer Related Fatigue

- Cancer
- Treatment
  - Surgery
  - Radiation
  - Chemotherapy
  - Biologics
- Anemia
- Dehydration
- Affective disorders
  - stress
  - anxiety
  - depression
- Nutritional deficits
- Uncontrolled symptoms
- How long does fatigue last?
- What are evidenced based treatments you would suggest to prevent/treat fatigue

Neurotoxicity

- Central
  - Reasons for?
  - Drugs to cause?
  - Assessment/treatment?
- Peripheral
  - Reasons for?
  - Drug classes that cause
    - Specific drugs
  - Assessment/treatments

Peripheral Neuropathy

- What are the drugs that typically cause
  - What other comorbidities add to the risk
- Injury, inflammation or degeneration of the peripheral nerve fibers
  - Sensory nerves- touch pain, temperature, position and vibration
  - Motor nerves-voluntary movement, muscle tone and coordination
  - Autonomic nerves-involuntary movement

Interventions for Peripheral Neuropathy

- Assessment
  - Terms that identify the pain as peripheral neuropathy vs somatic or visceral pain
  - Stocking drug distribution
- Treatment
  - Antiepileptic (gabapentin/pregabalin)
  - Antidepressant (duloxetine, amitryptiline)
  - Non medication (TENS, PT/OT, capsaisin topical, alpha lipeic acid- herbal)

Pain Management

- List the many reasons patients with cancer have pain?
  - Reasons for acute cancer pain
  - Reasons for chronic cancer pain
- How do we treat pain?
  - Patient has widely metastatic bone pain associated with prostate cancer
  - Patient on fentanyl patch 50mg TID and Morphine 30mg Q 2-3 hours for their rectal pain associated with metastatic rectal cancer. Still ranking pain 10/10
  - Patient with multiple myeloma who has low back pain associated with compression fracture
  - Patient is a known drug abuser and alcoholic who has metastatic pancreatic cancer and ranking abdominal pain 10/10

Pt is receiving 3mg/hr IV Morphine for her pancreatic cancer pain. After 3 days, she is scheduled to go home. You know that 30mg po is equal to 10mg IV Morphine.

The most appropriate discharge rx would be.

- 30mg Q 12
- 60mg Q 12
- 100mg Q 12
- 120mg Q 12

Should she get some breakthrough medication? What should it be/dose?
Which of the following methods of naloxone administration is preferred for a patient who has been receiving opioids on a long-term basis and who begins to experience respiratory depression?

- Single IV bolus
- Single subcutaneous injection
- Continuous subcutaneous infusion
- IV titration

A 51 year old with metastatic disease from colon cancer has a new prescription for MS Contin. What potential side effect also needs to receive prophylactic attention at this time?

- Nausea and vomiting
- Respiratory depression
- Skin rash
- Constipation

A nurse mistakenly administers a long-acting morphine tablet instead of the prescribed long-acting oxycodone. What is the nurse’s next step?

A. Continue to monitor the patient closely for the next 8hrs
B. Hold all further medications for the patient.
C. Notify the patient and physician of the error.
D. Call the risk management department to guide documentation.

Depression/Distress

- Risk Factors
  - Advanced disease and poor prognosis
  - Advanced Age
  - Previous mental health
  - Medications
  - Unrelieved symptoms
- Treatment
  - Supportive interventions
    - Active listening
    - Support groups
  - Psychotherapy
  - Psychopharmacology

Symptoms at the End of Life

- Some already discussed are similar to those experienced during treatment
  - Pain, constipation, fatigue
- Others

Medications at End of Life

- Opioids: combined with sedative, given IVCI, subcu CI, rectal
- Delirium: Haldol
- Sedatives: Lorazepam, haloperidol, alprazolam, diazepam
- Dyspnea: morphine
- Moist respirations: anticholinergics
- Myoclonus: benzodiazepines
An inappropriate coping mechanism/symptom during the first month of grieving would be:

- Crying
- Angry outbursts
- Substance abuse
- Poor appetite

Which of the following is an essential component of hospice care?

- There is provision for disease treatment
- The patient/family is the primary unit of care
- The care team includes nurse only
- Care is completed when the patient dies

Hospice focuses on the person rather than the disease. Hospice addresses not only the physical, but also the emotional, psychological, and spiritual needs of the patient and loved ones. Hospice emphasizes quality rather than quantity of life. Hospice rather focuses on preparation death. The goal is to make each remaining day as rich and positive as possible.

Hospice team is made of professionals and trained volunteers to provide support, education and counseling for the important persons in the life of the dying individual. Hospice supports both the patient and the patient’s family. Since serious illness impacts everyone in the family, hospice answers the family’s needs. See “Family” is whoever a person says he or her family is—whether they are related or not.

Hospice supplements care given by friends and family so that those with terminal illness can live at home—wherever home may be.

Hospice offers grief support to surviving families and friends as well as the entire community.

Survivorship Issues

- Survivor Care Plans
- Long term physical effects to cancer treatment
- Long term emotional effects of cancer
- Insurability
- Employment
- National coalition for cancer survivorship
  - toolbox
  - survivor day

Late Effects of Therapy/Survivorship issues

- Brain tumor patients
- Hodgkin Disease
- Head and neck cancer
- Testicular cancer
- Breast Cancer
- ALL
- Cervical cancer

Late Effects of Therapy/Survivorship issues

- **Brain:** Cognitive impairment, hearing loss, cataracts
- **H&N:** Hypothyroidism, osteonecrosis of mandible, dental caries, skin necrosis
- **Chest Wall/Lung:** Lung fibrosis, arm edema, esophageal stricture, pericarditis, CAD
- **Abdomen/Pelvis:** Colon perforation or obstruction, fistulas, bladder fibrosis, leg or scrotal edema, impotency, infertility, cystitis, vaginal retraction

(127) A young adult who received prophylactic cranial irradiation and intrathecal methotrexate 5 years previously is now at risk for which of the following side effects?

- Cerebral vascular accident
- Memory deficits
- Persistent headaches
- Dental abnormalities

Survivors in the extended or intermediate stage of survival are:

- Finished completely with all medical treatments
- In remission or receiving maintenance therapy
- Considered “cured” of their disease
- Undergoing initial therapy

Quality of life

Review Questions!!!!

A patient receiving dexamethasone during therapy for multiple myeloma is at risk for?

- Insomnia
- Anorexia
- Pruritis
- Decreased mobility

A nurse who works with a client from a different cultural background can promote communication in the therapeutic relationship by:

- Explaining cultural differences to the client
- Minimizing cultural differences
- Incorporating a knowledge of cultural patterns
- Maintaining eye contact
A patient with breast cancer is to undergo adjuvant chemotherapy with cyclophosphamide, doxorubicin, and 5FU. Which of the following statements about hair loss should be incorporated in the teaching plan?

- This drug combination will result in minimal hair loss
- Use of minoxidil 2% solution applied topically prior to each chemotherapy treatment will reduce the risk of hair loss
- The look good feel better program will supply wigs free of charge
- Complete nearly complete hair loss should be anticipated following the initial chemotherapy treatment

A male patient with lung cancer is scheduled to receive 50Gy of radiation to the chest area and is concerned about chest hair loss. The nurse’s response would be:

- “Hair loss only occurs when the head is irradiated”
- With this low dose of 50Gy, hair loss will be temporary, if it occurs at all.”
- “Hair loss may be permanent with radiation over 40Gy.”
- “Hair loss only occurs when you receive chemotherapy in combination with radiation”

A woman experiencing alopecia due to chemotherapy would best be referred to which of the following programs?

- Reach to recovery
- Y-Me
- Look good, feel better
- I can cope

A patient receiving high doses of an opioid to control pain related to metastatic cancer is prescribed dextroamphetamine, most likely to:

- Increase appetite and food intake
- Increase bowel motility and improve elimination
- Decrease secretions and improve breathing ability
- Decrease sedation and enhance pain relief

A patient who had a surgical resection for adenocarcinoma of the lung 2 years ago reports smoking two packs of cigarettes daily. A routine check up reveals recurrent disease. The first nursing priority will most likely be to:

- Provide emotional support because the discovery of recurrence is extremely stressful
- Provide physical support because rapid physical deterioration is expected
- Provide information about palliative care
- Encourage the patient to stop smoking since that is now more important than ever.
A patient experiences shaking chills during the administration of amphotericin B. Which of the following medications will most likely be recommended?

- Lorazepam
- Meperidine
- Diphenhydramine
- Acetaminophen

Which of the following are not signs and symptoms of malignant cerebral edema?

- Headache, nausea and vomiting
- Personality changes
- Speaking in tongues
- Visual disturbances

What can cause increased intracranial pressure in patients with cancer?

Rationale for safe handling

- Local reactions
  - skin and/or eye contamination
- Carcinogenicity
  - ability to cause cancer
- Mutagenicity
  - ability to cause change in DNA
- Teratogenicity
  - causes effect on unborn children
- Long term risks

Which of the following statements about the preparation of antineoplastic agents is true?

- Sterile technique is not required in the preparation of IV antineoplastics because of their lethal effect on tumor cells.
- Intravenous antineoplastics are best prepared and dispensed by the same procedures as any other IV admixture.
- Only specially trained physicians, nurses, and pharmacists should prepare antineoplastics for administration.
- In reconstituting antineoplastics, positive pressure must be used to inject the diluent into the vial.

(54) Which of the following national organizations was created to assist parents and families of children with cancer and adult survivors of childhood cancer?

- Make Today Count
- Road to Recovery
- I Can Cope
- Candlelighters Childhood Cancer Foundation

Resources for patients

- There definitely will be questions about what resources you would refer your patients to...
  - Komen
  - Fertile hope
  - Candlelighters Childhood Cancer Foundation
  - ACS
  - Leukemia/lymphoma
  - Cancer support networks (used to be called Wellness communities)
Which of the following is a voluntary public service organization that would be most likely to provide transportation for a person with cancer who needs daily radiation treatments?

- American Automobile Association
- American Red Cross
- National Hospice Organization
- American Cancer Society

Other Professional Performance
Issues to know

- Legal issues
  - Nursing errors (lack of documentation/medication errors)
  - You don’t have a blood return from your CVC and the doctor tells you “it is OK to give the chemo as I am writing the order for such and take liability for this”
  - You give cisplatin—there was no hydration ordered—the patient goes into renal failure.
- Ethical issues
  - List some typical ethical issues you deal with regarding patient care
  - Know the terms on the next two slides (hidden)
- Patient advocacy
  - National coalition for cancer survivorship
  - American’s with Disability Act

Know the definitions of the terms

- Beneficence: Duty to benefit
  - Situations:
    - Genetic testing
    - Treatment withdrawal/DNR
    - Investigational treatments
    - Undertreatment of pain
- Nonmaleficence: Duty to prevent or remove harm
  - Situations:
    - Genetic testing
    - Treatment withdrawal/DNR
    - Investigational treatments
    - Undertreatment of pain
- Autonomy: Personal freedom
  - Situations:
    - Treatment decisions, Right to refuse
    - Informed consent
  - Issues:
    - Free action
    - Authority
    - Effective deliberation
    - Moral reflection
  - Ethical issues:
    - Treatment decisions, Right to refuse
    - Informed consent
- Paternalism: Decisions made by others based on their own interpretation of what is best for that person
  - Situations:
    - Genetic testing
    - Treatment withdrawal/DNR
    - Investigational treatments
    - Undertreatment of pain
  - Issues:
    - Knowledge “what is in the person’s best interest”
    - Therapeutic privilege
    - Professional responsibility
- Justice: Fairness
  - Situations:
    - Allocation of resources
    - Universality
    - Publicity
    - Finality
- Veracity: Obligation to tell the truth
  - Situations:
    - Informed consent
    - Breathing bad news

A patient who has just completed treatment for cancer wants to return to her job in the aerospace industry. Her employer tells her that she cannot have her job back because she has had cancer. Her employer’s action is violating which of the following?

- The Federal Rehabilitation Act of 1973
- The National Cancer Act of 1971
- Current American Cancer Society guidelines
- Occupational Safety and Health Administration (OSHA) guidelines

(130) Which of the following is an indirect, rather than a direct, cost of cancer care?

- Child care
- Home care
- Medication
- Surgical supplies
Joint Commission accreditation is important to hospitals primarily because:

- Influential physicians practice only in Joint commission accredited facilities
- It is a requirement for reimbursement for services from most third party payors
- It designates a hospital as a comprehensive cancer center
- It guarantees quality nursing care to healthcare consumers

Last month study tips

- Go back and review your notes
  - Look at the blueprint and see the sections and where you may need more review (so you don’t have to review all)
- Questions, questions, questions
  - Do as many as you can out of the core curriculum since that is the most likely source/style of tests (you may be surprised, but some questions actually come out of that book)

Other Last Minute Strategies

- TEST QUESTIONS!!!!!!!!!!!!
  - ONS
  - Online review course
    - “bundles” on demand
    - $279+ member
  - Free tests on the ONCC website- do the ones we discussed!!!
  - Online tests for purchase

Test Taking Tips

- Reduce anxiety
  - make a list of what to bring to the test- have out the night before
  - Good rest/eat prior
    - Don’t cram the night before
  - Arrive early
    - Make a dry run to the center to ensure you know where you are going and how much time it takes
    - Check out parking
  - Don’t drink too much fluid/caffeine prior

- During the test
  - Listen to the proctor
  - Look for words such as most, first, initially, immediately, usually
  - Try turning each multiple choice option into a true false statement then mark “T” or “F” after each option
  - When weighing options, look for those that embody good nursing judgement and that enhances communication, respect and acceptance of pt’s feelings
  - Do not change an answer
  - Pace yourself
  - Stay calm
Facts about the test

- Total Oncology Certified Nurses: more than 32,000
- Stats for passing:
  - 165 questions
    - 145 count
    - 20 new/being tested
  - 3 hours
    - 10 minute tutorial
    - 2hr 45min test
    - 5 minute exit survey
- Multiple choice
  - Passing score based on how many correct

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Scoring of the Test...

What score do I need to pass the test?

ONCC tests are scored using a scaled score. A scaled score is not a percentage score; it is a transformation of a raw score (number of items answered correctly) into a different unit of measurement. Two well-known tests administered in the United States that report scores as scaled scores are the ACT and SAT. A scaled score of 55 is the passing score for all ONCC tests. The 55 equates to different raw scores on various forms of the test depending on the difficulty of the form. For more information on passing scores, please visit [http://oncc.org/TakeTest/TestInformation/Scores](http://oncc.org/TakeTest/TestInformation/Scores).

You are Going to Make it!!

- You will get a preliminary score before leaving the test center :)
- Reward yourself for a job well done!

Renewal in 4 years

The end is here!!

- Evaluations
- CEU’s
- Good Luck!!
- Email me any suggestions for future classes, ??, that you passed.
crimkus81@hotmail.com
References


Supplemental


Readings


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<td>Aredia</td>
<td>Bisphosphonate</td>
<td>Pamidronate</td>
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<td>Trisenox</td>
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<td>Elspar, L-Asparaginase</td>
<td>Allergic reaction Coagulopathies Pancreatitis</td>
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<td>All Trans Retinoic Acid (ATRA)</td>
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<td>Avastin</td>
<td>Antiangiogenesis</td>
<td>Bevacizumab</td>
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<td>Azacitidine or 5-Azacitidine</td>
<td>Hypomethylating Agent</td>
<td>Vidaza</td>
<td>In SQ form- skin reaction (2 shots), can be given IV or SQ, don’t hold dose for low bld ct</td>
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<td>Bevacizumab</td>
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<td>Bexxar</td>
<td>Congruated Monoclonal Antibody</td>
<td>Tostumomab I131</td>
<td>Secondary MDS/AML Severe myelosuppression Need to take something to protect the thyroid (SSKI, Lugols solution or potassium iodide) Special precautions for radiation exposure to staff/family</td>
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Revised 10-1-2013
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<td>Hycamtn</td>
<td>Topotecan</td>
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<td>Hydrea</td>
<td>Hydroxyruca</td>
<td>Oral, also used for sickle cells</td>
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<tr>
<td>Hydroxyurea</td>
<td>Hydrea</td>
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<td>Idamycin</td>
<td>Antitumor antibiotic</td>
<td>Idarubicin</td>
<td>Cardiac/vesicant, anthracycline</td>
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<tr>
<td>IFEX</td>
<td>Alkylating Agent</td>
<td>Ifosfamide</td>
<td>Cystitis- mesna always, Neurologic (coma, hallucinations)</td>
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<td>Ifosfamide</td>
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<td>Imatinib</td>
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<td>Gleevec</td>
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<td>Roferon</td>
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<td>Ixabepilone</td>
<td>Ixempra</td>
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<td>Ixabepilone</td>
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<td>Jevtana</td>
<td>Cabazitaxel</td>
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<td>MEDICATIONS</td>
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<td>Important information about the drug</td>
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<td>Alpha order</td>
<td>MONOCLONAL ANTIBODY</td>
<td>Ado-trastuzumab</td>
<td>To rebuild mucosa to prevent mucositis</td>
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<tr>
<td></td>
<td>Keratinocyte growth</td>
<td>Palifermin</td>
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<td>Elspar, Asparagine</td>
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<td>TKI</td>
<td>Tykerb</td>
<td>Prolonged QTc</td>
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<td></td>
<td>IMMUNOMODULATOR</td>
<td>Revlimid</td>
<td>Teratogenic, increased risk of blood clots</td>
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<tr>
<td></td>
<td>Not Chemo</td>
<td>Folinic Acid</td>
<td>Synergistic with 5FU and a rescue for high dose methotrexate, Not Chemo</td>
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<td>Cladrabine, 2CDA</td>
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<td>CCNU</td>
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<td>Procarbazine</td>
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<td></td>
<td>Nitrogen Mustard, Mustargen</td>
<td></td>
<td>Infertility, vesicant</td>
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<tr>
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<td>Alkeran</td>
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<td></td>
<td>6MP</td>
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<tr>
<td></td>
<td>Mesnex</td>
<td></td>
<td>Binds to metabolite of ifosphamide and cyclophosphamide</td>
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<td>Methotrexate</td>
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<td>High dose renal toxic and need leucovorin rescue</td>
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<td>Plicamycin</td>
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<td>Mitomycin</td>
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<td>Novantrone</td>
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<td></td>
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<td></td>
<td>Mozobil</td>
<td>Plerixafor</td>
<td>Abd cramping Used to mobilize stem cells for BMT</td>
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<tr>
<td></td>
<td>CXCR4 inhibitor</td>
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<tr>
<td></td>
<td>Abraxane</td>
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<td></td>
<td>Vinorelbine</td>
<td></td>
<td>Vescicant, give through side arm of running IV</td>
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<tr>
<td></td>
<td>Neurakarin</td>
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<td></td>
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<tr>
<td></td>
<td>Growth factor</td>
<td>Pegylated filgrastim, GCSF</td>
<td>24 hours after chemo 1 shot only</td>
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<tr>
<td></td>
<td>Oprelvekin</td>
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<td>Platelet growth factor</td>
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Revised 10-1-2013
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<th>Class of Drug</th>
<th>OTHER NAME</th>
<th>Important information about the drug</th>
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<tbody>
<tr>
<td>Neupogen</td>
<td>Growth factor</td>
<td>G-CSF - Filgrastim</td>
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<td>Nexavar</td>
<td>Multikinase inhibitor</td>
<td>Sorafenib</td>
<td>Rash, long eyelashes</td>
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<td>Nilotinib</td>
<td>TKI</td>
<td>Tasigna</td>
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<td>Nitrogen Mustard</td>
<td>Monoclonal antibody (PD1 inhibitor)</td>
<td>Opdivo</td>
<td>Immune mediated effects</td>
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<td>Nplate</td>
<td>Romiplostim</td>
<td>For ITP to improve platelets</td>
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<td>Mitoxantrone</td>
<td>Cardiac, blue</td>
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<td>Ontak</td>
<td>Denileukin diftitox</td>
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<td>Oncovin</td>
<td>Plant alkaloid</td>
<td>Vincristine</td>
<td>Peripheral neuropathy, Cap at 2mg, Jaw pain</td>
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<td>Monoclonal Antibody</td>
<td>Nivolumab</td>
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<td>Paclitaxel</td>
<td>Taxol</td>
<td>HSR*, premed with H1,H2 and dex, Peripheral neuropathy</td>
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<td>Palifermin</td>
<td>Kepivance</td>
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<td>bisphophonate</td>
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<td>Erythropoietin Alfa</td>
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<td>Provenge</td>
<td>Sipuleucel-T</td>
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<td>Revlimid</td>
<td>Lenalidomide</td>
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<td>Rituximab</td>
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<td>Interferon Alfa</td>
<td>Flu-like symptoms</td>
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<td>Romiplostim</td>
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<td>Provenge</td>
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<td>6-MP</td>
<td>Mercaptopurine, Purinethol</td>
<td>Oral</td>
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<td>Eculizumab</td>
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<td>Temozolamide</td>
<td>Immune suppression – need to be on septra</td>
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<td>Temozolamide</td>
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<td>Temsirolimus</td>
<td>Torisel</td>
<td>Fixed dosing</td>
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<td>Thalidomide</td>
<td>Thalomid</td>
<td>Peripheral neuropathy; constipation; STEPS (for reproductive issues)</td>
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<td>Thioguanine</td>
<td>6-TG</td>
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<td>Thioplex</td>
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<td>Vesenoid, All Trans Retinoic Acid (ATRA)</td>
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<td>Trisenox</td>
<td>Arsenic Trioxide</td>
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<td>Panitumumab</td>
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<td>Velban</td>
<td>Vinblastine</td>
<td>Myelosuppressive Peripheral neuropathy</td>
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<td>Velcade</td>
<td>Bortezomib</td>
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<td>Verinostat</td>
<td>Zolinza</td>
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<tr>
<td>Vesenoid</td>
<td>ATRA, Tretinoin</td>
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<td>Vidaza</td>
<td>5-Azycitabine or Azycitabine</td>
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<tr>
<td>Vinblastine</td>
<td>Plant alkaloid Velban</td>
<td>Peripheral neuropathy</td>
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<tr>
<td>Vincristine</td>
<td>Oncovin</td>
<td>Non myelosuppressive Peripheral neuropathy</td>
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<td>Vinorelbine</td>
<td>Navelbine</td>
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<td>VP-16</td>
<td>Etoposide</td>
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<td>Xeloda</td>
<td>Capecitabine</td>
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<tr>
<td>Zevalin</td>
<td>Y90 Ibritumomab tiuxetan</td>
<td>Same as Bexxar</td>
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<tr>
<td>Zolinza</td>
<td>Verinostat</td>
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<tr>
<td>Zometa</td>
<td>bisphosphonate Zolodrenic acid</td>
<td>Used for breast cancer now to prevent bone mets Renal toxic, osteonecrosis of the jaw</td>
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</tbody>
</table>

*HSR = hypersensitivity reaction*
### Supportive Care Drugs

<table>
<thead>
<tr>
<th>MEDICATIONS</th>
<th>OTHER NAME</th>
<th>Important information about the drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citalopram</td>
<td>Celexa</td>
<td>SSRI; Side Effects <strong>drowsiness</strong>, <strong>insomnia</strong>, <strong>nausea</strong>, weight changes, frequent urination, decreased sex drive, <strong>anorgasmia</strong>, <strong>dry mouth</strong>, increased <strong>sweating</strong>, <strong>trembling</strong>, <strong>diarrhea</strong>, excessive yawning, and <strong>fatigue</strong>. SSRI discontinuation syndrome: has been reported when treatment is stopped. Tapering off citalopram therapy, as opposed to abrupt discontinuation, is recommended in order to diminish the occurrence and severity of discontinuation symptoms.</td>
</tr>
<tr>
<td>Duloxetine</td>
<td>Cymbalta</td>
<td>Serotonin-norepinephrine reuptake inhibitor. Used for peripheral neuropathy as well as antidepressant. Side effects: dry mouth and sexual dysfunction (can also have discontinuation syndrome).</td>
</tr>
<tr>
<td>Metoclopramide</td>
<td>Reglan</td>
<td>Used for nausea as well as to increase gastric motility. Side effects include diarrhea, dystonic reactions.</td>
</tr>
<tr>
<td>Gabapentin</td>
<td>Neurontin</td>
<td>Used for peripheral neuropathy. Side effects: dizziness, drowsiness, and <strong>peripheral edema</strong> (swelling of extremities).</td>
</tr>
<tr>
<td>Pregabalin</td>
<td>Lyrica</td>
<td>Used most commonly for peripheral neuropathy. Side Effects: dizziness, blurry vision, weight gain, sleepiness, trouble concentrating, swelling of your hands and feet, dry mouth, and feeling “high”.</td>
</tr>
<tr>
<td>Amitriptyline</td>
<td>Elavil</td>
<td>Used for peripheral neuropathy and to help with depression. Side Effects: Blurred vision; change in sexual desire or ability; constipation; diarrhea; dizziness; drowsiness; dry mouth; headache; loss of appetite; nausea; tiredness; trouble sleeping; weakness.</td>
</tr>
<tr>
<td>Mirtazapine</td>
<td>Remeron</td>
<td>Antidepressant. Side Effects: somnolence, increase weight gain, increased appetite, dizziness.</td>
</tr>
<tr>
<td>Venlafaxine</td>
<td>Effexor</td>
<td>Used for hot flashes, PN and depression.</td>
</tr>
<tr>
<td>Xgeva</td>
<td>Denusumab</td>
<td>To prevent skeletal fractures; low calcium is a risk.</td>
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