

# Position of the Academy of Nutrition and Dietetics: Malnutrition (Undernutrition) Screening Tools for All Adults

## ABSTRACT

It is the position of the Academy of Nutrition and Dietetics that, based upon current evidence, the Malnutrition Screening Tool should be used to screen adults for malnutrition (undernutrition) regardless of their age, medical history, or setting. Malnutrition (undernutrition) screening is a simple process intended to quickly recognize individuals who may have a malnutrition diagnosis. While numerous malnutrition screening tools are in use, their levels of validity, agreement, reliability, and generalizability vary. The Academy of Nutrition and Dietetics reviewed the body of evidence supporting malnutrition screening tools and determined a single tool for identifying adults in all settings who may have malnutrition, regardless of their age or medical history. The Nutrition Screening for Adults Workgroup conducted a systematic review of the most robust evidence to promote using the highest-quality malnutrition screening tool available. *J Acad Nutr Diet.* 2019;■(■):■-■.

## POSITION STATEMENT

It is the position of the Academy of Nutrition and Dietetics that, based upon current evidence, the Malnutrition Screening Tool should be used to screen adults for malnutrition (undernutrition) regardless of their age, medical history, or setting.

**M**ALNUTRITION (UNDER-nutrition) among adults aged 19 years through old age is a common nutrition problem.<sup>1</sup> Because not all individuals with malnutrition have direct access to registered dietitian nutritionists (RDNs), screening to identify those who may have malnutrition or be at risk for malnutrition is a routine part of the intake or admission process in community and health care settings. Nutrition screening, as described in the Nutrition Care Process, is separate and distinct from nutrition assessment,<sup>2,3</sup> and is performed by nurses; medical assistants; and nutrition and dietetics technicians, registered. Based on a predetermined score, patients or clients are referred to an RDN for nutrition assessment, an in-depth process that is a licensed function in many states. Nutrition assessment may involve verifying some of the information obtained during screening and then obtaining additional information necessary for a malnutrition diagnosis.<sup>3</sup> Widespread use of valid and

reliable malnutrition screening tools increases the likelihood that individuals referred to an RDN for assessment will have a malnutrition diagnosis. Conversely, using valid and reliable tools avoids unnecessary referrals of people who do not have malnutrition.

## POSITION FOCUS

Malnutrition occurs in health care settings, and in communities where people suffer from food insecurity and hunger. Thus, this position applies in all settings where food assistance and nutrition services are available. This position is based on a comprehensive systematic review<sup>4,5</sup> and is intended to provide RDNs and all other health professionals with validity, agreement, reliability, and generalizability data for six malnutrition screening tools supported by the largest number of studies (Malnutrition Screening Tool [MST],<sup>6</sup> Malnutrition Universal Screening Tool,<sup>7</sup> Mini Nutritional Assessment–Short Form,<sup>8,9</sup> Short Nutritional Assessment Questionnaire,<sup>10</sup> Mini Nutritional Assessment–Short Form Body Mass Index,<sup>11</sup> and Nutrition Risk Screening 2002).<sup>12</sup> This position supports using a single tool to identify adults who may be

malnourished regardless of age, acute and chronic medical conditions, or settings where care is received.

## Position Statement Development Process

The Academy's Nutrition Screening for Adults Workgroup systematically reviewed validation studies for malnutrition screening tools published in the peer-reviewed literature from January 1997 through July 2017 and used the results as a basis for this position.<sup>4,5</sup> The Workgroup included tools that met the Academy's 2011 definition of nutrition screening (Figure 1), which was created for an earlier version of this project.<sup>13</sup> As in the earlier systematic review, the Workgroup sought quick and easy screening tools, defined as requiring fewer than 10 minutes to complete. For the current position, the requirement for robust data necessitated inclusion of tools with adequate supporting evidence, defined as greater than four validation studies. The Workgroup considered the overall validity, agreement, and reliability results and grades of supporting evidence for each tool, then generalizability of each tool to the widest variety of medical diagnoses or age groups and settings

**Definition:** Nutrition screening is the process of identifying patients, clients, or groups who may have a nutrition diagnosis and benefit from nutrition assessment and intervention by a registered dietitian nutritionist (RDN).

Key considerations:

- May be conducted in any practice setting as appropriate
- Tools should be quick, easy to use, valid, and reliable for the patient population or setting
- Tools and parameters are established by RDNs, but the screening process may be carried out by nutrition and dietetics technician, registered and other trained personnel
- Nutrition screening and rescreening should occur within an appropriate time frame for the setting.

**Figure 1.** The Academy of Nutrition and Dietetics' definition and key considerations for nutrition screening. (Reprinted with permission from Skipper and colleagues<sup>13</sup>; © 2012 American Society for Parenteral and Enteral Nutrition.)

and ranked the tools accordingly (Figure 2). The position paper was posted for public comment before publication.

## POSITION

***It is the position of the Academy of Nutrition and Dietetics that, based upon current evidence, the MST should be used to screen adults for malnutrition (undernutrition) regardless of their age, medical history, or setting.***

Ferguson and colleagues<sup>6</sup> developed the MST to detect malnutrition or risk for malnutrition. Between 1999 and 2017, the MST was validated in acute, long-term, rehabilitation, and ambulatory care and oncology clinics in at least nine different countries.<sup>15-33</sup> These studies revealed that the MST exhibited a moderate degree of validity, a moderate degree of agreement, and a moderate degree of inter-rater reliability in identifying malnutrition risk in adults (Figure 2). The strength of evidence for the MST is Grade I, *good/strong* with good generalizability.<sup>4,5,14</sup> Some of the other tools also had high or moderate validity, agreement, or reliability, but were not supported by Grade I evidence or good generalizability.<sup>4,5</sup>

## IMPLICATION FOR PRACTITIONERS

While disease-, age-, or setting-specific malnutrition screening tools exist, most organizations where malnutrition screening occurs have clients or patients of different ages with one or more medical problems and provide nutrition care in a variety of settings. The value of using different screening tools for individuals with different personal characteristics is unclear, and subject to practical limitations. It is appropriate to implement the screening tool that will most accurately identify

adults who may have malnutrition. Institutions and programs that implement the MST should have data available to consistently compare the populations screened for malnutrition, predict the resources for needed treatment, and support research.

Based upon the best available evidence,<sup>4,5</sup> the Academy advocates that RDNs:

- Assume a strong leadership role in implementing the MST. A benefit to society occurs if individuals who may have malnutrition obtain nutrition assessment and intervention services from an RDN. This benefit is not without cost because of the time required for an RDN to complete a nutrition assessment. Thus, the impact of changes to screening procedures affects the amount of RDN time available to provide other required nutrition services and provides justification for RDNs to select and oversee implementation of malnutrition screening tools.
- Implement the MST without changes to the wording of the questions or the scoring system for referrals as originally presented.<sup>6</sup> Adding items, modifying questions, or interpreting scores differently than intended by the authors of the tool should be avoided, as these changes invalidate the MST. Individual patients or clients with an MST score of  $\geq 2$  should achieve the greatest benefit from an RDN referral.
- Provide ongoing training to paraprofessionals who administer the MST and monitor the impact of the screening and referral process by summarizing data from individuals with malnutrition.

- Abandon all unvalidated malnutrition screening tools (eg, pressure injury and illness severity tools), including tools that were validated, then modified without rigorous re-validation against a standard definition of malnutrition.
- Discourage strongly the development of new screening tools in favor of further validating existing tools,<sup>13</sup> especially in adults between the ages of 19 and 49 years, over age 90 years, and in community and long-term care settings.
- Research the costs and outcomes of the malnutrition screening procedure. Minimal data exist on the financial implications of the proper identification of patients who do or do not have malnutrition or the costs of the screening procedure.<sup>4,5</sup> Obtaining these data could enable the projection of malnutrition assessment and intervention cost and should be a research priority.
- Research the minimum level of education and training needed to accurately administer the MST and develop education and training materials to facilitate consistency among users.
- Develop partnerships with patient advocacy groups, other health care professional organizations, and policy makers to implement the MST.

## CONCLUSIONS

The amount and quality of evidence for validated malnutrition screening tools has grown considerably since an earlier review of the topic. This additional evidence supports using a single tool,

TOOL	VALIDITY <sup>a</sup>					AGREEMENT <sup>a</sup>	RELIABILITY <sup>a</sup>	GENERALIZABILITY <sup>c</sup>	EVIDENCE GRADE, STRENGTH <sup>d</sup>
	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	OVERALL VALIDITY <sup>b</sup>				
MST <sup>e</sup>	Moderate	Moderate	Moderate	Moderate	MODERATE	MODERATE	MODERATE	Good	I, <i>Good/strong</i>
MUST <sup>f</sup>	Moderate	Moderate	Moderate	High	HIGH	MODERATE	MODERATE	Fair	II, <i>Fair</i>
MNA-SF <sup>g</sup>	Moderate	Moderate	Low	Moderate	MODERATE	LOW	MODERATE	Fair	II, <i>Fair</i>
SNAQ <sup>h</sup>	Moderate	High	Low	High	MODERATE	—	MODERATE	Fair	II, <i>Fair</i>
MNA-SF-BMI <sup>i</sup>	Moderate	Moderate	Moderate	High	HIGH	MODERATE	—	Limited	II, <i>Fair</i>
NRS-2002 <sup>j</sup>	Moderate	High	Moderate	Moderate	MODERATE	MODERATE	—	Limited	II, <i>Fair</i>

<sup>a</sup>Sensitivity, specificity, positive predictive value, negative predictive value cutoffs: High: 90% to 100%, moderate: 80% to ≤89%, low: ≤79%; agreement and reliability κ cutoffs: High: 0.8 to 1; moderate: 0.6 to ≤7.9; low: ≤5.9.

<sup>b</sup>See Figure 3 in Skipper and colleagues<sup>4</sup> for the algorithm to determine the overall validity.

<sup>c</sup>The Workgroup determined generalizability based on usefulness of each tool across the broadest array of adult age groups, locations, diseases, and treatments according to evidence.

<sup>d</sup>Elements considered in the evidence grade include quality of the evidence, consistency of results across studies, quantity of studies, and number of subjects, clinical impact of outcomes, and generalizability to population of interest.<sup>14</sup>

<sup>e</sup>MST=Malnutrition Screening Tool.

<sup>f</sup>MUST=Malnutrition Universal Screening Tool.

<sup>g</sup>MNA-SF=Mini Nutritional Assessment—Short Form.

<sup>h</sup>SNAQ=Short Nutritional Assessment Questionnaire.

<sup>i</sup>MNA-SF-BMI=Mini Nutritional Assessment—Short Form Body Mass Index.

<sup>j</sup>NRS-2002=Nutrition Risk Screening 2002.

**Figure 2.** Validity, agreement, reliability, generalizability, and strength of evidence of adult malnutrition (undernutrition) screening tools.

the MST, to screen all adults for malnutrition (undernutrition) in all settings where malnutrition screening occurs. Replacing other malnutrition screening tools, especially those not rigorously validated, with the MST is expected to identify persons with malnutrition and provide consistent data to support nutrition practice and policy.

## References

- White JV, Guenter P, Jensen G, Malone A, Schofield M. Consensus statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: Characteristics recommended for the identification and documentation of adult malnutrition (undernutrition). *JPEN J Parenter Enteral Nutr.* 2012;36(3):275-283.
- Swan WI, Vivanti A, Hakel-Smith NA, et al. Nutrition Care Process and Model Update: Toward realizing patient centered care and outcomes management. *J Acad Nutr Diet.* 2017;117(12):2003-2014.
- Field LB, Hand RK. Differentiating malnutrition screening and assessment: A nutrition care process perspective. *J Acad Nutr Diet.* 2015;115(5):824-828.
- Skipper A, Coltman A, Tomesko J, et al. 2018 Evidence Analysis Library Systematic Review of Adult Malnutrition (Undernutrition) Screening. *J Acad Nutr Diet.* 2019 (in press).
- Academy of Nutrition and Dietetics Evidence Analysis Library. Nutrition screening adults (NSA) systematic review (2016-2018). [www.andeal.org/nsa](http://www.andeal.org/nsa). Published 2018. Accessed July 31, 2019.
- Ferguson M, Capra S, Bauer J, Banks M. Development of a valid and reliable malnutrition screening tool for adult acute hospital patients. *Nutrition.* 1999;15(6):458-464.
- British Association for Parenteral and Enteral Nutrition (BAPEN). Screening and Malnutrition Universal Screening Tool (MUST). <https://www.bapen.org.uk/screening-and-must/must>. Updated April 25, 2016. Accessed May 23, 2018.
- Cohendy R, Rubenstein LZ, Eledjam JJ. The Mini Nutritional Assessment-Short Form for preoperative nutritional evaluation of elderly patients. *Aging (Milano).* 2001;13(4):293-297.
- Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. Screening for undernutrition in geriatric practice: Developing the short-form mini-nutritional assessment (MNA-SF). *J Gerontology.* 2001;56(6):M366-M372.
- Kruizenga HM, Seidell JC, de Vets HCW, Wierdsma NJ, van Bokhorst-de van der Schuerena MAE. Development and validation of a hospital screening tool for malnutrition: The short nutritional assessment questionnaire (SNAQ). *Clin Nutr.* 2005;24(1):75-82.
- Kaiser MJ, Bauer JM, Ramsch C, et al. Validation of the Mini Nutritional Assessment short-form (MNA-SF): A practical tool for identification of nutritional status. *J Nutr Health Aging.* 2009;13(9):782-788.
- Kondrup J, Allison SP, Elia M, et al. ESPEN guidelines for nutrition screening 2002. *Clin Nutr.* 2003;22(4):415-421.
- Skipper A, Ferguson M, Thompson K, Castellanos VH, Porcari J. Nutrition screening tools: An analysis of the evidence. *JPEN J Parenter Enteral Nutr.* 2012;36(3):292-298.
- Handu D, Moloney L, Wolfram T, Ziegler P, Acosta A, Steiber A. Academy of Nutrition and Dietetics methodology for conducting systematic reviews for the Evidence Analysis Library. *J Acad Nutr Diet.* 2016;116(2):311-318.
- Abbott J, Teleni L, McKavanagh D, Watson J, McCarthy A, Isenring E. A novel, automated nutrition screening system as a predictor of nutritional risk in an oncology day treatment unit (ODTU). *Support Care Cancer.* 2014;22(8):2107-2112.
- Arribas L, Hurtos L, Sendros MJ, et al. NUTRISCORE: A new nutritional screening tool for oncological outpatients. *Nutrition.* 2017;33:297-303.
- Bell JJ, Bauer JD, Capra S. The malnutrition screening tool versus objective measures to detect malnutrition in hip fracture. *J Hum Nutr Diet.* 2013;26(6):519-526.
- Ferguson ML, Bauer J, Gallagher B, Capra S, Christie DR, Mason BR. Validation of a malnutrition screening tool for patients receiving radiotherapy. *Australas Radiol.* 1999;43(3):325-327.
- Gabrielson DK, Scaffidi D, Leung E, et al. Use of an abridged scored Patient-Generated Subjective Global Assessment (abPG-SGA) as a nutritional screening tool for cancer patients in an outpatient setting. *Nutr Cancer.* 2013;65(2):234-239.
- Isenring E, Cross G, Daniels L, Kellett E, Koczwara B. Validity of the malnutrition screening tool as an effective predictor of nutritional risk in oncology outpatients receiving chemotherapy. *Support Care Cancer.* 2006;14(11):1152-1156.
- Isenring EA, Bauer JD, Banks M, Gaskill D. The Malnutrition Screening Tool is a useful tool for identifying malnutrition risk in residential aged care. *J Hum Nutr Diet.* 2009;22(6):545-550.
- Isenring EA, Banks M, Ferguson M, Bauer JD. Beyond malnutrition screening: Appropriate methods to guide nutrition care for aged care residents. *J Acad Nutr Diet.* 2012;112(3):376-381.
- Lawson CS, Campbell KL, Dimakopoulos I, Dockrell ME. Assessing the validity and reliability of the MUST and MST nutrition screening tools in renal inpatients. *J Ren Nutr.* 2012;22(5):499-506.
- Nor Azian MZ, Suzana S, Romzi MA. Sensitivity, specificity, predictive value and inter-rater reliability of malnutrition screening tools in hospitalised adult patients. *Malays J Nutr.* 2014;20(2):209-219.
- Nursal TZ, Noyan T, Atalay BG, Koz N, Karakayali H. Simple two-part tool for screening of malnutrition. *Nutrition.* 2005;21(6):659-665.
- Shaw C, Fleuret C, Pickard JM, Mohammed K, Black G, Wedlake L. Comparison of a novel, simple nutrition screening tool for adult oncology inpatients and the Malnutrition Screening Tool (MST) against the Patient-Generated Subjective Global Assessment (PG-SGA). *Support Care Cancer.* 2015;23(1):47-54.
- Ulltang M, Vivanti AP, Murray E. Malnutrition prevalence in a medical assessment and planning unit and its association with hospital readmission. *Aust Health Rev.* 2013;37(5):636-641.
- Wu ML, Courtney MD, Shortridge-Baggett LM, Finlayson K, Isenring EA. Validity of the malnutrition screening tool for older adults at high risk of hospital readmission. *J Gerontol Nurs.* 2012;38(6):38-45.
- Young AM, Kidston S, Banks MD, Mudge AM, Isenring EA. Malnutrition screening tools: Comparison against two validated nutrition assessment methods in older medical inpatients. *Nutrition.* 2013;29(1):101-106.
- Abe Vicente M, Barão K, Silva TD, Forones NM. What are the most effective methods for assessment of nutritional status in outpatients with gastric and colorectal cancer? *Nutr Hosp.* 2013;28(3):585-591.
- Hogan D, Lan LT, Diep DT, Gallegos D, Collins PF. Nutritional status of Vietnamese outpatients with chronic obstructive pulmonary disease. *J Hum Nutr Diet.* 2017;30(1):83-89.
- Marshall S, Young A, Bauer J, Isenring E. Nutrition Screening in Geriatric Rehabilitation: Criterion (Concurrent and Predictive) Validity of the Malnutrition Screening Tool and the Mini Nutritional Assessment-Short Form. *J Acad Nutr Diet.* 2016;116(5):795-801.
- Neelemaat F, Meijers J, Kruizenga H, van Ballegooijen H, van Bokhorst-de van der Schueren M. Comparison of five malnutrition screening tools in one hospital inpatient sample. *J Clin Nurs.* 2011;20(15-16):2144-2152.

**AUTHOR INFORMATION**

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*Authors:* Annalynn Skipper, PhD, RD (American Medical Association, Chicago, IL); Anne Coltman, MS, RD, LDN, CNSC (Trinity Health, Melrose Park, IL); Jennifer Tomesko, DCN, RD, CNSC (Rutgers University, School of Health Professions, Newark, NJ); Pamela Charney, PhD, RD (University of North Georgia, Dahlonega, GA); Judith Porcari, MBA, MS, RD (Lehman College, Bronx, NY); Tami A. Piemonte, MS, RDN, LD/N (Academy of Nutrition and Dietetics, Evidence Analysis Center, Chicago, IL); Deepa Handu, PhD, RD, LDN (Academy of Nutrition and Dietetics, Evidence Analysis Center, Chicago, IL); Feon W. Cheng, PhD, MPH, RDN, CHTS-CP (Academy of Nutrition and Dietetics, Evidence Analysis Center, Chicago, IL).

**STATEMENT OF POTENTIAL CONFLICT OF INTEREST**

The authors of the paper have no conflicts to disclose. A. Skipper is an employee of the American Medical Association (AMA), but the ideas expressed in this position are those of the Academy of Nutrition and Dietetics and do not reflect AMA policy.

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