

Managing Treatment Related Side Effects of Blood Cancers

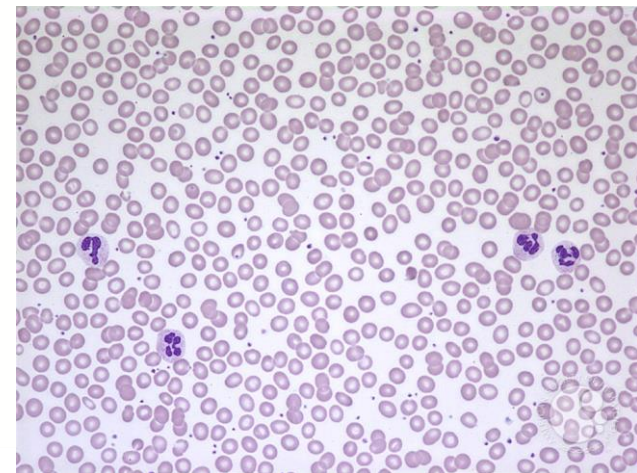
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What are blood cancers?

- Cancers that begin in blood-forming tissue, such as bone marrow, or in cells of the immune system
- These cancers change the way blood cells behave and how well they work
- Three types of blood cells:
 - **White blood cells** fight infection as part of your immune system
 - **Red blood cells** carry oxygen to your organs and body tissues
 - **Platelets** help your blood clot when you are injured



Three major types of blood cancer:

- **Leukemia**
 - Cancer of white blood cells or cells that become white blood cells
 - Leukemia can be either acute (fast-growing) or chronic (slower-growing)
- **Lymphoma**
 - Cancer of the lymphatic system (an important part of the immune system), particularly lymph nodes (small bean-shaped structures of the lymphatic system that filter out harmful substances)
 - Affect a type of white blood cell called lymphocytes
- **Multiple myeloma**
 - Cancer of the plasma cells, which are lymphocytes that make antibodies to protect against infections

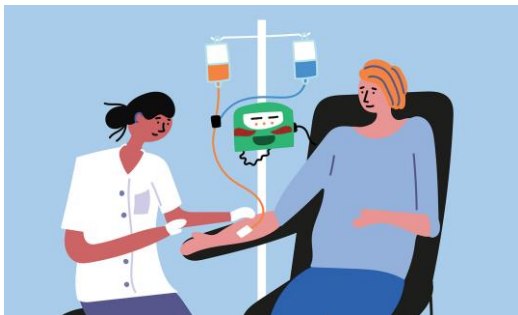
- These cancers cause your bone marrow and lymphatic system to make blood cells that do not work as well as they should
- Blood cancers affect different types of white blood cells, and they act in different ways
- Treatment for blood cancers depends on a lot of different factors:
 - type of blood cancer, extent of disease, symptoms or absence of symptoms, age, co-morbidities, functional status etc.

- Treatment for blood cancers has vastly improved over the past several decades
 - Many types of blood cancers are now highly treatable
 - Goal of treatment (e.g. cure, prolonged survival, palliation) may vary depending on type of cancer, and patient-specific factors
- Treatments for blood cancers come in various forms, and treatment might be with a combination of drugs and/or different treatment modalities



Common treatments for blood cancers:

- **Chemotherapy:** drugs that kill and halt the production of cancer cells
- **Radiation therapy:** uses high-energy x-rays or other beams to damage cancer cells and stop their growth
- **Targeted therapies:** drugs that specifically kill cancer cells (by targeting specific abnormalities present within cancer cells), without harming normal cells



- **Stem cell transplantation:** healthy stem cells can be infused into the body to help resume healthy blood production following therapy to destroy cancer cells
- **Immunotherapy:** uses one's immune system to fight cancer
- **Engineering immune cells to fight cancer:** a specialized treatment called chimeric antigen receptor (CAR)-T cell therapy takes your body's germ-fighting T cells, engineers them to fight cancer and infuses them back into your body

- **Clinical trials:** Clinical trials are investigations to test new cancer treatments and new ways of using existing treatments



- Cancer treatments have the potential to cause side effects
- Treatments are given at high enough levels to treat the cancer, while trying to keep side effects at a minimum
- Remember:
 - Not every person develops side effects
 - Severity of side effects varies from person to person
 - Side effects can be long-term and some might be short-term
 - Side effects can be acute or can even be delayed (occurring well past completion of treatment)



Common Side Effects



- Fatigue
- Hair loss
- Easy bruising and bleeding
- Infection
- Anemia (low red blood cell counts)
- Nausea and vomiting
- Appetite changes
- Constipation
- Diarrhea
- Mouth, tongue, and throat problems such as sores and pain with swallowing
- Peripheral neuropathy or other nerve problems, such as numbness, tingling, and pain
- Skin and nail changes such as dry skin and color change
- Urine and bladder changes and kidney problems
- Weight changes
- Chemo brain (affecting concentration and focus)
- Mood changes
- Changes in libido and sexual function
- Fertility problems

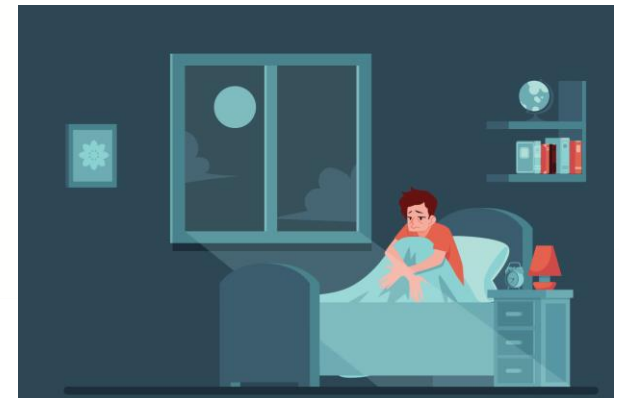
Management of Side Effects

Managing side effects:

- Open communication between patient and care team (physician, nurses, other care providers)
- Consideration for:
 - Dietician/nutritionist
 - Psycho-social oncologist
 - Medical sub-specialists
 - Neurology
 - Cardiology/cardio-oncology
 - Palliative care physician (expert in symptom/pain management)
 - Alternative medicine
 - Yoga, meditation, acupuncture, massage therapy
 - Physical and occupational therapists
 - Physical activity (stay active)



- **Fatigue** is a common problem in cancer patients
- Majority of patients will experience some level of fatigue during their treatment course, and approximately 1/3 will have persistent fatigue for a number of years post-treatment
- Profound affect on patient, and their families
- Fatigue is routinely identified as one of the most distressing symptoms



DEFINITION

- Cancer-related fatigue is defined as a distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and that significantly interferes with usual functioning
- Cancer-related fatigue differs from the fatigue that accompanies everyday life, which is usually temporary and relieved by rest

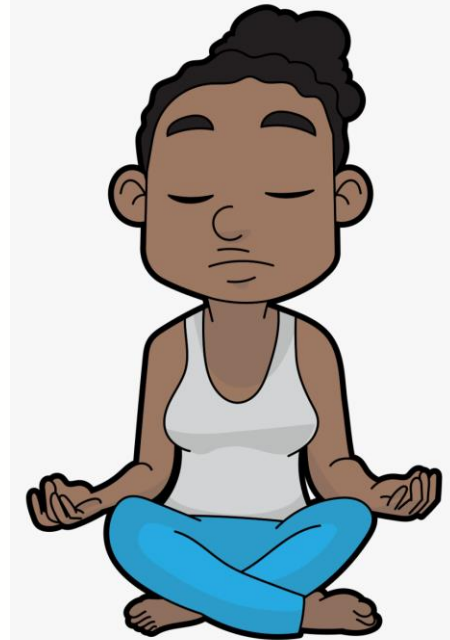
Factors contributing to cancer-related fatigue:

- Cancer therapies
- Progressive tumor growth
- Unrelieved pain
- Anemia
- Metabolic/hormonal/nutritional issues
- Comorbidities
- Medication side effects (e.g. sedation)
- Physical deconditioning
- Depressed mood, emotional distress, and sleep disturbance

- Control of contributory factors
 - Control of physical symptoms
 - Anemia
 - Sleep disturbance
- Nonpharmacologic interventions
 - Cognitive-behavior and psychosocial interventions
 - Planning and organizing
 - Pacing
 - Positioning
 - Prioritizing
 - Meal preparation
 - Childcare
 - Work
 - Leisure
 - Ways to conserve Energy:
 - Bathing and grooming
 - Dressing
 - Housework
 - Shopping

Management of cancer-related fatigue

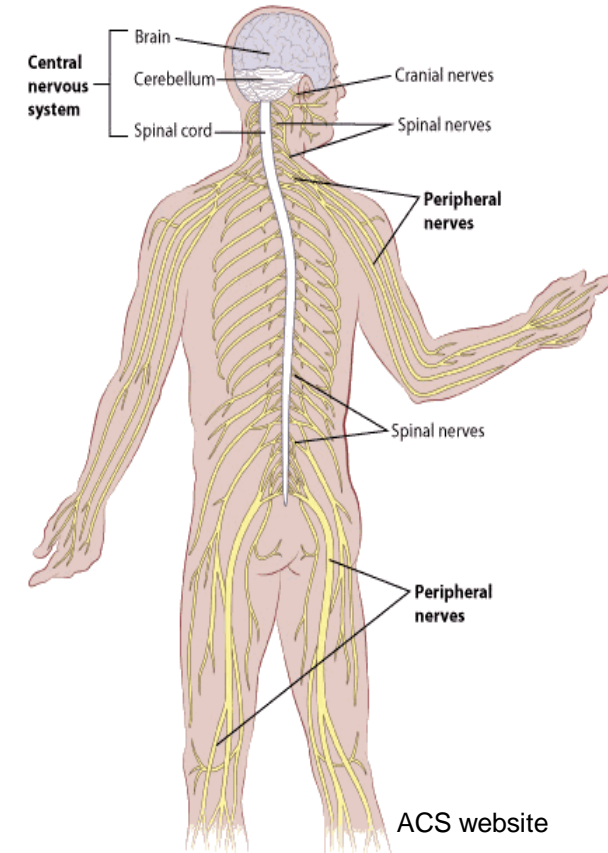
- Exercise
- Body-mind interventions
 - Mindfulness-based approaches
 - Yoga
 - Acupuncture
 - Other



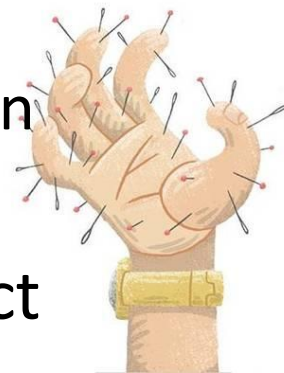
Pharmacologic management

- Psychostimulants and other wakefulness agents
 - Methyphenidate, dexamethyphenidate, modafinil, dextroamphetamine
- Testosterone for hypogonadal men
- For patients receiving opioids, opioid analgesics should be titrated or schedule/agent modified so as to alleviate pain without significantly altered mentation
- Antidepressants
- Glucocorticoids
- Complementary medicine approaches
 - Vitamins
 - Ginseng and guarana

- **Peripheral neuropathy:** set of symptoms caused by damage to the nerves outside the brain and spinal cord. These distant nerves are called peripheral nerves
- Some chemotherapy drugs can damage peripheral nerves and cause symptoms
 - Chemotherapy induced peripheral neuropathy (CIPN)
- However, peripheral neuropathy can be due to other causes
 - Important to know the cause



- Symptoms of CIPN may include:
 - Tingling (“pins and needles” sensation), burning or warm feeling, numbness, weakness, discomfort or pain, impaired ability to feel hot and cold, and/or cramps
 - Can affect ability to do things like walk, write, button your shirt, or pick up coin
- CIPN can affect quality of life and potentially impact treatment
- Incidence varies based on type of chemotherapy agent, dose, duration of exposure, and patient comorbidities
- Symptoms can be short lived, or may persist



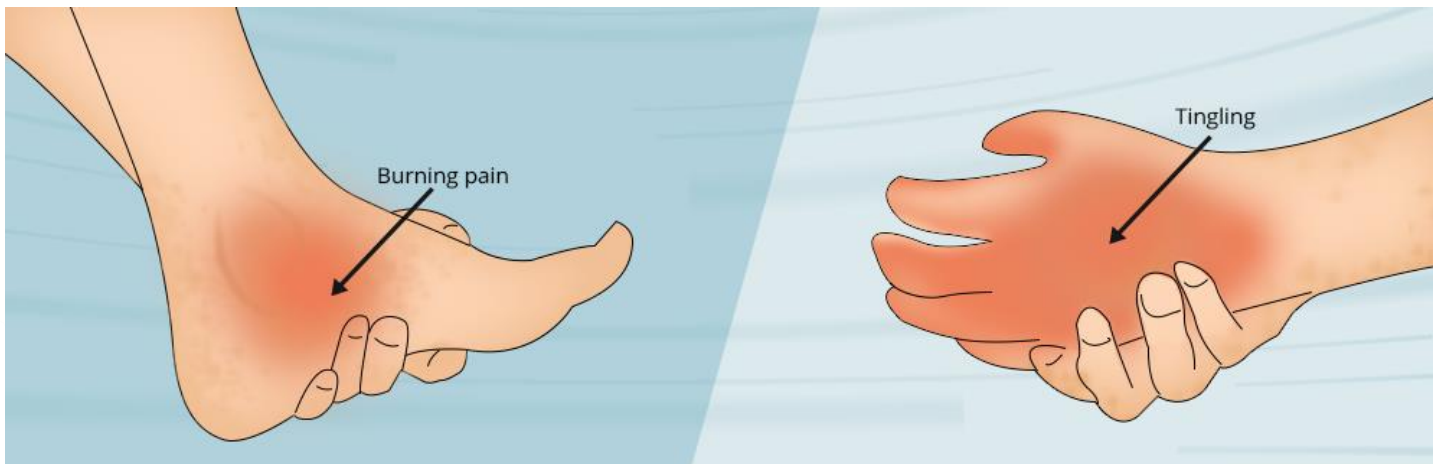
Preventative approaches:

- No established agents can be recommended to prevent CIPN
- Several interventions with potential, but unproven benefit include
 - Cryotherapy, compression therapy, exercise, acupuncture, and others
- Potentially beneficial measures for specific drugs:
 - Vincristine: many protocols recommend “capping” dose (upper limit dose regardless of BSA)
 - Bortezomib: weekly (rather than twice weekly) dosing; subcutaneous (rather than IV) administration

Treatment:

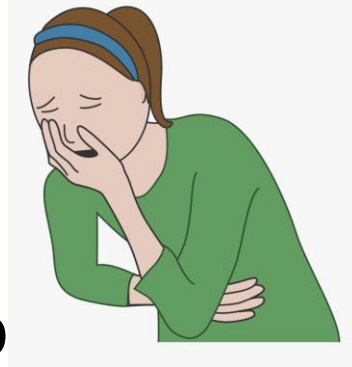
- Adjustments to drug dose, administration or regimen
 - Generally based on severity of symptoms
- Physical therapy/rehabilitation
 - Can help with abnormal gait and/or mobility deficits
 - Enhance postural control and balance (prevent falls)
- Exercise
- Acupuncture

- Medications:
 - Duloxetine (Cymbalta)
 - Tricyclic antidepressants (e.g. nortriptyline, amitriptyline)
 - Gabapentinoids (e.g. gabapentin, pregabalin)
 - Glutamine
 - Topical treatments (e.g. capsaicin)



- Nausea (feeling of being queasy or sick to your stomach) with or without vomiting (throwing up) can be caused by your cancer and/or cancer treatment
- If caused by chemotherapy, symptoms can occur on the day you receive your treatment and can last for three or more days after your chemotherapy
- If you are receiving radiation therapy, symptoms may start within 1 to 2 hours after receiving treatment to your chest, abdomen, or pelvis, and may last for several hours.

- Other causes of nausea and vomiting include intense pain, fatigue, illness, medications, and the stress of coping with cancer
- Feeling nauseous for a long time can affect your appetite and can cause you to lose weight
- If you vomit a lot, you can get dehydrated and have other problems from losing body salts



Prevention!



- To find an effective treatment for nausea and vomiting, it is important to know what is causing the problem
- Prescription medication is often needed to control nausea from chemotherapy and radiation therapy
- Nausea from anxiety and fatigue can often be managed by using physical and mental relaxation techniques or by making a change in your diet

- Effective treatment for nausea may be different for each person
- Assessing emetogenic* potential of chemotherapy regimen and patient/specific risk factors for nausea/vomiting
- Incorporation of preventative anti-nausea medications into chemotherapy treatment
- Use of breakthrough or rescue anti-nausea medications
- Continually reassessing patient for nausea/vomiting and modifying anti-nausea regimen as needed

**Causing nausea and vomiting*

Non-pharmacologic Management:

- Behavioral interventions
 - Relaxation
 - Biofeedback
 - Self-hypnosis
 - Cognitive distraction
 - Guided imagery
 - Acupuncture
 - Systematic desensitization



Some suggestions to consider:

- Eating six to eight small meals a day, instead of three large meals
- Rinse your mouth to help remove bad tastes
- Bland foods and foods served cool or at room temperature may be easier to eat than hot and spicy foods
- Foods that are very sweet, fatty, greasy, or spicy can aggravate nausea
- Create a peaceful eating place, if possible
 - Relaxed atmosphere will help calm you and make eating easier
 - Room should be well ventilated and not smell of strong food or cooking odors

Additional suggestions:

- Sip fruit juices, sports drinks, or flat soda pop throughout the day
- Hard candies, such as peppermints, lemon drops, and root beer barrels, can relieve nausea and get rid of the bad taste in your mouth
- Important to stay hydrated!!



Anti-nausea medication:

- Serotonin receptor antagonists
 - Ondansetron, granisetron, dolasetron, palonosetron
- Corticosteroids
 - Dexamethasone, prednisone
- Substance P/Neurokinin 1 receptor antagonists
 - [Fos]Aprepitant (Emend),
[Fos]Netupitant/palonosetron (Akynzeo), Rolapitant (Varubi)
- Atypical antipsychotics
 - Olanzapine (Zyprexa), haloperidol (Haldol)

Anti-nausea medication continued:

- Benzodiazepines
 - Lorazepam (Ativan)
- Phenothiazines
 - Prochlorperazine (Compazine), promethazine (Phenergan)
- Other
 - Cannabinoids (e.g. Nabilone (Cesamet), dronabinol (Marinol))
 - Metoclopramide (Reglan)
 - Scopolamine Patch

- Diarrhea is often defined as having more than two loose or watery stools per day
- It can be caused by cancer treatments (chemotherapy-related diarrhea)
 - It is often necessary to evaluate for other causes of diarrhea including infectious etiologies
- Uncontrolled diarrhea can lead to weakness, poor appetite, dehydration, and weight loss



- Because you lose fluid with diarrhea, you need to drink plenty of clear liquids throughout the day
 - Easier to tolerate liquids at room temperature
 - Avoid beverages with caffeine
- Eating small meals/snacks throughout the day
- Try to drink at least 1 cup of liquid after each loose bowel movement

- Drink and eat high-sodium foods, such as broths, soups, sports drinks, crackers, and pretzels
- Drink and eat high-potassium foods, such as fruit juices and nectars, potatoes without the skin, and bananas
- This can help replace electrolytes lost through persistent diarrhea
- Eat foods high in pectin, such as applesauce and bananas

Avoid

- Avoid greasy, fried, spicy, or very sweet foods
- Consider limiting milk/milk products; use lactose free products instead
- Avoid drinks and foods that cause gas (carbonated drinks, gas-forming vegetables)
- Limit use of sugar-free gums and candies made with sorbitol

- Consider the use of a bulking agent containing psyllium fiber (e.g. Metamucil)
 - Psyllium fiber helps with diarrhea because it absorbs water, which adds bulk to the stool
- Pharmacologic management:
 - Loperamide
 - Octreotide
 - Tincture of opium

- Constipation refers to being unable to move your bowels, having bowel movements less often than is normal for you, or having to push harder to move your bowels than you have in the past
- Constipation can cause pain and discomfort
- Being less active, eating or drinking less, or taking certain medications can cause constipation
- Keeping your bowel movements regular and easy to pass is important



- Eat at regular times each day
- Drink enough fluids
- If you are at risk for constipation or have constipation, establish a bowel plan to be regular
 - This may include such over-the-counter medications as Senokot, Colace, Metamucil, or any other preparation containing psyllium fiber
- Discuss use of laxatives with your physician

- Cancer and cancer treatments can sometimes cause the throat to become very sore and make it hard to eat and swallow
- Certain chemotherapy agents and radiation therapy to the head, neck, or chest area can make the inside of the throat irritated
- Some patients may even experience heartburn and gastric (acid) reflux

Mucositis:

- Painful inflammation and ulceration of the mucous membranes lining the digestive tract (usually as an adverse effect of chemotherapy and/or radiotherapy treatment)
- Can occur anywhere along the gastrointestinal (GI) tract, but **oral mucositis** refers to the particular inflammation and ulceration that occurs in the mouth

Prevention of mucositis

- Cryotherapy: chewing ice/popsicles during chemotherapy

Treatment of mucositis

- Treatment is largely supportive
 - Pain management
 - Oral hygiene
 - Magic mouthwash (diphenhydramine, hydrocortisone, nystatin, lidocaine)



- Eating foods that are bland, semi-solid or soft, and easy to swallow
 - Cream soups, cheeses, mashed potatoes, yogurt, eggs, custards, puddings, cooked cereals, ice cream, casseroles, gravies, shakes, and smoothies
- Make smoothies with soothing fruits (e.g. melons, bananas, peaches, kiwi fruit). Add yogurt, milk, ice cream, or silken tofu for extra protein
- Take your time while you eat. Chew and swallow foods carefully and allow ample time between bites

- Choose lukewarm or cool foods that are soothing. Very cold foods or very hot foods can cause distress
- Several small meals a day are easier to eat and digest than three large meals
 - Space meals around 2 to 3 hours apart to get the most comfort
- Remember to stop eating 2 to 3 hours before bed and to sleep with your head elevated if gastric reflux and heartburn are problems

- Your physician might prescribe medications that can numb and soothe your mouth or throat
 - Magic mouthwash (diphenhydramine, hydrocortisone, nystatin, lidocaine)
 - Pain medication
- Nutritional supplements, such as liquid meal replacements, may be helpful during this time

AVOID

- Tart, acidic, or salty beverages and foods can be irritating
- Avoid coarse or rough textured foods
 - Blend or moisten foods that are dry and solid
- Avoid commercial mouthwashes, alcoholic and acidic beverages, and tobacco
 - These can dry and irritate your mouth
- Avoid strong spices

- Changes in taste and smell are commonly experienced by patients receiving cancer therapy
- Common types of taste changes include:
 - Decreased ability to taste foods or loss of taste
 - Altered taste or food not tasting the same as it used to
 - For example, sweet, bitter, and salty tastes can seem very different
 - May experience a metallic taste in the mouth

- Taste and smell are closely related, so patients receiving cancer treatment may also experience changes in their sense of smell
- Usually, the sense of smell becomes more sensitive, particularly to odors that are unpleasant, such as body odors or hospital smells
- Changes in the senses of taste and smell can lead to food dislikes/aversions, decreased intake of food and weight loss

- Making sure that you are able to eat properly and maintain weight during cancer treatment is essential
- Being aware of issues with food intake/nutrition is important
- You should let your doctor or nurse know about:
 - Changes in your sense of smell or taste that prevent you from being able to maintain your intake of food or fluids
 - Symptoms such as nausea or vomiting that interfere with your ability to keep food or fluids down
 - Unintentional weight loss

- If foods taste good, eat them
- If foods no longer taste right, avoid them
- Eliminate odors that may affect taste
 - Using a kitchen fan when cooking, using an outdoor barbeque grill to cook, using boiling bags, covered pots or microwave ovens
- Cold foods are usually associated with fewer odors than warm or hot foods
 - Try deviled eggs, chicken, egg salad, ice cream, milk shakes, puddings, custard and cheese

- If a metallic taste is present, try smooth, blended foods
- Chewing gum or sucking on hard candy can be helpful in minimizing a metallic taste
- Foods that are spicy with a rough texture should be avoided
- Chew food well and take fluid in the mouth with each bite
 - This can help food get down to the taste buds

- Sometimes red meats no longer taste good; use other sources of protein (e.g. poultry, fish, eggs, peanut butter, cooked dried beans, peas, dairy products)
- Marinate meat, chicken or fish in sweet fruit juice, wine, salad dressing or barbeque sauce to help improve the taste
- Use herbs and spices such as oregano, rosemary, tarragon and lemon juice to enhance the taste of foods. Aromatic herbs may enhance flavor recognition.

- Try new and attractively prepared foods to help make the meal more appetizing
- Sugar can be used to tone down salty foods
- The flavor of starchy foods, such as rice or pasta, may be improved if they are not prepared with butter or margarine
- Tart foods such as orange juice, pickles, lemonade, vinegar, and lemon juice may be helpful in improving flavor

- Decreased appetite can lead to less food intake, weight loss, poor nutrition, and loss of muscle and strength
- This is common in cancer patients and can happen because of the side effects of cancer treatment
 - Treatments often cause side effects such as nausea or changes in the skin inside your mouth
- Sometimes changes in appetite can also be related to the cancer itself; cancers cause changes in appetite and metabolism
- These problems can interfere with the ability to eat normally

Prevention

- Be aware of any changes in your eating habits or weight from the time of diagnosis
- Be sure to consume enough calories and maintain your weight so that you feel your best during cancer treatment
 - Preventing weight loss and muscle wasting are important goals that can help you remain active
 - Many people might require education about what constitutes a healthy diet or assistance from dietician

- Small meals are more manageable (avoid large meals)
- Select calorie dense foods
- Make sure your diet contains foods that are good sources of proteins, carbohydrates and fats
- Mild exercise (10-20 minutes daily) helps stimulate appetite
- Additional support via certified dietician
- Pharmacologic interventions
 - Megestrol acetate, glucocorticoids

- **Neutropenia** is a low white blood cell count
 - Neutrophils are a type of white blood cell that helps the body fight infection
- People with neutropenia have a low number of these white blood cells, so it might be harder for their bodies to fight infection
- Neutropenia can be caused by certain cancer treatments, or it can be caused by cancer itself (cancer may cause a decrease in the body's ability to form normal new neutrophils)
- Risk of infection increases based on absolute neutrophil count (ANC)

- When you have a low neutrophil count, it is very important to protect yourself against infection
- It is also important to call your doctor as soon as you feel you may be getting an infection
 - May not have typical warning signs of infection when neutrophil count is low
 - Check temperature regularly
 - Some medications may cover up a fever
 - Symptoms: fever, chills, new cough, congestion, sore throat, new skin changes/rashes, slow wound healing, burning with urination, diarrhea, tenderness at catheter site

- Ways to protect against infection:
 - Hand washing
 - Limit visitors
 - Limit exposure to crowds
 - Safe food preparation and storage
 - Preventative Care
 - Oral hygiene
 - Skin care
 - Lungs
 - Bladder
 - Rectal area

- **Infection** is the process by which germs enter a susceptible site in the body and multiply, resulting in disease
- Infection is a common problem in persons with cancer
- People with cancer are at increased risk of infection due to:
 - Underlying disease and side effects of treatment which effects or interferes with the body's normal defense against infection
- Significant concern with infection in setting of neutropenia

Notify your medical team if:

- Temperature (101⁰F or sustained temp of 100.5⁰F or higher over an hour)
- Chills
- New or persistent cough, nasal congestion, sinus drainage, sore throat, or ear pain/discomfort
- A toothache, white patches or ulcers in the mouth, inflamed areas or soreness in the mouth or throat
- Increasing fatigue and weakness
- Flushed appearance of the skin or excessive sweating
- A new rash or sore, or any redness or tenderness of the skin

- Slow healing of a wound or incision
- Burning or urgency with urination
- Redness, tearing, or draining of your eyes
- Diarrhea
- Difficulty waking up
- Redness, drainage, swelling, or tenderness in the area of wounds or piercings
- If you have a central venous catheter, redness, drainage, swelling, or tenderness along the tunnel or at the exit site
- Swelling of the face, neck, or arm where the catheter is located

- Certain medications may be given after each cycle of chemotherapy to prevent your white blood cells from falling too low and/or for too long
 - e.g. filgrastim (Neupogen[®]), peg-filgrastim (Neulasta[®]), sargramostim (Leukine[®])
- Antimicrobial medications may be prescribed to prevent specific infections that are common when the immune system is suppressed by chemotherapy and/or other medications
 - e.g. sulfamethoxazole –trimethoprim, acyclovir[®], fluconazole[®]
- Other antibiotics or antimicrobials are used to treat specific types of infection as needed

- There are many different types of blood cancers
- Need for treatment and/or recommended treatment varies widely and depends on many different factors
- Cancer treatments have the potential to cause side effects; however, there might be other reasons for symptoms
- Regular and frequent communication with your medical team is recommended to address (and re-address) symptoms you might be experiencing

QUESTIONS ?