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**MALNUTRITION IN THE ELDERLY  
IN LONG-TERM CARE FACILITIES**

by

**Cindy L. Pitcher**

**Thesis submitted in partial fulfillment  
of the requirements for the degree**

of

**DEPARTMENTAL HONORS**

in

**Didactic Program in Dietetics  
Nutrition and Food Sciences**

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In 2000, there were 17,000 nursing homes in the United States housing about 1.5 million residents over the age of 65 (1). Approximately 75% of long-term residents are women. The average length of stay for residents is 2.5 years, so in essence the nursing home becomes their home (2). Those who are in these long-term care facilities are generally characterized as frail elderly adults who suffer from a host of chronic and acute diseases and conditions. They are most likely cognitively impaired and have a great number of limitations in their activities of daily living (ADL). In addition, data collected by the Centers for Medicare and Medicaid Services (CMS) in 1999-2000 indicated that 28% of nursing facility residents required assistance with eating and 19.2% were totally dependent on eating assistance (3).

These characteristics make the nutritional care very important in this population. Unfortunately, the exact nutrient requirements for the elderly are not clearly understood (3). What is known, however, is that there is a general decrease in total energy intake due to changes in body composition, a decrease in the basal metabolic rate, and a decrease in physical activity level. On the other hand, meeting the nutritional needs of the elderly can be a challenge because although energy requirements decrease, most requirements for protein, vitamins, and minerals remain the same or increase (4).

Due to the unique nutritional needs of the elderly, malnutrition is becoming a major concern especially due to the widespread malnutrition that is occurring among the elderly residing in long-term care facilities. This malnutrition is often labeled as one of the largest silent epidemics in the country and is rumored to be the skeleton in nursing homes closets (1).

Malnutrition is defined as having a body weight that is 65%-80% of ideal body

weight, serum albumin of 2.4-3.0 g/dL, serum transferrin 150-200 mg/dL, total lymphocyte count of 800-1500 per mm<sup>3</sup>, and a delayed hypersensitivity index of 1 (5). Those considered to be at risk for malnutrition include those who have lost  $\geq 10\%$  of their usual body weight during a three month period, have had no oral intake for more than 10 days, have increased metabolic needs due to extensive burns, infection, trauma, protracted fever, hyperthyroidism, or those taking drugs with anti-nutrient or catabolic properties (5).

Malnutrition in long-term care facilities is usually associated with the female gender, a longer length of time living in a care facility, and impaired ADL. Residents with dementia, pressure sores, stroke, swallowing difficulties, constipation, and those who eat less than half of the offered food portions are more likely to have an impaired nutritional status (6).

The problem of malnutrition in the elderly is compounded by the fact that the population over the age of 65 is projected to increase to 20% of the total population by the year 2030, up 7.7% from 2003. The majority of the growth will be in those 85 years and older (3,4). Due to this increase of elderly living longer than 85 years of age, the incidence of malnutrition is only going to continue to increase (1).

### **The Problem**

As reviewed in various institutional settings, the proportion of residents experiencing symptoms of malnutrition ranges from 15% to 85%, with the proportion of residents at risk for malnutrition ranging from 40% to 60% (3,6,7). These high rates make malnutrition one of the most serious problems in long-term care. For these malnourished patients, protein and energy requirements are often not even being met, which can lead to protein-energy undernutrition (PEU), a very serious and difficult-to-treat condition (1,8).

Due to these striking percentages of malnourished residents in long-term care facilities, a shocking comparison has been made showing similar incidences of PEU in American nursing homes and poverty-stricken developing countries (1). However, poorly nourished elderly do not all enter facilities malnourished; generally 60% of elderly hospital patients' nutritional status deteriorates during their stay (7).

Researchers from the University of Adelaide in Australia spent two weeks studying 48 hospital patients and 50 nurses in two medical wards and found some surprising statistics that may help identify why declining nutrition status is occurring during the institutionalized stay (7). They found that 58% of patients age 65 and older had problems eating. They determined that only 15% of the residents over the age of 65 ate all of their meals and that 31% ate less than 1/3 of their meals. This lack of consumption could be related to the fact that 55% of the residents had problems opening their food and about one third (36%) of them found it difficult to use cutlery or add seasoning (32%). Improper sitting positions could have also contributed to inadequate intakes since 23% of the residents reported that they were too far away from their food and 18% said that their eating position was uncomfortable or they had problems pouring drinks. Nurses did their best at describing the food and encouraging patients to eat it, but practical support such as helping with cutlery and moving them into a more comfortable position was only given to a small percent (6%) of the patients (7).

Patients also complained about interruptions during their meals. One in five patients (19%) had a doctor's visit during mealtime and more than half (51%) had their mealtimes interrupted by other staff, mostly nurses (92%). During these interruptions three patients were asked about their bowels, and four male patients had urine bottles placed on

the table beside their meals. Decreased food temperature and loss of appetite caused by these interruptions could have affected the patients' desire to eat (7).

The consequences of poor nutritional status in the elderly, including low body mass index (BMI), unintentional weight loss, and malnutrition are risk factors for mortality and have a negative impact on the functional status and psychosocial well-being in the elderly (6). Malnutrition is related to the functional status of the elderly because it is associated with falls, sarcopenia (age-related loss of skeletal muscle), impaired muscle function and strength, hip fractures, impaired immune function, increased sepsis, impaired wound healing, increased risk of pressure ulcers, anemia, hypotension, increased fatigue, and impaired cognition (3,4,6,9). Malnutrition also impacts the psychosocial function of the elderly due to the low quality of life that they experience when their functional status declines (3).

Dehydration is another nutritional issue commonly seen in long-term care facilities because it is the most common fluid and electrolyte disorder observed in the frail elderly (1). Dehydration is associated with swallowing impairment and feeding dependency (2). The elderly are also at an age-related risk of dehydration due to many reasons including; the kidney's decreased ability to concentrate urine, a decreased ability to detect thirst, relative renal resistance to vasopressin, decreased rennin activity and aldosterone secretion, changes in their functional status, delirium and dementia, and adverse effects from their medications. The elderly may also fear incontinence, or have increased arthritic pain, both of which may interfere with consumption of adequate fluid intake due to the elderly trying to avoid numerous trips to the toilet (2).

## **Physical Problems**

There are many contributing factors related to malnutrition. Some of the most common physical problems affecting nutritional status include poor appetite, pressure ulcers, sensory loss, poor oral health, difficulty swallowing, cognitive losses, and medications.

The decrease or loss of appetite that is generally seen in the elderly is one of the major causes of undernutrition in long-term care. It is often called “anorexia of aging,” which is a physiological decrease in food intake that counterbalances the decline in physical activity and resting metabolic rate that is usually seen in older adults. As the appetite decreases, the total intakes of energy, protein, vitamins, and minerals are reduced, which drains the body of its needed nutrients (3). Generally between the ages of 20 to 80, the mean energy intake declines by 1,000 to 1,200 kcals in men and about 600-800 kcals in women. Micronutrients (especially calcium, zinc, iron, and B vitamins) are particularly susceptible to deficiencies with this decline in energy intake (2). Recent studies have shown that residents who eat all or nearly all of the offered food portions or consume snacks between meals, experience a much better nutritional status than those who do not partake in these practices (6). Even skipping just a few meals per week will eventually result in unintended weight loss and malnutrition. The only way to reduce the rate of malnutrition and dehydration in this population is to ensure that food and fluid consumption are optimized during each meal or snack (3).

Other factors can affect the intake of nutrients in the elderly including poor sitting positions, impaired chewing ability, problematic eating behavior, and the absence of reasonable choices from the menu (9). The consumption of poor-quality diets can also

result in inadequate energy intake (2). One study found that typical accredited institutional menu cycles that were developed using public health guidelines such as the Food Guide Pyramid, did not provide the recommended levels of vitamins and minerals (specifically vitamin E, pantothenic acid, calcium, zinc, copper and manganese) even when meals were consumed entirely (10).

Serving large portions can also lead to a decrease in energy intake (6,9). Residents are often put off by these large portion sizes. It has been suggested that serving smaller portions more frequently during the day or providing nutritious drinks between meals are two possible solutions to this problem (7). If this is not a possibility and smaller portions are requested by residents, it is important to encourage full servings of the protein rich foods and adaptation of appetite made to the less nutrient-dense side dishes to help meet protein and energy requirements (11).

Residents with poor food intakes have an increased risk of developing pressure ulcers and their bodies also have a decreased ability to heal wounds (3). Pressure ulcers are a skin injury that can result from inadequate dissipation of pressure, fragile vessels and connective tissue, impaired healing, and malnutrition. Pressure ulcers have multiple causes, but nutritional status is a key contributing factor. Elderly who are malnourished are at an increased risk of developing a pressure ulcer because of their inadequate intake of kcals, protein, zinc, and vitamin C. Pressure ulcers are most common among the elderly who are confined to a bed or wheelchair or are unable to position themselves. In fact, 11.6% of adults 70 years and older experience pressure ulcers. If pressure ulcers develop, a high protein, high-energy diet plus vitamin C and zinc supplementation along with adequate fluid are needed to spare protein for wound healing and tissue epithelialization



(4). Pressure ulcers are serious in the elderly because they can increase the risk of death fourfold, and if the wound does not heal there is a sixfold increase of death (3).

Sensory losses of both olfactory ability and taste perception are common in the aging process and can be attributed to a decrease in food intake because of changes in taste and flavor sensations (2,3). These alterations in smell and taste are also likely to cause the elderly to exhibit less hunger and cause early satiety (2). Not only does aging effect the senses, but chronic disease and medications can effect the flavor of foods as well (3). To compact the problem, health care professionals put nutritional restrictions on these individuals with limited food enjoyment and compromised food intakes, creating a downward spiral of nutritional status that ends in malnutrition (3).

Poor oral health also contributes to inadequate intake of nutrients. Oral health problems include dry mouth, lack of teeth, extensive alveolar bone or residual ridge atrophy, mucosal lesions, and poorly fitting or worn out dentures. All of these problems can make chewing difficult and can limit food selection (1,3,6). In most nursing homes, at least 80% of residents have some tooth loss, 50% of residents who wear dentures need replacements or relining and about a third of residents have mucosal lesions, all of which affect their nutrient intake (1).

To be able to effectively and safely swallow is a basic human need. Those suffering from dysphagia, or difficulty swallowing, lack this basic ability making dysphagia another physical problem that often leads to malnutrition in the elderly (3,12). Dysphagia tends to cause malnutrition because it causes a decline in both oral intake and the enjoyment of eating (3). In fact, when residents have difficulty swallowing they suffer from malnutrition more often than those who do not (6). Dysphagia is characterized by drooling, coughing

during or after swallowing, facial or tongue weakness, difficulty managing secretions, pocketing food or beverages (of which the patient maybe unaware), absent gag reflex, poor head or posture control, chronic upper respiratory infections, and prolonged eating times (4).

Dysphagia occurs in more than 10% of residents in acute care facilities, 30% - 60% of residents in long-term care facilities, and more than 75% of those who have had a stroke affecting the brainstem (3). There are multiple causes of dysphagia; neurologic disorders such as stroke, head trauma, Parkinson's disease, Alzheimer's disease, and multiple sclerosis seem to be the biggest contributing factors. However, other factors such as carcinoma, complex infections, and diabetes are also associated with increased risk of developing age-related dysphagia (12).

Sixty to seventy percent of nursing home residents are cognitively impaired (1). These cognitive losses are often caused by dementia, which impairs residents' attention spans, reasoning, and judgment. These impairments often decrease residents' abilities to recognize feelings of hunger, thirst, and satiety. With dementia, appetite and food intake also can fluctuate with emotional state, agitation level, and confusion level (4). Most often feeding skills decline with cognitive and physical deterioration and nearly all residents in dementia units require feeding assistance (1). With advanced dementia, behavioral disturbance such as aversive eating behavior, restlessness and depression generally cause a patient to eat only small amounts of the offered meal, which may cause weight loss (6). All of these factors increase the occurrence of malnutrition in dementia patients.

Elderly patients also take multiple medications, called polypharmacy. In nursing homes, residents ingest an average of eight medications a day. Of the medications that

were used most frequently in this population, over 20 of them are known to cause adverse side effects such as anorexia, nausea, vomiting, food aversions, somnolence, and disinterest in food (3). Not only are these medications causing undesirable side effects, but they could possibly cause drug-nutrient interactions as well (4).

### **Psychological Concerns**

“Food is not only critical to one’s physiological well-being, but it also contributes to one’s social, cultural, and psychological quality of life (2).” The same concept applies to causes of malnutrition; some malnutrition is caused by physiological factors but some psychological problems can increase the risk of becoming malnourished as well.

Food is an essential part of quality of life. If an unacceptable or unpalatable diet is offered to residents, it can lead to poor food and fluid intake, resulting in weight loss and undernutrition creating a downward spiral of negative health effects (3). Besides seeing meals as a sense of security, meaning, and structure, older adults also relate food to its health importance or religious and cultural meanings (2,3). Potential loss of food choices when the elderly are institutionalized may lead to loss of autonomy and lower self-esteem (3). Elderly who are faced with disabilities may also face shame and psychological abuse due to their inability to feed themselves properly or even at all, particularly in nursing home facilities where others may observe them, which may decrease their desire to eat (3,9).

### **Other Explanations**

The question of whether the decrease in intake is related to the quality of the food served has been considered. However, studies show that residents generally voice satisfaction with the food service they receive, making researchers hypothesize that the

failure of so many residents to eat and drink sufficiently may be due to suboptimal aspects of nutritional care (8).

Researchers have found that the lack of individualized care, inadequate staffing, and the lack of mealtime supervision by professional staff are all associated with poor nutrient intakes (1). Eating habits are highly individualized but most nursing homes do not cater to individualized food choices. There is also a growing population of minority elders who are residing in care facilities and their ethnic preferences are often disregarded. In some cases where ethnic preferences are deeply embedded, residents may choose to eat nothing that is unfamiliar.

Nursing homes often have inadequate staffing, especially at meal times. There is also an extremely high turnover rate of nursing assistants (93.9% in 1997) and if professional staff are not available during mealtimes newly-hired CNAs who have received little nutritional training are left on their own (1).

### **Possible Solutions**

An interdisciplinary team involving physicians, nurses, speech pathologists, dietitians, dentists, and administrative home personal is needed to identify and minimize the multi-factorial causes of malnutrition in long-term care facilities (1). One of the purposes of the dietitian is to examine each patient on an individual basis and to make sure that each resident is meeting the two goals for nutritional care in long-term settings established by the American Dietetic Association (ADA), health maintenance and promotion of quality of life (3).

One way in which dietitians can help maintain health of the elderly is to make sure that health care facilities are monitoring food intakes. Nutrition in long-term care facilities

is not always considered as high of a priority as it should be. It has been suggested that food intake needs to be monitored as closely and accurately as urine output and drug intakes are monitored (7).

Some tools that dietitians have at their fingertips are medical nutrition therapy (MNT) protocols. When MNT protocols have been established in residential facilities, there has been an observation of improved nutritional status. These protocols have also been useful to identify unintended weight loss more quickly in at-risk populations (13).

The second goal of the ADA is the promotion of quality of life, of which food is an essential component (3). When the resident is very frail, the value of a therapeutic diet must be carefully weighed against the effect the diet is having on the resident's quality of life (2) "It is the position of the American Dietetic Association that the quality of life and nutritional status of older residents in long-term care facilities may be enhanced by liberalization of the diet prescription. The Association advocates the use of qualified dietetics professionals to assess and evaluate the need for medical nutrition therapy according to each person's individual medical condition, needs, desires, and rights (3)."

The balance between the benefits and risks of liberalizing the diet and the therapeutic diet needs to be determined by the family, the caregivers, and the health care team. Questions such as: Is the restricted diet necessary? Does the diet offer health benefits to justify its use? Is the resident benefiting from the restricted diet? need to be considered. For most frail elderly in long-term care facilities, the biggest challenge is getting enough nutrients into their bodies, not restricting eating due to optimal nutritional requirements. Sometimes nutrition must be pushed to the back seat when the priority is satisfying the frail resident's wants and cravings (3).

Ironically, it has been found that most long-term care residents with evidence of malnutrition were on restricted diets that might have been discouraging nutrient intake. Not only do restricted diets discourage nutrient intake, but they can also make meals less palatable by limiting familiar foods and eliminating or modifying seasonings. This can contribute to poor appetite, decreased food intakes, and eventually weight loss. How effective is a diet if it is not eaten? Restrictive diets, such as those low in cholesterol and fat, salt, and sugar, may take much of the enjoyment out of eating, therefore decreasing the quality of life (3).

The use of a more liberalized diet produces several benefits, including better intake, lower incidence of unintended weight loss, more consistent blood glucose, and, perhaps most importantly, a better quality of life for the resident (3).

A couple of other ways to help increase energy intake in nursing home residents is to serve energy-dense foods, promote snack intake, and to use nutritional supplements. Providing whole milk to all residents unless they prefer low-fat milk is an example of a way to help provide energy-dense foods (11). Regular menu items can also be enhanced with extra calories by adding margarine, mayonnaise, sour cream or whipped cream. Extra protein can be added to meals by adding cream, milk, cheese, peanut butter, yogurt, cream cheese, or powdered milk to menu items (14).

Promoting nutritious snacks rich in energy and protein can also have a positive effect in patients' intakes (8). Those who consume snacks between meals have shown higher nutritional status than those who do not consume snacks (6).

Nutritional supplements are also commonly used to help improve intake. They are sometimes labeled the "fast food of the nursing home industry." They are often used in

nursing homes when patients consume less than “X” amount of their meal. Nutritional supplements need to be used with caution, however, because these types of supplements can actually decrease appetites, thus reducing the amount of solid food consumed. They can also lead to constipation because they often lack fiber (1). Therefore, supplements should be taken only as prescribed, in conjunction with a fortified diet and nourishing snacks (11).

Research has shown that another way to help long-term care residents consume more food is to give them a flavor-enhanced diet (15). Enhancing the meal simply includes sprinkling ready-to-use flavor enhancers such as chicken, beef bouillon or turkey flavor over cooked meals. Using items such as lemon juice, herbs, and spices when cooking can also enhance the flavor of foods. This easy enhancement is an effective way to improve daily feelings of hunger, increase dietary intake and body weight in the nursing home population (15). Enhancing meals can also help improve the palatability of meals, increase salivary flow, and lessen the need for table salt (3).

Mealtimes in nursing homes are often the main social event and highlight of the day. Special care should be taken to enhance the dining experience, which can be done by creating a home-like surrounding during meals. Small round tables, colorful tablecloths, the elimination of trays, seating residents in chairs instead of wheelchairs, soft music, and allowing the choice of table-mates can all help create a warm and friendly environment during mealtimes (1). “Neighborhoods” or units are also being created in a variety of facilities. Neighborhoods house roughly 25 residents and are each equipped with steam tables, refrigerators, and freezers to help promote a social environment that caters to individual preferences (1).

This home-like atmosphere that provides residents the opportunity to eat with others may increase social interactions, as well as food consumption. It has been observed in nursing homes that when women eat with men they increase their overall food intake by 13% and both male and female residents consume 23% more food when friends or family dine with them (2). Encouraging family and friends to come and eat with the resident would be a positive way to help increase their food intake.

Changing the consistency of foods and liquids can help prevent the risk of aspiration and make swallowing easier for those with dysphagia. The National Dysphagia Diet Task Force has identified and created three standardized dietary levels for dysphagic patients to help guide health care professionals in selecting the diet that best fits the patients' diagnostic profile (12). The three dietary levels are Level 1: Dysphagia Pureed, Level 2: Dysphagia Mechanically Altered, and Level 3: Dysphagia Advanced. Level 1 consists of pureed, homogenous, and cohesive foods. They should be "pudding like" with no coarse textures or raw fruits or vegetables. Level 2 consists of foods that are moist, soft-textured, and easily formed into a bolus. Meats should also be ground to less than one-quarter of an inch. Level 3 consists of foods of regular texture except for foods that are hard, sticky, or crunchy. Foods should be moist and in bite-size pieces. Liquids can also be thickened using commercial thickeners to nectar-like, honey-like, and spoon-thick to help decrease the risk of aspiration (12). In 2005, 35.6% of nursing facility residents received mechanically altered diets, (including pureed and chopped), an increase from 13% in 1992 (3).

It is also essential to maintain the highest level of dysphagia diet tolerated by the patient and to prepare and serve altered-consistency foods in an attractive, appetizing



manner to help increase the patients' quality of life and desire to eat (3). During an audit of nutritional care in Leicestershire, UK approximately one-third of modified consistency meals were reported as being presented unattractively (11). Attractive presentations of altered food can be done by using three-dimensional molds, pastry bags to pipe attractive colors or shapes, sauces and gravies over meats and vegetables as a garnish or by purchasing pre-made molded foods (16). Quality of life is profoundly influenced by dysphagia because eating and drinking are social events that relate to friendships and communication. Not being able to function in these kinds of environments can lead to shame, isolation, and depression (12).

To assist people who have difficulty eating, there are also many specially designed adaptive tools that are available. Large easy-to-hold handles on utensils are available for those with limited dexterity to improve grip. There are also foam handles designed to slide onto normal utensils that serve the same purpose. Plates and bowls with rims or attachable food guards are available to help scoop the food onto the utensil. When it is crucial that residents maintain a proper head and neck position, such as in dysphagia, there are special cups with a nose area cut out of them so that bending of the neck or tilting of the head is not needed (17). All of these tools can help make the eating experience easier for residents in need.

Another way to help increase the nutritional status of the elderly is to have them be actively involved in their own nutritional care. It has been observed in acute care facilities that those who were actively involved in their own nutritional care plan demonstrated significantly higher intakes of energy and protein beginning from day one than those who received standardized nutritional nursing care, and therefore were released sooner (9).

A meta-analysis of 217 American nutritional intervention studies also confirmed the practice of active involvement in the treatment of patients. The analysis concluded that interventions to help solve nutritional problems should be based on national nutrition and healthy recommendations combined with the needs, perceptions, motivations, and desires of the target group (9). To enhance awareness and motivation, researchers determined these four key elements; (i) attention to motivators and reinforcers that have personal meaning; (ii) the use of personalized self-evaluation or self-assessment; (iii) active participation; and (iv) communication through various channels (9).

Also, when each individual resident has the ability to be involved in the decisions regarding their schedules, menus, dining locations and other diet-related choices, they generally find more enjoyment in their food and have an increased desire to eat. This positive impact can decrease the risk of weight loss, undernutrition, and other negative effects of poor nutrition and hydration (3).

Adequate staffing during mealtimes is also an important part of making sure residents do not become malnourished. Approximately 50% of residents cannot eat independently and the job of assisting them generally falls into the hands of the Certified Nursing Assistants (CNA) (1). Adequate staffing is therefore needed to give dependent residents sufficient time to eat. Studies indicate that a minimum of 20-30 minutes is needed to adequately assist a dependent resident with their meals. Many residents who require coaxing and encouragement to eat could easily increase the staff time required to feed them (1,3). Currently due to inadequate staffing during mealtimes, CNA's generally have only six to ten minutes with each resident that needs assistance. Due to this time constraint, residents are fed quickly and forcefully sometimes getting little or no food (1).

It has been suggested that a national minimum direct-care staffing ratio of one CNA for every two to three residents needing assistance with their meals be set (1). One element that could help increase the ratio of staff to residents during meal times would be to make sure that staff took their personal meal breaks at different times than the resident meals. This would allow them to be available to help assist the residents that need help with their meals (7).

However, just increasing the staffing ratio during meal times will not be sufficient if nurses attitudes and perceptions about the importance of nutrition do not change. Dietitians commonly spend an average of only 3.3 hours per week working in a nursing home (1). Therefore, nurses play a huge role in the nutritional care of the residents because they observe them on a daily basis. However, it has been reported that nurses do not think of nutrition as having any greater priority than other nursing activities (7). Staff attitude about the food served is important because it may determine whether the resident consumes the food provided (3). Consequently, changing nurses' attitudes and perceptions of mealtime care may be important

Continual education and in-service training of the staff on nutrition is also essential for resident well-being (1). Nurses should be able to assess the nutritional status and food intake of elderly residents and be able to respond to the needs of those with malnutrition and low energy intakes and make appropriate referrals (6).

## **Conclusion**

The skeleton needs to come out of the nursing home closet before malnutrition becomes any worse in this population. There are many possible explanations of why it is occurring, but there are also many possible solutions to this silent epidemic. However,

members of the health care team need to remember one very important aspect about nutrition. They need to keep in mind that food plays a part of many different aspects of the elderly life. It plays a role physically by giving them the nutrients they need to survive. It plays a role psychologically through its relationship to culture, ethnicity, religion, and the pleasurable experiences they enjoy because of it. Balances between both physical and psychological roles must be met in order to provide the utmost care for this well-deserving population.

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