

Appropriate Use of Visceral Proteins in Nutrition Screening and Assessment

Introduction

Serum albumin and prealbumin are not components of currently accepted definitions of malnutrition. These visceral proteins decline in the presence of inflammation, regardless of underlying nutrition status. The purpose of this fact sheet is to review appropriate use of these proteins and outline currently accepted nutrition screening and assessment practices.

Case Study

Patient presents with colon cancer requiring surgical resection. As part of a pre-operative assessment, nutrition risk screening is performed. Patient reported a 10 pound weight loss over 6 months and a slight decrease in oral intake. His serum albumin was reported to be 3.3 g/dL. Based on the serum albumin level, the surgeon postpones the procedure and tells the patient to see a dietitian and begin oral supplements. Is this the appropriate plan of care?

Recommendation: Since serum albumin is related to systematic inflammation rather than the nutritional status, the patient should move forward with the surgical procedure. Preoperatively, he should undergo a full nutrition assessment and be entered into an Enhanced Recovery After Surgery (ERAS) program which may include pre-operative and post-operative oral nutrition supplements.

In another situation: Patients can be overweight *and* be in semi-starvation with very low lean mass and declined function. Because patients can adapt to starvation, they can have normal levels of albumin until they reach an advanced state of decline. Using albumin as a marker causes this at-risk and malnourished population to be completely missed as a surgical risk.

When this population enters an inflammatory state such as major surgery or acute illness on top of semi-starvation, they can be prone to complications and negative surgical outcomes. It is more appropriate to use tools other than albumin to identify patients at risk of protein-calorie malnutrition and poorer surgical outcomes.

Nutrition Screening and Assessment

What is NUTRITION SCREENING and what tool should be used for screening?

- Nutrition screening is a process to identify an individual who may be malnourished or at risk for malnutrition to determine if a comprehensive nutrition assessment and appropriate intervention are indicated.
- ASPEN suggests using the MST Tool for nutrition screening. MST includes screening of weight changes and energy intake, and is recommended by the Academy of Nutrition and Dietetics for all adult patients. (See Table 1)

TABLE 1. NUTRITION SCREENING TOOLS

	MUST	NRS-2002	MST	PON
Energy intake		X	X	X
Body mass index	X	X		X
Weight changes	X	X	X	X
Disease severity	X	X		
GI symptoms				
Physical exam				
Mobility				
Functional capacity				
Cognitive function				
Aged > 70 years		X		
Serum albumin				X

Table adapted from Evans DC, Corkins MR, Malone A, et al. The use of visceral proteins as nutrition markers: an ASPEN position paper. *Nutr Clin Pract.* Feb. 2021;36(1):22-28. MNA, mini nutritional assessment; MST, malnutrition screening tool; MUST, malnutrition universal screening tool; NRS-2002, nutrition risk screening 2002; PON, perioperative nutrition screening tool; SGA, subjective global assessment; AND-ASPEN, Academy of Nutrition and Dietetics, American Society for Parenteral and Enteral Nutrition.

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What is NUTRITION ASSESSMENT and what method or measure should be used to identify malnutrition?

- Nutrition assessment is a comprehensive approach to identifying nutrition-related problems. It uses a combination of the following: medical, nutrition, medication and client histories; nutrition-focused physical examination; anthropometric measurements; and biomedical data/medical diagnostic tests and procedures.
- ASPEN suggests using the Academy of Nutrition and Dietetics (AND)-ASPEN Characteristics or Subjective Global Assessment (SGA) for nutrition assessment because they best reflect intake, physical changes, and functional status.
- AND-ASPEN nutrition assessment indicators are (suspect malnutrition if two or more characteristics are present):
 - » Insufficient energy intake » Decreased subcutaneous fat
 - » Unintentional weight loss » Fluid accumulation
 - » Decreased muscle mass » Decreased functional status (e.g. hand grip strength)

Most nutrition screening and assessment tools do not include albumin or prealbumin. See Tables 1 and 2 for a review of those tools and what factors are included.

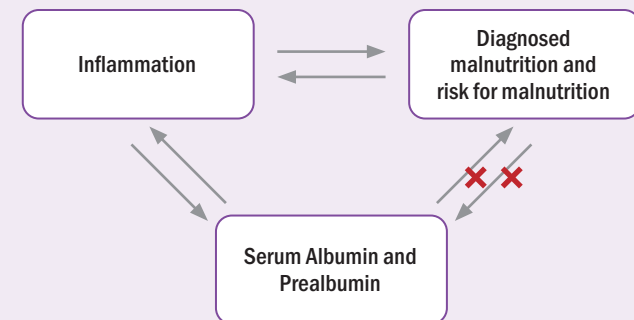
TABLE 2. NUTRITION ASSESSMENT TOOLS			
	SGA	MNA	AND-ASPEN
Energy intake	X	X	X
Body mass index		X	
Weight changes	X	X	X
Disease severity	X	X	X
GI symptoms	X		
Physical exam	X		X
Mobility		X	
Functional capacity	X		X
Cognitive function		X	
Aged > 70 years			
Serum albumin			

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Executive Summary*

- Serum albumin and prealbumin are not components of currently accepted definitions of malnutrition.
- Serum albumin and prealbumin do not serve as valid proxy measures of total body protein or total muscle mass and should not be used as nutrition markers.
- The serum concentrations of albumin and prealbumin decline in the presence of inflammation, regardless of underlying nutrition status.
- Serum albumin and prealbumin declines must be recognized as inflammatory markers associated with “nutrition risk” in the context of nutrition assessment rather than with malnutrition per se. Nutrition risk is broadly defined as the risk of developing malnutrition and/or poor clinical outcomes if nutrition support is not provided.
- The role of serum albumin and prealbumin in monitoring delivery and efficacy of nutrition support remains undefined. Their normalization may indicate the resolution of inflammation, the reduction of nutrition risk, a transition to anabolism, or potentially lower calorie and protein requirements.

Figure 1. Relationship between malnutrition, inflammation, and visceral proteins.*



*Evans DC, Corkins MR, Malone A, et al. The use of visceral proteins as nutrition markers: An ASPEN position paper. *Nutr Clin Pract.* Feb. 2021;36(1):22-28.

References

- Evans DC, Corkins MR, Malone A, et al. The use of visceral proteins as nutrition markers: An ASPEN position paper. *Nutr Clin Pract.* Feb. 2021;36(1):22-28.
- White JV, Guenter P, Jensen G, et al. 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.