Introduction

➤ Malnutrition is present in 20% of patients with head and neck cancer

➤ Malnutrition is associated with decreased cell-mediated immunity and increased postoperative sepsis

➤ Early recognition and correction of malnutrition could result in decreased morbidity and mortality
Definition and Classification

- Malnutrition is weight loss greater than 10% of ideal body weight associated with loss of muscle.
- Marasmus - total caloric intake decreased, serum protein level is normal.
- Kwashiorkor - protein caloric intake decreased.
Mechanisms of Malnutrition

- Reduced dietary intake
  - alcohol, local tumor effects, XRT mucositis, poor dentition
- Anorexia
  - learned aversion, sensory deficits
- Cancer cachexia
  - Cori (lactate) vs. Krebs (CO2 and H2O)
  - Amino acids sacrificed to make glucose
Mechanisms of Malnutrition (cont’d)

- Specific nutrient deficiencies
  - Decreased vitamin A or B-carotene is associated with cancer of the head and neck
  - Decreased selenium is associated with cancer of the esophagus
Assessing Nutrition

- History - diet, weight loss
- Physical Exam - loss of subQ fat, muscle wasting, edema, anthropometrics
- Subjective global assessment (SGA)
- Labs - albumin, transferrin, prealbumin, retinol binding protein, total lymphocyte count
- Antigen skin testing
Nutritional Requirements

- Energy required = Basal + additional secondary to illness
- Basal - 25 to 45 kcal/kg/day
- Major trauma/surgery with complications may require up to 50% more energy
- Calorie:nitrogen ratio 120 - 180:1 in severely stressed patients
Response to surgery

- Phase I - Catabolic phase lasting 3-7 days
- Phase II - Protein consumption and production are equal
- Phase III - Anabolic phase of protein and total calories
- Phase IV - Restoration of lipid stores
Amino acids / Micronutrients

- **Arginine** - positive effect on immune function and collagen synthesis

- Animal studies show increased lysine and decreased arginine in tumor bearing vs. control rats

- Phosphate replacement is important because it is important in energy metabolism

- Selenium, trace metals
Lipids

- Fat - 9 kcal/g
- Providing fat may help preserve protein
- Lipid composition of tumor cell membranes is sensitive to change in diet
  - Consider n-3 PUFA in cancer patients
  - May help to make more sensitive to chemotx. and hyperthermia
Delivering Nutrition

- Oral
- Enteral
  - NJ, PEG vs G-tube, G-J, J-tube
  - Parenteral hyperalimentation
    - PPN vs TPN
Nutritional Formulas

- Total calories, protein
- Volume restriction
- Osmolality
- Cost
- Taste
- Composition
Studies on the effect of nutritional replacement

- Preop TPN for 1 week decreased postop morbidity and mortality by 21 to 31% in G.surg patients
- In chemotx and xrt patients, no change was seen
- Need more prospective, randomized trials
Enteral vs. Parenteral Nutrition

- Enteral is safer, more convenient, and less expensive
- Enteral prevents mucosal atrophy, decreases the body’s stress response, and preserves normal flora
- TPN - ? effect on tumor growth
Conclusions

- Head and neck cancer patients are frequently malnourished.
- Perioperative nutritional support may be associated with decreased morbidity, mortality and cost.
- Further studies needed.