Nutrient as agent

1. **according to type :**
   a- under nutrition (quantity) starvation
   b- Mal nutrition (quality) protein, vitamins.
   c- over nutrition (quantity) 0besity.
   d- Food allergy.
2. **according to relation to immune mechanism**
   a- lower natural resistance (vitamin A Deficiency change in mucous membrane).
   b- Interfere with antibody productions.
   c- Increases in severity of diseases (vit C).

To assess nutritional condition we need:

A combination of
1. Clinical examination and
2. Epidemiological facts
3. Anthropometric Data
4. Biochemical testing is used to assess. Micronutrient deficiency diseases.

The Nutrition Care Process:

Identifying and meeting a person's nutrient and nutrition education needs. Five steps:

1) Assess Assessment of nutritional status
2) Analyze Analyze assessment data to determine nutrient requirements
3) Develop Develop a nutrition care plan to meet patient's nutrient and education needs.
4) Implement: Implement care plan
5) Evaluate: Evaluate effectiveness of care plan: ongoing follow-up, reassessment, and modification of care plan.

Assessing Nutritional Status

•Historical Information
•Physical Examination
•Anthropometric Data
•Laboratory Analyses

A- Historical Information:

Health History (medical history) - current and past health status
–diseases/ risk factors for disease
–appetite/food intake–conditions affecting digestion, absorption, utilization, & excretion of nutrients–emotional and mental health

Drug History
– Prescription.
– illicit drugs
–nutrient supplements, HERBS and other "alternative" or homeopathic substances
– Multiple meds (who's at risk?)
Meds can alter intake, absorption, metabolism, etc.
Foods can alter absorption, metabolism, & excretion of meds.

Socioeconomic History
Factors that affect one's ability to purchase, prepare, & store food, as well as factors that affect food choices themselves.
–Food availability (know local crops/produce)
–occupation/income/education level
–ethnicity/religious affiliations
–kitchen facilities
–transportation
–personal mobility (ability to ambulate)
–number of people in the household

Diet History
Analyzing eating habits, food intake, lifestyle, so that you can set individualized, attainable goals.
–Amount of food taken in
–Adequacy of intake – omission of foods/food groups
–Frequency of eating out
–IV fluids
–Appetite
–Restrictive/fad diets
–Variety of foods
–Supplements (overlaps)

B- Physical Examination:

-weight status
-mobility
-confusion
-signs of nutrient deficiencies/malnutrition
esp. hair, skin, GI tract including mouth and tongue
-Fluid Balance (dehydration/fluid retention).

Limitations of Physical Findings
–Depends on assessor!
–Many physical signs are nonspecific: ie. cracked lips from sun/windburn vs. from malnutrition, dehydration…

Nutritional status indicators

There are three primary anthropometric indices for children under five years of age: Wasting; Stunting, and Underweight.

Indicator	What it measures/What it is used for
Low weight-for-height	**WASTING** (acute malnutrition).
Low height-for-age or Low length-for-age	**STUNTING** (chronic malnutrition).
Low weight-for-age	**UNDERWEIGHT** (acute or chronic malnutrition, or both).

Index/indicator	What it measures/what it is used for
Body Mass Index (BMI)	It measures thinness in adolescents, adults & the elderly.
Low Birth Weight (LBW)	• It measure newborn weight. • It associated with poor nutrition in mothers (although other factors can also contribute to low birth weight.
Mid-Upper Arm Circumference (MUAC)	• It is an index of body mass. • It is usually measured using a MUAC that is placed around the middle of the upper arm • It is particularly good for identifying with high risk of mortality

Contexts in which these indicators are particularly useful:

Indicator	What it measures	Context
Low weight-for-height (Wasting)	acute malnutrition	EMERGENCIES
Low Mid-Upper Arm Circumference (MUAC)	acute malnutrition	EMERGENCIES
Low height-for-age (Stunting)	chronic malnutrition	STABLE SITUATIONS
Low weight-for-age (Underweight)	acute or chronic malnutrition or both	STABLE SITUATIONS
Low Body Mass Index	adolescent/adult/elderly nutritional status	EMERGENCIES and STABLE SITUATIONS
Low Birth Weight	newborn underweight (proxy for maternal malnutrition)	STABLE SITUATIONS

A combination of clinical examination and biochemical testing is used to assess micronutrient deficiency diseases.

Biochemical testing is carried out on blood or urine samples.

It is vital in situations where there is a strong indication of risk of micronutrient deficiency but a lack of clinical evidence.

Indicators used for assessing micronutrient deficiencies:

Indicators	What they measure	Contexts where used
• Clinical signs: pallor, tiredness, breathlessness and headaches. • Low haemoglobin	**Iron deficiency anemia (IDA)**	STABLE SITUATIONS
• Clinical signs: night blindness, bitot's spots, corneal xerosis, keratomalacia. • Low serum retinol	**Vitamin A deficiency (xeropthalmia)**	EMERGENCIES and STABLE SITUATIONS
• Clinical signs: goitre and cretinism • Low urinary iodine	**Iodine deficiency disorders (IDD)**	STABLE SITUATIONS

Other micronutrient deficiencies & relevant indicators

Indicators	What they measure	Contexts where used
Clinical signs: painful joints, minute hemorrhages around hair follicles, swollen and bleeding gums and slow healing.	Vitamin C deficiency (scurvy)	•Clinical signs are monitored in emergencies where cases have already been identified. •Often part of multiple vitamin deficiency.
Eight clinically recognizable signs of beriberi: five in adults, three in children.	Thiamin (vitamin B1) deficiency	•Clinical signs may be monitored in emergencies once cases have been identified. •Symptoms are most likely to occur in rice-eating populations.
• Dermatitis, dementia and diarrhea • Cassal's necklace	Niacin deficiency	•Niacin deficiency occurs mainly amongst maize-eating populations. •It appears to mostly affect females over 15 years of age.

Key indicators for rapid assessment:

Mortality rates and causes of mortality
Demographic profile
Morbidity data on the most common diseases
Presence of diseases with epidemic potential
Data on immunization and vaccine coverage
Coverage of vitamin A supplementation
Predominant infant and young child feeding practices

C- What are the anthropometric measurements & how are they used in nutritional assessment?

- Anthropometric measurements include height, weight, skin fold thickness and circumference measurements of different parts of the body. These measurements reflect present nutritional status and can be used to estimate the degree of obesity and even the percentage of body fat.
- Three commonly used anthropometric indices are derived by comparing height and weight measurements with reference curves:
  1- Height for age
  2- Weight for age
  3- Weight for height

Height for Age:

- Length: refers to the measurement in a recumbent position used in children aged less than 2 years who cannot stand well.
- Standing height: refers to as stature so height is used to cover both measurements:

a) Low height for age (shortness): either normal variation or pathological process.
Stunting: gaining insufficient height relative to age.
The term chronic malnutrition is used to describe low height for age.

b) High height for age: (tallness) is an indicator with little public health significance.

Weight for height:

Reflects body wt. relative to height

a) Low weight for height (thinness and wasting), **thinness** does not necessary imply a pathological process.
Wasting: refers to recent and sever process that led to significant weight loss, usually as a consequence of acute starvation and \ or sever disease.

b) High weight for height :over wt. and obesity

What is the Body Mass Index (BMI)?

The BMI is commonly used to estimate the level of adiposity in individuals or in groups It defines as a relationship of weight to height, so is defined as a ratio of weight to the square of height:
BMI = Weight in kg \ (height in meter) 2

Table cut- offs for BMI in adults:		
BMI	**Weight status**	**Risk of co-morbidities**
Below 18.5	under wt	low
18.5-24.5	normal	average
25.5-29.9	over wt.	increased
30.0-39.9	obese	moderate- sever
Above 40	very obese	sever

Weight for age:

a) Low weight for age: **(lightness)**: is a descriptive term for **low** wt. for age.
(Underweight) refers to underlying pathological process.

b) High wt. for age: seldom used for public health purposes. The proper descriptive term for high wt. for age would be **heaviness.**

Other anthropometric indices:

1) mid upper arm circumference : The advantage of MUAC include the portability of measuring tapes and the fact that a single cut – off value (12.5-13.0 cm) can be used for children under 5 years of age .
2) Body mass index.
3) Skin fold: assess the thickness of subcutaneous tissue and are widely used for assessing obesity among adults.
4) Head circumference ☹ occipital – frontal circumference) used as a part of health screening for potential developmental or neurological disabilities in children.
5) 5-proxies for length: limitation in obtaining accurate measurements of infant length. Potential proxies include leg (or fibular) and arm (or ulnar) length as well as head circumference.