# Review Article On Nutrition Screening And Assessment Tools In The Elderly

A Shabir

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**Abstract**

In order to review the literature on nutrition screening and assessment tools in older people we searched MEDLINE, Web of Science and Scopus, and did a manual search in J Nutr Health Aging, Clin Nutr, Eur J Clin Nutr and free online available publications.

## INTRODUCTION

Poor nutrition status is a major negative prognostic indicator in older people (1-6). Malnutrition may refer to both deficiencies (such as protein, calorie, vitamin, mineral, etc.) and excesses (e.g., obesity and hypervitaminosis)(7). Malnutrition appears when there is mismatch between intake and demand of aging body. As people age, the risks for undernutrition increases. Muscle strength and power decline with aging. Sarcopenia can be addressed with adequate nutritional support and exercise. Older men who lose more than 3 kg/yr over 5 years have a 3.5 times greater mortality risk than those who have no weight change (8). Malnutrition is associated with functional and cognitive impairment and difficulties eating.

In a large multi-national cross- sectional study, the prevalence of malnutrition was 22.8%, with considerable differences between the settings (rehabilitation, 50.5%; hospital, 38.7%; nursing home, 13.8%; community, 5.8%). In the combined database, the "at risk" group had a prevalence of 46.2%. Consequently, approximately two-thirds of study participants were at nutritional risk or malnourished (9). Despite high prevalence rates among geriatric patients, malnutrition and nutrition-related problems are rarely recognised and treated by physicians (10). If recognized, effective treatment can be given and complications prevented.

Comprehensive assessment of nutrition is complex and time consuming; rapid screening is beneficial to identify those at risk of malnutrition. There are a variety of screening tools to assess for nutritional risk. These instruments do not necessarily confirm that an individual has malnutrition, but they are useful for identifying those who need a more thorough nutritional evaluation.

## DISCUSSION

The aim of this brief review article is to update the physicians regarding various nutritional screening and assessment tools, their efficacy and limitations. ESPEN (European Society for Clinical Nutrition and Metabolism) recommends Nutritional Screening and Assessment to Identify Need for Nutritional Intervention in all older adults >65 years (11).

**Goals of nutrition screening and assessment**

1. To Identify patients malnourished
2. or at risk of malnutrition
3. Establish a nutritional diagnosis
4. Formulate a plan for nutrition therapy
5. Evaluate effects of interventions

**Nutritional screening**: It predicts probability of outcomes related to nutritional factors and evaluates effect of nutrition therapy.

**Nutritional Assessment**: Patients identified as malnourished or at risk of malnutrition by a nutrition screen should have a complete nutritional assessment. It is performed by a nutrition expert. Nutritional Assessment is necessary for planning nutrition intervention. It involves a thorough evaluation of factors that affect nutrition status such as

reasons for reduced food intake, any disease related factors, side effects of treatment, oral problems, meal-time challenges and cultural, social and ethnic barriers to food intake such as issues with access and affordability.

**Tools for Nutritional Screening only**

- MUST: Malnutrition Universal Screening Tool
- GNRI: Geriatric Nutritional Risk Index
- MST: Malnutrition Screening Tool
- NRS 2002: Nutritional Risk Screening 2002

**Tools for Nutritional Screening and assessment**

- MNA: Mini Nutritional Assessment

**Tools for Nutritional Assessment only**

- SGA: Subjective Global Assessment

**Other screening tools**

- SNAQ Short Nutritional Assessment Questionnaire)
- SCREEN II
- DETERMINE

**Malnutrition Universal Screening Tool (MUST).** It was developed by British Association of Parenteral and Enteral Nutrition (BAPEN). It is commonly used in the United Kingdom and is particularly sensitive for recognition of protein energy undernutrition in hospitalized patients (12). MUST is a five step screening tool to identify adults who are malnourished, at risk of malnutrition, undernutrition or obese. It also includes management guidelines which can be used to develop a care plan. It is for use in hospitals, community, care homes and other care settings. It is a short tool, less time consuming and can be used by all care workers. It has not been designed to detect deficiencies or excessive intakes of vitamins and minerals and is only used in adults. The score is a sum of BMI, weight loss in past 3-6 months and acute disease effect score. A score of 2 or more is high risk and patient should be referred to dietician and nutritional support team.

**Geriatric Nutritional Risk Index (GNRI)**. Nutritional Risk Index (NRI) can identify patients at risk of malnutrition, however remains limited for elderly patients because of difficulties in establishing their normal weight. In GNRI ideal weight is replaced by usual weight calculated from Lorentz formula (WLo). The GNRI utilizes only three objective parameters of body weight, height and serum albumin. Is a simple and accurate tool for predicting risk of morbidity and mortality in hospitalized elderly patients and should be recorded systematically on admission. (13)

[Formula]

**Nutritional Risk Screening (NRS-2002)**- (14). It is based on analysis of controlled clinical trials. Initial screening includes 4 questions regarding BMI, wt loss in last 3 months, reduced dietary intake in last week and whether patient is severely ill (e.g. ICU). If answer is “no” to all questions, re-screen at weekly intervals. If “yes” to any question, final screening is performed. Final screening I (impaired nutritional status) scores 0-3 based on BMI, wt loss >5%, food intake and impaired general condition. Final screening II (severity of disease) scores 0-3 from normal nutritional requirement to intensive care patients. Age over 70 years add 1 point. If the total score is 3 or more nutritional support is indicated.

**The Mini Nutritional Assessment (MNA)** developed by Vellas and Guigoz in 1989 consists of a global assessment and subjective perception of health, as well as questions specific to diet, and a series of anthropomorphic measurements (4) These include: Food intake and weight loss over 3 months, mobility, acute disease, neuropsychological stress and BMI. It has been widely validated and is predictive of poor outcomes. The major advantage is that it requires no laboratory investigations. Scores out of 14, 12-14 points normal nutritional status, 8-11 at risk of malnutrition, 0-7 points are malnourished. In hospital settings, a low MNA score is associated with an increase in mortality, prolonged length of stay and greater likelihood of discharge to nursing homes. Intervention studies demonstrate that timely intervention can stop weight loss in elderly at risk of malnutrition or undernourished and are associated with improvements in MNA scores. The MNA can also be used as a follow up assessment tool. The Mini Nutritional Assessment-Short Form (MNA-SF) uses six questions from the full MNA and can substitute calf circumference if BMI is not available. This form is accessible online. A recent validation study demonstrated good sensitivity compared to the full MNA (15). The MNA® Short Form is now available as an iPhone®, mobile digital device application. With the MNA®-SF iPhone® app, busy clinicians can quickly screen for malnutrition and obtain results and intervention recommendations while maintaining patient confidentiality. Formulas to estimate height using demispan (half total arm span), ulna length, or knee height (using special calipers) are available. On the other hand, relying only on a patient’s weight or body mass index (BMI) may not identify individuals who are malnourished but have fluid overload or sarcopenic obesity.

When the MNA identifies persons at risk, they also identify frailty; hence all persons who score as nutrition at risk should be worked for frailty (16). The MNA has gained worldwide acceptance and shows a high prevalence of malnutrition in different settings, except for the community. Because of its specific geriatric focus, the MNA should be recommended as the basis for nutritional evaluation in older people (9).

**Subjective global assessment (SGA)**

The best combination of sensitivity (0.82) and specificity (0.72) for nutritional assessment is with SGA. It involves taking a detailed history (weight loss, change in dietary intake, gastrointestinal symptoms, and functional capacity) and physical examination (muscles, subcutaneous fat, and ascites) (17). A clinician makes the overall judgment whether the patient has normal nutritional status or is malnourished

**The Simplified Nutrition Assessment Questionnaire (SNAQ)**, a simple four item screener, for early detection of undernourished nursing- and residential home residents (18).The diagnostic accuracy of these questions alone was insufficient (Se=45%, Sp=87%, PPV=50% and NPV=84%). However, combining the four questions with measured BMI called SNAQ (RC) sufficiently improved the diagnostic accuracy (Se=87%, Sp=82%, PPV=59% and NPV=95%)

**SCREEN II** (Seniors in the Community: Risk Evaluation for Eating and Nutrition) is a Canadian instrument with 17-item tool that assesses nutritional risk by evaluating food intake, physiological barriers to eating (difficulty with chewing or swallowing), weight change, and social/functional barriers to eating. The tool has excellent sensitivity and specificity, as well as inter-rater and test/retest reliability (19). An eight-question abbreviated version of SCREEN II is also available

**DETERMINE** is a ten item checklist developed by the USA Nutrition Screening Initiative (NSI) to increase awareness of nutritional risk (20). It has been criticized for its lack of validity though is in common use (21,22). It is more useful to promote nutrition awareness than in the identification of malnutrition.

**Summary and Time Table for Nutrition Care Pathway**

- Screen and assess

-- 24–48 hours: hospital and geriatric care
-- 1 week: long-term care

- Develop care plan

-- Estimate needs using simplified formulas

- Initiate nutritional therapy

-- At least 75% of calculated energy need: acute care
-- >100%: rehabilitation care
-- 100% (if not palliative or terminal): older adult

- Provide follow-up and transfer of information

While these screening tools can be used by nursing staff on the hospital wards and care providers in care homes, as doctors we should also use these tools for patients seen in the out-patient clinics to screen the community dwelling older people who are often missed and identify those with risk of malnutrition and hence prevent associated morbidity and mortality.

## CONCLUSION

Despite high prevalence rates among geriatric patients, malnutrition and nutrition-related problems are rarely recognised and treated by physicians. If recognized, effective treatment can be given which will prevent complications and reduce morbidity and mortality. Comprehensive assessment of nutrition is complex and time consuming. Rapid screening tool is beneficial to identify those at risk of malnutrition. ESPEN recommends screening anyone older than 65 years. All older persons should be routinely screened for malnutrition or risk of malnutrition whether they are hospitalized, institutionalised or free living in the community. Screening should be done on admission in both acute hospitals and Rehabilitation settings. The MNA is the best validated and most widely utilized screening test for malnutrition in older persons. Those that are at risk or are malnourished should have a Comprehensive Geriatric Assessment (CGA).Choose nutrition screening tool based on the care level, local regulations or preferences, availability and expertise. Ensure that a care pathway is in place and that it is being monitored.

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## Author Information

**A Shabir**
drafshanshabir@gmail.com