Nutrition in Surgical patient

- Surgical nutrition plays a pivotal role in patient recovery and overall health.
- Preoperative and postoperative nutritional management aims to reduce complications, enhance wound healing, and support immune function.
- Malnutrition is a common issue among surgical patients, and its presence is associated with poor outcomes such as delayed recovery, increased general infection rates, and longer hospital stays.
- In addition, poor wound healing, wound infection, and increased hospital readmissions.

Nutrition in Surgical patient (cont.)

- Surgical procedures, especially major surgeries, place enormous stress on the body, requiring a higher intake of essential nutrients.
- Without proper nutritional intervention before and after surgery, patients may suffer from impaired immune response, increased infection rates, and muscle wasting.
- Therefore, identifying and treating malnutrition before surgery is critical.

Preoperative Nutritional Screening

- Preoperative nutritional screening is essential for determining the nutritional status of patients before surgery.
- The screening process includes evaluating weight history, muscle mass, fat stores, and blood markers such as albumin levels.
- Patients identified as malnourished or at risk of malnutrition can be given specific dietary interventions to improve their nutritional status before surgery.
- This early intervention has been shown to reduce the risk of postoperative complications and improve surgical outcomes.

Nutritional Assessment Methods

- Various methods, including clinical evaluation, dietary history, and anthropometric measurements, can help identify patients at risk of malnutrition.
- Tools such as the Subjective Global Assessment (SGA) and the Mini Nutritional Assessment (MNA) can provide insights into a patient's nutritional status.
- Identifying nutritional deficiencies before surgery allows for timely interventions that can significantly improve recovery times and reduce postoperative complications.
- Comprehensive assessments also ensure that dietary plans align with individual patient needs.

Mini Nutritional Assessment
MNA®

Nestlé Nutrition Institute

Last name: First name:

Sex: Age: Weight, kg: Height, cm: Date:

Complete the screen by filling in the boxes with the appropriate numbers.
Add the numbers for the screen. If score is 11 or less, continue with the assessment to gain a Malnutrition Indicator Score.

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake ☐

B Weight loss during the last 3 months
0 = weight loss greater than 3kg (6.6lbs)
1 = does not know
2 = weight loss between 1 and 3kg (2.2 and 6.6 lbs)
3 = no weight loss ☐

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out ☐

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no ☐

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems ☐

F Body Mass Index (BMI) = weight in kg / (height in m)² ☐
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater ☐

Screening score (subtotal max. 14 points) ☐☐
12-14 points: ☐ Normal nutritional status
8-11 points: ☐ At risk of malnutrition
0-7 points: ☐ Malnourished
For a more in-depth assessment, continue with questions G-R

Assessment

G Lives independently (not in nursing home or hospital)
1 = yes 0 = no ☐

H Takes more than 3 prescription drugs per day
0 = yes 1 = no ☐

I Pressure sores or skin ulcers
0 = yes 1 = no ☐

J How many full meals does the patient eat daily?
0 = 1 meal
1 = 2 meals
2 = 3 meals ☐

K Selected consumption markers for protein intake
- At least one serving of dairy products (milk, cheese, yoghurt) per day yes ☐ no ☐
- Two or more servings of legumes or eggs per week yes ☐ no ☐
- Meat, fish or poultry every day yes ☐ no ☐

0.0 = if 0 or 1 yes
0.5 = if 2 yes
1.0 = if 3 yes ☐.☐

L Consumes two or more servings of fruit or vegetables per day?
0 = no 1 = yes ☐

M How much fluid (water, juice, coffee, tea, milk...) is consumed per day?
0.0 = less than 3 cups
0.5 = 3 to 5 cups
1.0 = more than 5 cups ☐.☐

N Mode of feeding
0 = unable to eat without assistance
1 = self-fed with some difficulty
2 = self-fed without any problem ☐

O Self view of nutritional status
0 = views self as being malnourished
1 = is uncertain of nutritional state
2 = views self as having no nutritional problem ☐

P In comparison with other people of the same age, how does the patient consider his / her health status?
0.0 = not as good
0.5 = does not know
1.0 = as good
2.0 = better ☐.☐

Q Mid-arm circumference (MAC) in cm
0.0 = MAC less than 21
0.5 = MAC 21 to 22
1.0 = MAC greater than 22 ☐.☐

R Calf circumference (CC) in cm
0 = CC less than 31
1 = CC 31 or greater ☐

Assessment (max. 16 points) ☐☐.☐
Screening score ☐☐.☐
Total Assessment (max. 30 points) ☐☐.☐

Malnutrition Indicator Score
24 to 30 points ☐ Normal nutritional status
17 to 23.5 points ☐ At risk of malnutrition
Less than 17 points ☐ Malnourished

Save Print Reset

References
1. Vellas B, Villars H, Abellan G, *et al*. Overview of the MNA® - Its History and Challenges. *J Nutr Health Aging*. 2006; **10**:**456**-465.
2. Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF). *J. Geront*. 2001; **56A**: M366-377
3. Guigoz Y. The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us? *J Nutr Health Aging*. 2006; **10**:466-487.

For more information: www.mna-elderly.com

SUBJECTIVE GLOBAL ASSESSMENT RATING FORM

Patient Name: **ID #:** **Date:**

HISTORY

WEIGHT/WEIGHT CHANGE: ***(Included in K/DOQI SGA)*** — **Rate 1-7**

1. **Baseline Wt:** _____(Dry weight from 6 months ago)
   Current Wt: _____(Dry weight today)
   Actual Wt loss/past 6 mo: _____ **% loss:**_____(actual loss from baseline or last SGA)
2. **Weight change over past two weeks:** _____No change _____Increase _____Decrease

DIETARY INTAKE No Change_____(Adequate) No Change_____(Inadequate)

1. Change: Sub optimal Intake: _____ Protein _____ Kcal _____ Duration_____
   Full Liquid: _____ Hypocaloric Liquid _____ Starvation _____

GASTROINTESTINAL SYMPTOMS ***(Included in K/DOQI SGA-anorexia or causes of anorexia)***

Symptom:	Frequency:*	Duration:*
_____ None	_____	_____
_____ Anorexia	_____	_____
_____ Nausea	_____	_____
_____ Vomiting	_____	_____
_____ Diarrhea	_____	_____

Never, daily, 2-3 times/wk, 1-2 times/wk > 2 weeks, < 2 weeks

FUNCTIONAL CAPACITY — b

Description	Duration:
_____ No Dysfunction	_____
_____ Change in function	_____
_____ Difficulty with ambulation	_____
_____ Difficulty with activity (Patient specific "normal")	_____
_____ Light activity	_____
_____ Bed/chair ridden with little or no activity	_____
_____ Improvement in function	_____

DISEASE STATE/COMORBIDITIES AS RELATED TO NUTRITIONAL NEEDS

Primary Diagnosis_____Comorbidities_____
Normal requirements ____Increased requirements____ Decreased requirements _____
Acute Metabolic Stress: _____None _____Low _____Moderate _____High

PHYSICAL EXAM

_____ Loss of subcutaneous fat (Below eye, triceps, biceps, chest) ***(Included in K/DOQI SGA)*** _____Some areas _____All areas

_____ Muscle wasting (Temple, clavicle, scapula, ribs, quadriceps, calf, knee, interosseous ***(Included in K/DOQI SGA)*** _____Some areas _____All areas

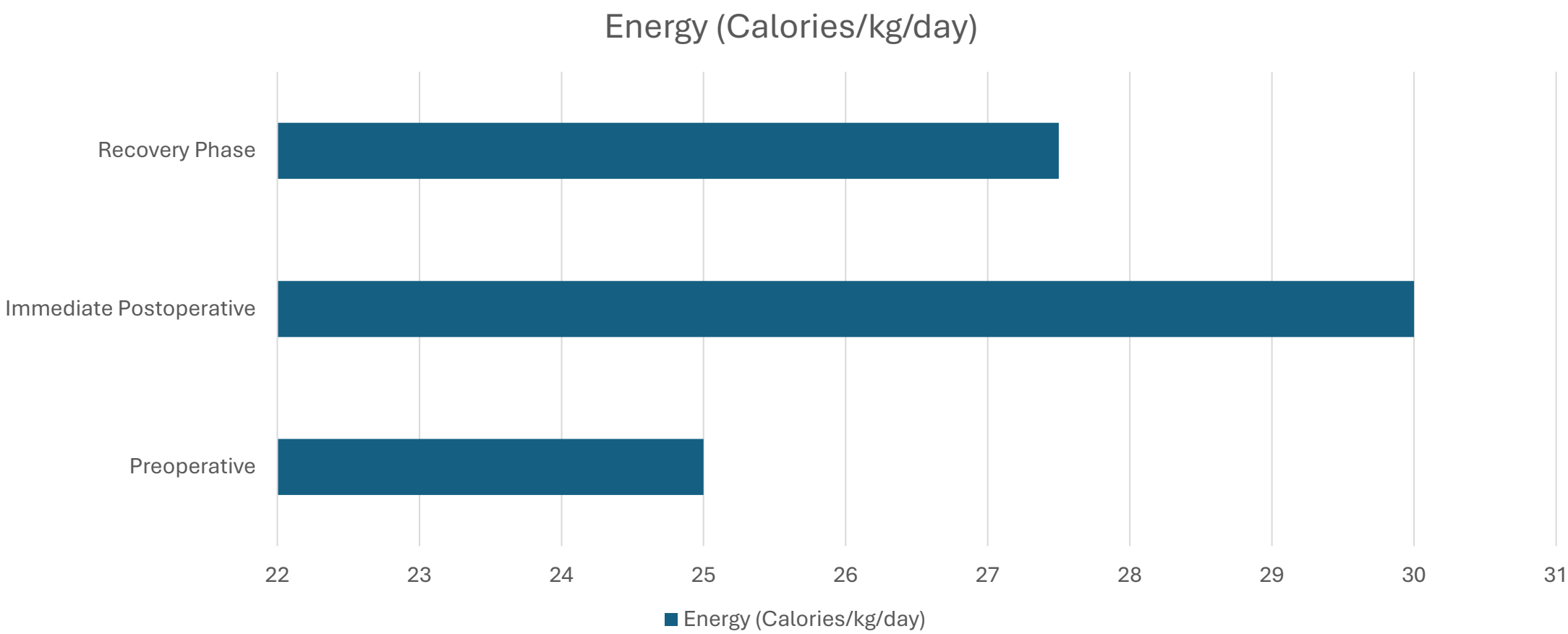
_____ Edema (Related to undernutrition/use to evaluate weight change)

OVERALL SGA RATING

Very mild risk to well-nourished=6 or 7 most categories or significant, continued improvement.
Mild-moderate = 3, 4, or 5 ratings. No clear sign of normal status or severe malnutrition.
Severely Malnourished = 1 or 2 ratings in most categories/significant physical signs of malnutrition.

Figure 3. The 7-point scale SGA form.

Changes in Energy Requirements Pre- and Post-Surgery



Recommended Nutritional Intake for Surgical Patients

Nutrient	Recommended Intake	Role in Recovery	At-risk Patients
Protein	1.2–2.0 g/kg/day	Tissue repair, immune function, muscle maintenance	All surgical patients, especially trauma and burn patients
Energy (Calories)	25–30 kcal/kg/day	Prevents muscle wasting, supports wound healing	Malnourished, critically ill patients
Carbohydrates	50-60% of total caloric intake	Primary energy source for healing	Diabetic patients
Fats (including Omega-3s)	20-30% of total caloric intake	Reduces inflammation, supports cellular repair	Patients with inflammatory conditions
Vitamin C	75-90 mg/day	Collagen synthesis, antioxidant	Malnourished, elderly
Zinc	8-11 mg/day	Wound healing, immune support	Patients with large wounds or burns
Selenium	55-75 mcg/day	Antioxidant defense, immune function	Critically ill patients
Iron	8-18 mg/day	Red blood cell production, oxygen transport	Anemic patients, post-blood loss
Calcium	1000-1200 mg/day	Bone healing	Orthopedic patients
Vitamin D	600-800 IU/day	Supports calcium absorption, immune regulation	Patients with fractures or bone surgery

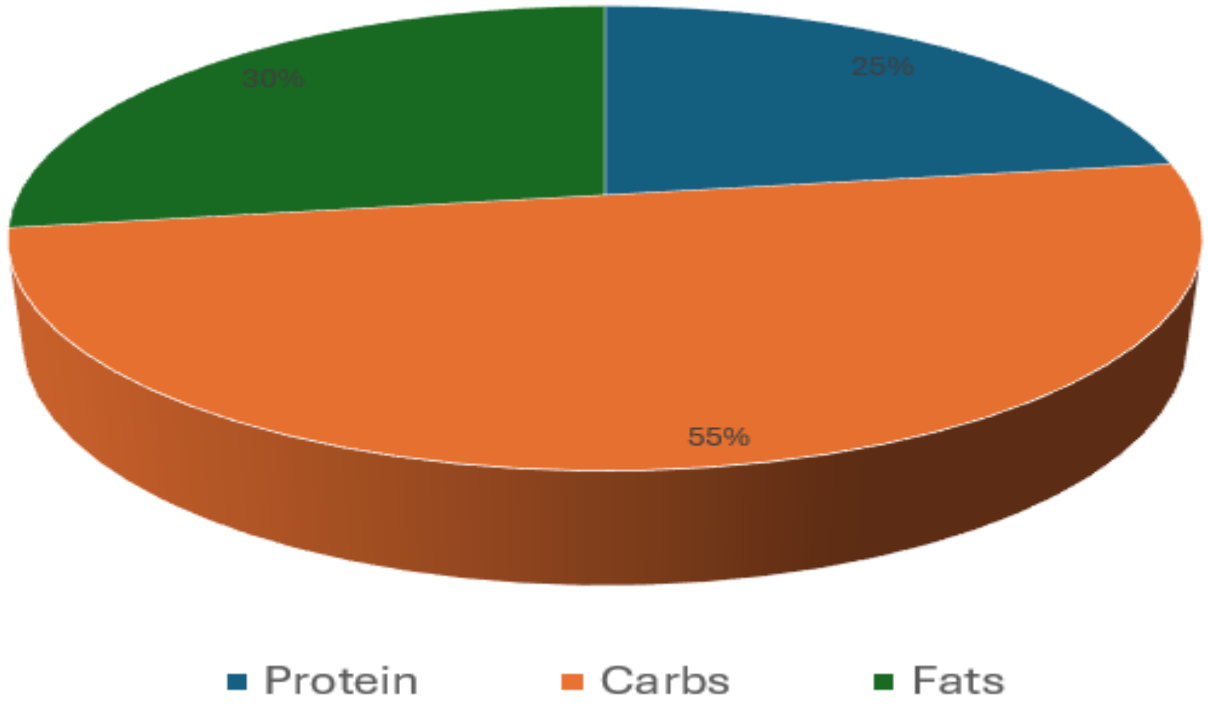
Nutrition for Trauma Surgical Patients

- **Increased Caloric Needs**
- **Energy Demands**: Trauma and surgery increase the body's metabolic rate. Patients may require more calories than usual to support healing, especially if they have extensive injuries or infections.
- **Calories from Protein, Fats, and Carbs**: A balanced approach to macronutrients is essential, focusing on high-quality proteins, healthy fats, and complex carbohydrates.
- **2. Protein Intake**
- **Tissue Repair**: Protein is crucial for the repair and regeneration of tissues. Surgery and trauma increase the need for amino acids, which are the building blocks of proteins.
- **Muscle Mass Preservation**: High-protein diets can help prevent muscle loss, especially in bedridden patients or those with limited mobility.
- **Recommendations**: A common guideline is around 1.5–2.0 grams of protein per kilogram of body weight per day, depending on the patient's condition.
- **3. Micronutrients**
- **Vitamins and Minerals**: Certain vitamins and minerals are essential for wound healing and immune function.
    - **Vitamin C**: Important for collagen synthesis and tissue repair.
    - **Vitamin A**: Plays a role in immune function and epithelial tissue repair.
    - **Zinc**: Helps with tissue regeneration and immune response.
    - **Iron**: Supports oxygen transport, which is crucial for healing tissues.
    - **Calcium and Vitamin D**: Support bone healing, especially in patients with fractures.
- **4. Hydration and Electrolytes**
- **Fluid Balance**: Trauma patients often lose fluids through blood loss, sweat, or other means. Rehydration is vital, but it should be done carefully, considering the patient’s cardiac and renal function.
- **Electrolyte Management**: Imbalances in sodium, potassium, and magnesium are common after trauma and must be corrected to avoid complications.
- **5. Anti-inflammatory Nutrients**
- **Omega-3 Fatty Acids**: Found in fish oil, omega-3s can help reduce inflammation, which is heightened after trauma and surgery.
- **Antioxidants**: Vitamins such as A, C, and E, along with selenium, help reduce oxidative stress, which can damage tissues after trauma.

Recommended Dietary Supplements for Surgical Patients

Supplement	Purpose	Recommended Dosage
Protein Powder	Supports muscle maintenance and recovery	20-30 g per serving, as needed
Multivitamin	Provides essential vitamins and minerals	Once daily, as directed
Vitamin D	Supports bone health and immune function	600-800 IU/day
Calcium	Aids in bone healing	1000-1200 mg/day
Omega-3 Fatty Acids	Reduces inflammation and supports recovery	1000-2000 mg/day

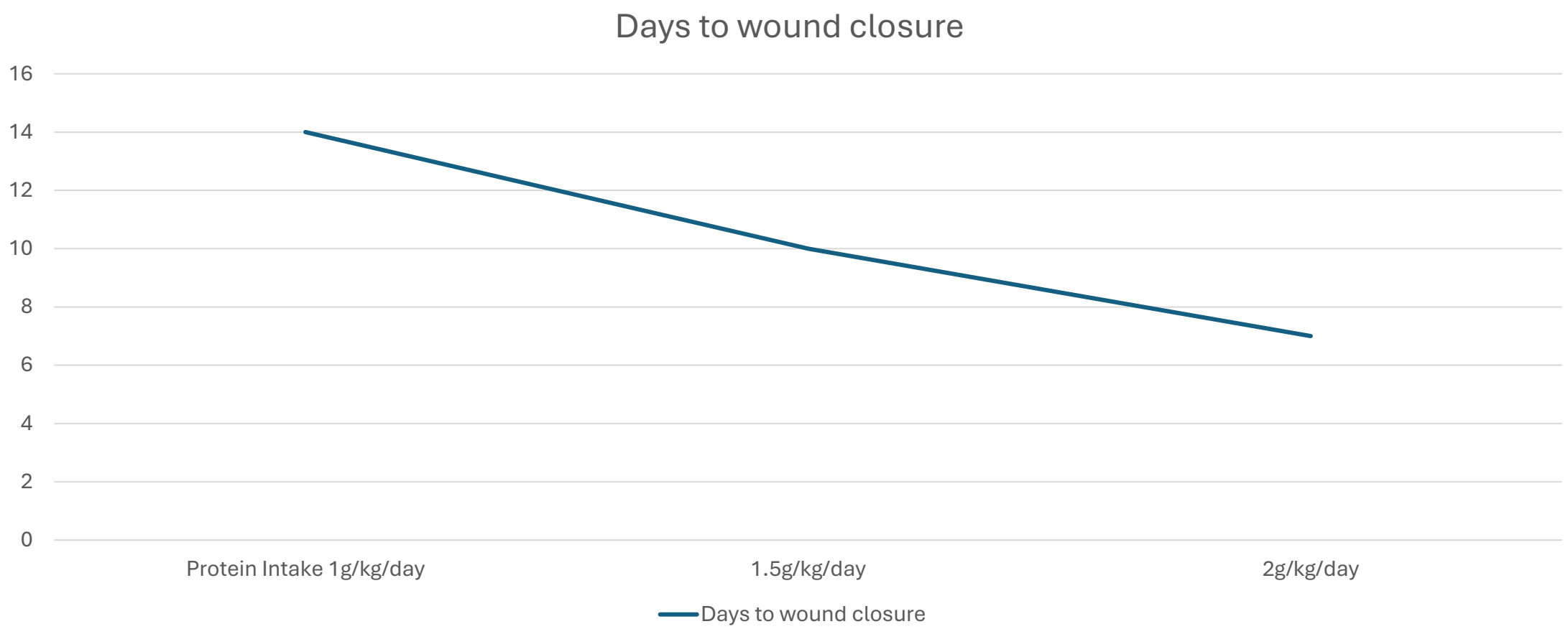
Macro-Nutrient Distribution



The Role of Protein in Healing

- Protein is one of the most critical nutrients for surgical patients, playing a major role in wound healing and tissue repair.
- After surgery, the body's demand for protein increases as it needs to rebuild tissues and produce new cells.
- Protein is also vital for production of enzymes, hormones, and antibodies that support the immune system.
- Inadequate protein intake can lead to muscle wasting, impaired wound healing, and an increased risk of infections.
- Patients recovering from surgery should consume high-quality proteins from sources such as lean meats, fish, eggs, and legumes.

Protein Intake and Wound Healing



Carbohydrates for Energy

- Carbohydrates are the primary source of energy for the body, and their role becomes even more important during the recovery phase after surgery.
- Surgery induces a state of increased metabolic activity, which requires a higher intake of calories to support healing and tissue repair.
- Carbohydrates provide the necessary energy for bodily functions, including the synthesis of proteins and the immune response.
- Insufficient carbohydrate intake can lead to fatigue, muscle breakdown, and delayed recovery.
- Complex carbohydrates such as whole grains, vegetables, and fruits are recommended for sustained energy release.

Fats and Essential Fatty Acids

- Fats provide a concentrated source of energy and are vital for cellular function and hormone production.
- In surgical patients, providing adequate fats, including essential fatty acids like omega-3 and omega-6, supports the immune response and reduces inflammation.
- Postoperative nutrition should include an appropriate balance of fats to meet the patient’s needs.

Hydration

- **Maintains blood volume and circulation**: Adequate fluid intake ensures that the body maintains sufficient blood volume, which is essential for delivering oxygen and nutrients to tissues, particularly during recovery when tissue repair is critical.
- **Prevents dehydration**: Surgery can result in fluid loss through blood, urine, and sweating. Dehydration can delay recovery, impair healing, and cause complications like low blood pressure or kidney issues.
- **Facilitates wound healing**: Fluids are necessary for transporting essential nutrients to the site of surgery and aiding in cellular repair.
- **Supports organ function**: Hydration helps maintain kidney function, aiding in the excretion of waste products from medications or anesthesia used during

Electrolytes

- **Sodium and Potassium**: Maintain fluid balance, muscle function, and nerve transmission. Hypokalemia or Hyponatremia can cause complications like muscle weakness, cardiac arrhythmias, or confusion.
- **Calcium**: Supports muscle contraction, blood clotting, and bone healing. Adequate calcium levels prevent complications like muscle cramps or delayed healing.
- **Magnesium**: Plays a role in enzyme reactions, muscle function, and energy production, and helps regulate other electrolytes.

The Role of Vitamin C in Wound Healing

- Vitamin C is a key nutrient for collagen synthesis, which is essential for wound healing.
- It also functions as an antioxidant, protecting cells from oxidative stress.
- Surgical patients with adequate vitamin C levels typically experience faster wound healing and reduced risk of infections, making supplementation beneficial in those with low levels.

Zinc and Its Importance in Postoperative Recovery

- Zinc is a critical mineral involved in tissue repair, immune function, and protein synthesis.
- A deficiency in zinc can lead to impaired wound healing and increased susceptibility to infections.
- In surgical patients, maintaining optimal zinc levels is essential for recovery, particularly in those with extensive wounds or burns.

Micronutrient Deficiencies Effects

Micronutrient	Deficiency Symptoms	Impact on Recovery
Zinc	Delayed wound healing, impaired immunity	Poor tissue repair, increased infection risk
Vitamin C	Poor wound healing, bleeding gums	Delayed collagen formation, scurvy
Vitamin D	Bone pain, muscle weakness	Impaired bone healing, immune dysregulation
Selenium	Fatigue, weakened immune response	Increased oxidative stress, higher infection risk
Iron	Fatigue, anemia	Poor oxygenation of tissues, delayed wound healing

Nutritional Support Guidelines for Surgical Patients

- Nutritional support for surgical patients should be guided by evidence-based protocols to optimize recovery and minimize complications. The following guidelines are crucial:
  - **Assessment of Nutritional Status**: Conduct comprehensive nutritional assessments to identify at-risk patients.
  - **Early Nutritional Intervention**: Initiate enteral nutrition as soon as possible postoperatively, typically within 24-48 hours, unless contraindicated.
  - **Adequate Caloric and Protein Intake**: Aim for a caloric intake of 25-30 kcal/kg and a protein intake of 1.2-2.0 g/kg to support healing and recovery.

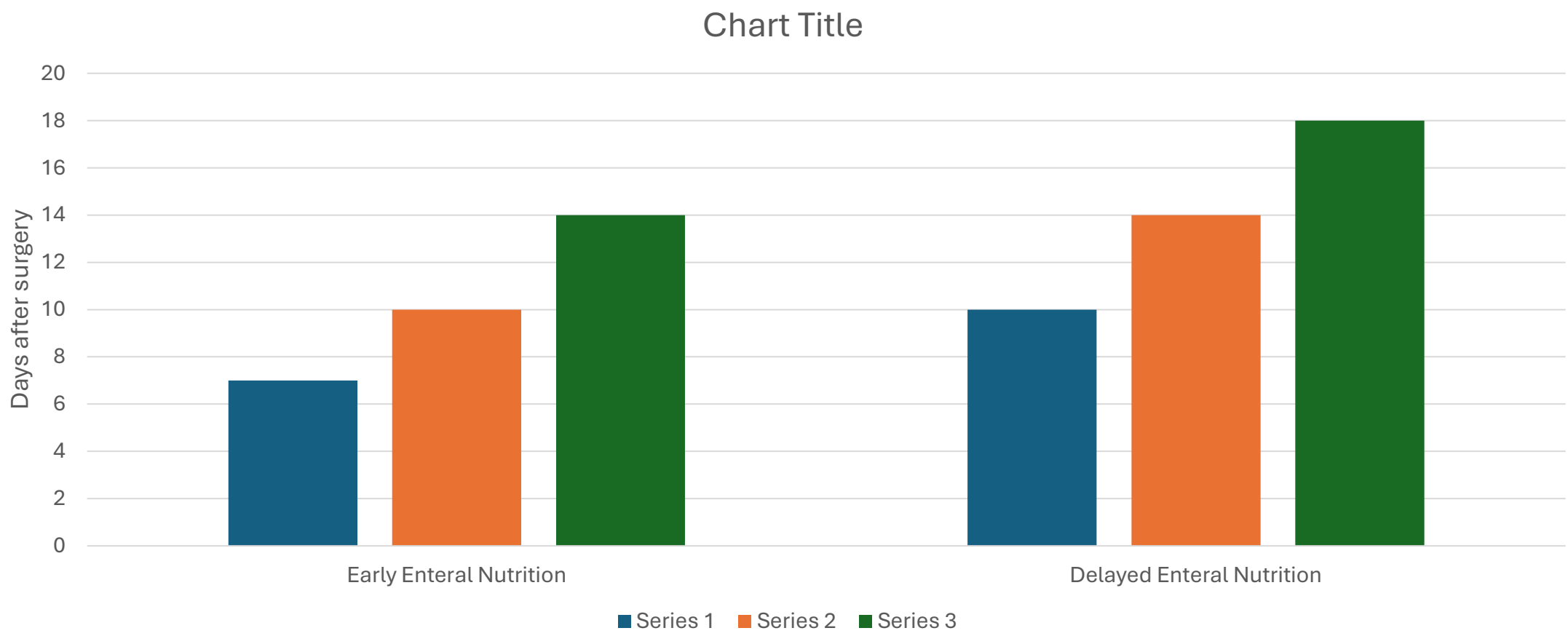
Nutritional Support Recommendations

Component	Recommendation
Energy Requirements	25-30 kcal/kg body weight
Protein Requirements	1.2-2.0 g/kg body weight
Fluid Requirements	30-35 mL/kg body weight
Nutritional Assessment	Conduct before surgery and regularly during recovery
Enteral Nutrition Timing	Initiate within 24-48 hours post-surgery
Supplementation Needs	Assess for vitamins and minerals, especially zinc and vitamin D

Importance of Early Enteral Nutrition

- Early enteral nutrition (EEN) refers to the initiation of nutritional support within the first 24-48 hours after surgery.
- Evidence suggests that EEN is associated with improved clinical outcomes, including shorter hospital stays and reduced infection rates.
- By providing nutrients early, patients can better meet their increased metabolic demands and support the healing process.
- Healthcare providers should assess patients' readiness for EEN and implement appropriate feeding strategies to maximize recovery benefits.

Impact of Early vs. Delayed Enteral Nutrition on Recovery Time



Importance of Continuous Monitoring

- Ongoing nutritional monitoring is essential throughout the surgical recovery process.
- Patients' nutritional needs may fluctuate due to changes in metabolic demands, fluid status, and overall health.
- Regular assessments help identify any emerging deficiencies and allow for adjustments in dietary plans or supplementation as needed.
- Incorporating feedback from healthcare professionals and patients can enhance the effectiveness of nutritional interventions.
- By maintaining close monitoring, healthcare teams can ensure that surgical patients receive the optimal support required for successful recovery.

1. NPO

- Stands for “Nothing by Mouth” and means not to consume fluids or food by mouth.
- It is used to rest the bowl or not to stimulate the digestive system.
- Used also to prevent aspiration in patients with impaired swallowing function. In Upper GI bleeding, GI blockage, and Acute Pancreatitis.
- Surgeons usually order “NPO” 6-12 hours before surgery and the zero day, unless indicated more in special occasions.

2. Clear fluid diets

- It consists of clear fluids and simple sugar solutions that are easily digested and absorbed for all the meals.
- The diet will yield 700 to 1,000 kcal.
- Given for a short period of time, not more than 24-hr.
- Not adequate: low in essential nutrients and do not cover the body requirements, except for water and has a little vitamin C.
- Given for a short period of time, not more than 24-hr.

2. Clear fluid diets (cont.)

- The diet includes:
  - Fruit juices from which peels, pulp, seeds and fibers are removed
  - Tea and coffee drinks from which solids are removed (no milk, sugar/ honey are acceptable).
  - In cases of gastric and heart diseases, coffee and tea drinks are excluded from full liquid diets.
  - Soups from which meat and vegetable particles are removed.
  - Water and fruit jellies.

Uses of clear fluid diets:

- Before and after surgeries, especially those of gastric surgeries.
- For short-term use when an acute illness or surgery causes an intolerance for foods (e.g., abdominal distention, nausea, vomiting, and diarrhea).
- In the transition period after enteral or parenteral feeding, and before the introduction of full fluid or soft diet.
- To prepare the bowel for surgery or a gastrointestinal procedure
- After surgeries, they are given to client gradually (small sips of water and then 30-60 ml/hr.).

FOOD GUIDE – CLEAR LIQUID DIET

FOODS ALLOWED	FOODS EXCLUDED
Carbonated beverages, regular and decaffeinated; coffee and tea; fruit-flavored soft drinks Clear flavored gelatin, fruit ices, Popsicles Cranberry, apple, and grape juices Lightly seasoned clear broth or consommé (fat-free) Sugar, honey, syrup	All other foods or fluids except water

SAMPLE MENU
(600 kcal)

Breakfast	Noon	Evening
Cranberry Juice Flavored Gelatin Coffee or Tea Sugar	• Beef Broth Grape Juice • Flavored Gelatin Coffee or Tea Sugar	Chicken Broth Apple Juice Water or Ice Chips Coffee or Tea Sugar

3. Full fluid (liquid) diets

- The diet consists of foods that are liquid at body temperature, including frozen liquids.
- The diet provides nourishment that is easy to consume and digest with very little stimulation to the gastrointestinal tract.
- Includes clear fluids in addition to normal soups and juices, milk and milk products, puddings, custard, honey and soft drinks. Solids and mashed foods are still not permitted in this diet.

Properties of full fluid (Liquid) diets:

- They are of better nutritional quality than the clear fluid diets: more energy (1800-2000 kcal) and more protein (but less than body requirements).
- More variety and have better choices.
- Contain good quantities of water, vitamin C, calcium, and phosphorous, but not all other nutrients.
- Can be given for 2-3 days, according to client's health.
- The diet as served meets the (DRIs) for Vit C, Vit D, Vit B12, vit b2, calcium and phosphorus. It may not meet the protein and caloric requirements of the individual.
- The diet as served will provide approximately 1200 kcal and 40 g of protein.

FOOD GUIDE – FULL LIQUID DIET

FOODS ALLOWED	FOODS EXCLUDED
Carbonated beverages, regular and decaffeinated coffee and tea, soft drinks, cocoa	All solid foods
Cooked refined cereal, farina, cream of rice, or strained cereal	
Custard, plain gelatin, ice cream, sherbet, pudding, yogurt, all without nuts; fruit or preserves	
Eggnog*, milk shake, and other milk drinks	
Butter, margarine, cream	
Fruit and vegetable juices (including one serving of citrus fruit juice daily)	
Broth, bouillon, consommé, strained cream soup	
Honey, sugar, syrup	

*Made from pasteurized eggs only or commercial product.

SAMPLE MENU

Breakfast	Noon	Evening
Orange Juice	Strained Cream of Chicken Soup	Strained Cream of Celery Soup
Cream of Wheat	Grape Juice	Apple Juice
Milk	Vanilla Ice Cream	Custard
Coffee or Tea	Milk	Milk
Sugar	Coffee or Tea	Coffee or Tea
	Sugar	Sugar

FULL LIQUIDS BETWEEN MEALS AS DESIRED

Uses of Full Fluid (liquid) Diet

- Postoperative and after clear fluid diets.
- In cases of dysphagia (difficulty swallowing), and difficulty chewing.
- After surgeries of the face, jaw or neck.
- In the transition period between clear fluid diet and soft diet

Soft (light) diets

- Include liquid, semi-solid, and soft solid foods that are easily chewed, swallowed, digested and absorbed.
- Soft-solid foods include easy-to-cut whole meats, soft fruits and vegetables (i.e., bananas, peaches, melon without seeds, tender meat cut into small pieces and well moistened with extra gravy or sauce, crusts should be cut off from bread .
- Food should be chopped or cut into small pieces .
- EXCLUDES hard, crunchy fruits and vegetables, sticky foods ,and very dry foods. NO nuts, seeds, popcorn, potato chips, coconut, raw vegetables, potato skins, corn, etc.

Properties of soft diets

- Lack fried and fatty foods.
- Lack salty foods
- Lack foods rich in dietary fibers, peels and seeds
- Lack irritating foods like spicy foods, dried legumes, coarse foods, cruciferous vegetables (cabbage, cauliflower), spices and condiments (dressings).
- Prepared in an easy-to eat form (vegetables are cooked, cut into small pieces and meats are minced).
- Cover the body requirements for all nutrients (better nutritional quality than fluid diets).

Uses of soft (light) diets

- For clients who cannot take the regular diet for physiological or psychological problems.
- In cases of difficulty chewing, as in the case of elderly people, and in cases of difficulty swallowing, as in case of esophagus and pharynx surgeries.
- Used until the client becomes able to eat a normal diet (between the full fluid and the normal regular diet).

SAMPLE MENU

Breakfast	Noon	Evening
Orange Juice	Honey Glazed Chicken, Ground	Braised Beef with Gravy, Ground
Cream of Wheat	Buttered Potatoes	Noodles with Gravy
Scrambled Egg	Soft-Cooked Carrots	Soft-Cooked Green Beans
Biscuit	Dinner Roll	Peach Slices
Margarine	Margarine	Dinner Roll
Jelly	Frosted Banana Cake	Margarine
Milk	Milk	Soft Cookie
Coffee	Tea	Iced Tea
Sugar	Sugar	Sugar
Creamer		
Beverages thickened to appropriate viscosity, per diet order		

FOOD GROUP	FOODS ALLOWED	FOODS EXCLUDED
Beverages and Milk	All beverages	None
Cereals and Grains *All items must be well moistened. Moisten cereals with ¼ cup milk or enough milk to moisten if thin liquids are restricted.*	Cooked cereals Well-moistened dry cereals Pasta, noodles, rice Moist bread dressing Well-moistened soft breads, rolls, pancakes, plain muffins, biscuits (*Use margarine, butter, jelly, or syrup to moisten.*)	Cereals or breads with raisins or nuts Granola-type, coarse, or dry cereals such as shredded wheat or All Bran Thick-crust breads (such as French bread or baguettes) Crackers
Vegetables, Potatoes, and Soups	Tender soft-cooked vegetables Vegetable juices Most soups Shredded lettuce Fried, mashed, or baked potatoes without skin	Raw or cooked vegetables with tough skins or seeds; fried or raw vegetables; cooked corn Tough, crisp-fried potatoes Soups with tough meats or vegetables; clam or corn chowder
Fruits and Juices	Ripe banana, melon, peeled peaches, pears Cooked or frozen fruit Canned peaches, pears, apricots Fruit juices Soft berries with small seeds such as strawberries	Fruit cocktail, grapes, cherries, or apricots with skin; fresh fruit except ripe banana and those listed as allowed; dried fruits Watermelon without seeds *(may be given if thin liquids are allowed)*

Meats, Meat Substitutes, and Entrees *All meats must be well moistened. Add extra gravy or sauces as needed.*	Tender meat, fish, or poultry Soft cheese Chopped or ground meats, poultry Soft casseroles Meat, fish, or egg salads Eggs (prepared any way) Smooth peanut butter; liverwurst Yogurt without nuts or coconut	Dry or tough meats (such as bacon, sausage, hot dogs, bratwurst) Chunky peanut butter
Fats	All except those to avoid	Fats with coarse, difficult-to-chew, or chunky additives
Desserts	Cake, tender cookies Custard, pudding Ice cream, sherbet, frozen yogurt, other ices *(may be given if thin liquids are allowed)* Pies: cream, custard, pumpkin, soft fruit with bottom crust only	Desserts containing nuts, coarse dried fruit, or tough fruit Desserts baked to a hard consistency
Miscellaneous	Soft candy Jelly, smooth jams All sauces	Candy containing tough fruits, coconut, or nuts; hard candy Chewy caramel or taffy-type candies

Modified diets

- Diets that are modified in their energy content, Protein, or Fat content to treat a nutrient-related problem.

- ***High energy diets:***
  - Contain $\geq$ 3000 Kcal/day, and $\geq$ 100 g protein
  - Contain good amounts of other essential nutrients.
  - Used in case of underweight people
  - In cases of recovering after surgeries and burns (for burns high protein+ high energy).
  - They should be introduced gradually not suddenly.

- ***Low energy diets***
- Also called energy-restricted diets.
  - Prescribed for obese and overweight people
  - Contain not less than 1000 kcal /day and 70 g protein. (US dietary guidelines recommend no less than 1600 kcal for healthy adults)
  - Should include all essential nutrients in good quantities.

Low-fat diets (fat-restricted diets):

- Prescribed for people who have certain malabsorptive disorders or symptoms of diarrhea, flatulence, or steatorrhea (fecal fat) resulting from dietary fat intolerance.
- ***Levels of fat restriction in the diet*:**
  - Mild: fats contribute ≤ 30% of total energy intake.
  - Moderate: fats contribute usually 20-25% of total energy intake
  - Severe: fats contribute ≤ 10% -15 % of total energy intake.
  - Very low: (<25 g/day) – for patients who don't respond to a mild restriction.

Low-fat diets (fat-restricted diets):

- Cases of maldigestion and malabsorption are:
  - Gallbladder diseases.
  - Enteritis.
  - Celiac disease (Gluten enteropathy).
  - Pancreatitis.
  - Liver cirrhosis

Low-cholesterol diets:

- The purpose of these diets is to reduce the intake of cholesterol and saturated fats that enhance the development of CVDs.
- Saturated fats contribute by $\leq$ 6-10% of total energy intake
- Cholesterol intake does not exceed 300 mg/day. Total fat <30% of kcal
- Uses of low cholesterol diets:
    - Hypertension
    - Atherosclerosis
    - Hyperlipoproteinemia (type I, II, IIb, IV and V)
    - Hypercholesterolemia.

TABLE 29-7 Fat-Restricted Diet*

Food Allowed	Food Excluded
Beverages	
Skim milk or buttermilk made with skim milk; coffee, tea, Postum, fruit juice, soft drinks, cocoa made with cocoa powder and skim milk	Whole milk, buttermilk made with whole milk, chocolate milk, cream in excess of amounts allowed under fats
Bread and Cereal Products	
Plain, nonfat cereals; spaghetti, noodles, rice, macaroni; plain whole grain or enriched breads, air-popped popcorn, bagels, English muffins	Biscuits, breads, egg or cheese bread, sweet rolls made with fat; pancakes, doughnuts, waffles, fritters, popcorn prepared with fat; muffins, natural cereals and breads to which extra fat is added
Cheese	
Fat-free or low-fat cottage cheese, ¼ c to be used as substitute for 1 oz of cheese, or low-fat cheeses containing less than 5% butterfat	Whole-milk cheeses
Desserts	
Sherbet made with skim milk; nonfat frozen yogurt; nonfat frozen non-dairy desserts; fruit ice; sorbet; gelatin; rice, bread, cornstarch, tapioca, or pudding made with skim milk; fruit whips with gelatin, sugar, and egg white; fruit; angel food cake; graham crackers; vanilla wafers; meringues	Cake, pie, pastry, ice cream, or any dessert containing shortening, chocolate, or fats of any kind, unless especially prepared using part of fat allowance
Eggs	
Three per week prepared only with fat from fat allowance; egg whites as desired; low-fat egg substitutes	More than one/day unless substituted for part of the meat allowed
Fats	
Choose up to the limit allowed among the following (1 serving in the amount listed equals 1 fat choice): 1 tsp butter or margarine 1 Tbsp reduced-fat margarine 1 tsp shortening or oil 1 tsp mayonnaise 2 tsp Italian or French dressing 1 Tbsp reduced-fat salad dressing 1 strip crisp bacon ⅛ avocado (4-inch diameter) 2 Tbsp light cream 1 Tbsp heavy cream 6 small nuts 5 small olives	Any in excess of amount prescribed on diet; all others
Fruits	
As desired	Avocado in excess of amount allowed on fat list
Lean Meat, Fish, Poultry, and Meat Substitutes	
Choose up to the limit allowed among the following: poultry without skin, fish, veal (all cuts), liver, lean beef, pork, and lamb, all with visible fat removed—1 oz cooked weight equals 1 equivalent; ¼ c water packed tuna or salmon equals 1 equivalent; tofu or tempeh—3 oz equals 1 equivalent	Fried or fatty meats, sausage, scrapple, frankfurters, poultry skins, stewing hens, spareribs, salt pork, beef unless lean, duck, goose, ham hocks, pig's feet, luncheon meats (unless reduced fat), gravies unless fat-free, tuna and salmon packed in oil, peanut butter
Milk	
Skim, buttermilk, or yogurt made from skim milk	Whole, 2%, 1%, chocolate, buttermilk made with whole milk

TABLE 29-7 Fat-Restricted Diet—cont'd

Food Allowed	Food Excluded
Soups	
Bouillon, clear broth, fat-free vegetable soup, cream soup made with skim milk, packaged dehydrated soups	All others
Sweets	
Jelly, jam, marmalade, honey, syrup, molasses, sugar, hard sugar candies, fondant, gumdrops, jelly beans, marshmallows, cocoa powder, fat-free chocolate sauce, red and black licorice	Any candy made with chocolate, nuts, butter, cream, or fat of any kind
Vegetables	
All plainly prepared vegetables	Potato chips; buttered, au gratin, creamed, or fried potatoes and other vegetables unless made with allowed fat; casseroles or frozen vegetables in butter sauce

Daily Food Allowances for 40-g–Fat Diet

Food	Amount	Approximate Fat Content (g)
Skim milk	2 c or more	0
Lean meat, fish, poultry	6 oz or 6 equivalents	18
Whole egg or egg yolks	3 per week	2
Vegetables	3 servings or more, at least 1 or more dark green or deep yellow	0
Fruits	3 or more servings, at least 1 citrus	0
Breads, cereals	As desired, fat-free	0
Fat exchanges*	4-5 exchanges daily	20-25
Desserts and sweets	As desired from permitted list	0
	Total Fat	38-43

High-protein diets

- Protein content is increased by 2-4 times more than the normal body requirements (0.8 g /kg body weight/day), which is ≥ 100 g/day
- High-kcalorie, high-protein diets Contain foods that are kcalorie and protein dense. Used for increased kcalorie and protein requirements (in cancer, AIDS, burns, trauma, and other illnesses); also used to reverse malnutrition, improve nutrition status, or promote weight gain.
- Uses of high protein diets:
  - Catabolic conditions (cancers, burns, trauma, chronic ulcerative colitis, bone fractures)
  - In pregnancy and lactation.
  - In cases of hypoalbuminemia and protein-energy malnutrition (PEM).

Low-protein diets

- Contain about 40 g protein, and about 1800 kcal/day.
- Low in iron, and some vitamins (B complex).
- Supplements may be used to cover iron and vitamin deficiencies.
- Uses of low protein diets:
  - Chronic renal failure.
  - Hyperammonemia (resulted from inborn error of metabolism).
- ***Special protein-modified diets***

o Gluten-free diet: for patients with celiac disease (gluten enteropathy).

o Phenylalanine-restricted diet: for patients with phenylketonuria (PKU).

o Purine-restricted diet: in case of gout (hyperuricemia).

Sodium-restricted diet:

- Used in hypertension, congestive heart failure, renal disease, and liver disease.
- A sodium-restricted diet limits the use of salt (both in cooking and at the table), eliminates most prepared foods and condiments, and limits consumption of milk and milk products (if excessive).
- Sodium restriction is difficult to implement on a long-term basis because many people find low-sodium diets unpalatable and fail to adhere to them.
- The degree of restriction depends on the illness, the severity of symptoms, and the specific drug treatment prescribed.
  - In most cases, sodium is restricted to 2000 or 3000 mg/day, although more severe restrictions may be used in the hospital setting.
  - NAS (no-added salt) diet: 1-2-gm sodium-restricted diet.

Potassium-restricted diets

- For patients with chronic and acute renal failure.
- Diets contain less than 2 gm potassium/day (50 mEq).
- Normal diet contains 2-6 gm/day.
- Cooked vegetables and meats contain less potassium
- Bananas, tomato, whole wheat, green leafy vegetables, and red meats should be reduced as well as other high potassium fruits and vegetables.

Other variants

- ***High-sodium diets*:** Prescribed for clients with hypoadrenalism (Adison's disease).
- ***High-potassium diets**:* prescribed for patients who take potassium-losing diuretics
- ***High-calcium, high-phosphorous diets*:** Prescribed for patients with rickets, osteomalacia, and tetany.
- ***Calcium-phosphorous restricted diets*:** Prescribed for patients with renal stones (kidney and urethra stones)

Immuno-Nutrition

- Immuno-nutrition refers to the provision of specific nutrients that can modulate the immune response and improve outcomes in surgical patients.
- This approach often includes supplementation with immunomodulatory nutrients such as arginine, omega-3 fatty acids, and glutamine.
- Research suggests that immuno-nutrition can reduce postoperative complications and shorten recovery times by enhancing immune function and reducing inflammation.
- Integrating immuno-nutrition into preoperative and postoperative care can be a valuable strategy for optimizing surgical recovery.

Nutritional Considerations for Elderly Patients

- Elderly patients often face additional nutritional challenges due to age-related physiological changes, chronic illnesses, and medication side effects.
- These factors can affect appetite, digestion, and nutrient absorption, increasing the risk of malnutrition.
- Tailoring nutritional interventions to meet the unique needs of older surgical patients is crucial for optimizing recovery.
- Special attention should be given to ensure adequate protein, vitamin, and mineral intake, as well as proper hydration.
- Multidisciplinary approaches involving dietitians, physicians, and caregivers can enhance nutritional support for this population.

Conclusion

- In conclusion, nutrition plays a critical role in the recovery of surgical patients.
- Adequate nutritional support before, during, and after surgery can optimize healing, reduce the risk of complications, and enhance overall outcomes.
- By implementing individualized nutritional assessments, monitoring nutrient intake, and addressing deficiencies through dietary interventions and supplements, healthcare providers can significantly improve the surgical experience for patients.
- A collaborative, multidisciplinary approach to nutritional care is essential in achieving the best possible outcomes.

Key Takeaways

- Nutrition is fundamental to surgical recovery, impacting wound healing and immune function.
- Early nutritional assessment and intervention are critical for identifying at-risk patients.
- Macronutrients (proteins, carbohydrates, fats) and micronutrients (vitamins, minerals) must be optimized to support recovery.
- Tailored nutritional plans based on individual patient needs enhance satisfaction and outcomes.
- Collaboration among healthcare professionals is vital for effective nutritional management of surgical patients.