

What is nutrition?	<ul style="list-style-type: none"> ■ Composition and quantity of food intake by living organisms ■ Biochemical utilization of food 	
Human nutrition is divided into three areas:	<ul style="list-style-type: none"> <input type="checkbox"/> Undernutrition (nutrient deficiency) <input type="checkbox"/> Overnutrition (excessive nutrient intake) <input type="checkbox"/> Optimal nutrition (balanced nutrient intake) 	
Assessment of malnutrition	<p>Malnutrition in humans is measured by:</p> <ul style="list-style-type: none"> ■ Dietary intake studies: identify people with deficient diets ■ Biochemical studies: identify subclinical nutritional deficiencies ■ Clinical symptoms: identify clinical nutritional deficiencies 	
Dietary Reference Intakes (DRIs)	<ul style="list-style-type: none"> ■ Quantitative estimates of nutrient intakes required to prevent deficiencies and maintain optimal health in populations ■ Recommended by: Food and Nutrition Board of the National Research Council, USA 	
DRIs have four standards:	Estimated Average Requirement (EAR)	The amount of nutrient intake estimated to meet the nutritional requirement of half of the healthy individuals (50%) in an age and gender group
	Recommended Dietary Allowance (RDA)	<p>The amount of nutrient intake that is sufficient to meet the nutritional requirement of nearly all (97-98%) healthy individuals in a group</p> <ul style="list-style-type: none"> ■ RDA is two SD above EAR ■ RDA = EAR + 2 SD
	Adequate Intake (AI)	<ul style="list-style-type: none"> ■ It is used instead of EAR and RDA if: ■ A nutrient is considered essential but the experimental data are inadequate for determining EAR and RDA ■ AI covers the nutritional requirement of all individuals in a group with approximation due to insufficient data
	Tolerable Upper Intake Level (UL)	The highest level of daily nutrient intake that has no adverse health effects or toxicity in almost all individuals
Acceptable Macronutrient Distribution Ranges (AMDR)	<ul style="list-style-type: none"> ■ Range of adequate intake of a macronutrient associated with reduced risk of chronic diseases ■ AMDR for adults (% of total calories) <ul style="list-style-type: none"> <input type="checkbox"/> Carbohydrates 45-65 <input type="checkbox"/> Fats 20-35 <input type="checkbox"/> Proteins 10-35 <input type="checkbox"/> Fiber >25 g 	
Food Pyramid	<ul style="list-style-type: none"> ■ Public educational tool established in 1992 ■ Recommends size of daily servings ■ Pyramid shape ■ Fats, oils and sweets have small serving size 	
Dietary guidelines and goals	<ul style="list-style-type: none"> ■ Consume a variety of foods from the basic food groups ■ Control calorie intake to manage body weight ■ Be physically active everyday ■ Choose fats and CHOs wisely for good health ■ Increase daily intake of fruits, vegetables, whole grains, and non-fat or low-fat milk and milk products ■ Choose and prepare foods with little salt 	
Energy requirement in humans	<ul style="list-style-type: none"> ■ The dietary energy intake required to maintain energy balance in a healthy individual ■ Energy balance is maintained by calorie intake and energy expenditure ■ Energy content of food is measured in calories or kilocalories (heat energy) 	

Vegetarians	<p><i>Vegetarians and nutrient intake</i></p> <ul style="list-style-type: none"> ■ Lower intake of iron, calcium and vitamin D ■ Long-term vegans may develop megaloblastic anemia due to vitamin B₁₂ deficiency ■ Most consume enough protein ■ Lower in total dietary fat <p><i>Vegetarians and chronic disease</i></p> <ul style="list-style-type: none"> ■ Lower Body Mass Index (BMI) ■ Lower death rate from ischemic heart disease ■ Lower blood pressure ■ Lower cancer rates compared to non-vegetarians
Basic energy expenditure depends on:	<p>Resting metabolic rate (RMR)</p> <ul style="list-style-type: none"> ■ Energy expense at rest ■ Required for normal body function ■ Depends on age, sex, growth, body surface area, fever, fasting, stress ■ Men: 1800 kcal ■ Women: 1300 kcal <p>Physical activity</p> <ul style="list-style-type: none"> ■ Sedentary person: 30-50% above RMR ■ Active person: 100%+ above RMR <p>Thermic effect of food</p> <ul style="list-style-type: none"> ■ Heat produced by the body due to food digestion and absorption ■ 5-10% of total energy expenditure
Total Parenteral Nutrition (TPN)	<ul style="list-style-type: none"> ■ A type of exogenous nutrition in which terminally-ill patients are provided with all essential nutrients intravenously or through tube feeding ■ TPN is particularly indicated in severe inflammatory bowel disease, coma, cachexia, prolonged ileus and extensive burns ■ Nutrients are pumped into a large central vein to allow rapid dilution of the solution (3 L / 24 hr) ■ Tube feeding is only provided to patients whose GI tract is intact and supports this type of nutrition <p>■ Standard composition of TPN feed (24 hr requirement)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Energy content: 2000 kcal <input type="checkbox"/> Nitrogen: 12–14 g <input type="checkbox"/> Fat: 900 kcal <input type="checkbox"/> Glucose: 1000 kcal <input type="checkbox"/> Electrolytes, trace elements, vitamins: present <input type="checkbox"/> Volume: 3 liters <ul style="list-style-type: none"> ■ Individual nutritional requirements of patients may vary ■ Continuous biochemical, hematological and immunological monitoring of patient on TPN is required