**Nutritional Support**

The body uses nutrients in a variety of ways. Each cell requires carbohydrates, proteins, fats, water, electrolytes, vitamins, and trace elements to provide the energy necessary to maintain bodily functions.

* All critically ill patients are assumed to be at nutritional risk
* Nutritional support is an important part of overall care plan

Anatomy and Physiology Review

Utilization of Nutrients:

* Nutrients are ingested orally
* Mouth first breaks down food with saliva
* Stomach stores and mixes food with gastric secretions
	+ Secretes intrinsic factor for vitamin B12 absorption
	+ Secretes fluids high in Na+ and K+
* Duodenum
	+ Pancreas and liver empty here
	+ Absorbs minerals
* Jejunum
	+ Glucose and water-soluble vitamins absorbed
* Ileum
	+ Protein broken down and absorbed
	+ Absorbs fat-soluble vitamins
* Colon
	+ Absorbs Na+ and K+
	+ Vitamin K formed
	+ Water reabsorbed
	+ Absorption of short-chain fatty acids
* Pancreas
	+ Secretes digestive enzymes
* Liver
	+ Multiple functions
* Gallbladder
	+ Assists in emulsifying fats

Nutritional Assessment:

Nutritional status: is the balance between a patient’s current nutritional supply and demand. A comprehensive approach to determine nutritional status evaluates several criteria: medical history and examination, nutrition and medication histories, physical assessment, anthropometric measurements, and laboratory data.

The purposes of a nutritional assessment in the critically ill patient are to

* Provides baseline subjective and objective data regarding nutritional status
* Determines nutritional risk factors
* Identifies nutritional deficits
* Establishes nutritional needs
* Identifies medical, psychosocial, and socioeconomic factors.

Nutritional assessment of the critically ill patient begins with the collection of subjective and objective data.

* Objective data in ICU patient
	+ Patient’s medical history
	+ Malabsorptive syndrome
	+ Laboratory values
		- What is important?
		- Review laboratory alert
	+ Input and output
	+ Daily weight
	+ Able to swallow without difficulty.
	+ Muscle or adipose tissue loss
* Subjective data in ICU patient
	+ Gag reflex
	+ Dysphagia
	+ Adequate dentition
	+ Oral mucosa
	+ Hydration status.

**The nutritional assessment includes:**

• A history, including questions aimed at understanding factors that can affect the patient’s food intake and the patient’s usual eating habits and

preferences.

• Physical examination (Table 7-1)

• Anthropometric measurements (ie, height, weight, body mass index [BMI], triceps skinfold thickness, and mid arm and arm muscle circumference)

• Laboratory studies (Table 7-2).





Nutritional Therapy Goal:

* Goal is nutritional support consistent with metabolic needs and disease process while avoiding complications
* Any patient who cannot meet needs orally for 3 or more days requires nutritional support.
* Prevention and treatment of macronutrient and micronutrient deficiencies

• Maintenance of fluid and electrolyte balance.

• Reduction in patient morbidity and mortality.

Nutrition Care Plan:

* Determine
	+ Patient’s calorie, protein, and fluid needs
	+ Intake targets
	+ Route of administration
* Set measurable short- and long-term goals
	+ Weight gain
	+ Stable laboratory values

Enteral Nutrition:

Patients who are not able to meet their needs orally are started on enteral nutrition in the first 24 to 48 hours.

 Enteral nutrition (EN) refers to the delivery of nutrients into the GI tract, which is the preferred route of nutrient administration unless contraindicated**.**

Decisions regarding access for enteral nutrition take into account:

1. The effectiveness of gastric emptying, GI anatomy, and aspiration risk.

 2. Enteral nutrition depends on an intact bowel that is able to absorb nutrients.

Physiological stressors, such as illness and injury, alter the body’s metabolic and energy demands. Patients can experience considerable weight loss (>10 kg) during and after a stay in the critical care unit. This unintentional weight loss may deplete vital nutrient reserves, which may predispose the patient to malnutrition.

Malnutrition from starvation alone can usually be corrected by replacing body stores of essential nutrients

Consequences of Malnutrition for the Hospitalized Patient

• Delayed wound healing

• Increased complications

• Immunosuppression

• Increased length of hospitalization

• Organ impairment

• Increased morbidity and mortality.

Enteral Nutrition

* Delivery of nutrients to GI tract
* Preferred method
	+ Lower risk of infection
	+ Less expensive
* Small- versus large-bore tubes for delivery
* Gastric versus small bowel feeding

Enteral Formulas

* Standard 1 calorie/mL
	+ Contain protein, fats, carbohydrates, vitamins, and trace elements
* Specialized formula examples
	+ Elemental
	+ High protein
	+ Fiber enriched
	+ Wound healing
* Immune-enhancing formulas

Guidelines for Enteral Feeding:

* Short-term enteral feeding
	+ Nasogastric route
	+ Nasoduodenal route
	+ Nasojejunal
* Long-term enteral feeding
	+ Gastrostomy tube
	+ Jejunostomy tube
* Feeding schedule
	+ Intermittent: gastric
	+ Continuous: small bowel feedings
* Assess gastric residuals
	+ How? Frequency?
	+ What is significant?
	+ Differences between gastric and small bowel locations?
* Feeding delivered into bloodstream
	+ Central line (TPN)—hypertonic
	+ Peripheral line (PPN)—isotonic
* Monitor for complications
	+ Infection (sepsis)
	+ Electrolyte imbalances
	+ Fluid imbalances
	+ Hyperglycemia

Drug-Nutrient Interactions:

* Check medications for compatibility with enteral feeding
* Flush before and after administration of medication via enteral route
* Prefer liquid formulations
	+ Consult pharmacist

Nursing Care:

* Assess patient’s ability to obtain or use nutrients
* If infection, look for malnutrition as cause
* Be alert for food-nutrient-drug interactions
* Assess for recent changes in health status
* Weigh daily
* Assess protein-energy malnutrition in the elderly
* Interpret laboratory findings cautiously

Monitoring Complications:

* Risk of refeeding syndrome
* Risk for diabetes or glucose intolerance
* Monitor liver function for parenteral support

Prevent Complications:

* Enteral tube obstruction
* Aspiration and improper tube placement
* Diarrhea
	+ Consider Clostridium difficile
* Dumping syndrome
* Hyperglycemia
* Electrolyte imbalances

Monitoring and Evaluating:

* Assess progress in meeting objectives
	+ Begins at the initiation of therapy
	+ Stable patient assessed every week
	+ Critically ill patient assessed more often
* Documentation
* Review changes in medications