Nutritional status classification in the Department of Veterans Affairs

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ABSTRACT

The Department of Veterans Affairs (VA) Nutrition Status Classification scheme uses clinical data that are routinely collected on admission or shortly thereafter for quick inpatient nutrition screening. In this scheme, patients are assigned to 1 of 4 classification levels according to 7 individual indicators. The indicators include nutrition history, unintentional weight loss as a percent of usual body weight, percent of ideal body weight, diet, diagnosis, albumin, and total lymphocyte count. After ratings (1 to 4) are assigned to each of the 7 indicators, overall nutritional status for each patient is determined by an algorithm.

The VA classification system includes many of the same criteria used in other nutritional status classifications. Where it differs is in the greater emphasis on the use of objective criteria and in the rigorous evaluation of reliability and validity that went into its development. Because of these extra measures, the VA classification can be used for prioritizing workload, as well as for determining staff requirements and for comparing workload and productivity across health care facilities. So that others might benefit from using this system, this article provides information on how the classification scheme was developed and explains how it is used. *J Am Diet Assoc. 2001;101:786-792.*

A number of studies have shown that despite the high prevalence of malnutrition in hospitalized patients, especially the elderly (1-4), this problem is often not addressed (3,5-7). Recognizing this phenomenon, the Department of Veterans Affairs (VA) developed a tool to identify nutrition-compromised patients quickly and reliably, so that efforts to prevent the occurrence of subsequent morbid events associated with malnutrition can begin immediately(1,8-11).

The VA Nutrition Status Classification scheme is a quick method of inpatient nutrition screening that uses clinical data that are routinely collected on admission or shortly thereafter. Its primary purpose is to identify—within 24 hours of admission—patients who could benefit from a more comprehensive nutrition assessment, and to rank patients in order of the magnitude of benefit they would be likely to obtain from nutrition intervention, thereby assisting in the prioritization of workload.

BACKGROUND

A considerable amount of information on the development and use of various methods of nutritional status classification is available. However, in a review of the current status of nutrition assessment, Charney (12) points out that there is no method of nutrition evaluation "that is universally accepted,

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easily applicable, an accurate predictor of prognosis, and forecasts patient response to therapy." Three major reasons likely contribute to lack of acceptance of a single methodology:

First, many of the systems require that considerable judgment be used in assigning an overall nutritional status (13-17). Although some degree of professional judgment is warranted and desired, the more that judgment is required, the less reliable the tool(18). Further, studies relying on the use of professional judgment rarely evaluate their tools for reliability, which makes it impossible for potential users to compare the relative merits of various classifications. One exception is Subjective Global Assessment, which has been shown to have good reliability when the ratings of 2 observers are compared (14).

Second, extensive clinical data are required for some classifications, precluding their use as relatively quick screening tools at, or shortly after, admission (1,17,19,20).

Third, classifications that have objective scoring systems and simple data requirements are rarely evaluated for their validity and reliability, making it impossible to compare systems. Exceptions include evaluations of Subjective Global Assessment (13,14,21) and a classification described by Kovacevich, et al (22). However, no published study we know of has evaluated reliability among more than 2 observers. For a large, multifacility health care system such as the VA, demonstrated reliability among multiple clinicians at multiple sites is critical for acceptance of a classification.

The VA Nutrition Status Classification scheme overcomes each of these limitations because it uses an objective algorithm that does not rely on judgment, uses data that can be easily obtained within 24 hours of a patient's admission, and has been rigorously evaluated for its reliability and validity.

Evaluation was based on an analysis of ratings of 20 patients by 113 registered dietitians and clinical dietetic technicians representing 98 VA medical centers. A detailed description of the evaluation methodology and the results has been published elsewhere (23). In summary, the results from the evaluation demonstrated good to very good interrater reliability among both registered dietitians and clinical dietetic technicians (κ=0.74 and 0.65, respectively). Evaluations of other nutrition status classifications (eg, Subjective Global Assessment [14], Nutrition Risk Classification [22]) have shown comparable reliability, but only between 2 raters, making the VA evaluation the most extensive study of the reliability of a nutritional status classification methodology that has been conducted. This demonstration of interrater reliability among multiple raters is critical and supports the Nutrition Status Classification scheme's use in a multiprovider health care system.

Content validity was established by comparing the ratings assigned by the 113 VA clinicians to ratings assigned by an expert panel of registered dietitians, whereas construct validity was established by determining that nutritional status level is significantly associated with time requirements for providing nutrition services (24). A relationship between nutritional status and morbid events has not yet been evaluated.

DESCRIPTION OF CLASSIFICATION SCHEME

Screening criteria for the classification system were selected according to a 1992 review of the literature on nutrition screening and assessment, which consistently recommends the inclusion of multiple parameters, including weight, diagnosis, clinical condition, diet information, brief physical assessment, and preliminary laboratory data (12,25). In addition, criteria that are readily available from the medical record and a brief interview with the patient/significant other within 24 hours of admission were selected. Laboratory data that are included as part of routine lab work for an admission were incorporated as well, resulting in the following 7 criteria: nutrition history (15,26,27), percent weight loss (28,29), percent of ideal body weight (17,25,26,30-32), diet order (33,34), diagnosis (30), and serum albumin level and total lymphocyte count (26,27,31). An updated literature review conducted in 1999 verified that these 7 criteria continue to be recommended and used as measures of nutritional status (1,12,35-49).

Within 24 hours of admission, a patient's medical record is reviewed, the patient is interviewed, and each of the 7 clinical indicators is assigned a rating of 1 through 4. When data are not available for an indicator, it is not rated and is not considered in overall status determination. The criteria for assigning ratings to each of the indicators follows (See Figures 1 and 2 for additional details for rating the indicators).

Nutrition History

This indicator covers factors that have had a recent affect on the patient's ability to consume adequate nutrition. These include appetite changes, chewing or swallowing difficulties, gastrointestinal complaints, and limitations in independence. Nutrition history information should ideally come from the patient; however, it may also be obtained from other reliable sources such as family, caregiver, or nurse. Current criteria/symptoms should be rated rather than complaints of the past. If any of the listed symptoms is an active problem, regardless of frequency or duration, it should be checked. In the event the patient has multiple criteria/symptoms representing different levels of nutritional status, the highest or most compromised rating is used as the final rating for the indicator.

Unintentional Weight Loss As a Percent of Usual Body Weight

This indicator is defined as the percent of usual body weight lost unintentionally over the past 6 months. To rate this indicator the following must be determined: the patient's usual weight before weight loss, the patient's current (or most recently recorded) weight, and the length of time during which the weight loss occurred. Percent of usual body weight loss is calculated as:

$$(\text{Usual weight} - \text{Current weight})/(\text{Usual weight}) \times 100$$

The indicator should not be rated if any of the following is true: the patient has gained weight, weight loss is due to sensible dieting, weight loss is attributed to diuresis or amputations, and weight data are greater than 6 months old. If a patient's weight has been recorded more than once in the past 6 months, the most recent weight loss should be used. If weight loss is noted and no statement is made regarding intention, it should be considered unintentional. Patients whose weight remains stable or unchanged should be assigned a rating of 1.

Percent of Ideal Body Weight

There are a variety of methods available for estimating ideal body weight (IBW), including the Hamwi Method (50), the Metropolitan 1959 tables (51), and the Metropolitan Life 1983 tables (52). Percent IBW is calculated as:

Nutrition Status Classification Worksheet

SECTION A. NUTRITION HISTORY

1. Please check ALL that apply. (The #'s correspond to Nutrition History rating categories)

Chewing problems	(2)	Diarrhea	(3)
Constipation	(2)	Swallowing problems	(3)
Nausea	(2)	Vomiting	(3)
Feeding assistance required	(2)	None of above	(1)
Limited Activities of Daily Life	(2)	Info. on pt. not available (Leave Box 1 Blank)	
Restricted ambulation	(2)		

Looking at the boxes you checked, place the highest corresponding value in BOX 1	1.

2. Please check ONE of the following describing the patient's appetite:

Good	(1)	None	(4)
Fair	(2)	Info. not available (Leave Box 2 Blank)	
Poor	(3)		

Place the # corresponding to the rating you checked in BOX 2.	2.
Compare the values in 1 and 2. Place the larger of the two in BOX A. This is the nutrition history rating.	A.

SECTION B. UNINTENTIONAL WEIGHT LOSS

NOTE: STOP here and leave BOX B BLANK if any of the following is true:
- past weight data or time frame is missing or > 6 months old
- patient has gained weight or weight is stable
- wt. loss is due to diuresis, amputation or sensible dieting

If not stated, assume wt. loss is unintentional.

Use data on the patient's most recent weight loss (unintentional only) to perform the following calculations:

Enter the previous weight and date.	Wt_____1. Date_____2.
Enter the current weight and date.	Wt_____3. Date_____4.
Calculate the following: Weight Change: 1-3=	_____5.(Lbs or Kgs)
Time Period: 2-4=	_____6.(Mos)
If 5 >0, calculate: % Weight Loss: (5/1)*100=	_____% 7.

Using 6 (time) and 7 (percent) find the correct rating from the table below. Place this rating in BOX B.	B.

Unintentional Weight Loss Ratings

	Time Period			
Percent	<2 Weeks	2 Weeks-<2Months	2 Months-<4 Months	4 Months-<6 Months
<2	1	1	1	1
2-4.9	4	3	2	2
5-7.4	4	4	3	2
7.5-9.9	4	4	4	2
10-14.9	4	4	4	3
>=15	4	4	4	4

SECTION C. % IDEAL BODY WEIGHT

Patient's Height	1.	Patient's current weight	2.
Frame size (default = medium)	3.	Ideal body weight (Calculate from ht./wt. tables)	4.

If the patient's height or weight is MISSING, STOP and Leave BOX C BLANK.	
Calculate % of ideal body weight: (2/4)*100=	5.
Using the value in box 5, find the patient's % of body weight rating in the table below. Place this rating in BOX C.	C.

% Ideal Body Weight Scores

Value From Box 5 Above	90-119	81-89 or 120-129	75-80 or 130-149	< 74 or > 150
Rating	1	2	3	4

FIG 1. Page 1 of the Department of Veterans Affairs Nutrition Status Classification Worksheet.

SECTION D. DIET

Circle the patient's current diet(s) in the table below. Place the corresponding rating in BOX D (use the highest if more than one). NOTE: If there is NO ORDER, STOP here and leave BOX D BLANK. **If the patient's diet is not listed, write it under "Other" and use your clinical judgement in assigning a rating.**

D.

Rating	Diet Name
(2)	ADA/Wt. reduction
(4)	Clear liquids > 3 Days
Blank	Clear liquids ≤ 3 days
(2)	Consistency other than mechanical
(2)	Drug-nutrient interaction
(2)	Dysphagia

Rating	Diet Name
(3)	Fluid restriction (<1000cc)
(2)	Lactose free
(2)	Low fat/Low cholesterol
(1)	Mechanical
(3)	Mineral restricted other than sodium
Blank	NPO ≤ 3 days
(4)	NPO > 3 days

Rating	Diet Name
(4)	PPN
(3)	Protein restricted
(1)	Regular
(2)	Sodium restricted
(4)	TPN
(3)	Tube feeding, Stable
(4)	Tube feeding, unstable
	Other (specify) _____

SECTION E. DIAGNOSIS

Circle ALL of the patient's diagnoses in the table below. Find the diagnosis with the HIGHEST corresponding rating and place that rating in BOX E. A "rule out" diagnosis should be given the same rating as the diagnosis itself. This is not a complete list, so please refer to the instructional manual for further detail. If no exact or close match exists, use your professional judgement and list the diagnosis(es) here _____

E.

Rating	Diagnosis
(3)	AIDS
(2)	Alzheimer's disease
(2)	Angina
	Cancer:
(3)	Head & neck
(3)	GI tract
(2)	All others
(2)	Cardiac disease
(3)	Cardiomyopathy
(3)	Chemotherapy
(3)	Congestive heart failure
(2)	COPD, stable
(3)	COPD, unstable
(2)	CVA
(2)	Dementia
(2)	Diabetes: controlled
(3)	Diabetes: uncontrolled
(3)	Diabetes: newly diagnosed
(3)	Dysphagia

Rating	Diagnosis
(3)	Fracture, traumatic
(2)	Fracture, other
	GI disease:
(3)	W/ malabsorp. or maldigest.
(2)	All others
(4)	GI obstruction
(4)	Hepatic coma
(4)	Hepatic encephalopathy
(1)	HIV+
(1)	Hypertension (HTN)
(4)	Ileus
(3)	Infection w/ fever
(3)	Liver disease
(4)	Malnutrition
(3)	Neurological disorders: coma
(2)	Neurological disorders: others
(2)	Nutritional anemia
(2)	Pneumonia

Rating	Diagnosis
	Psychological disorders:
(2)	Eating disorders
(1)	Others
	Pulmonary disease:
(3)	O2 dependent
(4)	Failure requiring vent
(2)	Peripheral vascular disease
	Radiation therapy:
(3)	Head & neck
(3)	GI tract
(2)	All others
(2)	Renal disease
(4)	Acute renal failure
(3)	Chronic renal failure
(3)	Spinal cord injury (SCI), new
(4)	Sepsis
(2)	Substance abuse
(1)	Surgeries; all not mentioned
(2)	Tuberculosis

SECTION F. ALBUMIN LEVEL

Put the patient's most RECENT Albumin level (g/L) in box 1.						1.
Find the Albumin value in the table below and record the corresponding rating in BOX F. (g/L)						
Alb.	No data OR > 6 Wks. old	*Insert Site Specific Values Here*				
Rating	Leave Blank	1	2	3	4	
Place the Albumin RATING in BOX F.						F.

SECTION G. TOTAL LYMPHOCYTE COUNT

Place the patient's most RECENT TLC (cells/cmm) in BOX 1.						1.
Find the TLC value in the table below and record the corresponding rating in BOX G (cells/cmm)						
TLC	No data OR> 6 Wks. old	>1500	1200-1499	800-1199	<799	
Rating	Leave Blank	1	2	3	4	
Place the RATING in BOX G						G

OVERALL RATING Transfer ratings of individual indicators to the following boxes.

RATING	A	B	C	D	E	F	G

Sum the 3 highest scores and place in the Sum box, then place the corresponding Status in the Overall Status box.

Sum of top 3 scores	3-5	6-8	9-11	12
Overall Nutrition Status	1	2	3	4

Sum of Top 3	Overall Status

FIG 2. Page 2 of the Department of Veterans Affairs Nutrition Status Classification Worksheet.

Current weight/IBW × 100.

Use of the tables requires knowledge of the patient's frame size. When frame size is not known, a medium frame size should be assumed.

Diet

When rating this indicator, only the current diet is considered. Generally, the more complex or restrictive a diet, the more likely the diet will be inadequate in some nutrients. In addition, patients who require highly specialized diets are likely to have compromised nutritional status. The indicator should be left blank if, at the time of screening, any of the following is applicable: no diet has been ordered, the patient has taken nothing by mouth for less than 3 days; or the patient has been on a clear liquid diet for less than 3 days. The latter 2 situations might occur in newly admitted patients who have been transferred from another facility.

Nutritional status levels have been shown to be highly correlated with time spent in the provision of clinical nutrition services, and the classification system has been used as the key variable in a clinical nutrition staffing model

Diagnosis

This indicator is rated using the most current diagnostic data available; potential diagnoses should not be extrapolated from a patient's history or laboratory data. As new diagnoses are confirmed and added, the rating for this indicator can change. Pertinent medical problems, including a rule-out diagnosis, that affect the patient's nutritional status should be considered. A rule-out diagnosis should be rated the same as the diagnosis itself. For patients with more than 1 diagnosis, the diagnosis that yields the highest or most compromised status should be used.

The diagnoses listed in the VA Nutrition Status Classification Worksheet (Figures 1 and 2) are not all inclusive; it includes only those most frequently seen in VA patients. If the exact stage or diagnosis is not listed in the worksheet, the most similar diagnosis should be used.

Serum Albumin

Facilities have their own criteria for "normal" serum albumin levels. These should be used for calculating the ranges that correspond to each of the 4 ratings of nutritional status. To calculate site-specific ranges, data from the site's laboratory service must be obtained on the mean and standard deviation (SD) for the serum albumin level of a normal or test population. Using these data, calculations for each of the 4 nutrition status levels are as follows: nutritional status 1: patient's value ≥ normal mean serum albumin –2 SD; nutritional status 2: patient's value is between normal mean –2.3 SD and normal mean –3.3 SD; nutritional status 3: patient's value is between normal mean –3.6 SD and normal mean –4.6 SD, and nutritional status 4: patient's value ≤ normal mean –4.9 SD.

The resultant values should be entered into section F of the Worksheet (see Figure 2). For example, a mean serum albumin level of 43 g/L ±2.5 g/L[1] gives the following ranges for the 4 levels: status 1, ≥38 g/L; status 2, 35 g/L to 37 g/L; status 3, 32 g/L to 34 g/L; status 4, ≤31 g/L.

A variety of non-nutritive factors may affect a patient's serum albumin level, including dilutional state, liver disease, sepsis, acute stress, and/or blood loss. The rating of serum albumin level should be left blank if it is likely to be affected by the presence of non-nutritive factors. In addition, serum albumin levels older than 6 weeks should not be considered, and the rating should be left blank.

Total Lymphocyte Count

A variety of factors may affect a patient's total lymphocyte count (TLC), including cancer, chemotherapy, infection, anesthesia, acquired immunodeficiency syndrome (AIDS), and immunosuppressant medication. The rating of TLC should be left blank if it is likely to be affected by the presence of non-nutritive factors. In addition, TLC values older than 6 weeks should not be considered, and the rating should be left blank.

DETERMINING AN OVERALL STATUS

After rating each indicator, an overall nutritional status based on data from a minimum of 4 indicators can be determined and a status category assigned. The 4 nutritional status categories are: normal, where the patient is not nutrition compromised and is considered nutritionally stable; mildly compromised, where the patient is considered somewhat nutritionally unstable and a few nutrition-related problems or indicators that affect the patient's health status exist; moderately compromised, where several nutrition-related problems or indicators that directly affect the patient's health status exist and the patient may be medically unstable; and severely compromised, where the patient has overt nutrition deficiencies or malnutrition, and many nutrition-related problems or indicators that have a profound affect on the patient's health status exist, so that the patient is generally considered unstable, nutritionally and/or medically.

As part of the study that evaluated the reliability and validity of the VA Nutrition Status Classification scheme, an algorithm was constructed for determining a patient's overall nutritional status (23). The algorithm was designed to produce ratings consistent with those assigned by an expert panel (the registered dietitians who developed the classification system). The results of the reliability study showed that the algorithm gave more reliable and valid results than did professional judgment (fair reliability for professional judgment vs very good reliability for the algorithm).

[1]To convert grams of albumin to g/dL, multiply g/L by 0.1. To convert g/dL to g/L, multiply g/dL by 10. Serum albumin of 43 g/L=4.3 g/dL.

In the algorithm, number values assigned to the 3 indicators with the highest ratings (ie, where the patient was most compromised) are summed and overall nutritional status is determined from the table provided on the Nutrition Status Classification Worksheet (see Figure 2). For example, if ratings for the 7 clinical indicators were 2, 3, 3, 2, 4, 2, and 3, the 3 highest ratings are 3, 3, and 4, which sum to 10. According to the worksheet (Figure 2), an overal nutritional status of 3 should be assigned.

After a nutritional status category is determined, patient care workload can be prioritized so that the most compromised patients are seen first and the issues addressed as indicated in *Practice Guidelines for VA Dietetic Service* (53), which outlines actions for care and corresponding time frames based on nutritional status.

Although the Nutrition Status Classification Worksheet (Figures 1 and 2) may appear complicated at first glance, it is designed to provide as much detail as possible for guiding practitioners through the process of determining a patient's nutritional status. As practitioners become familiar with the process, the worksheet becomes a very simple and straightforward tool to use. Consequently, determining nutritional status can be performed not only by registered dietitians, but also by dietetic technicians and dietetic interns. Data collected as part of the VA Clinical Nutrition Staffing Study (24), revealed an average screening time of 4.1±1.7 minutes per patient (minimum, 1 minute; maximum, 10 minutes) when the worksheet was used. A handbook that includes several exercises explaining how to use the classification is also available (54).

APPLICATIONS

A survey conducted of VA medical centers in 1998 showed that of 139 responding medical centers, 117 (84%) use the VA classification system for prioritizing workload. However, informal feedback from some medical centers indicates that the instrument does not meet the screening needs of all facilities. The staff at some medical centers prefer tools that require less data, whereas others want tools that allow for professional judgment.

■ As health care institutions consider screening tools, they should evaluate the ease of use, content (face) validity (does it include those parameters that most experts consider to be indicative of malnutrition), and established reliability of each tool. We believe the VA Nutrition Status Classification scheme performs better than most on these criteria; but each facility must consider their own requirements when making their decision.

■ Health care facilities outside the VA system considering implementation of the VA classification system should note that the reliability and validity of the tool were established using data from a sample of patients representative of the VA patient population (average age 59 years, range: 29 to 79 years, 90% male). VA medical centers use the classification with female patients; but we cannot say if the classification is more or less valid for that population. There is no reason to believe it should be any less reliable; and none of the criteria are gender specific. However, until additional research is conducted to evaluate the use of the tool in a broader patient population, facilities should perform a subjective assessment of the face validity of the tool for use with their own patient populations.

■ The VA classification system has applications beyond the prioritization of daily workload. Because it has demonstrated reliability, it allows for the comparison of patient characteristics and productivity across facilities. For instance, VA clinicians and managers can examine the distribution of patients across the 4 nutritional status levels at each medical center to compare differences in severity of illness, or, perhaps, in the outcomes of treatment. The total number of patients in each nutritional status level divided by the number of staff at each medical center can also be compared to identify differences in productivity.

■ In addition, nutritional status levels have been shown to be highly correlated with time spent in the provision of clinical nutrition services, and the classification system has been used as the key variable in a clinical nutrition staffing model (24). Data on the number of patients in each of the 4 nutritional status levels is obtained from the medical center's clinical database, and these data are multiplied by a standard time requirement for each patient at each level to determine total direct patient care time requirements. This number, in turn, is divided by number of productive hours available per full-time-equivalent dietitian to arrive at the number of staffmembers required. Using the model, clinical nutrition staffing requirements can be determined for an entire medical center, or for different patient care units within a medical center.

■ Because the data required by the 7 indicators are generally collected as part of standard health summaries, and because a reproducible, mathematical algorithm is used for combining the data from the 7 indicators, the VA Nutrition Status Classification scheme readily lends itself to automation. This contributes to the goal of using computers to perform calculations and to accurately and quickly assess large amounts of data, leaving staff free to perform the work that computers cannot—delivering high quality, personalized patient care.

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