



2nd Clinical Nutrition
Update 2010
17th & 18th September, 2010



DIET CONSIDERATIONS FOR PATIENTS UNDERGOING CHEMOTHERAPY AND BMT

Dr. Vinitha Krishnan
HOD -Apollo Speciality
Hospital -Chennai

INTRODUCTION



-
- Concerns in nutrition planning
 - Nutritional assessment
 - Strategies for nutritional support
 - Food safety guidelines
 - BMT diet plan
 - Diet considerations for patients on chemo



RISK FACTORS



- MALNOURISHED PATIENTS
- Relapsed ALL
- Long-term steroid therapy
- History of multiple infections
- Metabolic disorders (neurological impairment)
- Solid tumors



TRASPLANTATION -PHASES

- CYTOREDUCTION
- CYTOPENIA
- ENGRAFTMENT
- ORGAN FAILURE(any time) .



TRASPLANTATION-METABOLIC CHANGES

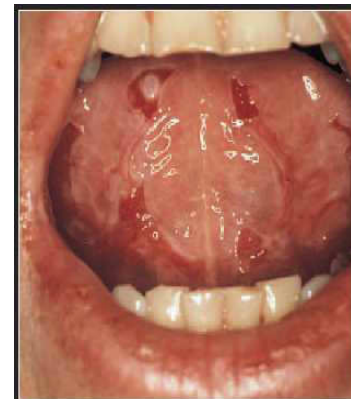
- Negative nitrogen balance
- Glucose intolerance
- Increase in the need for antioxidant vitamins
- Mineral deficiency (Zinc)



NUTRITIONAL PROBLEMS IN HSCT PATIENTS



- Sore throat and mouth
- Decreased salivation and dry mouth
- Lack of appetite (anorexia)
- Nausea, vomiting and food aversion
- Early satiety



NUTRITIONAL PROBLEMS IN HSCT PATIENTS



-
- Alteration in smell and taste
 - Loss of taste
 - Mucositis / oesophagitis
 - Diarrhea
 - Malabsorption



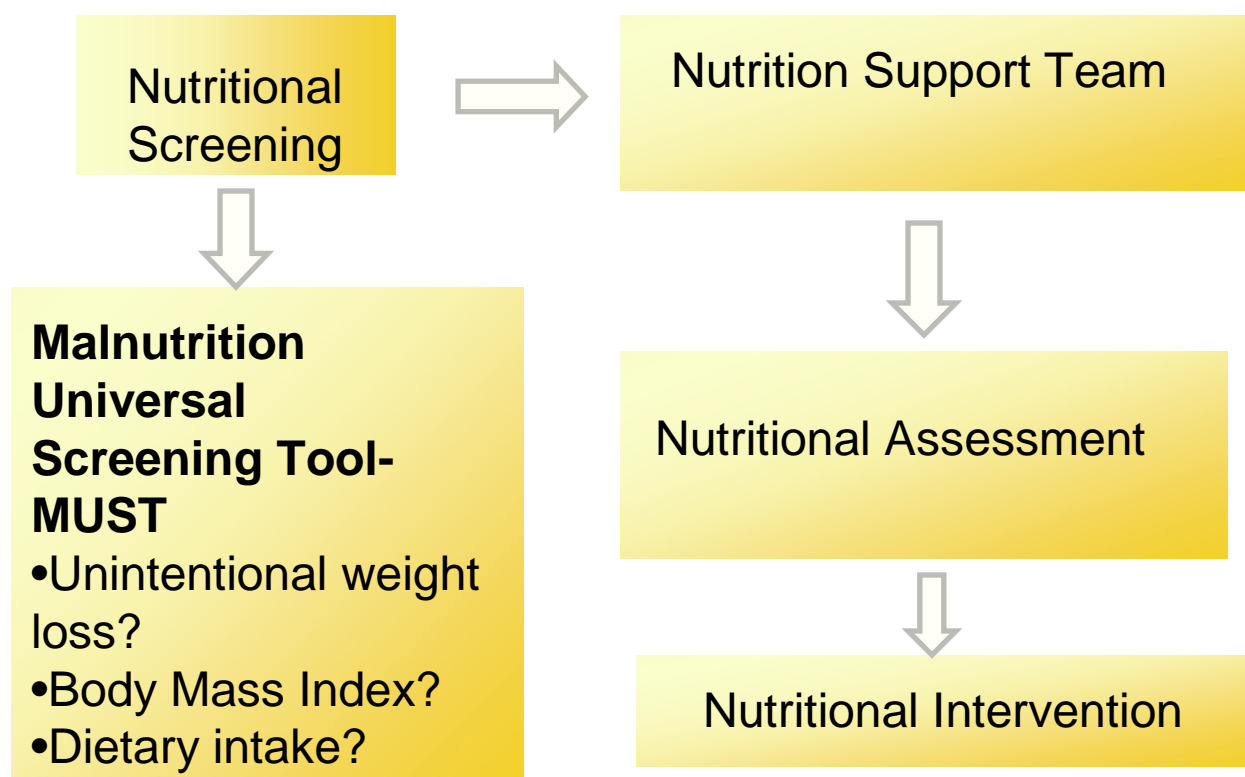
WHY?

- **Conditioning therapy has deleterious consequences on the integrity of the gastrointestinal tract**

**Increased risk of
malnutrition**



NUTRITIONAL RISK ASSESSMENT: HOW?



AIMS OF NUTRITIONAL SUPPORT



- **Maintenance of nutritional status**
- **Adequate and specialized nutrition may also:**
 - Improve tolerance to chemotherapy
 - Prevent and reduce mucositis
 - Reduce septic complications
 - Modulate the biological response



NUTRITIONAL SUPPORT RECOMMENDATIONS



-
- Low microbial Diet
 - 130-150% of the estimated BEE
(30-50kcal/kg/day)
 - Protein:1.5-2g/kg/day
 - Lipids-30-40%of non-protein energy
 - A Balanced calorie intake with both fat and carbohydrate is recommended.



STRATEGIES FOR NUTRITIONAL SUPPORT

- Nutrition support
 - Tailored for each patient
- Strategies:
 - Dietary counseling
 - Artificial nutrition
 - Specialized nutrition



DIETARY COUNSELING



- Low bacterial diet
- Modification of foods:
 - Food preferences
 - Eating ability
 - Symptoms
- Oral nutrition supplements (hyper caloric, lactose free, hyperproteic, etc)



BACTERIA FOUND IN FOODS

- **More commonly reported bacteria found in foods:**
- E. Coli, Pseudomonas Aeruginosa, Klebsiella (fresh fruits and vegetables);
- Other pathogens: Enterobacter agglomeran, Enterobacter colacae, Citro bacter, Salmonella, Shigella, Campylobacter;
- Aspergillus (food, water and ice)



LOW RISK IMMUNOSUPPRESSED DIET



- Sterile diet- foods with no bacteria and fungal growth
- Low- microbial diet- pathogen containing foods are eliminated

Different practice in all HSCT Units



FOUR BASIC STEPS TO FOOD SAFETY

FIGHT BAC!



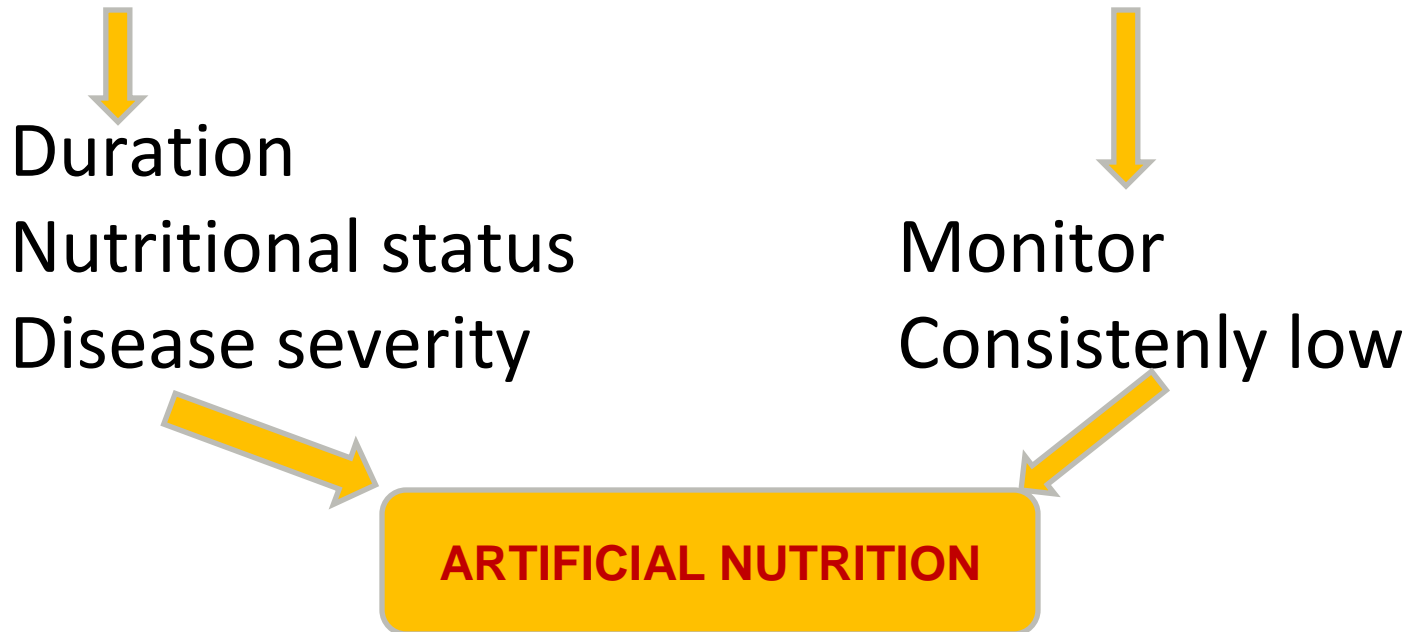
Keep Food Safe From Bacteria™

- **CLEAN:** Wash hands and surfaces often
- **SEPARATE:** Do not cross contaminate
- **COOK:** Cook to proper temperatures
- Poultry, meat, egg, soups & gravies-160 *f
- Sea food-140*f
- **CHILL:** Refrigerate promptly
- Refrigerator temp-40*f & freeze at 0*f



ARTIFICIAL NUTRITION SUPPORT (ANS)

1. Can the patient eat? Diet \pm Supplements
2. Evaluate intake
3. Insufficient (< 50%) vs sufficient (>50%)

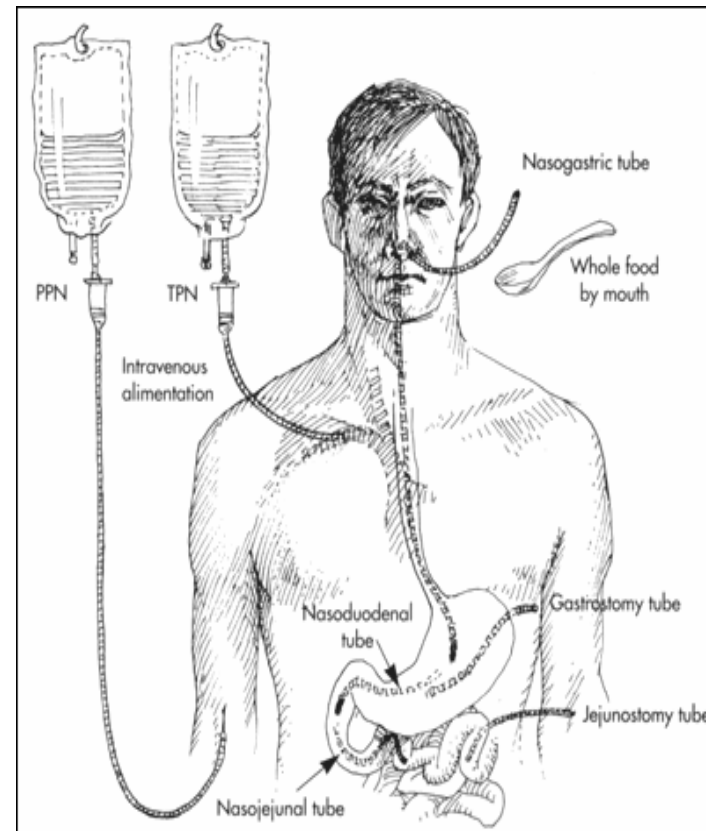


ARTIFICIAL NUTRITION SUPPORT (ANS)

Timing of ANS and Enteral/Parenteral nutrition



- Less well defined aspects
- Different practices in HSCT units



INDICATIONS

ENTERAL NUTRITION

- ↓ Oral intake
- Nutrient repletion
- Support during transition phase after parenteral nutrition

PARENTERAL NUTRITION

- Severe malabsorption
- Hyperemesis
- Severe mucositis
- Malnourished
- GvHD gut



SPECIALIZED NUTRITIONAL SUPPORT



-
- Glutamine (0.57g/kg/day)
 - Antioxidants (vitamin E, A and β Carotene)
 - n-3 Fatty acids (Eicosapentaenoic acid)



GASTROINTESTINAL – DIET 1



-
- **Beverages (1 cup)**

- **Supplements**

Predigested/ Polymeric formulas-1/2 cup , High protein drinks-1/2 cup

- **Cereals (1/2 cup)**

- **Protein Sources**

Well cooked chicken (no skin),baked, broiled, or boiled (30g) , well cooked egg only (1no), fish, baked or poached (30g.)



GASTROINTESTINAL – DIET 1



-
- **FRUITS(½ cup)**
 - Applesauce, Banana, Peaches, Pears, canned in juice or light syrup
 - **VEGETABLES(1/2 cup)**
 - Carrots, well cooked ,green beans, well cooked sweet potatoes (no skin), baked or mashed potatoes
 - **MISCELLANEOUS:** Sugar 1 packet or teaspoon; salt, as desired.



GASTROINTESTINAL – DIET 2



-
- **BREAD AND CEREAL PRODUCTS: 4 or more servings per day**
 - Cereals with less than 2 gm of fiber per serving
Bread , rice cakes, noodles , white rice, baked potato chips& pancakes
 - **DAIRY AND SUPPLEMENTS: 3 or more cups per day**
Skim milk , Soy milk , Buttermilk, Low fat yogurt (150g)
AVOID: Any milk or milk-based product not pre-treated



GASTROINTESTINAL – DIET 2



- **MEAT OR MEAT SUBSTITUTES:** 3 or more 30g servings per day

Well-cooked fish, skinless poultry, well cooked eggs , cooked tofu.

- **SOUPS:** As desired

Broth-based soups made with allowed meats and vegetables



GASTROINTESTINAL – DIET 2



- **FRUITS AND FRUIT JUICES: 2 or more ½ cup servings per day**
- **Juices:** cranberry
- ½ strength juices: apple, grape, (mix equal parts of water and juice)
- **Fresh fruit** (peeled): apricots, bananas, melons, pears, peaches, papaya, mango.
- Apples, **baked** and peeled
- **Canned fruit:** peaches, pears, plums, apricots
- **Jelly or sauce**



GASTROINTESTINAL – DIET 2



-
- **VEGETABLES: 2 or more ½ cup servings per day**
 - Well cooked, tender vegetables, as tolerated:
 - Beets, carrots, green beans , lettuce, pumpkin, sweet potatoes ,potatoes and yams (without skin), winter squash.



GASTROINTESTINAL – DIET 2

- **DESSERTS:**
- Cake (plain, without frosting)
- Custard made with lactose-free milk
- Jelly
- Popsicles
- Puddings, made with lactose-free milk
- Plain cookies
- Angel food cake



GASTROINTESTINAL – DIET 2



Fats with limited portion size:

- Butter (1 tsp) ,Cooking oil (1 tsp) , Margarine (1 tbsp)
Mayonnaise (1 tbsp) , Peanut butter (2 tsp)

Miscellaneous:

- Herbs and spices for seasoning: basil, bay leaf, rosemary, thyme, cinnamon
- Honey,Hard candy,Jelly ,Marshmallows,Fruit roll-ups
- Salt, Sugar , Soy sauce , Syrups, Vinegar



CONCLUSION



-
- Nutritional screening is important for identification of patients at nutritional risk
 - Artificial Nutrition should be used according to individual needs
 - Encourage Enteral Nutrition
 - Nutrition education is A MUST



Chemotherapy



What is cancer?



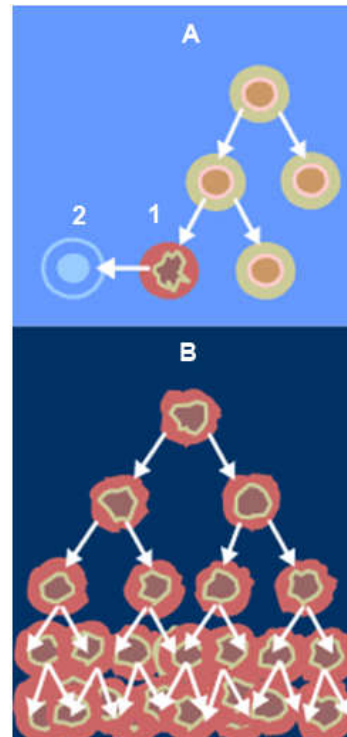
-
- A general name for more than 100 diseases
 - A disease where abnormal cells grow out of control and form malignant tumors



Cancer

Cancer cells

- grow out of control
- don't die normally



A. Normal cell division

1- damaged cell

2- cell death

B. Cancer cell division



Chemotherapy or “chemo”

- What is it?
- How does it work?
- Nutritional concerns



Rosy periwinkle – Vinca rosea.
Compound from the rosy periwinkle flower, vincristine and vinblastine, are used to treat some cancers.



What is it?

‘Chemotherapy involves repeated cycle of cytotoxic drugs at regular intervals’



Eating well during ‘good times’ between doses help maintain nutritional status

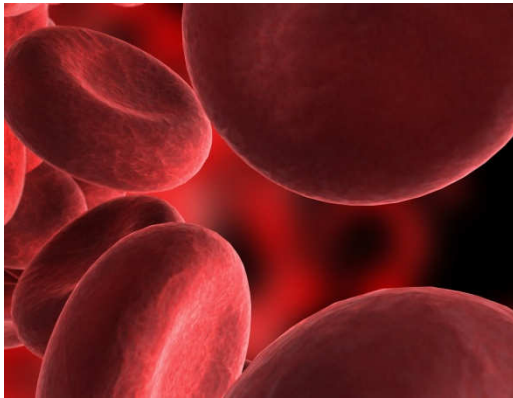


How does chemotherapy work?

- Interrupts cell division
- Prevents DNA production
- Interrupts cell metabolism
- **Chemotherapy will destroy some healthy cells, causing side effects.**

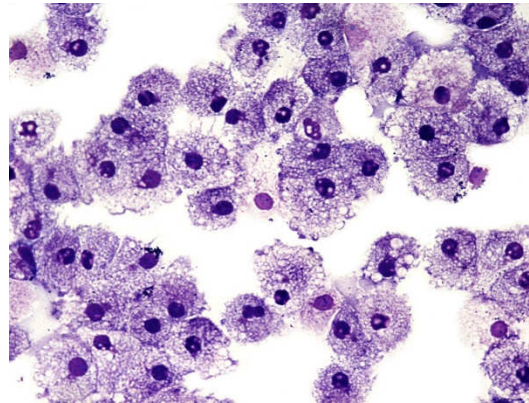


Blood cells



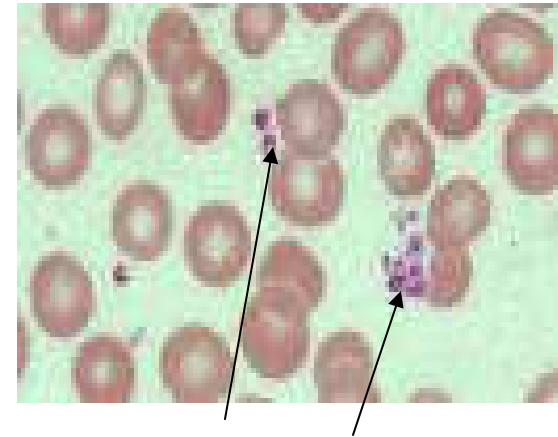
Red blood cells

Carry nutrients
and oxygen



Neutrophils

A type of white
cell that fights
infection

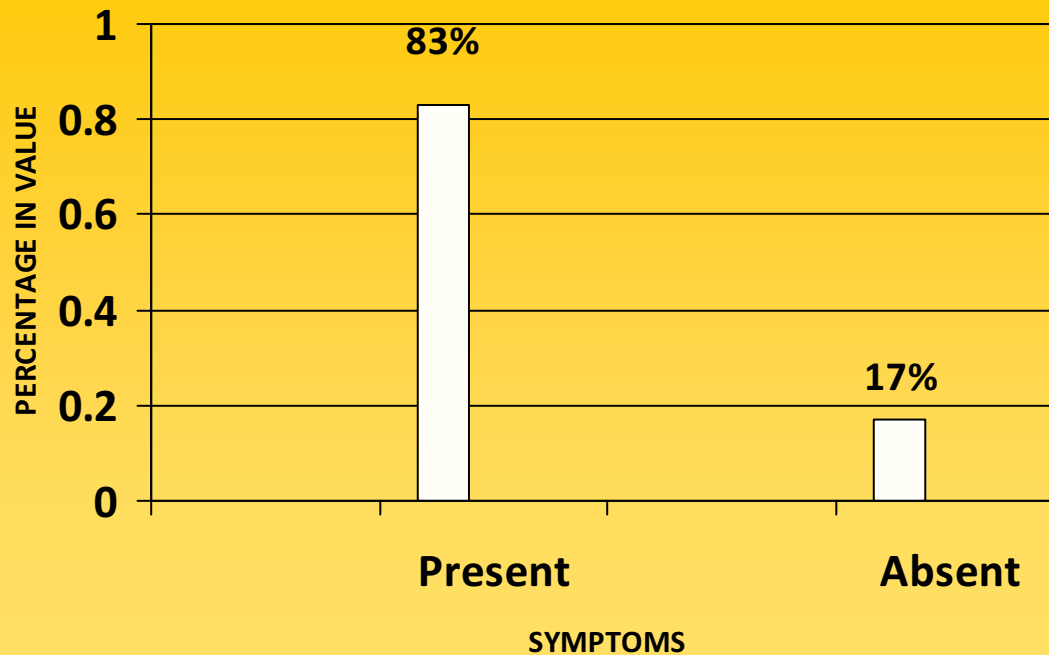


Platelets

Helps the
blood to clot



SYMPTOMS EXPERIENCED BY PATIENTS AT ASH



Common concerns with chemotherapy

-
- Infection
 - Fatigue
 - Fluids
 - Nutrition
 - Nausea and vomiting
 - Oral care
 - Skin care
 - Preventing bleeding
 - Constipation
 - Diarrhea
 - Stress



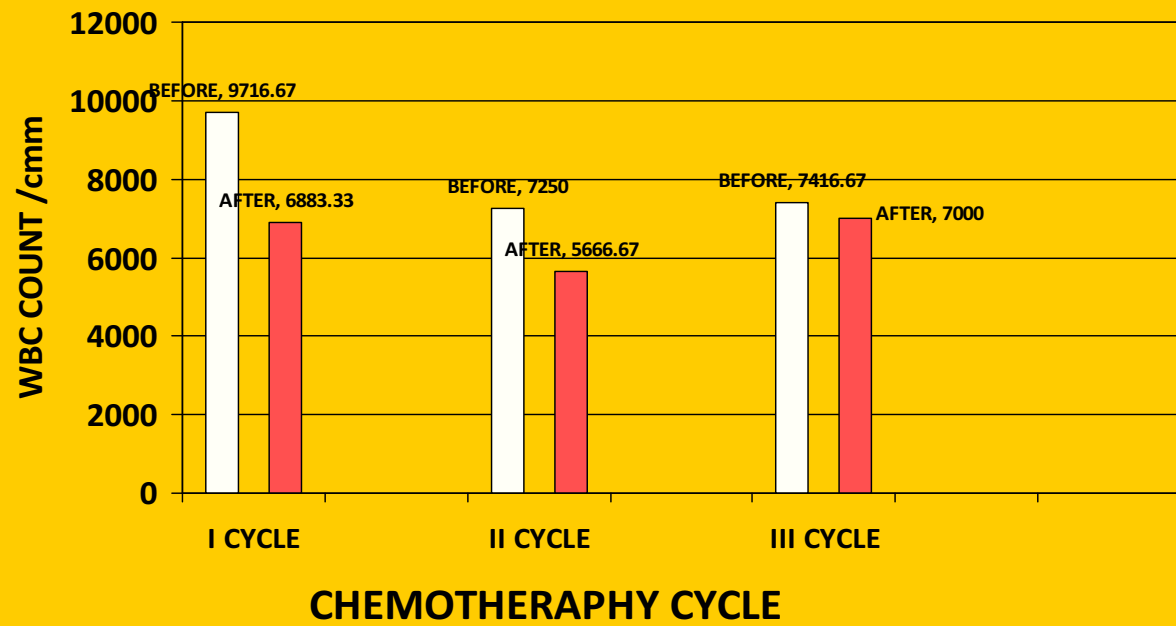
INFECTION



Chemotherapy can increase risk for infection because it may lower the white blood cell count.



VARIATION OF WBC COUNT



FLUIDS



-
- Keeping hydrated with fluids is important during chemotherapy treatment.
 - Fluids are in water, beverages, and food.
 - Advice sipping of water or juice.



NUTRITION



-
- Loss of Appetite (Anorexia)
 - Loss of Lean Body Mass
 - Early satiety
 - Changes in taste and smell
 - Sore mouth or throat
 - Disturbance of GI tract
 - Nausea and vomiting, Diarrhoea, lactose intolerance, constipation



NUTRITION RELATED SIDE EFFECTS

-
- ANOREXIA
 - High Energy, High Protein foods
 - Taste changes
 - Food chilled
 - More of food still tastes good
 - Strong flavour like ginger, lemon or spices
 - Regular mouth care



NUTRITION RELATED SIDE EFFECTS



-
- Nausea and Vomiting
 - Avoid off – putting smell
 - Avoid lying down after eating
 - Plain foods in small quantities
 - Sip drinks through out day, but wait for 15 minutes after eating
 - Suggest ginger flavours, mint and plain biscuits



NUTRITION RELATED SIDE EFFECTS

- MUCOSITIS
 - Soft smooth foods with plenty of sauce
 - Avoid spicy and salty foods, citrus taste
 - Avoid toast, cracker and pastries
 - Chilled and warm food better than hot foods



NUTRITION RELATED SIDE EFFECTS

- DIARRHOEA
 - Avoid irritants like pulses, onion, strong spices
 - Reduce fibre rich foods
 - Adequate fluid intake
 - Reduce fat and milk products
 - BRAT diet



NUTRITION RELATED SIDE EFFECTS



-
- CONSTIPATION
 - Drink plenty of fluids.
 - Encourage daily walks .
 - Increase fiber in diet by including well-washed fruits and vegetables, whole grain breads and cereals.



DIETARY SUPPLEMENTS



- MVI supplements discouraged by NCI
- Glutamine
- High doses of antioxidants (Vit .A, C, E)
 - ↓ Oxidative stress
 - ↑ Responsiveness to chemo
 - ↓ Toxicity of treatment



SPECIALISED NUTRITION SUPPORT



-
- Enteral nutrition
 - PEG
 - PEJ
 - Parenteral Nutrition
 - Peripheral
 - Central



THANK YOU

