

1, 4, 6, 7, 8, 9, 11, 12, 13, 17 (comment specifically on albumin, pre-albumin, RBC, Hgb, Hct, MCV, MCHC and answer what is the likely cause of anemia in this patient?), & 20

**1. Mr. Seyer has been diagnosed with adenocarcinoma of the esophagus. What does the term adenocarcinoma mean?**

Adenocarcinoma is a cancer is the most common type of esophageal cancer and it consists of cancerous tumors that are found in the lower part of the esophagus, near the stomach.

**4. Cancer is generally treated with a combination of therapies. These can include surgical The type of malignancy and stages of the disease will, in part, determine the types of therapies that are prescribed. Define and describe each of these therapies. Briefly describe the mechanism for each. In general how do they act to treat malignancy?**

**Surgical Resection-** Involves using surgery to remove abnormal tissue. This is done because the tissue already unhealthy and destroyed and would only continue to affect healthy tissue. Surgery may be the only treatment or may be used with other therapies, such as hormone therapy, radiation therapy, chemotherapy or others to continue treatment.

**Radiation therapy-** Is a type of treatment that can be used on cancer patients to kill cancerous cells. Power from X-rays, protons and other types of energy may contribute to intensifying beams of energy that target and kill these cells. Often times, high-energy beams are sourced from an external machine that aims the beam at a specific location on the body. This is often referred to as external beam radiation therapy. During brachytherapy, another form of radiation therapy, radiation is used inside the body rather than the outside. During radiation therapy, the genetic material that is responsible for controlling the growth and rate of division of cells is destroyed, damaging cells. Both cancerous and healthy cells are damaged during this process, but the goal is to damage as few healthy cells as possible.

**Chemotherapy-** Chemotherapy is the treatment of cancer with one or more cytotoxic antineoplastic drugs. Traditional chemotherapeutic agents act by killing cells that divide rapidly, one of the main properties of most cancer cells. This means that chemotherapy also harms cells that divide rapidly under normal circumstances: cells in the bone marrow, digestive tract, and hair follicles. This results in the most common side-effects of chemotherapy: myelosuppression (i.e. decreased production of blood cells, hence also immunosuppression), mucositis (i.e. inflammation of the lining of the digestive tract), and alopecia (i.e. hair loss). Some newer anticancer drugs (e.g. monoclonal antibodies) are not indiscriminately cytotoxic, but rather target proteins that are abnormally expressed in cancer cells and that are essential for their growth. Such treatments are often referred to as targeted therapy, distinct from classic chemotherapy, and are often used alongside traditional chemotherapeutic agents in antineoplastic treatment regimens.

Chemotherapy works on cells that are actively reproducing

**Immunotherapy** is treatment that uses an individual's own immune system to fight cancer. This can be done by either stimulating your immune system to work harder or smarter to attack cancer cells, or by giving the immune system components, such as man-made immune system proteins.

**II. Understanding the Nutrition Therapy**

**6. Many cancer patients experience changes in nutritional status, briefly describe the potential effect of cancer on nutritional status.**

Cancer of the head and neck, or esophageal cancer are cancers closely related to nutrition and food intake, it can decrease a patient's need to eat. Chemotherapy can significantly increase nausea and other GI problems, which lead to lack of appetite. The symptoms associated with cancer can make eating very difficult, and most patients lose weight rapidly.

**7. Both surgery and radiation affect nutritional status. Describe potential and metabolic effects of these treatments**

Side effects of radiation include fatigue, mucositis, dysphagia, or severe esophagitis. Another main concern is dehydration which should be observed by receiving intravenous fluids and electrolyte correction. Feeding tube may also be required since there may be difficulty in oral intake of food.

**III. Nutrition Assessment**

**8. Calculate and Evaluate Mr. Seyer's %UBW and BMI.**

%UBW = 86.8% (198 lbs. vs. 228 lbs.) BMI = 24.74

**9. Summarize your findings regarding his weight status. Classify the severity of his weight loss. What factors may have contributed to his weight loss? Explain.**

The patient has unintentionally lost over 30 lbs. to get to his current weight of 198 lbs. He lost over 13.2% of his usual body weight. which is Cancer Cachexia. Patient also reported difficulty of swallowing (dysphagia) and pain in throat, potentially leading to less food intake Due to his cancer state, patient may have higher caloric needs.

**11. Estimate Mr. Seyer's energy and protein requirements based on his current weight.**

Energy Requirements - Weight = 198lbs/90kgs Height = 6ft 3inches/ 75inches/190.5cm  
 REE -  $66.5+(13.8 \times 90\text{kgs})+(5.0 \times 190.5\text{cm})-(6.8 \times 58) \times (\text{Stress Factor } 1.2/1.3) = 2240\text{kcal} - 2430\text{kcal}.$   
 $35\text{kcal} \times 90\text{kg} = 3150\text{kcal}$

Protein Requirements - Healthy person 0.8g protein /kg of body weight  
 Increased protein needs - 1.5-2.5g protein/kg of body weight  
 $1.5\text{g/protein} \times 90\text{kg} = 135\text{g protein/ per day}$

**12. Estimate Mr. Seyer's fluid requirement based on his current weight.**

Fluid Requirements - 30-35ml/kg -Increased need for fluid due to dehydration  
 $30\text{-}35\text{ml} \times 90\text{kg} = 2700\text{-}3150\text{ml}$

**13. What factors noted in Mr. Seyer's history and physical may indicate problems with eating prior to admissions.**

The factors noted in Mr. Seyer's history and physical indicate several issues with his food intake.  
 History: Over a period of 3-5 months, Mr. Seyer had dysphagia and for 5-6 months. Over the previous year, the patient experienced significant heartburn. The patient stated he was unable to consume food, because of esophageal pain and heartburn. When he did eat, he experienced difficulty with swallowing foods, notably textured foods. In addition, he noted a decrease in appetite and a sense of feeling full all the time.  
 Physical: It was observed that Mr. Seyer had dry mucous membranes in his throat, which likely exacerbated his dysphagia and odynophagia. In addition, the dry mucous membranes in his throat and nose and his dry skin suggest dehydration. Upon abdominal palpation, the patient displayed signs of epigastric tenderness.

**17. Review the patient's chemistries upon admission. Identify any that are abnormal and describe their clinical significance for this patient, including the likely reason for each abnormality and its nutritional implication.**

Chemistry	Normal Value	Mr. Seyer's Value	Reason for Abnormality	Nutritional Implications
Total Protein	6-8	5.7	Inadequate Protein intake	Increase protein intake
Albumin	3.5-5	3.1/3.0	Inadequate protein intake, dehydration	Increase protein intake, rehydrate
Prealbumin	16-35	15/12	Inadequate protein intake	Increase protein intake
RBC	4.5-6.2	4.2/4.3	Malabsorption/side effect of cancer	Increase iron, B12, folate
Hemoglobin	14-17	13.5/13.9	Low RBC due to cancer	Increase iron, B12, folate
Hematocrit	40-54	38	Decreased RBC	Increase iron, B12, folate
Mean cell Hgb	26-32	32.4/32.3	Low RBC	Increase iron, B12

**IV. Nutrition Diagnosis**

**20. Select two high priority nutrition problems after Mr. Seyer's surgery and complete the PES statement for each.**

- Inadequate protein energy intake related to metabolic abnormality due to cancerous state as evidenced by the estimated protein intake higher than recommended prescribed enteral nutrition therapy.
- Malnutrition related to insufficient enteral nutrition recommendations as evidence by weight loss of over 30 pounds in a two month period and signs of cachexia