

**Nutrition** :The science of foods and the substances they contain

Or :The science or study that deals with food and nourishment, especially in humans

**Dietitians** :apply the art and science of human nutrition to help people understand the relationship between food and health and make dietary choices to attain and maintain health, and to prevent and treat illness and disease.

**A nutritionist:** a person who is trained or expert in the science of nutrition. plans food and nutrition programs, and supervises the preparation and serving of meals.

**Food** :Material, usually of plant or animal origin, that contains or consists of essential body nutrients, such as carbohydrates, fats, proteins, vitamins, or minerals, and is ingested and assimilated by an organism to produce energy, stimulate growth, and maintain life.

**Diet :**The foods one consumes .The quality of which affects the risk of chronic diseases

The usual food and drink of a person or animal.

**Chemical composition of nutrients**

**Inorganic nutrients**

* Minerals
* Water

**Organic nutrients**

* Carbohydrates
* Lipids
* Proteins
* Vitamins

**Essential nutrients**

* Macronutrients

Nutrients are substances needed for growth, metabolism, and for other body functions. Macronutrients are nutrients that provide calories or energy. The prefix macron is from the Greek and means big or large, used because macronutrients are required in large amounts. There are three broad classes of macro-nutrients: proteins, carbohydrates, and fats.

* Micronutrients

Micronutrients are essential elements needed by life in small quantities. They include micro minerals and Vitamins.

Micro minerals or trace elements include at least iron, cobalt, chromium, copper, iodine, manganese, selenium, zinc, and molybdenum

**Influences of Nutrition on individual**

* Health
* Appearance
* Behavior
* Mood

**Role of Nutrients**

* Growth and development: are essential for growth and maintenance of body tissues and for the production of substances such as hormones and enzymes which help to control many functions within the body.
* Provide energy : Foods provide us with energy in the form of calories (Kcal). Calories effectively act as the fuel that powers our bodies and enables us to function, in the same way that petrol fuels a car.
* Give you vitality and energy for life
* Help you stay at a weight that's right for you
* Boost your immune system
* Improve sports performance
* Delay the effects of aging
* Keep you active and fit into old age
* Help beat tiredness and fatigue
* Protect teeth and keep gums healthy
* Enhance your ability to concentrate and possible alter mood
* Ward off serious illnesses like heart disease, certain cancers, mature-age onset diabetes, and gallbladder disease

**Classes of Nutrients**

* Carbohydrates
* Proteins
* Fats
* Vitamins
* Minerals
* Water

**Nutritional Assessment**

**The purpose of nutritional assessment is to:**

* Identify individuals or population groups at risk of becoming malnourished
* Identify individuals or population groups who are malnourished
* To develop health care programs that meet the community needs which are defined by the assessment
* To measure the effectiveness of the nutritional programs & intervention once initiated

**Nutritional assessment summarized as ABCD**

* Anthropometric methods
* Biochemical, laboratory methods
* Clinical methods
* Dietary evaluation method

An assessment of nutritional status in adults may include a comprehensive evaluation consisting of a tailored history and physical examination, laboratory assessment, anthropometrics, body composition, and functional data.

**A-Clinical assessment of nutritional status (signs and symptoms )**

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| --- | --- | --- |
| Area/System | Symptom or Sign | Deficiency |
| General appearance | Wasting | Energy |
| Skin | Rash | Many vitamins, zinc, essential fatty acids |
| Hair and nails | Thinning or loss of hair | Protein |
| Spooning of nails | Iron |
| Eyes | Impaired night vision | Vitamin A |
| Mouth | Cheilosis and glossitis | Riboflavin, niacin, pyridoxine, iron |
| Bleeding gums | Vitamin C, riboflavin |
| Extremities | Edema | Protein |
| Neurologic | Paresthesias or numbness in a stocking-glove distribution | Thiamin (beriberi) |
| Tetany | Ca, Mg |
| Cognitive and sensory deficits | Thiamin, niacin, pyridoxine, vitamin B12 |
| Dementia | Thiamin, niacin, vitamin B12 |
| Musculoskeletal | Wasting of muscle | Protein |
| GI | Diarrhea | Protein, niacin, folate, vitamin B12 |
| Endocrine | Thyromegaly | Iodine |

**B-Anthropometry are reflect the nutritional status**

measurements of growth and body size are used to describe the nutritional status of children and adults.

The most common anthropometric measurements in children are:

**These measurements are then used to construct the following indices in children:**

Weight-for-height/length (weight in relation to the normal weight for a given height)

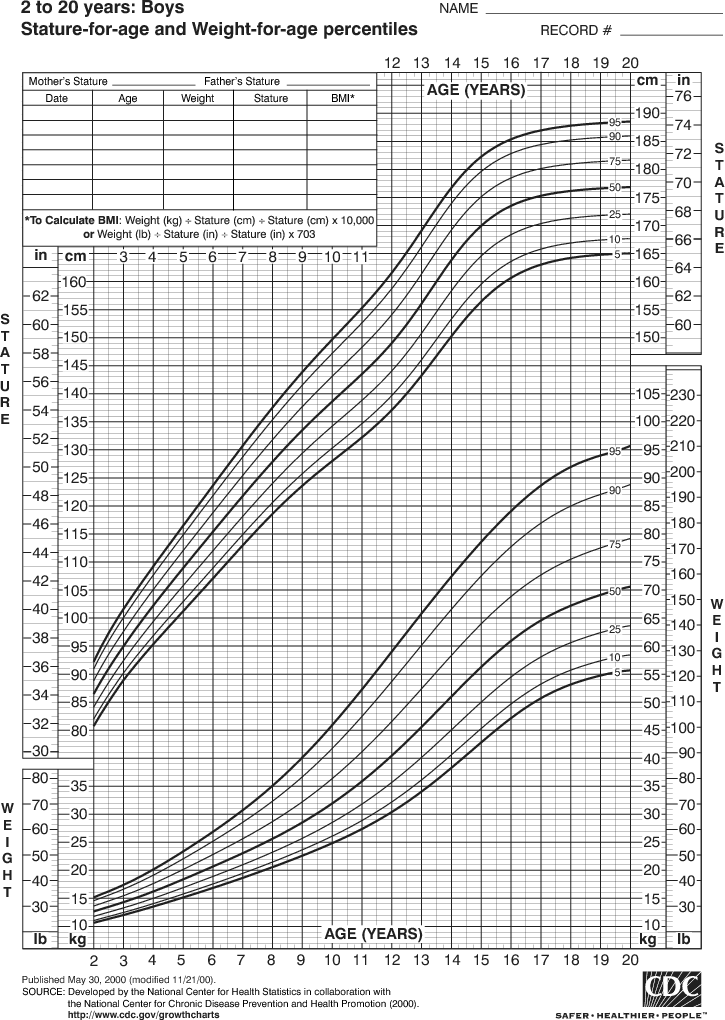
Length/height-for-age (height in relation to the normal height at a given age)

Weight-for-age (weight in relation to the normal weight at a given age)

Weight-for-height :Weight-for-height is a measure of current nutritional status

Height-for-age :Height-for-age is a measure of long-term or chronic nutritional status in children. Children who suffer from chronic under nutrition grow poorly and have low height for their age i.e. they are short

Weight-for-age :Weight-for-age has historically been the most commonly used index of childhood under nutrition and is still widely used for growth monitoring.



Middle-Upper Arm Circumference (MUAC)

MUAC is the circumference at the mid-point of the left upper arm, and is a proxy measure of total body fatness. MUAC is relatively constant in children aged 6 months to 5 years and is therefore a useful overall measure of nutritional status.

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Skin fold and waist circumference

thickness is an indirect measure of subcutaneous adipose tissue using skin fold calipers at various body sites. Body density and percentage body fat can then be estimated based on these measurements.

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Anthropometry in adults

In adults, the most common anthropometric measures taken are weight and height, and these are normally combined in the calculation of the [Body Mass Index (BMI)](javascript:glossary('bmi')). The same formula is used for both genders.

BMI Formula: BMI equal to weight in kilograms divided by the square of height in meters

|  |  |
| --- | --- |
| BMI (kg/m2) |  |
| <16.00 | Severe underweight |
| 16.00 - 16.99 | Moderate underweight |
| 17.00 - 18.49 | Mild underweight |
| <18.49 | Underweight |
| 18.50 - 24.99 | Normal weight |
| 25.00 - 29.99 | Overweight |
| ≥30.0 | Obese |
| ≥40.0 | Morbidly obese |

**Biochemical and Clinical Measures of Deficiency**

Low serum retinol: <0.70 µmol/l indicates vitamin A deficiency and levels <0.35 µmol/l indicate severe vitamin A deficiency.

**Dietary Assessment**

The assessment of dietary intake is the final method we will discuss that is commonly used to assess nutritional status in individuals and populations. From a national food and nutrition planning perspective, dietary intake information can be used to:

assess the adequacy of food supply

improve nutritional quality of food supply

set targets for food production

monitor progress towards production targets

assess how food is distributed within population

use as a basis for developing food regulations

Measuring past intake

There are two main methods used to measure the past intake.

1-24-hour dietary recall

2-Food frequency questionnaire

**Summary**

* The measurement of growth is one of the most sensitive indicators of child health
* The pattern of human growth is unique and is negatively affected by environmental factors such as infection and food insecurity
* The most common measurements taken are height, weight and MUAC, these being used to construct three main indicators for child nutritional status: weight-for-height, height-for-age, weight-for-age
* Vitamin A, iron deficiency anemia, iodine deficiency and zinc deficiency can be assessed biochemically
* Methods of assessing dietary intake are varied and include determining past intake and present intake. Many are expensive or place a large burden on the subject leading to a change in intake for the period of assessment. Dietary assessment usually involves a trade-off or compromise between accuracy and precision versus feasibility and representativeness