THE PRACTICAL NUTRITIONAL ASSESSMENT

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Introduction

Nutritional health is maintained by a state of equilibrium in which nutrient intake and requirements balance. Malnutrition occurs when net nutrient intake is less than requirements. Malnutrition leads to a succession of metabolic abnormalities, physiological changes, reduced organ and tissue function, and loss of body mass (Figure 1-1). Concurrent stress such as trauma, sepsis, inflammation, and burns accelerates loss of function and body mass leading to losses that leave the individual's body function and mass insufficient to maintain health and life.

Clinically important evaluation of nutritional status should be able to predict whether the individual would have increased morbidity and mortality in the absence of nutritional support. In short, it can predict the occurrence of nutrition-associated complications and thus predict outcome. Unfortunately, disease and nutrition interact so that disease in turn may cause secondary malnutrition or malnutrition may adversely influence the underlying disease.

Traditional nutritional science was first developed in the field of agriculture in which the effect of nutrition was entirely judged by the amount of meat on the carcass of an animal and by the production of proteins by the animal's liver. This approach was embodied in the initial attempts to assess nutritional status in humans, as discussed below. These techniques lacked the ability to predict outcomes and to detect early changes in function that occur with nutritional support.

This chapter will address nutritional assessment, and Chapter 44 discusses pediatric parenteral feeding and addresses assessment specific to pediatric patients.

TRADITIONAL NUTRITIONAL ASSESSMENT INDICES

Nutritional status has been traditionally defined by body composition, plasma protein concentrations, immune competence, and multivariate analysis.[1,2] Assessment of nutritional status based on body composition involves relating the values in a given patient to normal standards. These measurements are affected by the reproducibility and error in the measurements themselves, and the interpretation by the normal range of values. A person who begins at the upper end of the normal range and loses a lot of weight may be classified as "normal" because, despite losses, his or her measurements remain within the normal range. Therefore, it is possible for a person to be in a negative nutritional state for a long time before anthropometric measurements fall below normal.

BODY WEIGHT AND WEIGHT LOSS

Body weight is a total body of components and, therefore, has to be related to the stature of the person calculated by the Body Mass Index (BMI). The BMI is calculated as weight in kilograms divided by height in meters squared. The interpretation of different BMIs can be found in Table 1-1.[3] A BMI of 14-15 is associated with significant mortality. However, measurements of body weight in patients in hospitals and intensive care units and those with liver disease, cancer, and renal failure are confounded by changes in body water due to dehydration, edema, and ascites.

Changes in body weight may provide some useful information in the clinical setting. Changes in body