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EDUCATIONAL PAPER

Basic concepts in nutrition: Diagnosis of malnutrition — Screening and assessment

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Body mass index;
Bioelectrical impedance

Learning objectives

- To be familiar with nutritional screening
- To understand different methods used for the nutritional assessment
- To know limitations of different method for nutritional assessment

Malnutrition goes largely undiagnosed and untreated particularly among hospital patients. This is mainly due to lack of nutritional training and awareness among staff, but also to lack of proper protocols for screening, assessment and action.

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Screening

Screening should be a simple and rapid process, which can be carried out by busy admitting nursing and medical staff. It should be sensitive enough to detect all or nearly all the patients at nutritional risk. There are some advantages in registering disease severity as well as nutritional status since the two interact. Moderate malnutrition may be more significant in the presence of severe disease. It should be capable of being scored numerically and audited, and should lead to appropriate and explicit action.

Most screening tools address four basic questions: recent weight loss, recent food intake, current body mass index and disease severity or some other measure of predicting risk of malnutrition. In 2003, ESPEN published

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guidelines for nutrition screening in the community, in the hospital and among elderly in institutions. The usefulness of screening methods recommended is based on aspects of predictive validity, content validity, reliability and practicability. For adult patients in hospital it is suggested to use the Nutrition Risk Screening 2002 (see Table 1). A score equal to or greater than 3 generates a nutrition plan in all cases. If the patient is at risk, but metabolic or functional problems prevent a standard plan being carried out, or if there is doubt as to whether the patient is at

Table 1 Nutritional risk screening (NRS 2002)

Step 1: Initial screening		Yes	No
1	Is BMI <20.5?		
2	Has the patient lost weight within the last 3 months?		
3	Has the patient had a reduced dietary intake in the last week?		
4	Is the patient severely ill ? (e.g. in intensive therapy)		

Yes: If the answer is 'Yes' to any question, the screening in Step 2 is performed.
No: If the answer is 'No' to all questions, the patient is re-screened at weekly intervals. If the patient e.g. is scheduled for a major operation, a preventive nutritional care plan is considered to avoid the associated risk status.

Step 2: Final screening			
Impaired nutritional status		**Severity of disease** (≈ increase in requirements)	
Absent **Score 0**	Normal nutritional statusA	Absent **Score 0**	Normal nutritional requirements
Mild **Score 1**	Wt loss >5% in 3 months or Food intake below 50–75% of normal requirement in preceding week.	Mild **Score 1**	Hip fracture* Chronic patients, in particular with acute complications: cirrhosis*, COPD*. ***Chronic hæmodialysis, diabetes, oncology.***
Moderate **Score 2**	Wt loss >5% in 2 months or BMI 18.5 – 20.5 + impairedgen. condition or Food intake 25–50% of normal requirement in preceding week	Moderate **Score 2**	Major abdominal surgery* Stroke* ***Severe pneumonia, hematologic malignancy***.
Severe **Score 3**	Wt loss >5% in 1 months (>15% in 3 months) or BMI <18.5 + impaired general condition or Food intake 0–25% of normal requirement in preceding week in preceding week.	Severe **Score 3**	Head injury* Bone marrow transplantation* ***Intensive care patients (APACHE>10).***
Score: +		**Score:**	**= Total score:**
Age	if ≥ 70 years: add 1 to total score above		**= age-adjusted total score:**

Score ≥3: the patient is nutritionally at-risk and a nutritional care plan is initiated

Score < 3: weekly rescreening of the patient. If the patient e.g. is scheduled for a major operation, a preventive nutritional care plan is considered to avoid the associated risk status.

NRS-2002 is based on an interpretation of available randomized clinical trials. *indicates that a trial directly supports the categorization of patients with that diagnosis. Diagnoses shown in *italics* are based on the prototypes given below.

Nutritional risk is defined by the present **nutritional status** and risk of impairment of present status, due to **increased requirements** caused by stress metabolism of the clinical condition.

A nutritional care plan is indicated in all patients who are
1) severely undernourished (score = 3), or
2) severely ill (score = 3), or
3) moderately undernourished + mildly ill (score 2 +1), or
4) mildly undernourished + moderately ill (score 1 + 2).

Prototypes for severity of disease
Score = 1: a patient with chronic disease, admitted to hospital due to complications. The patient is weak but out of bed regularly. Protein requirement is increased, but can be covered by oral diet or supplements in most cases.
Score = 2: a patient confined to bed due to illness, e.g. following major abdominal surgery. Protein requirement is substantially increased, but can be covered, although artificial feeding is required in many cases.
Score = 3: a patient in intensive care with assisted ventilation etc. Protein requirement is increased and cannot be covered even by artificial feeding. Protein breakdown and nitrogen loss can be significantly attenuated.