



Round : ..General surgery.....

Group no : B3.....

Done By : ..Fatima abu assal.....

Nutrition for surgical patients:

Weight Categories	BMI (kg/m ²)
Underweight	< 18.5
Healthy Weight	18.5 - 24.9
Overweight	25 - 29.9
Obese (Class I)	30 - 34.9
Severely Obese (Class II)	35 - 39.9
Morbidly Obese (Class III)	40 - 49.9
Super Obese (Class IV)	>50

✨ Serum Albumin is not a reliable short term marker for a nutritional assessment during nutritional support because it has a long half life.(2wks-3wks), its role as marker for inflammation.

✨ Pre-albumin(2-3 days), transferrin(7-10 days) ,and retinol binding protein (hours)are useful in monitoring the impact of nutritional support.

ESPEN Guidelines:

- Diagnosis of Malnutrition: BMI < 18.5 kg/m² or combination of weight loss and reduced BMI
- Severe Nutrition Risk: Weight loss >10-15% within 6 months, BMI < 18.5 kg/m², SGA grade C or NRS > 5, Preoperative serum albumin < 30 g/L

✨ It is now advisable to drink clear liquids 2 hours before the surgery, breast milk 4 hours before, non-human milk and solid light food 6 hours before, and anything else 8 hours before the surgery.

✨ Crystalloids are ideal for extracellular fluid (ECF) replacement, distributing mostly in the interstitial space. After administering 1 liter, around 250 mL stays intravascular, and 750 mL moves to the interstitial compartment. Excessive crystalloids may dilute plasma proteins, reduce oncotic pressure, and cause interstitial pulmonary edema. Colloids, being larger molecules, remain intravascular longer and require smaller volumes but may cause allergic reactions, are more expensive, and can worsen pulmonary edema if vascular permeability increases. In perioperative patients, crystalloids are typically used first, with colloids reserved for specific cases as determined by the physician.(Crystalloids don't need cross matching unlike colloids)

✨ Early Enteral Nutrition involves delivering nutrients directly into the (GI) tract and is preferred for postoperative patients within the first 24-48 hours after surgery. It helps maintain gut

integrity, supports immune function, reduces the risk of bacterial translocation, and minimizes complications such as infections, sepsis, and mortality. and reduces the hypercatabolic state caused by surgery, However, patients with GI dysfunction (e.g., bowel obstruction or severe ileus) may require cautious initiation with lower volumes or through NG tubes that bypass the stomach.

✨ Parenteral Nutrition (PN) delivers nutrients directly into the bloodstream via a central or peripheral venous line While PN meets nutritional needs, it bypasses the GI tract, potentially leading to gut atrophy. **Indications:** - Severe bowel obstruction - Short bowel syndrome - Inability to tolerate enteral nutrition (EN) **Risks and Complications:** - Infections (central venous catheter-related) - Liver dysfunction - Hyperglycemia and electrolyte imbalances - Lack of gut stimulation, increasing infection risk **Guidelines:** PN should be reserved for patients unable to tolerate EN. For low nutritional risk patients, initiate PN 5–7 days postoperatively if EN is not feasible. For high-risk or malnourished patients, PN can start earlier, within 3–5 days.

✨ Avoidance of Simple Carbohydrates: After surgeries like gastric bypass, patients may experience Dumping syndrome (nausea, diarrhea, palpitations) if they consume simple sugars. Complex carbohydrates should be prioritized instead of sugary foods or drinks.

✨ Fiber Management: Low-fiber diets may be recommended initially to avoid gastrointestinal distress, but fiber intake should gradually increase to prevent constipation, which is common post-surgery.

CHAPTER 4: NUTRITION

Multiple Choice Questions

1. A 36-year-old female undergoes an uncomplicated laparoscopic cholecystectomy. Her preoperative weight is 198 lb (89.8 kg) and she is 5 ft 6 in (167.6 cm) tall. What weight should be used to calculate her calorie needs?
 - a. 198 lb (89.8 kg)
 - b. 130.7 lb (59.3 kg)
 - c. 140.7 lb (63.8 kg)
 - d. 157.6 lb (71.5 kg)
 - e. 163.6 lb (74.2 kg)
2. A 55-year-old emaciated alcoholic male presents with a 2-day history of chest pain after forceful vomiting. He is taken to the OR for a thoracotomy after he is found to have an esophageal rupture. A jejunal feeding tube is placed and he is started on tube feeds on POD 1, when he develops confusion, shallow breathing, and pulmonary edema. What electrolyte abnormalities do you expect to see?
 - a. Hypophosphatemia, hypokalemia, hypomagnesemia
 - b. Hyperphosphatemia, hypokalemia, hypomagnesemia
 - c. Hyponatremia, hyperkalemia, hyperphosphatemia
 - d. Hyponatremia, hypokalemia, hypophosphatemia
 - e. Hyperkalemia, hypophosphatemia, hypomagnesemia
3. A 42-year-old female is admitted to the ICU after being operated on for a perforated duodenal ulcer. Her past medical history is significant for steroid-dependent COPD. Given the degree of contamination in her abdomen, the decision is made to wait at least 1 week before obtaining a UGI and starting enteral feeds. She will be started on TPN and has vascular access with a right IJ triple-lumen catheter. She is currently on low-dose norepinephrine and mechanically ventilated. She weighs 50 kg and is 150 cm tall. She does not have any renal or hepatic dysfunction. What should the composition of her TPN be?
 - a. 35 kcal/kg/day, 0.8 g/kg/IBW of protein/day
 - b. 30 kcal/kg/day, 1.5 g/kg/IBW of protein/day
 - c. 30 kcal/kg/day, 2.5 g/kg/IBW of protein/day
 - d. 25 kcal/kg/day, 0.8 g/kg/IBW of protein/day
 - e. 25 kcal/kg/day, 2.5 g/kg/IBW of protein/day
4. For the above patient, what is her target blood glucose level?
 - a. <100 mg/dL
 - b. <150 mg/dL
 - c. <180 mg/dL
 - d. <120 mg/dL
 - e. There is no blood glucose goal
5. A 60-year-old TPN-dependent male with short-gut syndrome and diarrhea presents with a nonhealing leg wound. Which trace element may he need supplementation with?
 - a. Manganese
 - b. Fluorine
 - c. Selenium
 - d. Copper
 - e. Zinc

Chapter 24 Surgical Nutrition

What is the motto of surgical nutrition?

“If the gut works, use it”

What are the normal daily dietary requirements for adults of the following:

Protein?

1 g/kg/day

Calories?

30 kcal/kg/day

What is the calorie content of the following substances:

Fat?

9 kcal/g

Protein?

4 kcal/g

Carbohydrate?

4 kcal/g

What is the formula for converting nitrogen requirement/loss to protein requirement/loss?

Nitrogen $\times$ 6.25 = protein

What is RQ?

Respiratory Quotient; ratio of CO₂ produced to O₂ consumed

What is the normal RQ?

0.8

What can be done to decrease the RQ?

More fat, less carbohydrates

What dietary change can be made to decrease CO₂ production in a patient in whom CO₂ retention is a concern?

Decrease carbohydrate calories and increase calories from **fat**

What lab tests are used to monitor nutritional status?

Blood levels of:

Prealbumin ($t_{1/2}$ ≈2 to 3 days)—acute change determination

Transferrin ($t_{1/2}$ ≈8 to 9 days)

Albumin ($t_{1/2}$ ≈14 to 20 days)—more chronic determination

Total lymphocyte count

Anergy

Retinol-binding protein ($t_{1/2}$ ≈12 hours)

Where is iron absorbed?

Duodenum (some in proximal jejunum)

Where is vitamin B12 absorbed?

Terminal ileum

What are the surgical causes of vitamin B12 deficiency?

Gastrectomy, excision of terminal ileum, blind loop syndrome

Where are bile salts absorbed?

Terminal ileum

Where are fat-soluble vitamins absorbed?

Terminal ileum

Which vitamins are fat soluble?

K, A, D, E (“KADE”)

What are the signs of the following disorders:

Total Parenteral Nutrition = IV nutrition

What is the major nutrient of the gut (small bowel)?

Glutamine

What is “refeeding syndrome”?

Decreased serum **potassium**, **magnesium**, and **phosphate** after refeeding (via TPN or enterally) a starving patient

What are the vitamin K–dependent clotting factors?

2, 7, 9, 10 (Think: 2 + 7 = 9, and then 10)

What is an elemental tube feed?

Very low residue tube feed in which almost all the tube feed is absorbed

Where is calcium absorbed?

Duodenum (actively)

Jejunum (passively)

What is the major nutrient of the colon?

Butyrate (and other short-chain fatty acids)

What must bind B12 for absorption?

Intrinsic factor from the gastric parietal cells

What sedative medication has caloric value?

Propofol delivers 1 kcal/cc in the form of lipid!

Why may all the insulin placed in a TPN bag not get to the patient?

Insulin will bind to the IV tubing

How can serum bicarbonate be increased in patients on TPN?

Increase acetate (which is metabolized into bicarbonate)

What are “trophic” tube feeds?

Very low rate of tube feeds (usually 10 to 25 cc/hr), which are thought to keep mucosa alive and healthy

What is the best lab to check adequacy of nutritional status?

Prealbumin