Management of Weight Loss in People With Cancer
Cancer-related cachexia is a multifactorial, complex process characterized by loss of lean body mass. Which of the following metabolic abnormalities is present in cancer cachexia?

A. Decreased catabolism  JL102
B. Lipolysis  JL103
C. Induction of inflammatory response to tumor  JL104
D. Both B and C  JL105
Your patient complains of loss of appetite due to early satiety. Which of the following medications would be most appropriate to enhance gastric emptying?

A. Dronabinol  JL106
B. Metoclopramide  JL107
C. Megestrol  JL108
D. Olanzapine  JL109

Pretest Question #2
Management of Weight Loss in People With Cancer

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Financial Disclosure

Ms. Hager has no potential conflicts of interest to disclose.
Learning Objectives

1. Define the incidence of weight loss in patients with cancer and optimal approaches to the workup and differential diagnosis of anorexia

2. Discuss the pathophysiologic changes that occur in patients with cancer, leading to anorexia and weight loss

3. Review optimal pharmacologic and nonpharmacologic treatment approaches to weight loss in patients with cancer

4. Describe the role of the advanced practitioner in the management of patients with cancer-related anorexia and weight loss
How would you describe the area where you currently work?

A. Urban  **JL110**
B. Suburban  **JL111**
C. Rural  **JL112**
In your respective areas of practice, do you currently have access to a registered dietitian (RD)?

A. Yes, RD is part of team JL113
B. Yes, RD is referral only JL114
C. No current access to RD JL115
The Importance of Nutrition

Definition of nutrition

Adequacy of intake = necessary for:
- Body tissue growth and repair
- Daily activity energy
- Fighting off diseases, infections
- Treatment and recovery

Balanced diet = provision of 6 basic nutrients:
- Carbohydrates
- Vitamins
- Protein
- Minerals
- Fat
- Water
6 Basic Nutrients

**Carbohydrates**
- Body’s preferred energy source (glucose)
- 3 forms: Starch, sugar, cellulose
- Sources: Grains, potatoes, cereals, pasta, vegetables, fruits

**Protein**
- Produce 8 essential amino acids
- Healing of tissues
- Sources: Meat, fish, poultry, dairy, eggs, dried peas, beans

**Fat**
- Essential fatty acids, longer digestion period
- Cushion and support
- Sources: Vegetable oils, butter, margarine, salad dressing, nuts
6 Basic Nutrients (cont)

Vitamins
- Essential for food use, healthy body functioning
  - Vitamin A: Vision
  - Vitamin B: Nerves, skin
  - Vitamin C: Infection
  - Vitamin D: Bones, teeth

Minerals
- Strong builders, aid in vital body functions
- Calcium: Bones
- Iodine: Thyroid, thermostat
- Iron: Blood
- Magnesium: Muscle, nerve function, steady heart rhythm
- Sources: Milk, milk products, dark leafy green vegetables, fish

Water
- Essential to life, 2/3 of body weight
- Dissolves foods, eliminates waste
- Sources: All fluids, many solid foods
Weight Loss in Oncology Is Significant

- As many as 40% of patients experience weight loss and anorexia prior to diagnosis
- 40% to 80% of patients are expected to experience malnutrition at some point during their treatment
- At the time of diagnosis, up to 80% of patients with upper gastrointestinal cancer and 60% of patients with lung cancer have already experienced significant weight loss
- Weight loss is associated with decreased performance status in a majority of tumor categories
- Weight loss of as little as 6% of body weight can predict a reduced response to oncology treatment, reduced survival, and reduced quality of life

It is possible to starve cancer cells by eliminating all sugar from your diet.

A. True  JL116
B. False  JL117
ANSWER: FALSE

- All cells require glucose, including cancer cells
- Backup strategies to make glucose
- Attempts to “starve cancer cells”
- Anxiety
- Limit processed foods
- Plate method
Risk for Malnutrition

Highest-risk cancers
- Head and neck cancer
- Gastrointestinal cancers

Negative outcomes
- Dose reductions
- Holding treatments
- Termination of treatment

Malnutrition Screening

- Screening process essential
- Early identification of malnutrition
- Reversal of severe depletions: challenging
- Screening conducted upon admission to oncology services and routinely throughout treatment regimen

Validated Screening Tools

Patient Generated–Subjective Global Assessment (PG-SGA)
- 17 data points, includes screening and assessment criteria, inpatient and outpatient setting

Malnutrition Screening Tool (MST)
- 2 data points, pure screening tool, inpatient and outpatient setting

Malnutrition Screening Tool for Cancer Patients (MSTC)
- 4 data points, includes ECOG performance status, inpatient only

Malnutrition Universal Screening Tool (MUST)
- 4 data points, contains screening & assessment criteria, inpatient only

Malnutrition Screening Tool (MST)

- Has the resident **lost weight recently** without trying?
  - No 0
  - Yes, how much (kg)?
    - 1-5 1
    - 6-10 2
    - 11-15 3
    - >15 4
    - Unsure 2

- Has the resident been **eating poorly** (for example less than ⅓ of usual intake) because of a decreased appetite?
  - No 0
  - Yes 1

Malnutrition Screening Tool (MST)

If the total score is ≥ 2, the individual is likely to be underweight and/or at risk of malnutrition and should be assessed by a dietitian.

It is important to note that overweight or obese individuals can still have protein and nutrient deficiencies that can often be missed. Unintentional weight loss in these individuals may be equally detrimental as they will lose protein stores instead of fat.

Malnutrition

“Undernutrition and changes in body composition, which occur due to the cancer itself or from the impact of the oncology treatment.”

Effects of Malnutrition

- Impact immune response
- Muscle strength
- Level of fatigue
- Wound healing
- Psychosocial function
- Quality of life
- Tolerance to treatment
- Treatment outcome

Increased treatment- or disease-related complications, frequent hospital admissions, increased length of stay, increased healthcare costs

Definitions of Malnutrition

- “Decline in lean body mass with the potential for functional impairment” “any nutritional imbalance”
- “Adult undernutrition typically occurs along a continuum of inadequate intake and/or increased requirements, impaired absorption, altered transport, and altered nutrient utilization.”
- “A state of nutrition in which a deficiency or excess (or imbalance) of energy, protein, and other nutrients causes measureable adverse effects on tissue/body form (body shape, size, and composition) and function and clinical outcome.”

Cancer Cachexia

- Up to 80% of patients with advanced cancer may be diagnosed with cancer cachexia
- “Multifactorial syndrome characterized by an ongoing loss of skeletal muscle mass (with or without loss of fat mass) that cannot be fully reversed by conventional nutritional support and leads to progressive functional impairment”
- Indicated as a factor in the cause of death of 30% to 50% of all patients with cancer

Cancer Cachexia (cont)

Pathophysiology
- Negative protein and energy balance driven by reduced food intake and/or abnormal metabolism

Stages
- Precachexia
- Cachexia
- Refractory cachexia: Last 3 months of life

Address and intervene
- Anorexia
- Reduced food intake

Malnutrition: Six Clinical Characteristics

- Nutrition assessment: Evaluation of malnutrition characteristics
- Goal: Prevent or modify the factors that influence malnutrition
- Malnutrition = Worse outcomes in patients treated for cancer
- ≥ 2 of the 6 Recommended for Diagnosis of Malnutrition:
  - Insufficient energy intake
  - Unintended weight loss
  - Loss of subcutaneous fat
  - Loss of muscle mass
  - Localized or generalized fluid accumulation (may mask wt. loss)
  - Diminished functional status, as measured by hand grip strength

Nutrition Benefits

- Meet increased nutritional demands
- Support healing process
- Fewer complications
- Better quality of life
- Tolerate full prescribed treatment plan

Cancer Patients Need Extra Nutrition

<table>
<thead>
<tr>
<th>Healthy individual</th>
<th>Individual with cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calories</strong></td>
<td></td>
</tr>
<tr>
<td>25 Kcal/kg</td>
<td>Maintenance: 25–30 Kcal/kg</td>
</tr>
<tr>
<td></td>
<td>Gain: 30–35 Kcal/kg</td>
</tr>
<tr>
<td><strong>Protein</strong></td>
<td></td>
</tr>
<tr>
<td>0.8 g/kg</td>
<td>Maintenance: 1.5–2.5 g/kg</td>
</tr>
<tr>
<td></td>
<td>w/severe stress (cachexia)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Healthy individual</th>
<th>Individual with cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kcal/day needed for 150 lb (68 kg)</strong></td>
<td>1700</td>
</tr>
<tr>
<td></td>
<td>Gain: 2040-2380</td>
</tr>
</tbody>
</table>

g = gram; Kcal = calorie; kg = kilogram, lb = pound.

It is recommended for patients with cancer to clean their plates at meal times due to the need for extra calories and protein.

A. True  JL118
B. False  JL119
Patients with cancer see food in a different way
- Overwhelmed with volume
- Family and friends: Good intentions
- Change your tactics: Bigger is not always better

## Prevalence of Side Effects Affecting Nutrition

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Weight loss</th>
<th>Fatigue</th>
<th>Nausea/vomiting</th>
<th>Oral mucositis</th>
<th>Taste alterations</th>
<th>Constipation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall %</td>
<td>50%–90%</td>
<td>70%–100%</td>
<td>30%–90%</td>
<td>40%–100%</td>
<td>35%–70%</td>
<td>40%–50%</td>
</tr>
<tr>
<td>Chemo-therapy</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Radiation</td>
<td>✓</td>
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<tr>
<td>Surgery</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immuno-therapy</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

✓ = treatment in which side effect is common
Cycle of Malnutrition

- Infections and Medications
- Mouth Sores
- Decreased Appetite
- Diarrhea
- Too Tired to Eat
- Too Tired to Cook
- Eat Less
- Lose Weight
- Tire Out Quickly
- Lose Strength

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Weight Loss and Poor Appetite

- Small, frequent portions
- Favorite foods, pleasant surroundings, use the clock
- Eat before and after a treatment, drink fluids
- Avoid gas-forming foods and beverages
- High calorie/protein choices, add extras, make every bite count
- Commercial nutritional supplements: Remember foods first

Appetite Stimulants

- Megestrol acetate: Fluid retention, thromboembolic complications
- Dronabinol: Active ingredient is tetrahydrocannabinol; avoid use in elderly
- Corticosteroids: Hyperglycemia
- Cyproheptadine: Antihistamine
- Mirtazapine: Antidepressant
- Future drugs: Anamorelin

Early Satiety

- Food and liquid intakes at separate times
- Calorically dense liquids
- Avoid greasy and fried foods
- Use of metoclopramide

Fatigue

- Utilize single-serving items, convenience items
- Don’t force yourself to cook, rely on family or friends
- Use frozen meals, takeout from favorite restaurants
- Graze, graze, graze (stock those cabinets)
- Use of nutritional supplements

Great Snack Ideas

- Yogurt
- Cheese and crackers
- Cereal and milk
- Pudding cups
- Nuts, sunflower seeds
- Fruit cups, dried fruit
- Raw veggies (if tolerated)
- Finger sandwiches
- Cottage cheese
- Tuna, egg, or chicken salad
- Smoothies

- Milkshakes
- Cream soups
- Hard-boiled eggs
- Muffins
- Peanut/nut butter
- Granola bars
- Popsicles
- Sherbet, ice cream cups
- String cheese
- Hummus dip
- Berries, canned fruit

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Dysphagia

- Texture changes: Soft, blended, or moist foods
- Confirm safety of swallow: Good posture, limit distractions
- Double swallows, verbalization
- Swallowing evaluation with speech-language pathologist
- Further altered textures, thickened liquids
Dry Mouth

- Moist foods, adequate hydration at and between meals
- Proper daily oral hygiene
- Use of broth, gravy, or sauces, dunk dry foods
- Foods with high water content
- Avoid: Caffeine, commercial mouthwashes containing alcohol
- Biotene, artificial saliva products, humidifier use

Oral Mucositis

- Confirm correct medication use
- Soft foods, avoid acidity
- Cold items, ice chips during treatment
  *Caution: Oxaliplatin
- Nutritional supplements, low-acid fruits
- Use a straw
- Glutamine rinses, honey
Taste and Smell Alterations

- Confirm no mucositis
- Tart, sour, acidic foods
- Mouth rinse: ¾ tsp. salt, 1 tsp. baking soda, 4 cups water
- Excessive seasonings, marinate and cook in sweet juices, acidic dressings, wine
- Plastic vs. metal
- 50 mg elemental zinc: Limit to 60 days, copper deficiency

Taste and Smell Alterations (cont)

- Cold foods = no odors
- Use a fan during cooking, no microwave ovens
- Plate foods prior to placement on table
- Keep serving dishes away
- Sippy cups

Nausea and Vomiting

- Take prescribed medications correctly
- Small portions, eat slowly
- Dry or sour foods, ice chips, liquids between meals
- Avoid grease, spices, fatty foods, strong odors
- Avoid tight clothing, stuffy atmosphere
- Other considerations: Ginger
Constipation

- High-fiber diet
  *Caution: Too much too quickly*
- Adequate fluids
- Consistent eating times, exercise
- Ways to increase fiber
- Establish a bowel plan

*Probiotics, herbals, methylaltrexone bromide

Diarrhea

- Maintain hydration: 1 cup fluid after each loose bowel movement
  *Caffeine-free fluids
- Low-fiber diet: More than BRAT (bananas, rice, apple sauce, toast)
- Sugar alcohols
- Beneficial medications: Octreotide acetate, opium tincture
Hypomagnesemia

- Repletion based on degree of deficiency, severity of clinical signs
- Severe signs and symptoms: IV repletion, cardiac monitoring
- Asymptomatic: Oral replacement therapy
  Sustained-release preferred
  Magnesium chloride (Mag Delay, Slow-Mag)
  Magnesium L-lactate (Mag-Tab SR)
- Magnesium oxide: If sustained release unavailable
  **Diarrhea**
Hypomagnesemia (cont)

- IV replacement, dose based on plasma magnesium levels
- Severe depletion (Mg < 1 mg/dL):
  Give 4–8 g over 12–24 hours, repeat as necessary
- Moderate depletion (Mg 1–1.5 mg/dL):
  Give 2–4 g over 4–12 hours
- Mild depletion (Mg 1.6–1.9 mg/dL):
  Give 1–2 g over 1–2 hours
Summary

- Nutritional status is critical during cancer and treatment
- Encourage variety: Colorful, limit processed foods
- Malnutrition: Mandatory early intervention
- Treatment-related side effects: Common but manageable
Resources for the Advanced Practitioner

- The Oncology Nutrition DPG of the Academy of Nutrition and Dietetics www.oncologynutrition.org. To Find Local CSO.
- The Academy of Nutrition and Dietetics www.eatright.org
- The American Institute for Cancer Research www.aicr.org
- The National Cancer Institute www.cancer.gov
- www.nutrition411.com
- www.chemocare.com
Questions?
Cancer-related cachexia is a multifactorial, complex process characterized by loss of lean body mass. Which of the following metabolic abnormalities is present in cancer cachexia?

A. Decreased catabolism  JL121
B. Lipolysis  JL122
C. Induction of inflammatory response to tumor  JL124
D. Both B and C  JL125
Posttest Question #2

Your patient complains of loss of appetite due to early satiety. Which of the following medications would be most appropriate to enhance gastric emptying?

A. Dronabinol  JL126
B. Metoclopramide  JL128
C. Megestrol  JL129
D. Olanzapine  JL130