




# The side effects of cancer treatment and their management

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# Cancer Treatments

- Chemotherapy/Biotherapy
  - Radiation
  - Surgery
- 




# Chemotherapy/Biotherapy





# Normal Cell with Highest turnover rates

- Bone marrow
  - GI tract (mouth to anus)
  - Hair Follicles
  - Reproductive Organs
- 

A stethoscope is positioned in the upper left corner, resting on a stack of colorful medical charts. The charts have various colored tabs (red, yellow, green, blue) with some text and symbols. The background is a soft, out-of-focus image of a desk with a stethoscope and charts, creating a medical atmosphere.

# Systemic Side Effects

- Myelosuppression
- Gastrointestinal and Mucosal
- Anorexia
- Skin and Nail
- Alopecia
- Fatigue
- Sexuality
- Reproductive Alterations

# Myelosuppression



Neutrophils



Eosinophils



Basophils



Lymphocytes



Monocytes



Platelets



Erythrocytes



# Circulating Blood Cells Life Span

Blood Cell	Life Span
Erythrocytes (RBC responsible for oxygen transport)	90 – 120 days
Platelets (Assist with clotting)	7 – 8 days
Neutrophils Eosinophil Basophil/Mast cell Monocyte/Macrophage B Lymphocyte T Lymphocyte  (WBC fight infection with neutrophils being the 1 <sup>st</sup> line of defense )	7 – 12 hours 3 – 8 hours 7 – 12 hours 3 days Type dependent Type dependent

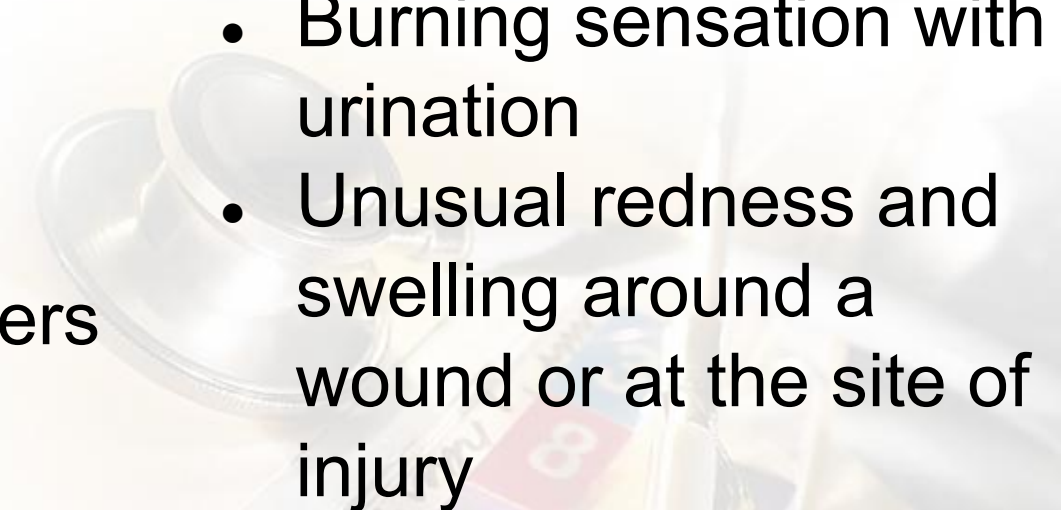
# Neutropenia







# Neutropenia Signs & Symptoms

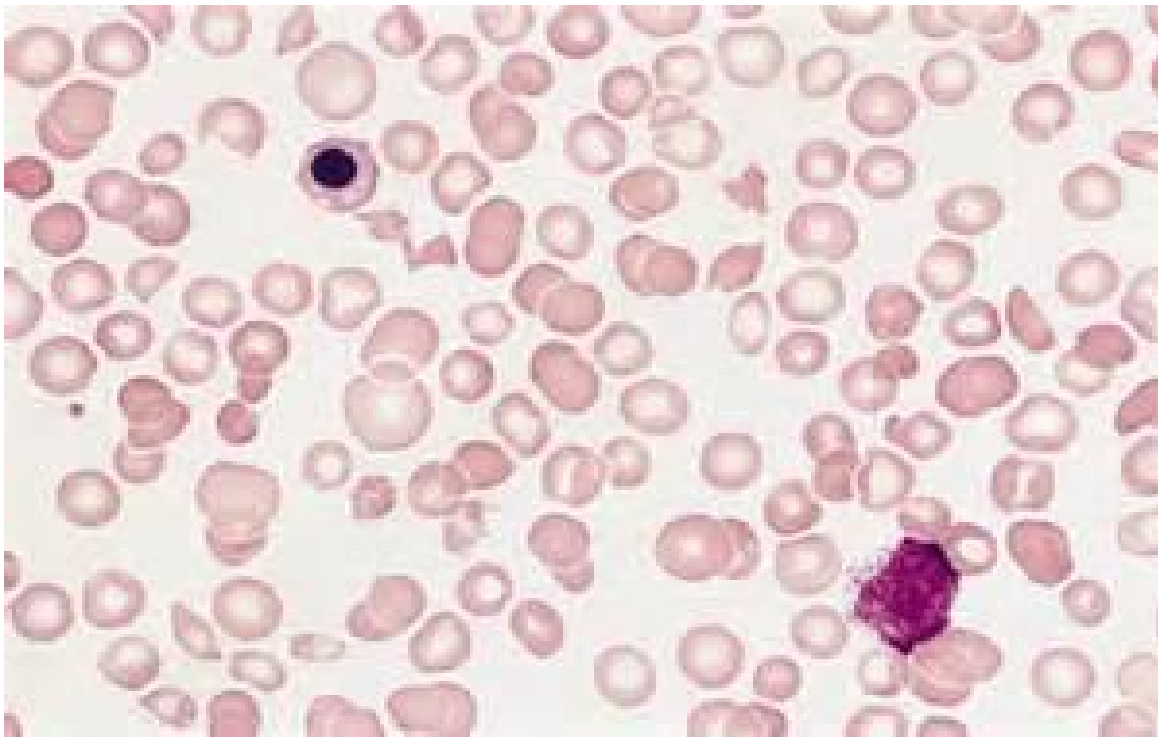
- Frequent infections
  - Unexpected fever  
    > (38° C)
  - Chills
  - Sore throat
  - Ear pain
  - Mouth and anal ulcers
  - Enlarged lymph nodes
    - Stiff or sore neck
  - Diarrhea
  - Burning sensation with urination
  - Unusual redness and swelling around a wound or at the site of injury
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# Neutropenia Management

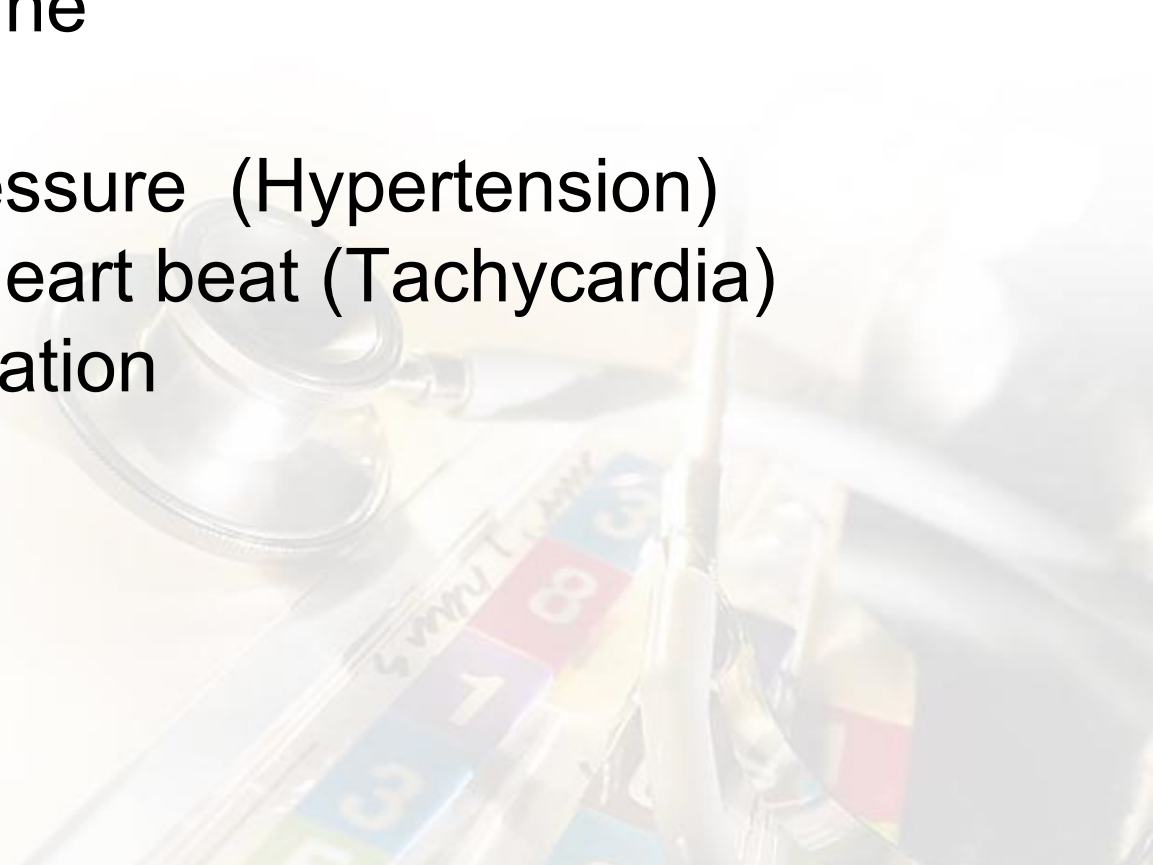
- Excellent hand hygiene
- Basic safe food handling
  - Fresh fruits/vegetables okay if washed
- Environment
  - Strict isolation unsupported use caution
  - Plants
- Prevent trauma
  - Use electric shaver not a razor
  - Clean yourself well and gently after going to bathroom

# Thrombocytopenia





# Thrombocytopenia Signs and Symptoms

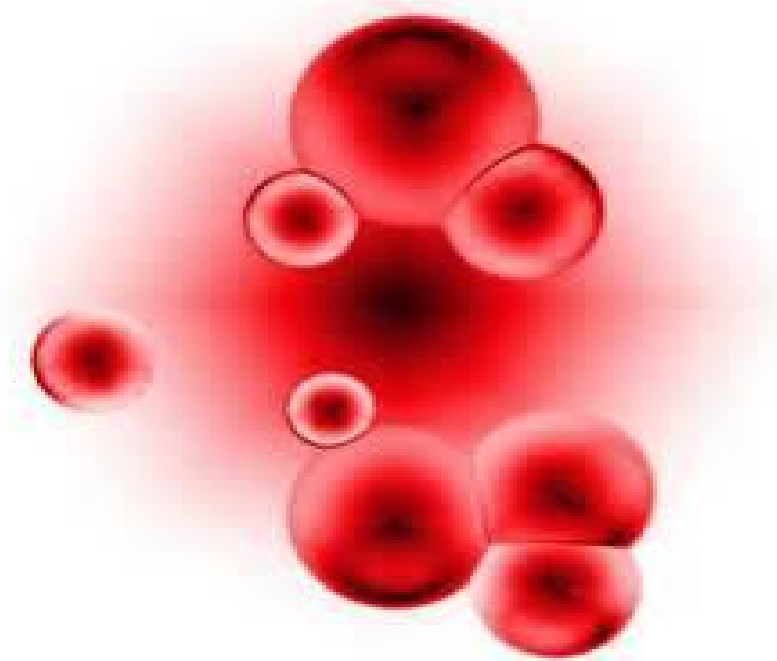
- Petechiae and bruising
  - Overt bleeding
  - Blood in stool or urine
  - Headaches
  - Elevated Blood Pressure (Hypertension)
  - Rapid or irregular heart beat (Tachycardia)
  - Prolonged menstruation
- 



# Thrombocytopenia Management

- Maintain integrity of skin, GI, GU systems
  - Brush your teeth with a very soft toothbrush
  - Do not use dental floss or toothpicks
  - Use electric shaver, not a razor
  - Use pads instead of tampons
  - No enemas or suppositories
  - Care when using scissors, knives, or other sharp objects
- Avoid activities that can cause injury or bleeding
- Maintain good nutrition
- Avoid Aspirin containing products

# Anemia



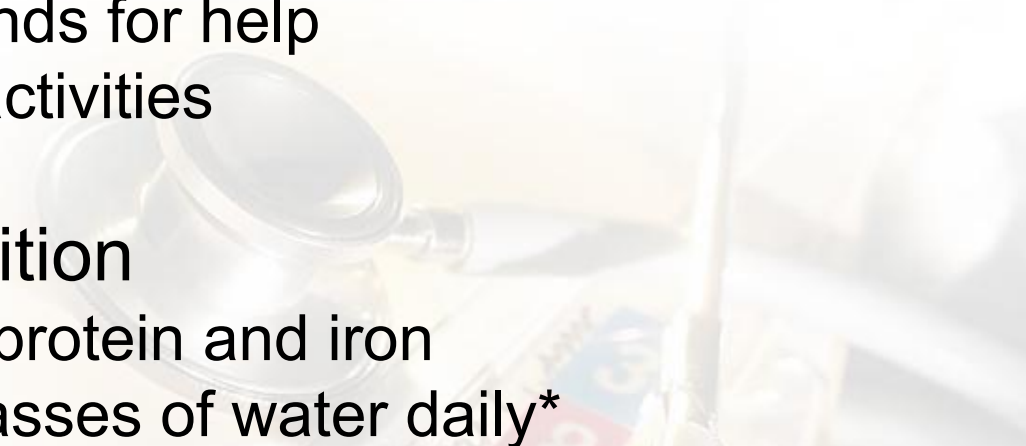


# Anemia Signs & Symptoms

- Fatigue
  - Dyspnea
  - Palpitations
  - Sweating
  - Tachycardia
  - Dizziness
  - Difficulty sleeping
  - Poor concentration
  - Headaches
  - Angina
  - Irritability
  - Cold intolerance
  - Anorexia
  - Pallor
- 



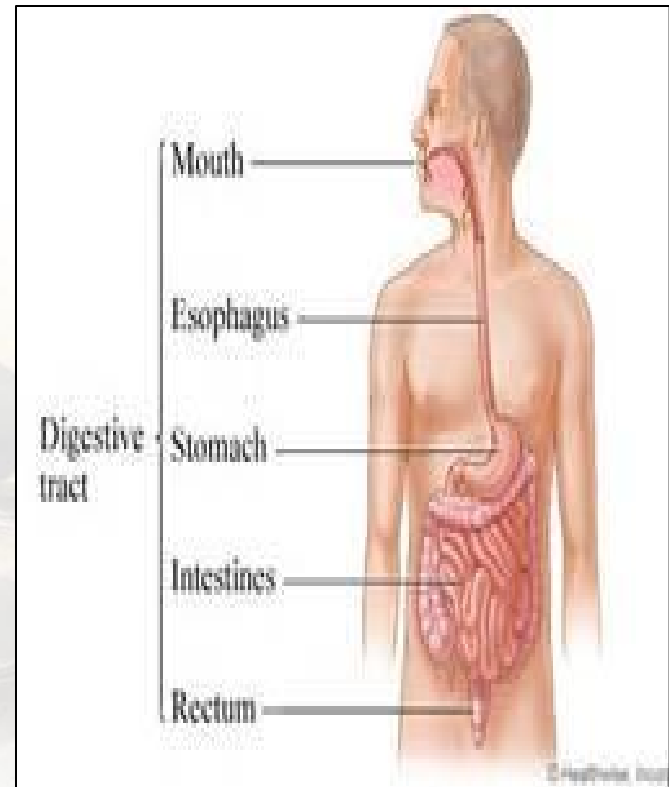
# Anemia Management

- Recognize symptoms to report to your healthcare provider
  - Conserve energy
    - Choose the most important things to do each day
    - Ask family and friends for help
    - Balance rest with activities
    - Exercise
  - Maintain good nutrition
    - Eat food with high protein and iron
    - Drink at least 8 glasses of water daily\*
- 



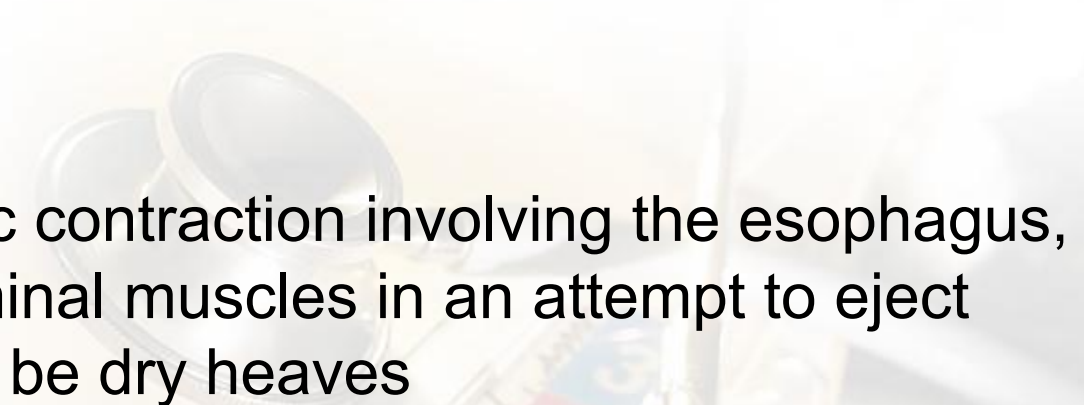
# GI and Mucosal Effects

- Nausea/Vomiting
- Diarrhea
- Constipation
- Mucositis



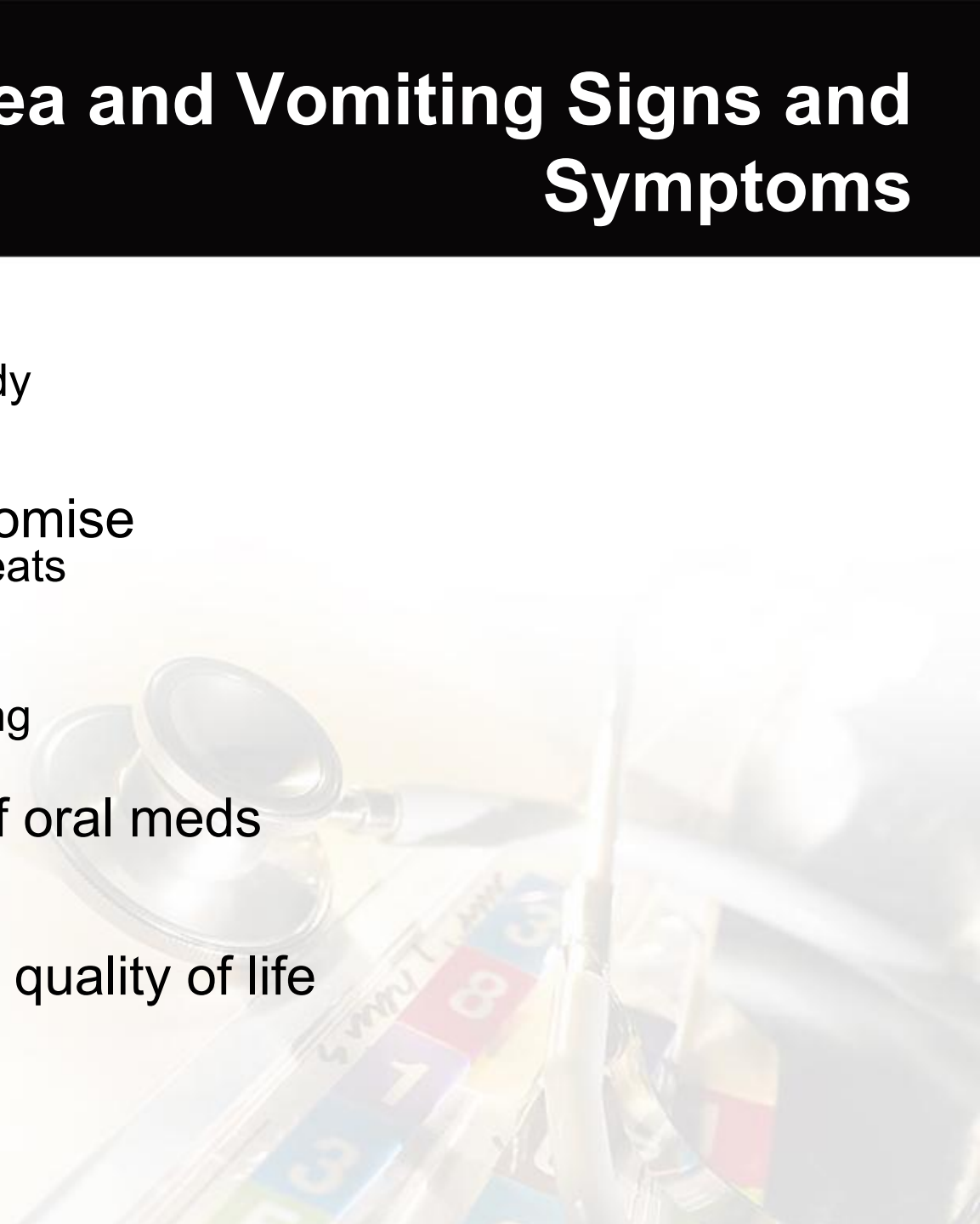


# Nausea and Vomiting

- **Nausea** is defined as an unpleasant subjective experience that is describes as a wavelike feeling in the stomach and/or back of the throat, that may be accompanied by vomiting.
  - **Vomiting** is described as forceful expulsion of GI contents through the mouth
  - **Retching** is a rhythmic contraction involving the esophagus, diaphragm and abdominal muscles in an attempt to eject stomach content, may be dry heaves
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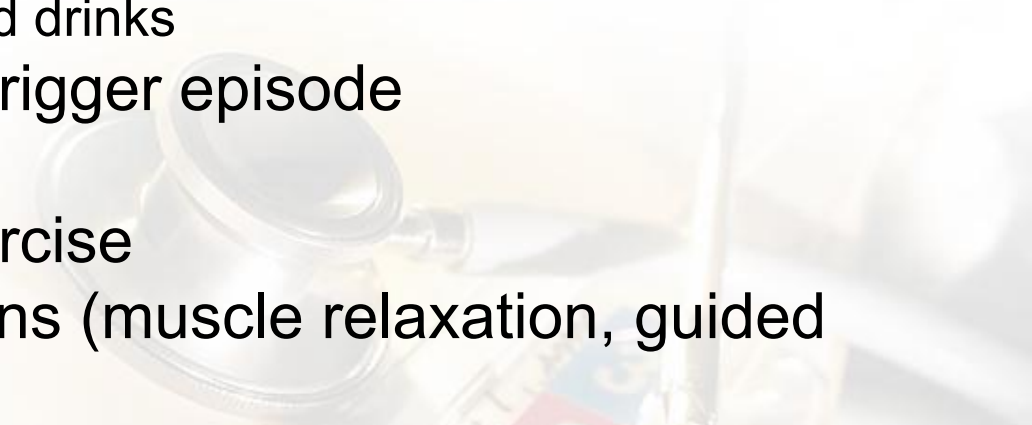



# Nausea and Vomiting Signs and Symptoms

- Dehydration
    - Lack of fluids in the body
    - Decrease urine output
    - Constipation
  - Cardiovascular compromise
    - Irregular or fast heartbeats
    - Low blood pressure
  - Orthostasis
    - Dizziness when standing
  - Skin breakdown
  - Reduced absorption of oral meds
  - Pain
  - Anxiety
  - Exhaustion/decreased quality of life
- 



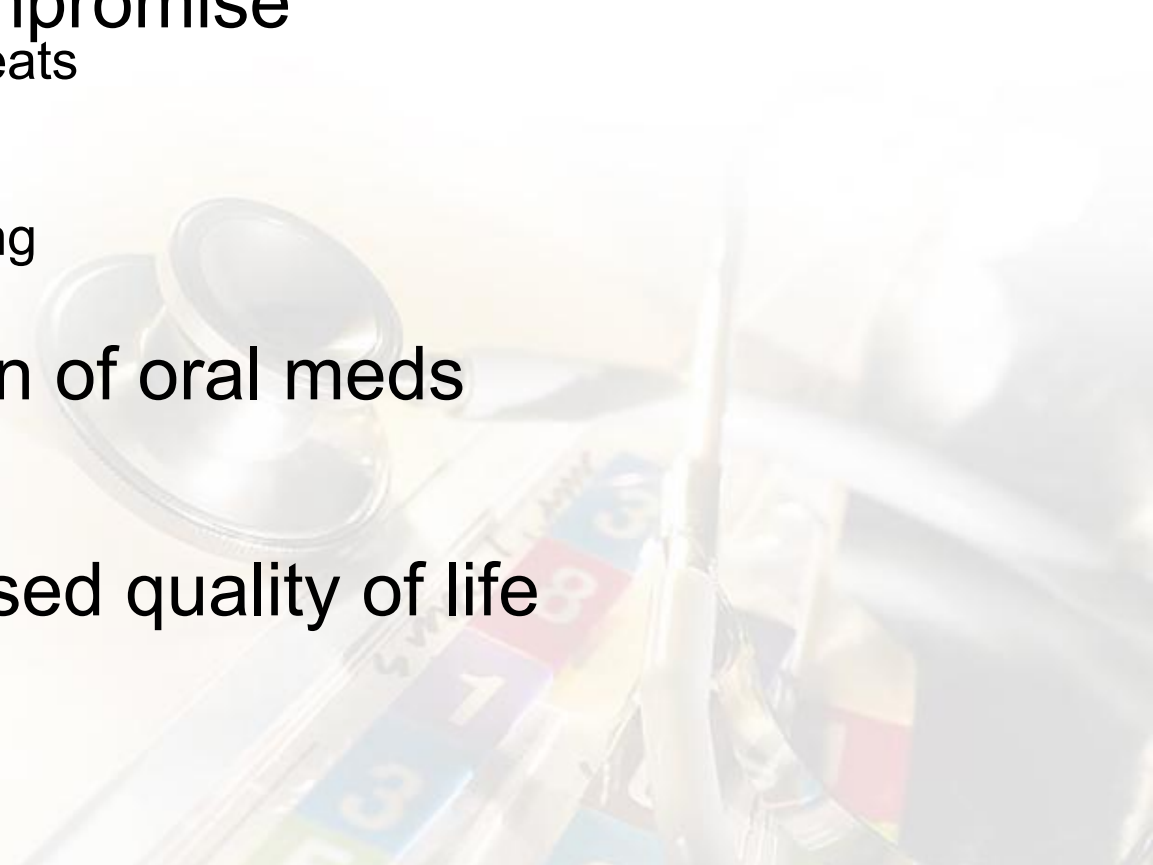
# Nausea and Vomiting Management

- Anti-nausea medicines
    - Take as directed even when feeling well
  - Dietary interventions
    - Milk products should be avoided for the first 24-48 hours during an episode of nausea and vomiting.
    - Small meals with limited drinks
  - Avoid odors that can trigger episode
  - Music therapy
  - Moderate aerobic exercise
  - Behavioral interventions (muscle relaxation, guided imagery, distraction)
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- **Definition: Loose or watery stools**
    - 10-30% of patients receiving chemotherapy only experience diarrhea
    - Number is significantly higher for patients receiving multimodality therapy
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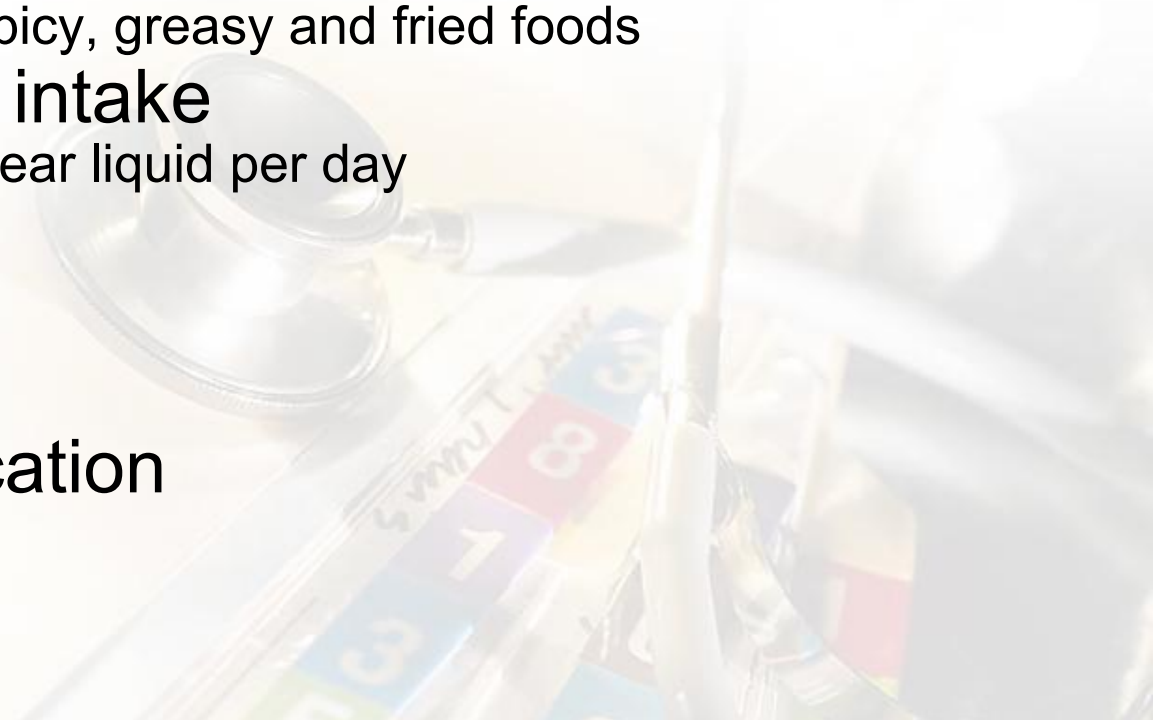


# Diarrhea Signs and Symptoms

- **Dehydration**
    - Lack of fluids in the body
    - Decrease urine output
  - **Cardiovascular compromise**
    - Irregular or fast heartbeats
    - Low blood pressure
  - **Orthostasis**
    - Dizziness when standing
  - **Skin breakdown**
  - **Reduced absorption of oral meds**
  - **Pain**
  - **Anxiety**
  - **Exhaustion/decreased quality of life**
- 



# Diarrhea Management


- Monitor stool number, amount, consistency
  - Excellent Hygiene of rectal area
    - Sitz baths
    - Creams
  - Dietary Changes
    - Avoid dairy products, spicy, greasy and fried foods
  - Increase clear fluid intake
    - 8-10 large glasses of clear liquid per day
      - Clear broth
      - Gelatin
      - Pedialyte®
      - Gatorade
  - Antidiarrheal medication
- 





# Constipation

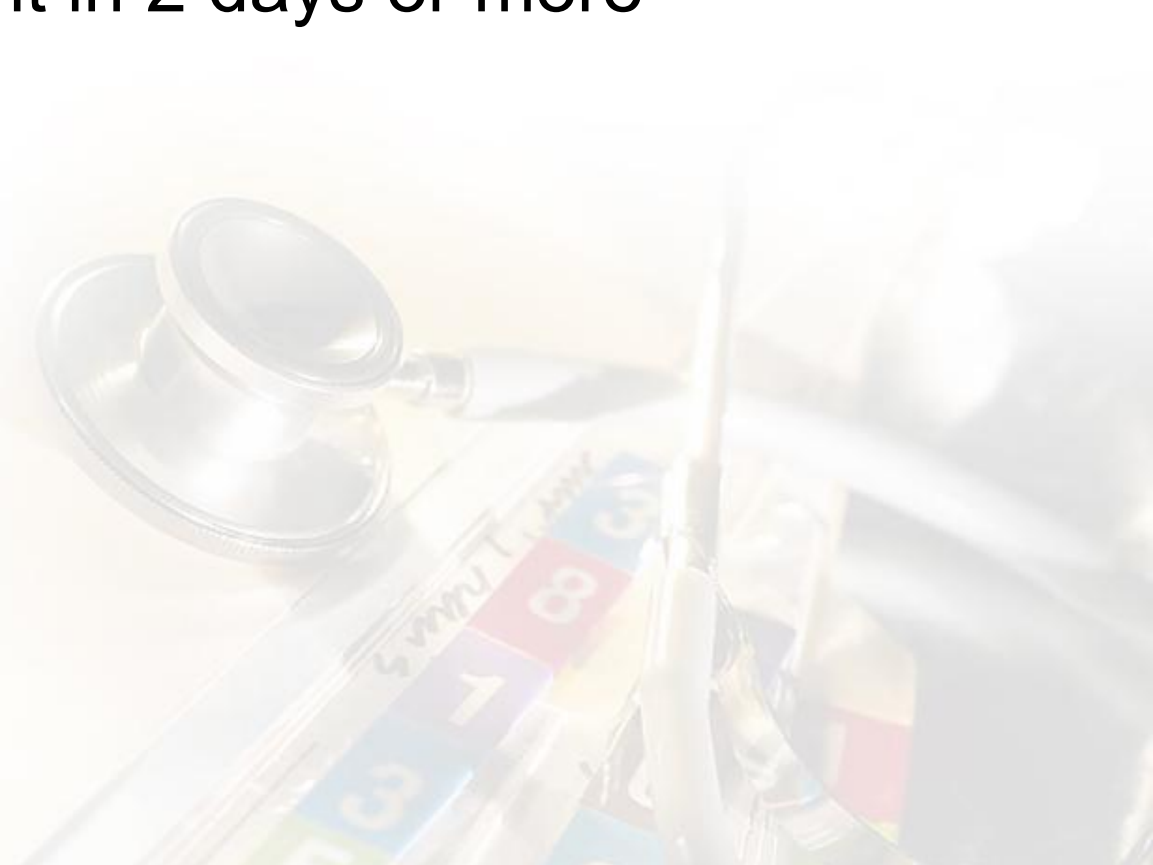
**Definition:** Excessively hard and dry bowel movements that are infrequent and a result of decrease in rectal emptying for filling.







# Constipation Signs and Symptoms

- Abdominal or rectal discomfort
  - No bowel movement in 2 days or more
  - Nausea/vomiting
  - Decrease appetite
  - Hemorrhoids
  - Blood in stool
- 

A medical-themed background featuring a stethoscope and several colorful charts or graphs. The stethoscope is positioned in the upper left corner, and the charts are scattered across the lower half of the image, partially obscured by the text.

# Constipation Management

- Increase physical activity or passive exercise
- Increase fluid intake
- Increase fiber intake
- No use of suppositories or enemas if myelosuppressed
- Bowel Regimen
- Laxatives as directed by health care provider



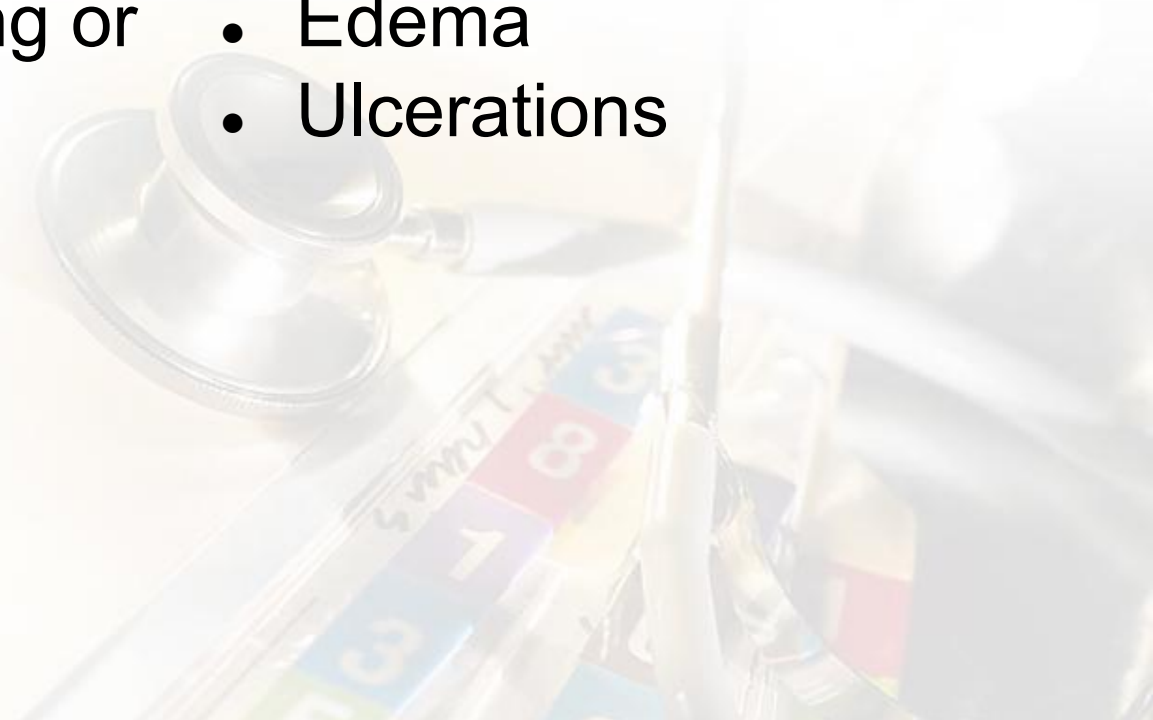
# Mucositis

Inflammation of the mucosa, including the oral cavity





# Mucositis Signs and Symptoms

- Taste changes
  - Swallowing difficulty
  - Hoarseness
  - Pain with swallowing or talking
  - Changes in color of oral mucosa
  - Oral moisture changes
  - Edema
  - Ulcerations
- 

The background of the slide features a blurred image of a medical setting. In the top left corner, a stethoscope is visible, resting on a stack of books with colorful spines. The overall scene is dimly lit, with a focus on the medical equipment and books, suggesting a clinical or educational environment.

# Mucositis Management

- High protein diet
- Increase fluid intake
- Cut down on or avoid caffeine and alcohol
- Avoid all forms of tobacco and nicotine
- Exam by a dentist to treat problems before chemotherapy treatment
- Good oral care
  - Use of soft tooth brush
  - Non-alcoholic mouth washes
- Oral pain medication as prescribe by healthcare provider

# Anorexia




Abnormal loss of appetite for food





# Anorexia Signs and Symptoms

- Involuntary weight loss  $>5\%$  of usual weight
  - Lack of appetite
  - Brittle hair and nails
  - Dry Skin
  - Loss of muscle mass
  - Loss of adipose tissue
  - Slow heart rate and low blood pressure
  - Fatigue and weakness
- 



# Anorexia Management

- Weekly weight
  - Small, frequent meals, high protein/calorie
    - Enteral feedings or parenteral feedings
    - Keep food diary
  - Involve family
  - Dietary consult
  - Physical Activity
  - Pharmacologic management by healthcare provider
    - Megestrol acetate
    - Corticosteroids
    - Cannabinoids
- 



# Skin and Nail





# Skin and Nail changes

- Hair changes
- Trichomegaly (eyelashes)
- Paronychia
- Nail shedding
- Beau's lines
- Hyperpigmentation
- Rash
- Blistering of the skin
- Xerosis
- Painful fissures
- Telangiectasia
- Ocular changes
- Palmar-plantar erythrodysesthesia
- Photosensitivity
- Transient erythema or urticaria
- Acneiform eruptions
- Pruritis or itching

A background image showing medical supplies. In the top left, there is a stethoscope. Below it, a clipboard with a checklist is visible, featuring colored tabs labeled 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z'. The title 'Skin and Nail Management' is overlaid in white text on a dark background in the upper right.

# Skin and Nail Management

- Use only mild soaps
  - Shower or bathe in warm water
- Use lotions and creams free of perfume, alcohol and petroleum jelly
  - Do not use OTC medications to treat acne
- Avoid sun exposure
  - Wear sun screen and lip balm
  - Wear hat with a brim
- Report severe itching
  - May use antihistamine
- Report pain, rash or hives

# Alopecia

Alopecia is one of the most visible signs that a person has cancer. As many as 65% of patients undergoing chemotherapy will experience alopecia to some degree



A background image showing medical supplies. In the top left, there is a stethoscope. Below it, a clipboard with a checklist is visible. The checklist has several items with checkboxes, some of which are marked with colored dots. The items on the checklist include 'Check patient', 'Review chart', 'Administer medication', 'Document findings', and 'Obtain vital signs'. The background is a light, slightly blurred image of these items.

# Alopecia Management

- Mild shampoos
- Avoid permanent waves, bleach, coloring
- Avoid excessive brushing/combing
- Shave your head safely
- Get a wig
  - Wigs may be covered by insurance
- Protect head from cold and sun
- Protect your eyes and ears




# Fatigue



Feeling weak and very tired

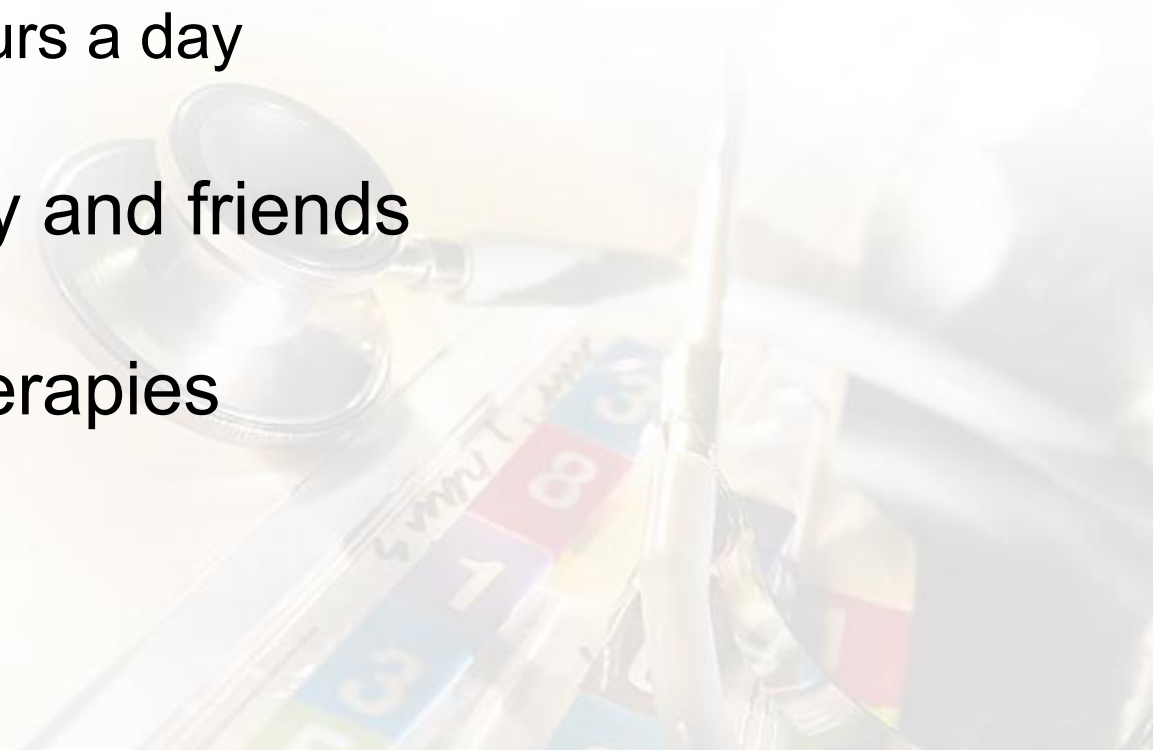


# Fatigue Signs and Symptoms

- Sleep disorders
  - Emotional distress
    - Anxiety
    - Depression
  - Anemia
  - Malnutrition
  - Decreased activity
  - Pain
- 



# Fatigue Management

- Energy conservation
    - Do activities that are most important first
  - Energy-saving devices
    - Take time to rest
    - Sleep at least 8 hours a day
  - Eat healthy foods
  - Delegation to family and friends
  - Exercise
  - Complementary therapies
- 



# Sexuality



**50% of cancer survivors  
report ongoing problems with  
sexual functioning**



# Sexuality Signs and Symptoms

## Females

- No sexual desire
- Low desire
- Dyspareunia:  
painful intercourse  
due to vaginal  
dryness

## Males

- No sexual desire
  - 54% on  
androgen-  
deprivation  
therapy report no  
desire
- Erectile difficulties




# Sexuality Management

- Talk with your doctor to see if it is okay for you to have sex during treatment
- Discuss your feelings with your partner
- Women
  - Use birth control: don't get pregnant during treatment (chemotherapy may damage fetus)
  - Ask your healthcare provider about products or brands that can help vaginal dryness
- Men
  - Need to wear condom because some chemotherapy may be in semen



# Reproductive Alterations

- If you wish to have children you should discuss this with your health care provider **before** starting treatment.
  - Males:
    - Sperm banking
  - Females:
    - Preserving fertility may delay start of treatment
- 



# Radiation Therapy




A stethoscope is positioned on a stack of colorful medical charts. The charts have various colored tabs (red, yellow, green, blue) with some text and symbols. The background is a soft, out-of-focus light color.

# Radiation Therapy

- Treatment Sites
  - Prostate
  - Lymphoid
  - Head & Neck
  - Gynecologic Cancers
  - Colon, Rectum and Anus
  - Brain
  - Breast or Chest Wall
  - Chest



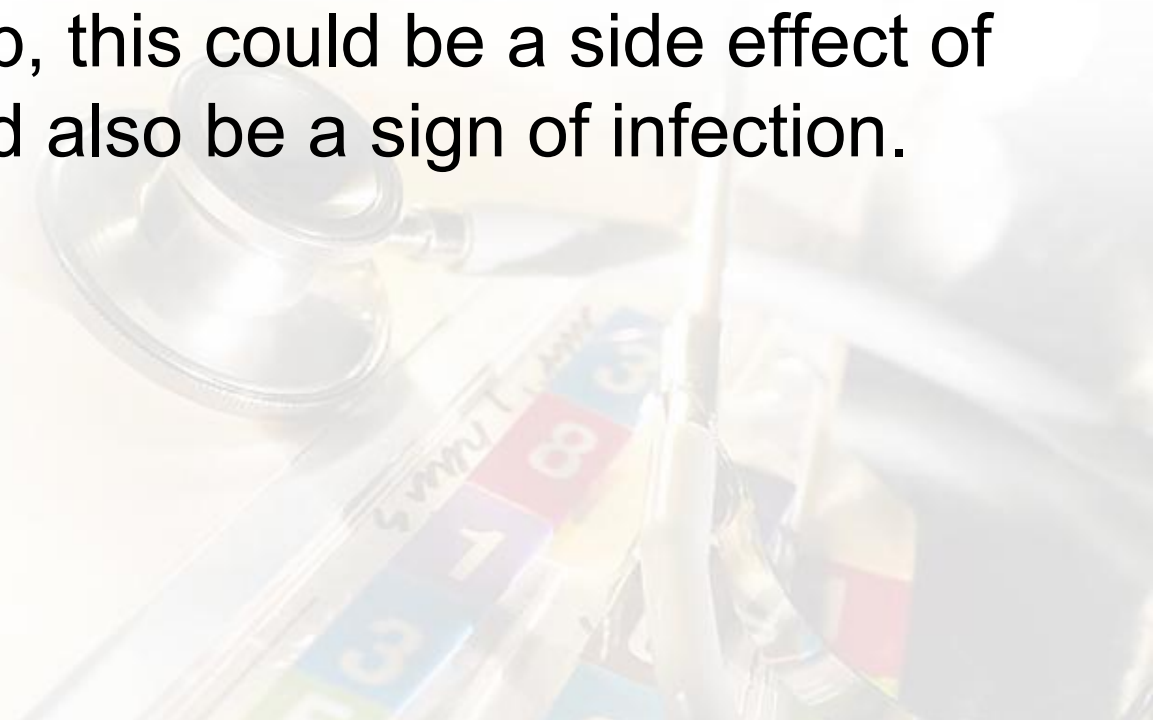
# Symptoms

- Symptoms depend on area being treated, dose of radiation, the number of treatments, and the patient's general state of health. Side effects may be worse if the patient is undergoing chemotherapy.
    - Common Symptoms include:
      - Skin Reaction
      - Fatigue
      - Loss of Appetite
      - Bone Marrow Suppression
      - Sexual Issues
      - Emotional Concerns
- 





# Skin Reaction

- During the course of radiation therapy, the skin and hair area being treated may change.
  - Skin reaction sometimes becomes more severe during the week after treatment is completed.
  - A rash may develop, this could be a side effect of treatment, but could also be a sign of infection.
- 




# Skin Reaction Management

- Keep Skin Clean
  - Bathe or shower daily
    - Tattoo marks are permanent and will not wash off
  - Only use those moisturizers recommended by a doctor or nurse. Over-the counter moisturizers include Aquaphor®, Eucerin®, or pure aloe vera gel.
    - Apply twice a day, either before treatment or four hours after treatment and before you go to bed
- Avoid irritating the skin in the area being treated.
- Do not use make-up, perfumes, powders, or after-shave in area being treated.
- Use a PABA-free sunblock with an SPF of 30 or higher if you are going to be in the sun



# Fatigue

- Fatigue gradually goes away after treatment but it may last several months.
    - Fatigue is described as:
      - Tiredness
      - Weariness
      - Lack of energy
      - Weakness
      - Being unable to concentrate
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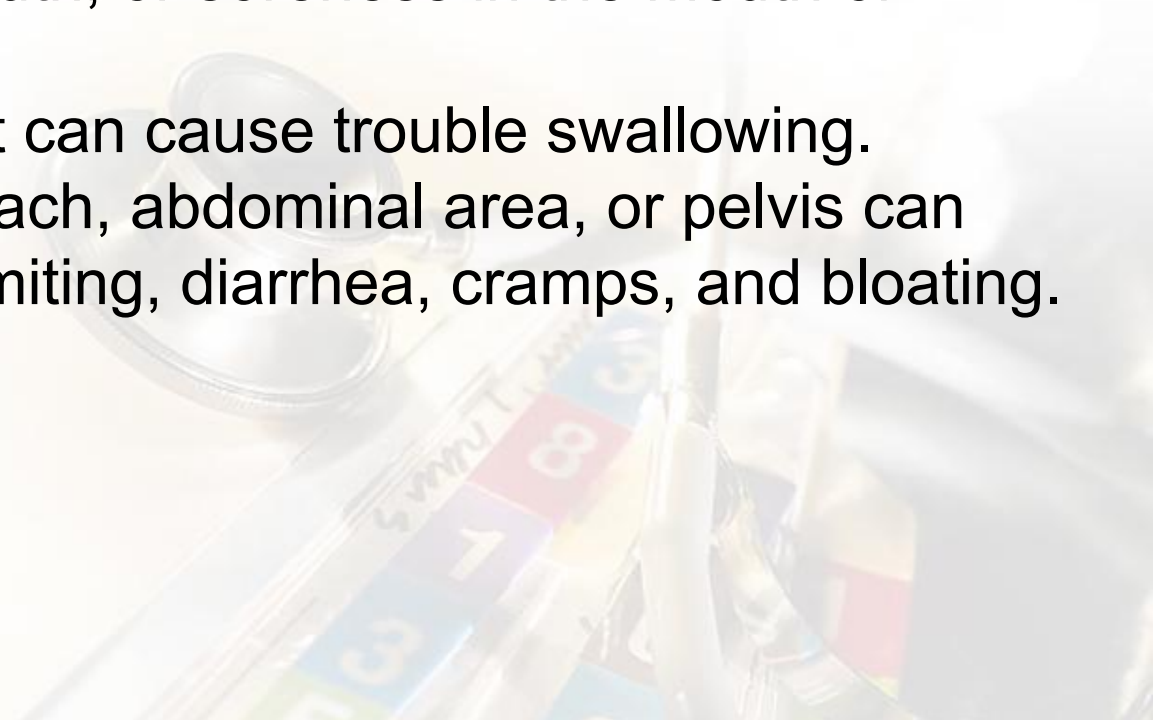


# Fatigue Management

- Limit your activities, if possible.
- Exercise each day to maintain your strength.
- Prepare meals ahead of time and freeze them.
- Use convenience foods that are ready to eat.
- Accept offers of help from friends and relatives.
- Drink eight glasses of fluid each day to avoid the build-up of cellular waste products.
- Increase rest by getting more sleep at night and taking naps during the day.
- Try to eat even when you are tired. Sometimes a little food will increase energy.

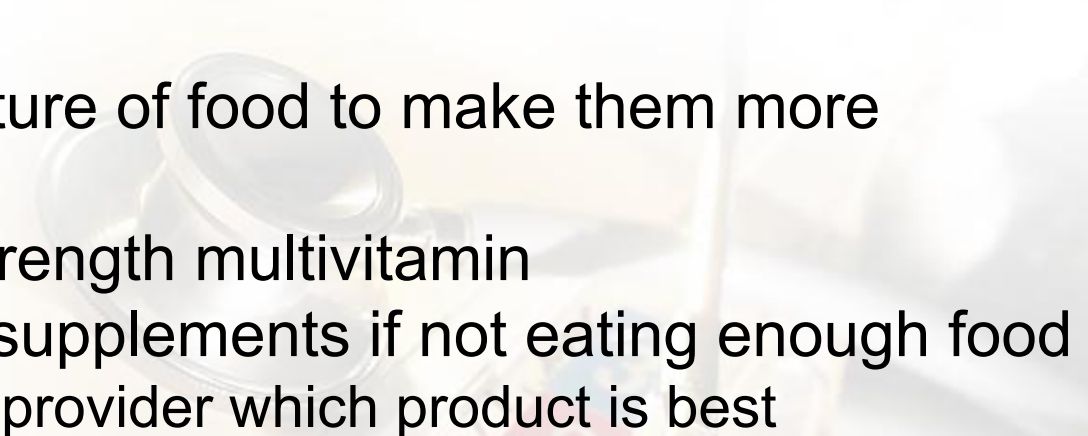


# Loss of Appetite

- Your appetite may decrease during treatment. Good nutrition is important during and after your radiation treatment.
  - Radiation of head and neck can cause trouble swallowing, taste changes, dry mouth, or soreness in the mouth or throat.
  - Treatment to the chest can cause trouble swallowing.
  - Treatment to the stomach, abdominal area, or pelvis can cause nausea and vomiting, diarrhea, cramps, and bloating.
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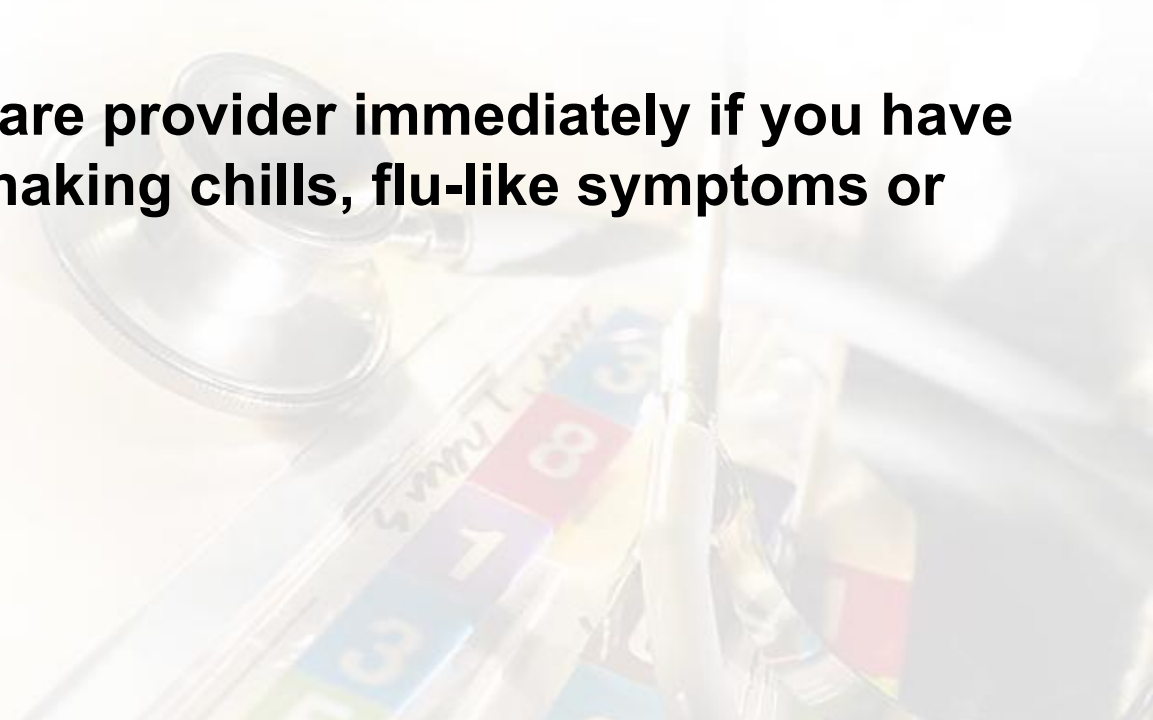


# Management of Loss of Appetite

- Increase your calories and protein intake
  - Eat small meals throughout the day
    - Set up a schedule to ensure you eat regularly
    - Eat with family and friends whenever possible
    - Take snacks and drinks with you to treatment while you are waiting
  - Vary the color and texture of food to make them more appealing
  - Take a daily regular strength multivitamin
  - Take liquid nutritional supplements if not eating enough food
    - Ask your health care provider which product is best
- 




# Bone Marrow Suppression

- When large areas of bone marrow are in the area being irradiated, it can affect the production of blood cells
    - Blood counts may go down
    - Complete blood count (CBC) will be monitored
    - Treatment may be held until counts return to higher level
  - **Notify your health care provider immediately if you have fever 38° C (100.4), shaking chills, flu-like symptoms or bleeding.**
- 






# Sexual Issues

- You do not have to change your sexual activity unless your doctor gives you specific advice.
  - Be sure to use contraceptive if there is a possibility of pregnancy.
- 



# Emotional Concerns

- A cancer diagnosis is likely to cause you to react in many ways and if you find yourself unable to cope you are encouraged to speak with your health care provider, social worker or counselor.
    - Anxious
    - Depressed
    - Angry
    - Nervous
    - Worried
    - Numb
    - Afraid
    - Alone
- 

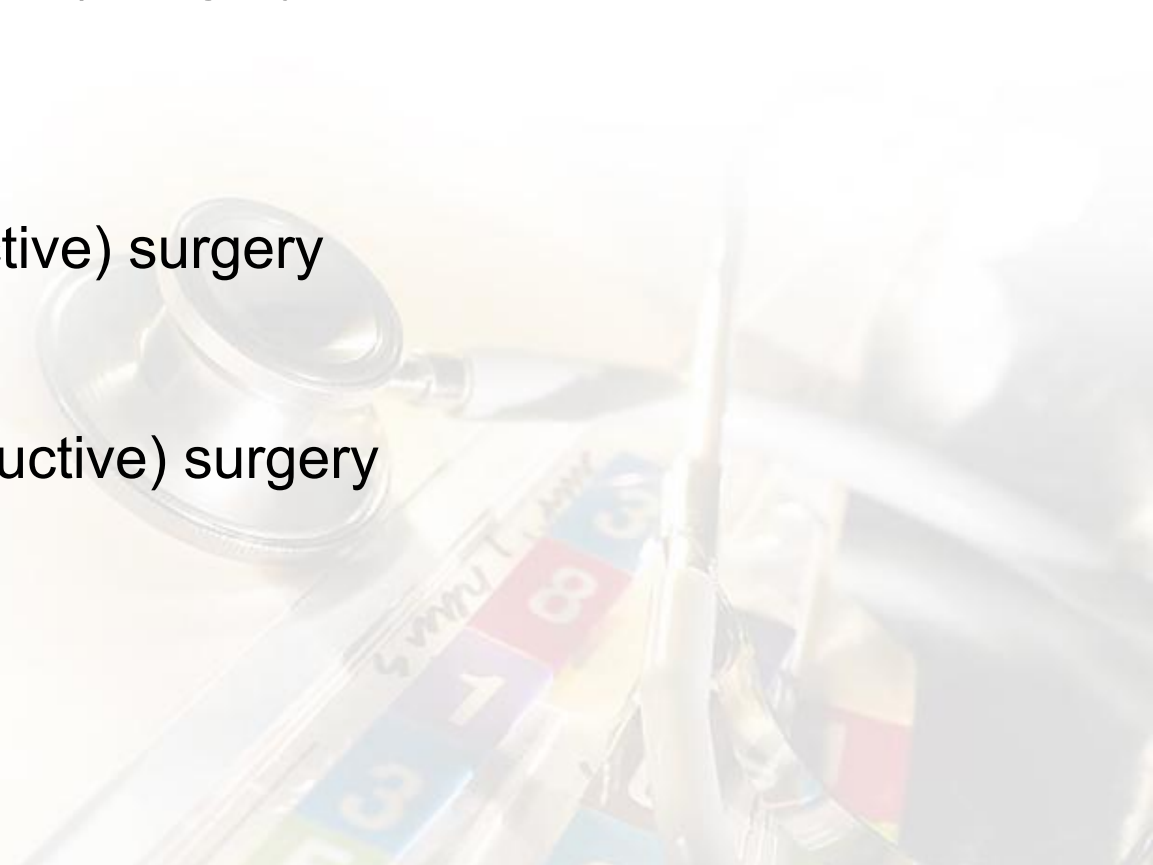


# Surgery






# Surgery

- Surgery is the oldest form of cancer treatment
  - Surgery is done for many reasons
    - Preventive (prophylactic) surgery
    - Diagnostic surgery
    - Staging surgery
    - Curative surgery
    - Debulking (cytoreductive) surgery
    - Palliative surgery
    - Supportive surgery
    - Restorative (reconstructive) surgery
- 



# Risk and Side effects

- Risk and side effects are dependent on the type of surgery
  - Discuss with your health care provider **before** you are scheduled for surgery the risk and expected side effects
  - Common Risks of surgery
    - Anesthesia complications
    - Bleeding
    - Infection
    - Blood clots\*
    - Death
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Is there such a thing?





Yes There is such a thing!

**CHEMO BRAIN RESEARCH  
PROVES IT'S REAL**







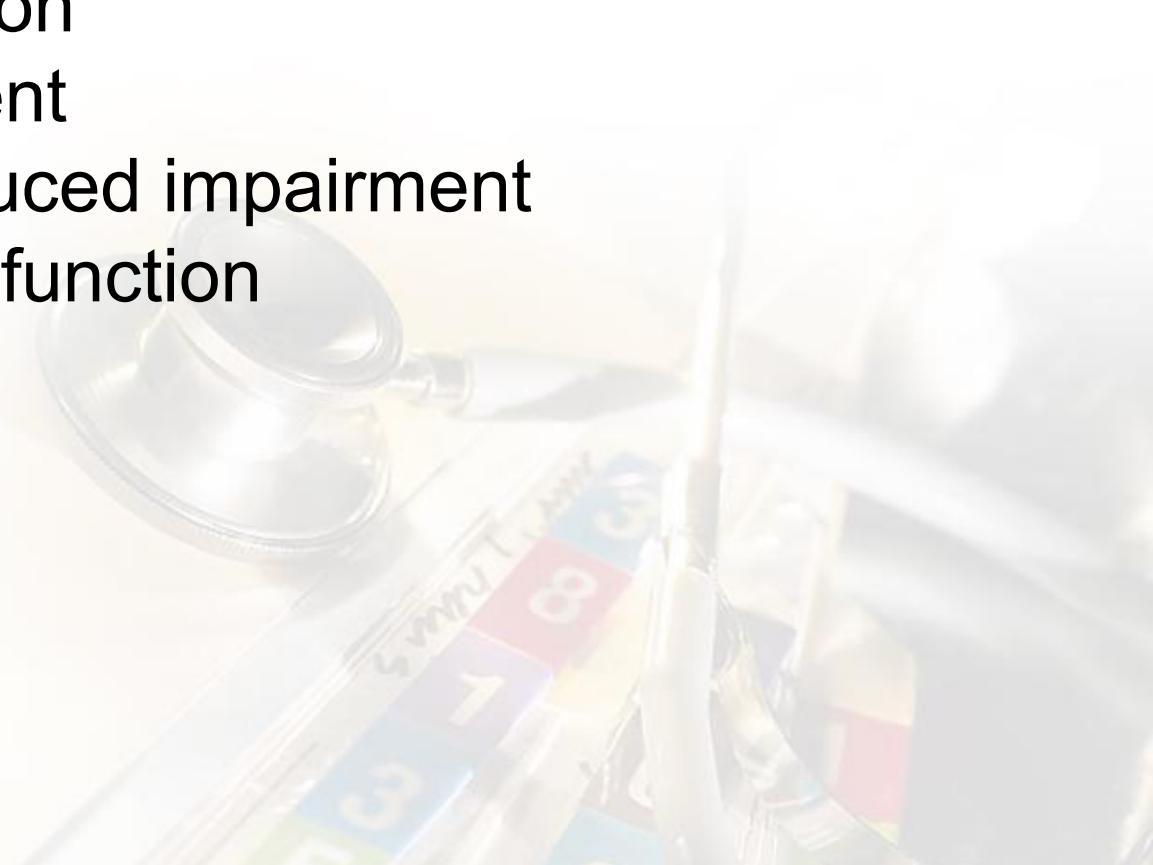
# CHEMO BRAIN

- Described as:
  - Dysfunction, weakening or impairment of memory in patients who have been treated with chemotherapy for cancer






# Chemo Brain AKA

- Chemo Fog
  - Central Neurotoxicity
  - Cognitive dysfunction
  - Cognitive impairment
  - Chemotherapy-induced impairment
  - Neurocognitive dysfunction
- 



# Chemo Brain

- Hard to study
  - Risk factors not well defined
  - Subjective complaints do not often correlate with objective measures of cognitive function
- 



# Chemo Brain

- Blood-brain barrier (BBB) protects the brain from harmful agents.
  - Drugs that can pass through the BBB
    - Cyclophosphamide & 5-fluorouracil
  - Drugs that can alter BBB permeability allowing entry to the brain
    - Cisplatin, doxorubicin, methotrexate, and vincristine
- Genetic link consideration
  - Presence of apolipoprotein E  $\epsilon 4$ 
    - Patients who carry APOE  $\epsilon 4$  may be more susceptible to chemotherapy-induced cognitive impairment

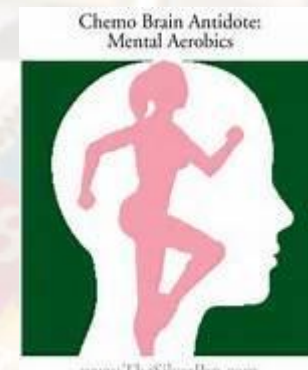
# Chemo Brain

- Genetic link consideration
  - Presence of apolipoprotein E  $\epsilon$ 4
    - Patients who carry APOE  $\epsilon$ 4 may be more susceptible to chemotherapy-induced cognitive impairment



# Chemo Brain Symptoms

1. Forgetting things
2. Trouble concentrating
3. Trouble remembering details
4. Trouble multi-tasking
5. Taking longer to finish things
6. Trouble remembering common words



# Chemo Brain Management


- Use a daily planner to keep track of appointments and schedules
  - To do list
  - Important dates
  - Phone numbers and addresses
- Keep everything in one place to make it easier to find
- Set up a routine
- Get enough rest and sleep
- Exercise your mind and your body
- Focus on one thing at a time instead of trying to multi-task
- Avoid stressful situations
- Ask for help when you need it from family and friends





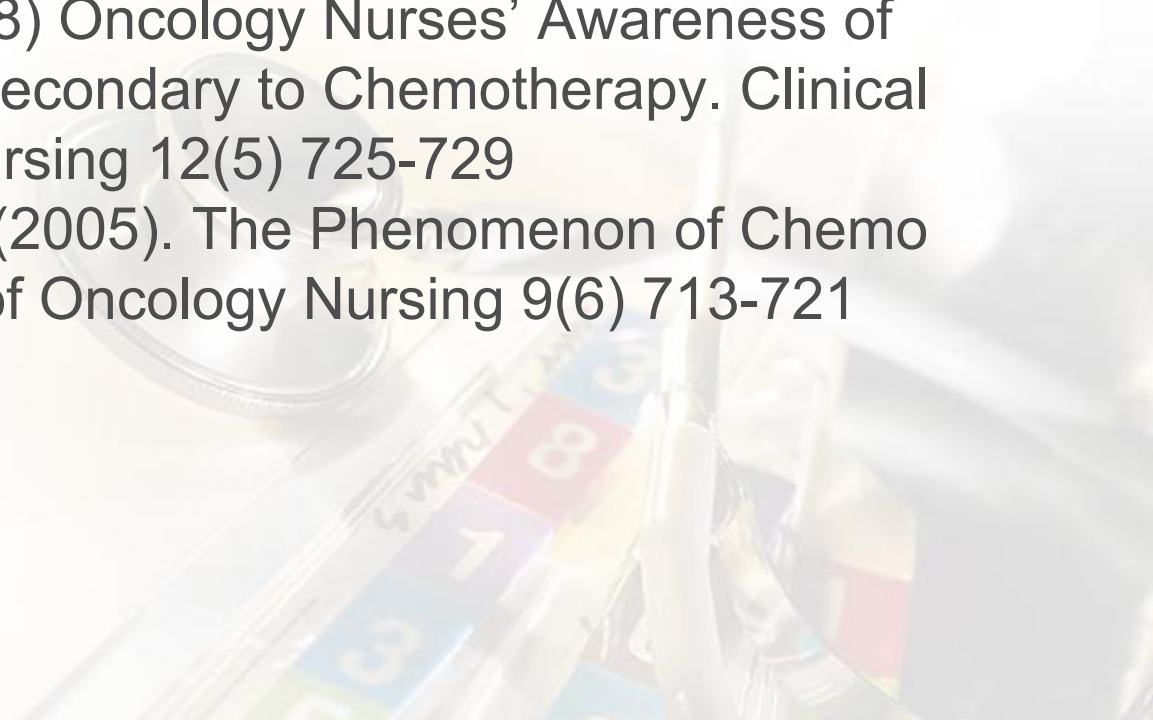


# Symptoms Management References

1. Oncology Nursing Society (2009) Chemotherapy and Biotherapy Guidelines and Recommendation for Practice
  2. National Cancer Institute, US Department of Health and Human Services National Institutes of Health [www.cancer.org](http://www.cancer.org)
    - <http://www.cancer.org/treatment/treatmentsandsideeffects>
- 



# Chemo Brain References

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  3. Myers,J & Teel,C. (2008) Oncology Nurses’ Awareness of Cognitive Impairment Secondary to Chemotherapy. Clinical Journal of Oncology Nursing 12(5) 725-729
  4. Staat,K & Segatore,M. (2005). The Phenomenon of Chemo Brain. Clinical Journal of Oncology Nursing 9(6) 713-721
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Q & A

