

# Nutritional Assessment

Nutritional assessment is the evaluation of nutritional status ( as the health condition of an individual as influenced by food consumption and utilization of nutrients ).

Nutritional status:-

Is the degree to which an individual's physiological need for nutrients is being met by the foods he/she is eating. It is the state of balance in the individual between the nutrient intake and the nutrient expenditure or need. It can be affected by many factors including disease, cultural patterns, eating behavior or habits, psychological stress, economic and nutrient absorption. Nutritional assessment is a comprehensive approach to the definition of nutritional status. It include information about medical history, social history, laboratory data and anthropometric measurements. The process usually includes two parts;-

Screening and Assessment

The purpose of screening is to identify patients at risk for nutritional problems. These include malnutrition but also such nutrition related diseases as diabetes and ulcerative colitis. The goals of assessment are directed towards therapy. The outcome of a nutritional assessment should be a care plan for the patient which identifies the appropriate medical nutrition therapies, both in people requiring only modification of a normal diet and in those who require aggressive nutritional repletion and support.

## Malnutrition:-

Is defined as state of over nutrition or under nutrition. Over nutrition is called obesity, and malnutrition is usually taken to mean under nutrition. Malnutrition can be classified by loss of body weight, one must consider the hydration status of the individual before doing so. One calculates the percent of usual weight.

Actual weight = usual weight x 100

The classification of malnutrition is as follow ( base on percent of usual weight ).

- Mild ▶ 85-90%
- Moderate ▶ 75-84%
- Severe ▶ < 74%

**Assessment of nutritional status is usually under taken for three reasons:-**

- 1. To confirm the diagnosis of under nutrition.**
- 2. To identify the reasons for the presence of under nutrition.**
- 3. To provide a means of monitoring the effectiveness of nutritional support.**

So the evaluation of one's nutritional status is carried out by one or more of the following methods:-

1. Anthropometric Measurements.
2. Clinical Evaluation.
3. Laboratory Assessment.
4. Dietary Assessment.

## 1. Anthropometric Measurements:-

The science of measuring the size, the physical dimensions and the gross composition of the body, include height, weight, skin fold thickness, and the circumference measurements of various parts of the body. It uses measurements of body thickness to estimate fat and lean tissue mass. It is the simplest and most quantitative measure of nutritional status. It is useful in monitoring normal growth and nutritional health in well-nourished individual as well as in detecting nutritional inadequacies or excesses.

The main advantage of such measurements are that it is simple, safe and inexpensive and can be applied at the bed side.

The limitation of the technique is that it can detect only those nutrient abnormalities that result in measurable changes in body size or proportion.

Body weight is one of the most convenient and useful indicators of nutritional status.

Skin fold thickness:-

As skin fold consists of two layers of subcutaneous fat without any muscle or tendon. Since a correlation exists between subcutaneous fat and the fat within the body skin fold thickness ( SFT ) measurements are used to estimate total body fat. Skin fold sites typically measured are the:- triceps, biceps, below the scapula and above the iliac crest.

The thickness may vary according to the subject age, sex and correlate as well with subcutaneous fat. In man, values of thickness less than ( 12.5mm ) suggest under nutrition and values over ( 20mm ) suggest excess fat and over nutrition. In women values less than ( 16.5mm ) suggest under nutrition, while values greater than ( 25mm ) indicate excessive body fat and over nutrition.

Circumference measurements can include the waist and hip circumference ratio ( differentiates between Gynoid and Android obesity ). Mid upper arm circumference ( indicative of skeletal muscle mass ). These numbers are then compared against norms.

## Body Mass Index ( BMI ):-

The BMI is commonly used to estimate the level of adiposity in individual or in groups. It defines obesity as a relationship of weight to height. So BMI is defined as the ratio of the weight to the square of the height

$$\text{BMI} = \text{Wt kg} / (\text{Ht in meters})^2$$

The commonly used definition of normal BMI is 20-25kg/h. A BMI of 20-25 shows the least risk for early death.

A score above 25 is classified into three categories of obesity:-

Mild ▶ 25-29

Moderate ▶ 30-40

Severe ▶ 40+.

Generally a BMI greater than 27 indicates clinical obesity and is associated with greater risk for the development of health problems and diseases.

## **2. Clinical Evaluation:-**

a. Medical History

b. Physical Examination



### **a. Medical History:**

**Contributing factors to malnutrition may be uncovered from the history of chronic illness, weight loss, and weight gain. History is geared to identify underlying mechanisms that put patients at risk for nutritional depletion or excess. From the history the physician may detect reasons for an existing nutritional problems or assess the likelihood of a nutritional problem developing in the future. The individual's nutrient utilization may be affected by prescribed drugs.**

## **b. physical examination:**

This forms an important part of all nutritional surveys by assessing the physical signs which gave us an idea about deviation from health due to nutritional conditions, as nails ridging, brittle, spoon shaped ( iron def ), mouth angular stomatitis, angular scar ( riboflavin def ), bones, bow legs ( vit D ), eyes ( xerophthalmia, keratomalacia ( vit A def ), neck ( goiter ) ( iodine def).

By noting physical changes in the patient, the physician have a clinical impression of the nutritional status which objective anthropometric and laboratory measurements can confirm.

## **4. Laboratory Assessment:-**

Laboratory evaluation can identify specific nutrition-related abnormalities such as, anemia, iron deficiency, or protein deficiency. Biochemical tests provide the first indication of nutritional abnormality before clinical or anthropometric changes occur. These tests are specific for the particular nutrient being investigated and, therefore, one must have a suspicion on clinical ground that a particular deficiency may exist, so the appropriate test can be under taken.

•A number of laboratory tests are available for studying nutritional status, these are:-

### **Protein:**

Serum protein fractions, especially albumin, urinary urea, urinary creatinine excretion/unit-time .

### **Vitamin A:**

Serum vit A, serum carotene.

### **Folic acid:**

Hemoglobin, serum folate, RBC folate ( figlu test ).

### **Vitamin D:**

Serum alkaline phosphatase.

### **Vitamin B12:**

Hemoglobin, serum B12, Schilling's test.

### **Iodine:**

Urinary iodine, tests for thyroid function.

### **Calcium:**

Serum and bone calcium.

### **Iron:**

Serum iron, iron binding capacity and serum ferritin.

## 4. Dietary Assessment:-

Dietary evaluation is an important adjunct to the other three assessments since it provides the description of dietary intake background which may help to explain any observed clinical or biochemical abnormalities which may suggest proper remedial steps. Twenty-four hour recall is one of the most common methods of dietary assessment. As the individual is asked to recall all food and beverages consumed over the preceding 24hrs and sometimes the physical activity level/ during this period. The advantage of the 24hr recall is that it requires little effort on the part of the respondent, but the consumption in a single 24hr may not be representative of current weekly or monthly consumption and, in addition, the data are subject to inaccuracies due to faulty memory and quantitative errors in assessing how much has been eaten. Diet history by recall can be corroborated by asking specific questions about the patient consumption and the family's purchases of individual food items such as bread, milk, vegetables, eggs, meat, beverages and so on. A more accurate assessment is performed by the **dietitian** by having the patient maintain a one week diet diary. All foods and fluids ingested with approximate quantities are recorded at the time of actual consumption. The data obtained from these records are then evaluated, understanding an individual dietary practices and food consumption patterns allows the medical professional to identify nutrient deficiencies, imbalances and excesses.

# Thank you

