

Overview of Geriatric Nutrition

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Abstract. Restoration and maintenance of optimal nutritional status in the long-term care setting may enhance the quality of life for geriatric patients. The elderly are at increased risk for poor nutrition due to age-related physiological and psychosocial changes, as well as the added toll of chronic disease. All of these may have a negative impact on adequate food intake. Health care providers must identify and address nutrition-related problems in a timely manner to correct nutrient imbalances and restore nutritional well-being in this population.

Key words: Nutrition, geriatric patients – Anorexia, geriatric patients – Deglutition – Deglutition disorders.

The relationship between optimal nutrition and the maintenance of physical and emotional health in the elderly cannot be overlooked. Adequate nutrition may delay the onset of chronic degenerative disorders such as coronary heart disease, cancer, hypertension, and diabetes. It also may enhance depressed immune response in the aged [1], enabling them to maintain their functional capacities, with resultant improvement in the quality of life as the outcome. Therefore, all health care providers must recognize the need to maintain or restore nutritional well-being in this population as a precursor to all other treatment plans and modalities.

Malnutrition, including both overnutrition (excesses) and undernutrition (deficiencies), has been found to be prevalent in varying degrees in the elderly population [1]. As many as half of aged individuals have clinically identifiable nutrition

problems that require professional intervention [2]. Existing data [3] reveal that older persons typically consume diets that contain less than recommended levels of nutrients. This, coupled with their increased susceptibility to chronic, often debilitating disease and age-related physiological and psychosocial changes, may have a negative impact on their nutritional status. The incidence and degree of malnutrition in elderly persons is further increased during hospitalization in acute care facilities as well as long-term care institutions [1]. Since projected estimates show that the proportion of elderly people in the United States will increase through the year 2035 [4], one may expect the number of persons residing in long-term care facilities also to escalate. In contrast to patients in an acute care setting, patients may remain in long-term care residences for months or years [5]. It is therefore critical to address nutrition problems and concerns in this setting, with continuous monitoring and evaluation of individual residents to determine the effectiveness and appropriateness of the nutritional care plan [5]. This article presents an overview of nutrition-related problems and issues in the aged, so that health care providers can identify nutrient imbalances and provide appropriate suggestions in a timely manner.

Overview of Nutrition and Aging

The normal aging process causes physiological changes in both body composition and various organ systems, both of which can affect nutritional status. Loss of lean body mass, with a proportionate increase in adipose tissue and reduction in total body water [1], contributes to changes in nutrient requirements. The decline in basal metabolic rate (BMR) and activity level in the elderly implies that daily caloric needs decrease. However, older adults

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Sociodemographic factors
 Low income
 Living alone
 Minority

plus
Health factors
 Acute infections
 Fractured hip
 Congestive heart failure
 Chronic lung disease
 Late effects of stroke
 Amputations resulting from diabetes
 Arthritis
 Cancer

lead to
Disabilities
 Loss of mobility

resulting in
Failure of food access
 Can't do food shopping
 Can't cook
 Can't manage special diet

which explains
Nutritional risk
 Less than 7 hot meals per week
 Days without food

causing dependency and need
 for geriatric care unless food
 needs are met by
Community services
 Home-delivered meals
 Food shopping assistance
 Special diets
 Nutrition counseling
 Homemaker services

Fig. 1. Overview of sociodemographic and health characteristics of the frail elderly that contribute to nutritional risk and need for services. Reprinted with permission from [7].

continue to require as much protein, vitamins, and minerals [6].

Diminished efficiency of the gastrointestinal and renal systems may affect adequate ingestion, digestion, absorption, utilization, and excretion of nutrients [2]. Sensory losses that accompany the aging process may have a further impact on nutritional status. Decreased sense of taste or smell, a frequent complaint in the elderly, may diminish the palatability of food, resulting in a poor appetite. Poor hearing may interfere with socialization at mealtime and impaired vision may interfere with food procurement and preparation. Motor disabilities may interfere with shopping, food preparation, and self-feeding [5, 7].

The high incidence of chronic disabilities and social isolation may lead secondarily to psychiatric illness such as depression, with accompanying anorexia and poor intake. Those with irreversible or terminal disease also are liable to experience malnutrition from anorexia and/or dysphagia. In these patients, refusal to eat is often a nonverbal signal that they no longer wish to live [7].

Table 1. Major causes of reduced food intake in the elderly [7]

Unattractive surroundings	Cirrhosis
Unpleasant company	Congestive heart failure
Bad food service	Pulmonary insufficiency
Mealtime disturbances	Chronic renal disease
Breathlessness	Cancer
Gastric distention	Malnutrition
Abdominal pain	Postgastrectomy syndromes
Gassy diarrhea	Lack of coordination
Dysphagia	Paralysis
Taste or smell perversion	Arthritis
Nausea and vomiting	Loss of consciousness
Depression	Drugs (e.g., digoxin or cancer chemotherapeutic agents)
Confusion	Restricted diets
Paranoia	Alcohol abuse
Dementia	

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Psychosocial changes that affect older adults may also increase their nutritional risk status. Loss of independence, social isolation resulting from separation from family, and economic hardship may lead to indifference about food with subsequent anorexia [5].

In a national survey of 2800 persons above age 65, 40% indicated that not having enough money to live on was a serious problem [5]. Significant numbers of older Americans live below the poverty level [8], causing financial limitations in their ability to purchase appropriate quantities and quality of food as well as influencing the availability of adequate facilities for food storage and preparation.

Food preferences and habits in the aged are often based on ethnicity, culture, family tradition, or religious custom [7]. These food habits often become more rigid as one ages, leading to unhappiness if these foods are not available, especially in a long-term care facility. The avoidance of a specific food group, such as milk and milk products, due to unpleasant symptoms associated with intake, such as diarrhea, may limit ingestion of nutrient-dense foods [7].

Major causes of reduced food intake in the elderly are summarized in Table 1. An overview of sociodemographic and health factors contributing to the high nutritional risk status of the elderly is shown in Figure 1.

Dental Status and Food Intake

The multitude of natural and pathologic changes that occur in the oral cavity during the aging pro-

cess can have profound effects on the ability of the elderly to chew and/or swallow.

Approximately half of all American individuals have lost their teeth by age 65 [1, 2, 4, 9]. Osteoporotic change in the alveolar bone of the mandible is the chief cause of tooth loss [4]. Resorption in this bone may also cause structural changes so that chewing, with either teeth or dentures, is impaired [4]. Decrease in both the volume and viscosity of saliva produced [4] may cause xerostomia, interfering with tongue mobility and chewing, with subsequent problems in initiation of swallow. Thinning of gum tissue combined with shrinking connective tissue [7] and atrophy of the oral mucosa may alter sensory receptors, causing pain and irritation from foodstuffs [4], with subsequent avoidance of many items. Normal changes in the tongue, including fissures, decreased papillae, and taste receptors [4], may decrease the ability to appreciate the pressure and taste of the bolus in the oral cavity.

Poor masticatory function and dysphagia in the elderly often lead to increased use of texture-modified diets in long-term care facilities. Recent studies [10] show that 39–45% of elderly residents in nursing homes receive texture-modified diets, with 13–18% (mean) of patients receiving pureed or blenderized food. Patients with dysphagia secondary to neurologic impairments may have more difficulty with pureed foods, since these foods lack sufficient taste, texture, temperature, and pressure requirements to elicit an adequate swallow/protective reflex [11]. A pureed diet also tends to lack visual appeal, causing further nonacceptance among those geriatric patients who frequently are anorexic. The appropriateness of pureed diets for individuals in nursing homes has also recently been questioned. Cluskey [10] found that pureed food is ordered most often for behavioral feeding problems such as a patient's reluctance to eat, confusion, and lack of cooperativeness during mealtime. Other considerations for use of pureed diets are the patient's ability to self-feed and for the patient who requires assistance from the nursing staff at mealtime. The question of the nutritional adequacy of pureed diets in health care facilities should also be a matter of concern for health care providers [10].

Constipation

Age-related changes in the lower gastrointestinal tract may result in constipation, which is the most common digestive disorder seen in elderly populations [4]. Decreased intestinal motility, weakened abdominal and pelvic muscles, and decreased sen-

Table 2. Factors contributing to constipation in the aged [4]

Poor dentition causing selection of soft, nonfibrous foods
Inadequate food intake
Low fluid intake
Immobility
Decreased intestinal muscle tone
Failure to act on urge to defecate
Laxative abuse
Medications
Acute and chronic disease: cardiovascular accident, Parkinson's disease, diverticulosis, Crohn's disease, strictures, cancer
Long-term irregular bowel habits

sory perception [4] are involved in the causes of prolonged retention of hard, dry stools. Chronic constipation, which may be a factor in geriatric anorexia, may also be caused by a variety of factors associated with aging that are summarized in Table 2. Diets for elderly individuals who are constipated should include a variety of high-fiber foods that stimulate peristalsis, such as raw fruits and vegetables and whole grain breads and cereals. Fluid intake should also be increased concurrently with a high fiber diet (equivalent of six to eight glasses of fluid per day). For patients on soft textured diets, bran can be added to hot cereal, soup, mashed potatoes, and soft casseroles. Prune juice can be an invaluable food item from an institution's kitchen for the treatment of constipation and serves as a thicker liquid for those dysphagic patients who are unable to manage thin liquids.

Anorexia and weight loss

Loss of body weight is the end result of anorexia, the loss of appetite that reduces food intake [12]. Chronic anorexia and weight loss are complex nutritional problems that are reaching epidemic proportions in the elderly. As many as 40% of institutionalized and hospitalized elderly persons are below the 15th percentile of their weight for height [13]. A recent survey of Florida nursing homes showed that up to 58% of residents had some degree of malnutrition [14]. Chronic weight loss and malnutrition may have serious consequences for this population, such as increased incidence of infections, depressed immune responses, and the development of decubitus ulcers for those who are bedridden [13]. Treatable causes of weight loss need to be identified early to avoid these consequences.

Decreased caloric intake in old age is mainly due to a decline in physical activity with subse-

quent reduction in basal energy metabolism. The variety of social, psychological, and physical factors previously discussed also have strong implications in affecting the quantity of food ingested by elderly persons.

Causes of anorexia and weight loss in the elderly may also be associated with chronic disease states and systemic illnesses such as cardiac, renal, hepatic, and pulmonary disease, autoimmune disease, cancer, and infectious processes [13], since the presence of disease usually has an adverse effect on appetite and total intake [12]. Weight loss may also be present in conjunction with dysphagia secondary to chronic neurologic disease, high-dosage digitalis therapy, or as a consequence of drug-induced maldigestion and malabsorption [7].

Chronic weight loss of unknown cause presents the greatest challenge to the health care provider attempting to restore optimal nutritional status. It remains undetermined whether anorexia in the aged, and its ultimate effect of loss of body weight, is actually a normal part of the aging process or a reflection of the catabolic effect of disease and the often complex interrelated factors such as sensory losses, social isolation, multiple drug regimens, motor disabilities, and economic hardship. Morley and Silver [14] suggest that anorexia in the elderly may be the result of pathophysiological changes in neurotransmitter activity that regulate feeding drive and food intake as well as elevated levels of satiety-producing hormones, such as cholecystokinin. The presence of food in the gut initiates the secretion of cholecystokinin from the intestinal mucosa, which stimulates the gallbladder to contract and release bile into the duodenum, to aid in digestion and inhibit gastric motility [15, 16].

One segment of the elderly population found to be at particular risk for anorexia and weight loss are the demented. Sandman et al. [17] noted energy and/or protein malnutrition in 50% of institutionalized patients examined with Alzheimer's disease and multi-infarct dementia, despite a mean dietary intake of 2059 calories.

Factors contributing to weight loss in this population remain obscure but could be the consequence of the neuropsychiatric manifestations of the disease, such as memory loss (forgetting to eat), indifference (not interested in eating), disorientation and restlessness, apraxia, and impaired judgment [14, 17]. Lack of time needed to feed demented patients in an institutionalized setting may also affect their nutritional intake [14]. Metabolic disturbances, such as low fasting blood sugar levels and hyperinsulinism, as well as potential neu-

rotransmitter abnormalities [14] may also play a role in the anorexia and weight loss seen in patients with Alzheimer's disease.

For those patients unable to consume adequate calories to correct nutrient deficiencies, enteral feeding can be a valuable and often essential component of the nutritional care plan in the long-term setting. The registered dietitian should be consulted for formula selection based on individual needs, amount of formula required to ensure nutritional adequacy, the speed of delivery, and fluid requirements to prevent dehydration. Initially, tube feedings should be diluted to 1/2 to 3/4 strength to avoid the gastrointestinal intolerance that is often related to the osmolality of the formula. Feeding volume should initially be small and increased slowly to appropriate levels. If intolerance becomes a problem, diluted feedings should be temporarily resumed. To avoid aspiration, the feeding should not be delivered unless the patient is positioned with the head and thorax elevated to a 45 degree angle and left in that position for at least 30 min after feeding [4].

The lack of age-related standards for assessing the nutritional status of patients over the age of 55 makes this task challenging for the clinician. Traditional measurements used to detect malnutrition, including anthropometric data and biochemical indices, have been established based on data obtained from young or middle-aged adults. Their application in a geriatric setting can be both misleading and inappropriate [8]. Norms particular to the aged, taking into consideration the specific physiological effects of aging, need to be developed.

The use of a patient's usual body weight, if known, height/weight tables, and evaluating the significance of weight change in the institutional setting are useful for nutritional assessment of the elderly. Normal adult values for laboratory data which often are specific to the institution can be used for biochemical assessment. These data should be interpreted relative to the patient's medical status such as the type of disease process and ingestion of specific nutrients and/or medications. For instance, a slight elevation in certain laboratory values in an elderly patient, such as blood urea nitrogen and blood glucose levels, may be suggestive of normal age-related decreased kidney and pancreatic function, respectively [4], as opposed to an episode of acute renal failure or the onset of diabetes mellitus.

Dietitians in long-term care facilities are directly responsible for assessing nutritional status, formulating patient care plans, and implementing fea-

sible nutritional goals for all residents. Implementing nutritional goals in the long-term care facility requires a close relationship between dietary staff and nursing personnel. Methods to identify patients who are not eating, such as meal rounds, communication via team meetings, review of monthly weights, food intake records, and review of clinical records [18], must be established. Observation of residents at meal time is an invaluable way of obtaining first-hand information on any problems in chewing, swallowing, self-feeding ability, or overall food intake. Nursing staff usually assist patients with tray preparation and feeding, when necessary, and are usually responsible for documenting food and fluid intake.

Dietitians should conduct continuous inservice education on procedures for documenting accurate calorie counts. Nursing staff should be aware of standard measurements of food/fluid containers specific to the portion sizes served from an institution's dietary service for patient menus. For instance, most hospital portions of ice cream and gelatin are 120 ml, soup 180 ml, and coffee 200 ml; however, these measurements may vary from one institution to another based on the type of containers used for meal service and specific preportioned food items purchased for the menu. A small chart with these measurements, attached to calorie count and/or input and output sheets, may facilitate greater accuracy in documenting nutrient intake. Once that is known, staff should be aware of the importance of recording all food and fluid taken by the patient by mouth, including solid and liquid meal tray items, calorie-containing condiments, such as sugar, jelly, and margarine, between meal nourishments, fluid given with medication, and food items brought in by patients' visitors. Many of these items are frequently omitted from food intake records. Communication with the dietitian on a day-to-day basis to share pertinent information and identify patients requiring more aggressive nutritional support is essential.

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