

# Malnutrition in Elderly Ambulatory Medical Patients

## ABSTRACT

Elderly ambulatory persons may be especially susceptible to malnutrition, particularly those who are poor and socially isolated or have comorbid chronic medical diseases. We found that 98 of 2,986 persons aged 60 years or older attending a hospital-based medical practice between 1979 and 1989 weighed less than 45.4 kg (100 lbs). All but 1 of these subjects met criteria for malnutrition as judged against age-specific norms for weight. Thus the prevalence of malnutrition in this sample was 3.25% (95% CI 2.61, 3.89%). Interviews and physical examinations of a subsample (n = 16) revealed that all 16 subjects either met anthropometric-based criteria for malnutrition or were being treated for malnutrition. Of the 98 subjects who weighed less than 45.4 kg, 62 (63.3%; 95% CI 53.8, 72.8%) had comorbid conditions that could have contributed to malnutrition. Physicians did not record a diagnosis of malnutrition or weight loss in 47.9% of subjects (95% CI 38.0, 57.8%) and did not prescribe a nutrition supplement for 76.5% of subjects (95% CI 68.1, 84.9%). Subjects treated with nutrition supplement were more likely to have cancer. These findings suggest that malnutrition, both with and without concomitant major comorbid disease, is relatively frequent among elderly ambulatory patients and that a specific nutritional diagnosis is not made in many cases. We suggest that weight under 45.4 kg in an elderly person is a useful criterion for identifying elderly patients at nutritional risk. (*Am J Public Health*. 1991;81:1195-1197)

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### Introduction

In 1968 Jean Mayer testified before Congress that as many as 10% of Americans were malnourished due to poverty.<sup>1</sup> During the ensuing decade, government programs reduced malnutrition, but more recently funding for these programs has diminished.<sup>2</sup> The two largest nutritional surveys in the United States, the Ten-State Nutrition Survey<sup>3</sup> and the National Health and Nutrition Examination Surveys (NHANES I and II),<sup>4-6</sup> collected comprehensive data but were conducted in the 1970s, and neither study estimated the prevalence of malnutrition in the elderly. Other studies of malnutrition or weight loss among the elderly are anecdotal, describe small numbers, include hospitalized patients, or do not estimate the prevalence of malnutrition in the populations studied.<sup>7-24</sup> We therefore studied the prevalence of malnutrition among elderly ambulatory patients.

### Methods

The study population consisted of outpatients aged 60 years or older, who were receiving care in the medical faculty practice at Columbia-Presbyterian Medical Center, and whose recorded weights in the practice database were 45.4 kg (100 lbs) or less on at least two office visits during the period from 1979 to 1989. Patients were routinely weighed on a balance scale at most visits. In 1989, there were 8,956 patient records in the database; of these 2,987 (33.3%) referred to patients who were age-eligible; one age-eligible patient did not have a recorded weight in the database. Hospital charts of 124 of the 128 age- and weight-eligible patients were obtained, and these patients' weight of 45.4 kg or less on at least two visits in 98 of these 124 patients was confirmed (Table 1).

We reviewed the medical records of these 98 patients using standardized data forms. The diagnoses of malnutrition or weight loss were considered to have been recorded if there was explicit mention in the chart subsequent to the index visit. Treatment of weight loss or malnutrition was considered to have been provided if

chart notes recorded the prescription of liquid nutrition supplement. Alcoholism, cancer, severe chronic pulmonary disease, congestive heart failure, dementia, depression, or stroke were noted as comorbid conditions that could contribute to malnutrition.

We further defined nutritional status on the basis of two sets of age- and sex-specific norms, NHANES<sup>25</sup> and the Ten-State Nutrition Survey.<sup>3</sup> Subjects were considered severely malnourished if measurements of weight for height<sup>25</sup> or weight<sup>3</sup> were below the fifth percentile according to these norms. Subjects were considered moderately malnourished if these measurements were between the fifth and fifteenth percentiles.

### Results

Laboratory findings in the 98 subjects were consistent with although not specific for malnutrition (Table 1). Of the 48 subjects with recorded heights and weights, 28 (58.3%) were severely malnourished, and 15 (31.3%) were moderately malnourished as measured against the norms from NHANES. All five of the remaining subjects, who could not be classified because their heights were below the minimum height in these distributions, either were taking nutrition supplements or had a diagnosis of malnutrition in the medical record. Measured against norms based on weight alone<sup>3</sup> 2 subjects more than 85 years old could not be classified, 48 (49.0%) were severely malnourished, 42 (42.9%) were moderately malnourished, and 6 (6.1%) were above the 15th percentile. Of the 6 subjects above the 15th percentile, 4 were described as malnourished

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**TABLE 1—Characteristics of 98 Subjects with Weights of 45.4 kg (100 lbs) or Less Attending a General Medicine Ambulatory Care Practice in New York City, 1979–1989<sup>a</sup>**

	Mean	SD
Age (years)	75.2 ±	9.8
Follow-up time (months)	33.1 ±	32.4
Weight (kg)	40.9 ±	3.9 (range 26.1–45.4)
Height (cm)	155.4 ±	10.1 (range 134.6–175.3)
Albumin (mg/dl)	4.0 ±	0.46
Hemoglobin (mg/dl)	12.3 ±	1.8
Absolute lymphocyte count (cells/microliter)	1,647 ±	761

<sup>a</sup>Five (5.1%) of the subjects were men, and 28 (28.6%) were receiving Medicaid.

**TABLE 2—Characteristics of 98 Subjects with Weights of 45.4 kg (100 lbs) or Less Classified by Nutritional Diagnosis as Recorded in the Medical Record**

Basic Characteristics	Subjects with Diagnosis of Malnutrition or Weight Loss (n = 51)		Subjects with No Nutritional Diagnosis (n = 47)	
	Mean	SD	Mean	SD
Age (years)	75.6 ±	9.4	74.7 ±	10.4
Follow-up time (months)	29.9 ±	27.4	36.5 ±	37.0
Weight (kg) <sup>a</sup>	40.8 ±	4.0	41.1 ±	3.9
Height (cm)	153.3 ±	11.2	157.8 ±	8.2
Albumin (mg/dl) <sup>b</sup>	3.97 ±	0.42	4.04 ±	0.51
Hemoglobin (mg/dl) <sup>c</sup>	12.2 ±	1.6	12.4 ±	2.0
Absolute lymphocyte count <sup>d</sup> (cells/microliter)	1,767 ±	816	1,519 ±	690
Number (percent) men	4 (7.8%)		1 (2.1%)	

  

Comorbid Disease <sup>e</sup>	Subjects (Percent) with Diagnosis Malnutrition or Weight Loss (n = 51)		Subjects (Percent) with No Nutritional Diagnosis (n = 47)	
Alcoholism	5	(9.8%)	3	(6.4%)
Cancer	11	(21.6%)	4	(8.5%)
Chronic pulmonary disease	8	(15.7%)	15	(31.9%)
Depression	10	(19.6%)	9	(19.1%)
Congestive heart failure	9	(17.6%)	11	(23.4%)
Dementia	9	(17.6%)	5	(10.6%)
Stroke	3	(5.9%)	5	(10.6%)

<sup>a</sup>Height was available for 48 subjects.  
<sup>b</sup>Serum albumin was available for 80 subjects.  
<sup>c</sup>Hemoglobin was available for 77 subjects.  
<sup>d</sup>Absolute lymphocyte count was available for 60 subjects.  
<sup>e</sup>Sixty-two subjects had one or more comorbid conditions; 28 subjects had more than one.

in the medical record, and a fifth subject met criteria for malnutrition as measured against norms of weight for height.<sup>25</sup> Both extremely elderly subjects were described as malnourished in the medical record. Thus the false positive rate in classifying these 98 subjects using weight alone was 1% or less. We therefore estimated the prevalence of malnutrition among subjects over the age of 60 years in this medical practice as 97 of 2,986 (3.25%; 95% CI 2.61, 3.89%).

The diagnosis of malnutrition was recorded in the charts of 23 subjects

(23.5%), and the diagnosis of weight loss was recorded in 28 additional subjects (28.6%, Table 2). Twenty-three subjects (23.5%) were treated with calorie supplement (Table 3). Thus 47 of 98 subjects (47.9%; 95% CI 38.0, 57.8%) had no recorded diagnosis of malnutrition or weight loss, and 75 (76.5%; 95% CI 68.1, 84.9%) were not treated with calorie supplement.

Comorbid conditions that could have contributed to malnutrition were present in 62 subjects (63.3%; 95% CI 53.8, 72.8%, Table 2). Presence of a comorbid condition was not significantly associated with

a recorded diagnosis of malnutrition or weight loss; however, such subjects were more likely to have cancer (odds ratio = 2.96; 95% CI 0.87, 10.04).

A substudy (N = 16) of subjects who made scheduled visits to the practice between July 1989 and February 1990 found that the observed weight was 45.4 kg or less in all subjects and that the mean observed weight differed from that in the chart by less than 1%. Using norms for bone-free upper arm muscle area based on triceps skinfold and mid-arm circumference measurements,<sup>25</sup> we found 11 subjects to be below the fifteenth percentile. Of the remaining 5, 4 had a recorded diagnosis of malnutrition or were taking nutrition supplement. The remaining subject met criteria for malnutrition according to norms for weight<sup>3</sup> and weight for height.<sup>25</sup> Thus, all 16 substudy subjects either met anthropometric criteria for malnutrition or were being treated for malnutrition, including 7 subjects with no recorded nutritional diagnosis.

### Discussion

This study found that 3.25% of ambulatory elderly patients in a medical practice had evidence of malnutrition, that weight of 45.4 kg (100 lbs) or less is a useful screening criterion for malnutrition, and that the diagnosis of malnutrition was noted in only 52.1% of the 98 malnourished subjects. Of the 98 subjects, 62 (63.3%) had an underlying disease that probably contributed to malnutrition, but more than a third did not; this suggests that malnutrition among the elderly is often present in the absence of major comorbid illness.

It is likely that our method underestimated the prevalence of malnutrition. A weight of 45.4 kg may be too low to identify some malnourished men with larger frames. Thus, only 5 subjects in this series were male.

Although data were collected retrospectively, it is unlikely that information regarding other diagnoses was incomplete since there were computer-based lists of medical diagnoses for all subjects, and the mean observation time in the medical record was 33 months. Weights recorded in the chart were measured during routine care; however, weights measured in the validation substudy corroborated those in the chart.

Although their findings are not conclusive, several longitudinal studies have found that extreme leanness is associated with adverse medical outcomes.<sup>26,27</sup> Al-

TABLE 3—Characteristics of 98 Subjects<sup>a</sup> with Weights of 45.4 kg (100 lbs) or Less Classified by Nutritional Treatment as Recorded in the Medical Record<sup>b</sup>

Men	Treated (n = 23)		Not Treated (n = 75)	
	Mean	SD	Mean	SD
Age (years)	75.0 ±	8.7	75.2 ±	10.2
Follow-up time (months)*	18.7 ±	18.7	37.4 ±	34.5
Weight (kg)	39.9 ±	4.1	41.2 ±	3.8
Height (cm)	154.3 ±	11.1	155.9 ±	9.6
Albumin (mg/dl)	3.80 ±	0.41	4.07 ±	0.46
Hemoglobin (mg/dl)**	12.5 ±	1.0	12.2 ±	2.0
Absolute lymphocyte count (cells/microliter)	1,403 ±	567	1,720 ±	802

<sup>a</sup>Four (17.4%) of the treated subjects were men, and 7 (30.4%) had cancer.  
<sup>b</sup>Fisher's Exact Test was used to determine statistical significance.  
\*P = .002. \*\*P = .003.

though the prognostic significance of a weight of 45.4 kg or less (100 lbs) in the elderly is not known, our data indicate that this easily remembered indicator is a useful screening criterion for malnutrition in the elderly and can be used to define the prevalence of this condition.<sup>28</sup> □

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