

# **Opportunities to Improve Nutrition for Older Adults and Reduce Risk of Poor Health Outcomes**

Jane Tilly, DrPH

Administration for Community Living, Center for Policy and Evaluation

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## **Abstract**

As people age, they may experience malnutrition. Appetite and the body's ability to process food may decrease with age, while health conditions and use of medications that can affect nutrition status may increase. In addition, limited ability to shop for and prepare food can affect a person's access to it. Psychosocial factors like isolation and depression also can affect nutrition.

Malnutrition may lead to poor health in older adults. Fortunately, states, aging and health services providers, and health plans can access evidence about how to improve older adults' nutrition status. Interventions include provision of meals and meal enhancements. These interventions can improve the nutrition status of many older adults who are at risk of undernutrition in the community or in the hospital. Evidence shows that Older Americans Act nutrition programs also help older adults.

This issue brief offers examples for states and others to consider about how they might improve older adults' health and well-being through malnutrition interventions for: 1) community-living older adults, and 2) those experiencing hospitalization. Examples this issue brief describes could assist state and local officials from State Units on Aging, Medicaid programs, and health care organizations that serve older adults. Please note that this issue brief does not address nutrition in group residences like nursing homes and assisted living.

## **1. Introduction**

As people age, they may experience malnutrition. Appetite and the body's ability to process food may decrease with age, while health conditions and use of medications that can affect nutrition status may increase. In addition, limited ability to shop for and prepare food can affect a person's access to it. Psychosocial factors like isolation and depression can affect nutrition status.

Inadequate attention to malnutrition may lead to poor health in older adults. This issue brief defines malnutrition and describes the aging process' effects on nutrition status. Next, the issue brief summarizes the evidence and professional consensus around interventions that can be effective in helping malnourished older adults. The interventions include: provision of meals, meal enhancements, and those targeting hospital patients. Finally, the brief offers some examples for states to consider when they address malnutrition through meals and other nutrition-related assistance for community-living older adults.

## **2. Malnutrition among Older Adults**

The most common definition of malnutrition is: too little or too much energy, protein, and nutrients that can cause adverse effects on a person's body and its function, and clinical outcomes (Agarwal, et al., 2013). Malnutrition happens when a person has an imbalance between the nutrients they need and those that they receive and can result from overnutrition or undernutrition. Overnutrition comes from consuming too many calories or too much of any nutrient—protein, fat, carbohydrate, vitamin, mineral, or dietary supplement. Undernutrition results from not consuming enough calories, protein, or nutrients (Merck Manual, 2017). This condition can lead to weight loss and muscle wasting, and can result in vitamin and mineral deficiencies, among other consequences.

This issue brief focuses primarily on undernutrition because there is evidence and professional consensus about how to treat this condition. While older adults often experience overnutrition or obesity, this brief does not address the topic because: 1) evidence about how to treat these conditions is insufficient, and 2) little professional consensus exists about whether or how to treat these conditions among older adults.

### **2.1 Aging and Nutrition**

Older adults may experience nutrition risks or malnutrition as their bodies change with age. Physiological processes slow, appetites may decrease and physical problems can arise. In addition, older adults' chronic conditions and use of multiple medications may increase, which may affect nutrition status. Psychosocial risk factors for malnutrition include cognitive impairment, depression, isolation and difficulty accessing food. People can become malnourished whether they are underweight, overweight, or obese and experience the resulting adverse effects on their health, function and well-being.

Physiological and physical changes associated with aging include: lower energy requirements due to a slower metabolism and, sometimes malabsorption,<sup>1</sup> which causes less efficient use of many nutrients. Many older adults experience loss of appetite, changes in taste and smell, problems with eating (e.g.,

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<sup>1</sup> Malabsorption occurs when the small intestine does not properly absorb nutrients from food. A number of conditions can cause this.

chewing and swallowing), and oral health problems,<sup>2</sup> that can affect nutrition (NASEM/HMD, 2016). As adults age, they may be more quickly satisfied when they eat and have less ability to smell food, which also affects their appetite (Nieuwenhuizen et al., 2010). In addition, older adults tend to consume smaller portions of food as they age (Silver, 2009). Other physical factors, such as impaired mobility and vision can affect nutrition. For example, older adults often have difficulty opening, reading and using packages. Not all are mobile enough to shop for food (NASEM/HMD, 2016).

Another complication is that most older adults have at least one chronic condition or take medications that can cause problems. Medical factors include gastrointestinal disease, and a number of other diseases. Additional risk factors include certain medications, which can cause malabsorption of nutrients, gastrointestinal symptoms, and appetite loss (Soenen and Chapman, 2013).

Psychosocial factors can contribute to decreased food intake. These include: cognitive impairment (problems with thinking, learning, and remembering); dementia, which causes cognitive problems; and depression. People who have cognitive impairments or depression may not be able to organize a meal, remember to eat, or want to eat because of their conditions. For example, people with dementia are more likely to be malnourished than age-matched controls without the condition (44% vs 25%) and weight loss increases with severity of dementia. Progressive dementias can result in loss of ability to feed oneself and the presence of poor eating behavior, such as spitting food out. People with more advanced dementia have a high risk of difficulty swallowing and of aspirating food and liquids (Allen et al, 2013).

Additional psychosocial factors include living alone, social isolation, and poverty (Soenen and Chapman, 2013). Isolation can contribute to malnutrition because older adults who need help may not have anyone to assist them with their meals, medications, and health conditions. Poverty and low income means a person's financial ability to obtain food may be severely limited without assistance.

## **2.2 Malnutrition**

As a result of these physiological, physical, health, and psychosocial factors, studies document a 30% decrease in food intake in healthy, community dwelling adults between the ages of 20 and 80 (Soenen and Chapman, 2013). In addition, many studies document undernutrition among older adults in developed countries, including the U.S. One literature review stated that up to 15% of community-dwelling older adults and 23% to 62% of hospitalized older patients experience undernutrition (Soenen and Chapman, 2013). Two additional studies support the conclusion that nutrition inadequacy is a major problem among older adults (Kaiser et al, 2010; Agarwal et al, 2013). Those at greatest risk of undernutrition are older women, minorities, and people who are poor or live in rural areas. Being age 75+ is an independent risk factor for poor nutrition (Silver, 2009).

Overweight or obese older adults may also experience malnutrition when their diet is of poor quality (Porter Starr et al., 2016). This means that they take in enough calories but are missing important nutrients that affect their nutrition status. So, weight alone is not an indicator of nutrition status. National statistics show that 41% of women age 65-74 and 31% of those age 75 and over are obese. The percentages for men in the same age groups are 24% and 13% respectively. [Federal Interagency Forum on Aging Statistics, 2016].

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<sup>2</sup> For more information, please see Tilly J, *Oral Health's Relationship to Disease and Options for Expanding Services for Older Adults and Adults who Have Disabilities*, ACL, 2016 at: [https://acl.gov/Get\\_Help/BrainHealth/Index.aspx#oralhealth](https://acl.gov/Get_Help/BrainHealth/Index.aspx#oralhealth) .

Preventing or treating nutrition problems may improve older adults' health and well-being. A review and meta-analysis of observational data show that mental and physical quality of life is better for older adults who are well-nourished (Rasheed and Woods, 2013). For example, a study of Medicare home health beneficiaries found that 63% were malnourished or at risk of it. Controlling for basic demographics and comorbidities, undernutrition was associated with higher rates of hospitalization, emergency department use, home health aide use, mortality at 6 months, and with hospitalization and nursing home use at 1 year (Yang et al., 2011). Randomized-controlled trials show that nutrition interventions may improve physical and mental quality of life in older adults (Rasheed and Woods, 2013).

### **2.3 Impact of Malnutrition and Undernutrition on Older Adults' Health**

Those experiencing malnutrition of any type, including undernutrition, are at risk of many health consequences. Malnutrition can impair bodily systems, and function, which can result in even more harm (Agarwal et al, 2013). Undernutrition is related to many outcomes including: reduced cognition, loss of lean body and skeletal mass, sarcopenia (low muscle mass associated with aging), inflammatory stress, compromised immune function, susceptibility to infection, impaired physical function, depression, increased dependence, and reduced quality of life (Visvanathan, 2014; Silver, 2009). Undernutrition also results in increased falls, poor wound healing, delayed recovery from surgery, more hospital use, premature institutionalization, and increased mortality (Visvanathan, 2014; Tappenden et al., 2013). Despite these adverse outcomes, health care professionals diagnose and treat undernutrition inconsistently (Silver, 2009).

### **3. Interventions to Address Malnutrition and Undernutrition among Older Adults**

The basic approach to addressing malnutrition among community living older adults involves periodic screening, assessment of those at risk of malnutrition, and individually-tailored approaches to addressing the condition. Through regular screening, health care professionals can determine who is at risk for malnutrition. Those at risk need an assessment to determine the sources of their risks. Successful treatments for those in the community who experience undernutrition involve addressing the individual's unique set of risks documented during assessments. Addressing these risks may involve provision of meals, meal enhancements, and, for those who need them, nutrition supplements. Addressing psychosocial factors, such as depression and isolation may require opportunities for treatment and socialization. Social interventions may improve nutrition status (Luger et al., 2016). Inadequate access to enough nutritious food may result from low income and financial resources, mobility difficulties, "food deserts,"<sup>3</sup> or a person's limited understanding of what is nutritious food. These risk factors may require different interventions.

#### **3.1 Screening and Assessment**

Studies highlight the importance of general malnutrition screening among older adults as the first step in the nutrition care process. Those who may be experiencing undernutrition need monitoring of their weight and body composition as well (Agarwal et al, 2013; Visvanathan, 2014). Recommendations are that all community-dwelling older adults receive an annual malnutrition screening. Those receiving home and community-based services should receive a quarterly screening. Older hospital patients should have screening on admission and at least weekly during a long stay (Bauer et al., 2010).

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<sup>3</sup> This is an area where it is difficult to buy affordable or good-quality fresh food.

If a person has malnutrition or is considered at risk for it, whether underweight, overweight or obese, they need a nutrition assessment (Visvanathan, 2014). Since the potential causes for malnutrition are diverse, the assessment should address a wide array of factors: medical history, medicines, diet, oral health, swallowing ability, physical and cognitive function, gastrointestinal, psychiatric, and neurological conditions; body measurements and laboratory analysis; and social aspects of a person's life (Bauer et al., 2010). Interventions should be tailored to the individual's needs, based on the results of the assessment.

Understanding the causes of undernutrition is the key to implementing nutrition interventions tailored to the individual. For example, starvation may be reversed, if the cause is undernutrition. Dietary interventions are generally not sufficient to address sarcopenia, but adding weight training can be effective. Cachexia is a complex condition related to an underlying illness, such as cancer, which involves weight and muscle loss. Treatment of cachexia may involve dietary interventions, appetite stimulants, as well as drug and exercise interventions (Agarwal et al, 2013). If a person has psychosocial conditions, such as cognitive impairment or depression, professionals need to address them too.

### 3.2 Dietary Goals

Keeping in mind the results of screening and assessment, the major goal for older adults experiencing malnutrition, including over and undernutrition, is to achieve a nutrient dense diet that takes into account their unique medical, health, function, and psychosocial risks. Professionals can use scientific guidelines to help older adults achieve this kind of diet.

- 1) The Federal government updates its *Dietary Guidelines for Americans* (DGAs) every 5 years (USDHHS and USDA, 2015). The five general DGAs during 2015-2020 are:
  - Follow a healthy eating pattern across the lifespan.
  - Focus on variety, nutrient density, and amount.
  - Limit calories from added sugars and saturated fats, and reduce sodium intake.
  - Shift to healthier food and beverage choices.
  - Support healthy eating patterns for all.
- 2) The Health and Medicine Division of the National Academies of Science, Engineering, and Medicine (NASEM/HMD) in its report on nutrition for older adults (NASEM, 2016) provides the following recommendations for older adults' diets:
  - Make fruits and vegetables central to the diet.
  - Eat nuts and legumes and whole grains.
  - Eat fish.
  - Eat/drink low-fat dairy products.
  - Limit refined foods and sugar.
- 3) NASEM/HMD develops Dietary Reference Intakes (DRIs), which offer current science on the nutrition that healthy populations need. The Older Americans Act nutrition assistance programs<sup>4</sup> must follow the DRIs. The DRIs provide a basis for some other federal nutrition programs and for certain standards in hospitals.

If poor quality diet is the primary cause of undernutrition, improving diets may involve provision of healthy meals and meal enhancements for those who are likely to respond to these interventions.

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<sup>4</sup> Discussed later in this issue brief.

Addressing malnutrition complicated by overweight or obesity is more complex because the appropriate responses to these conditions are not clear in the literature.

### **3.3 Meals and their Enhancement**

Many steps can be taken to improve community-living older adults' nutrition intake. Steps include improving the eating environment, providing assistance with eating when needed, dietary advice, fortifying meals, and offering energy dense snacks between meals (Nieuwenhuizen et al., 2010). Between meal snacks may increase total energy intake as could older adults' participation in programs offering delivery of locally grown fruits and vegetables. The body of evidence is largest for providing healthy, home-delivered meals. Studies show that these meals can improve nutrition and other outcomes for older adults.

- A 2015 review of home-delivered meals studies from 1959-2015 found 13 quasi-experimental studies of various interventions, which included add-ons of snacks, more food choice, and nutrition education. These interventions improved participants' nutrition and functional status, hospital readmission rates, and quality of life. Three studies found that those receiving meals, when compared to waitlist control groups, had better outcomes for food intake and food insecurity.<sup>5</sup> A randomized-controlled trial found that increasing the nutrient density of home-delivered meals improved participants' food-energy uptake (Campbell et al., 2015).
- Six of eight studies of the impact of home-delivered meals found that they improved diet quality, increased nutrient intake, and reduced food insecurity and nutrition risk. Other outcomes included improved compliance with dietary guidelines, quality of life and social opportunities (Zhu and An, 2014).
- Researchers used a randomized-controlled trial to compare traditional home-delivered meals (one meal, 5 days a week) to a new intervention (3 meals a day, 7 days a week and 14 snacks delivered weekly with daily phone calls from an older volunteer). Participants in the new model gained significantly more weight at 3 and 6 months than those in the traditional model. Scores on a nutrition assessment improved significantly faster for participants in the new model. Malnourished participants in the new model did better at 6 months (Kretser et al., 2003).
- A Canadian study found a significant reduction in nutrition risk for those in high risk categories after participating in a home-delivered meal program (Silver, 2009.)
- Adding breakfast to home-delivered meal programs in 5 states increased total dietary intake for participants, compared to those receiving one meal a day (Silver, 2009).

## **4. Federal Nutrition Assistance Programs**

According to the evidence, certain federal nutrition assistance programs, which are available under the Older Americans Act (OAA), help older adults in meeting their nutrition needs. The OAA funds three programs. The Home-delivered and Congregate Nutrition Services Programs provided meals to about 2.4 million people, among other services, in Federal Fiscal Year 2014.

### **4.1 Older Americans Act Programs**

Title III of the Older Americans Act (OAA) funds nutrition services through three major programs. These programs' purposes are to reduce food insecurity, promote socialization, and promote health and well-being. Title III programs include the: 1) Home-delivered Nutrition Services program, 2) Congregate

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<sup>5</sup> Food insecurity is uncertain access to adequate food.

Nutrition Services Programs, and 3) Nutrition Services Incentive Program (NSIP). The first two programs must comply with *the Dietary Guidelines for Americans 2015-2020* (USDHHS and USDA, 2015) and meals must provide 1/3 of the recommended Dietary Reference Intakes, be appealing, and be adjusted to meet special dietary needs of participants (Older Americans Act Section 339; Lloyd and Wellman, 2015).

Nutrition service providers, whether providing home-delivered or congregate meals, must offer at least one meal per day, five or more days per week, except those in rural areas, which may offer fewer meals (OAA sections 331,336; Colello, 2014). Nutrition service providers must offer nutrition screening and education and, when appropriate, nutrition assessment and counseling (OAA sections 331,336,339; Colello, 2011). A variety of sites provide meals as part of the Congregate Nutrition Services Program, including senior centers, community centers, schools and adult day centers. The NSIP supplements the OAA home-delivered and congregate nutrition services programs. States, territories and Indian Tribal Organizations may use NSIP funds to purchase food or receive commodities (OAA section 311; Colello, 2011). In Federal Fiscal Year 2014, 837,000 OAA Home-Delivered Nutrition Services Program participants received 138 million home-delivered meals, representing 34% of total OAA Nutrition Program participants and 63% of total OAA Nutrition Program meals served. Congregate settings delivered 80 million meals to 1.6 million program participants (DHHS/ACL, 2016).

People age 60 and over and their spouses of any age are eligible for OAA-funded nutrition programs. People must be homebound, frail, or isolated to receive home-delivered services. In addition, people under age 60 with disabilities can participate in nutrition programs, if they reside in a congregate setting where most residents are older, or if they live with an older adult. (OAA section 339; Lloyd and Wellman, 2015; Colello, 2011)

States must target the home-delivered and congregate nutrition services to people with the “greatest social and economic need.” Those at greatest economic need include minority, limited-English-speaking, and rural populations as well as those at risk of institutionalization (OAA sections 102,305,306). Program participants are not subject to a means-test, but are encouraged to make voluntary contributions to the cost of nutrition services. No one can be denied nutrition services due to failure to contribute.

#### **4.2 Impact of OAA Nutrition Programs**

Older Americans may participate in OAA Nutrition Services Programs regardless of income, or disability. However, the OAA requires targeting services to those in “greatest social and economic need,” as described above. The nutrition programs serve their intended populations. A disproportionately large percentage of program participants are likely to be poor, minorities, live alone, and have disability or poor health. Statistics documenting these conclusions come from the 2014 Older Americans Act State Program Report (SPR); 2015 National Survey of OAA Participants (NSOAAP);<sup>6</sup> and an independent researcher:

- 43.1% of home-delivered and congregate meals participants live alone, 32.4% live in poverty, 36.5% live in rural areas, and 28.6% are minorities (SPR).
- 67% of home delivered meals and 40% congregate meals participants take 5 or more medications (NSOAAP).
- 78% of home-delivered meals participants have difficulty with walking, preparing meals, or going outside the home (NSOAAP).

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<sup>6</sup> Data drawn from <http://www.agid.acl.gov/CustomTables/>



- Congregate nutrition service participants are twice as likely and home-delivered nutrition service participants are 10 times as likely as the population age 60 and over to have difficulties with 3 or more daily activities, such as eating, bathing, and dressing (Kowlessar et al., 2015).
- 37% of home-delivered meals and 19% of congregate meals participants had an overnight hospital stay in the last year (NSOAAP).

Consistent with the positive results from the research literature on home delivered meals and meal enhancements, OAA nutrition program participants experience benefits including more food security, self-reported ability to remain at home, and social interaction.

- An evaluation of mid-1990s Older Americans Act congregate and home-delivered nutrition services programs indicated that participants had higher intakes of a number of nutrients than controls (Ponza et al, 1996; Silver, 2009).
- The 2015 National Survey of OAA Participants documents that:
  - 30% of home-delivered meals and 18% of congregate meals participants said that their meals supplied more than half of their food.
  - 81% of home-delivered meals participants said that meals helped their health improve.
  - 92% of home-delivered meals and 61% of congregate meals participants said that meals helped them to stay in their own homes.
  - 86% of home-delivered meals participants said that meals helped them live independently.
  - 85% of congregate meals participants said that they see friends more often due to their meals.
- A Georgia study compared home-delivered nutrition program participants to those waitlisted for services and found that those on the waitlist had higher levels of food insecurity. (Lloyd and Wellman, 2015).
- Researchers found that a 1% increase in the proportion of a state's older adult population receiving home-delivered nutrition services was associated with a 0.2% decrease in the percentage of the state's low-care nursing home population (Thomas and Mor, 2013).

## **5. Malnutrition and Hospitalization**

Hospitalization poses special risks for older adults' nutrition. A large minority of patients in developed countries, including the U.S., are malnourished when entering the hospital and a majority of patients get worse during hospitalization. Much of the literature indicates that patients age 85 and over are at particular risk for malnutrition. Health professionals may fail to screen, assess, or diagnose patients with malnutrition. Fortunately, there are clear practice recommendations available related to hospitalized patients and evidence that certain interventions can help hospital patients cope with malnutrition.

### **5.1 Prevalence of Malnutrition among Hospital Patients**

At least 1/3 of patients of all ages in developed countries, including the U.S., are malnourished when admitted to the hospital, and, if untreated, about 2/3 will have their nutrition status decline during their hospitalization. One third of patients who are not malnourished upon admission become so during the hospitalization (Guenter et al., 2015; Tappenden et al., 2013). Studies of prevalence of malnutrition among hospitalized older adults show rates ranging from 12% to 70% (Mogensen and DiMaria-Ghalili, 2015).

In 2013, 3% of U.S. adult hospital inpatient stays involved documented malnutrition codes, most commonly protein/calorie undernutrition in 64% of patients. In 22% of patients with malnutrition

codes, the diagnosis was weight loss or failure to thrive. Patients tended to be older, especially age 85 and over (Weiss et al., 2016). When considering nonmaternal/neonatal adult stays the percentage of hospital stays involving documented malnutrition codes rises to 7%. African Americans, people with low incomes, and those living in rural areas had the highest hospitalization rates for malnutrition (Weiss et al., 2016). Patients with a malnutrition diagnosis were more likely to be admitted to the hospital on an emergency basis, experience infections, receive home care post-discharge, have at least one of more than 27 co-morbid conditions, or die (Corkins et al., 2010). Please note that malnutrition is often not diagnosed or is misdiagnosed (Guenter et al., 2015), so the rates reported above are likely lower than older adults' actual experience.

Malnutrition during hospitalization can occur because of reduced nutrition intake due to illness-induced poor appetite, gastrointestinal symptoms, reduced ability to chew or swallow, or medical requirements that the patient take nothing by mouth. Patients may have increased energy and protein needs during hospitalization due to inflammation, infection or other conditions (Guenter et al., 2015; Tappenden et al., 2013).

Two Southern US studies of adults age 65 and over support these conclusions. One found that high nutrition risk was associated with a 51% increase in all cause and non-surgical hospital inpatient admissions. Moderate nutrition risk was associated with mortality in the same population (Buys et al., 2014). A study of older emergency department patients who lived in the community without cognitive impairment found that 16% had undernutrition and only 23% of them had a diagnosis. Those subgroups at highest risk of undernutrition had difficulty buying groceries, symptoms of depression, or difficulty eating. Forty percent of those with depression had undernutrition compared to 5.3% of those without depression (Pereira et al., 2015).

Hospital patients can be anxious and frightened about food supply before entering a hospital, while there, and at discharge. Those with lower socioeconomic status and poorer health are more likely to experience food anxiety. Receipt of home-delivered meals after hospitalization reduces food anxiety (Vaudin and Sahyoun, 2015).

## **5.2 Interventions during Hospitalization and Care Transitions**

Several researchers and certain professional groups advocate identifying those hospital patients at risk of malnutrition and implementing interventions to address the problem.

- Guenter and colleagues (2015) state that the care system should identify the person who is at risk of malnutrition, who is actually malnourished, and introduce nutrition interventions as early as possible and during discharge planning. Hospital patients should have a screening upon admission and at least weekly thereafter. (Bauer et al., 2010)
- The Joint Commission<sup>7</sup> requires nutrition screening, when the patient needs it, within 24 hours of inpatient admission. The Commission recommends that patients receive assessments and nutrition interventions when needed. (Guenter et al., 2015)

The Alliance to Advance Patient Nutrition recommends improving hospital nutrition practices by encouraging identification of patients with or at risk of malnutrition, promoting early nutrition intervention and treatment, and including nutrition as a standard component of care (Tappenden et al.,

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<sup>7</sup> The Joint Commission is a non-profit organization that accredits and certifies nearly 21,000 health care organizations and programs in the United States.

2013). The Alliance offers detailed recommendations for implementing six principles for improving hospital patients' nutrition and thereby reducing risks for many adverse outcomes. The principles are:

1. Create an institutional culture that supports adequate nutrition.
2. Ensure clinicians include nutrition as one of their responsibilities.
3. Recognize and diagnose all patients at risk of malnutrition using valid screening and assessment tools.
4. Rapidly implement and monitor interventions.
5. Communicate nutrition plans.
6. Develop discharge nutrition care and education plans (Tappenden et al., 2013).

Nutrition interventions around hospitalization fall into 4 categories: nutrition delivery, nutrition education, nutrition counseling, and coordination of nutrition care. Specific nutrition interventions may include lifting diet restrictions, encouraging frequent nutrient dense meals, and use of oral nutrition supplements (ONS) to increase caloric or nutrition consumption (Mogensen and DiMaria-Ghalili, 2015).

Nutrition interventions significantly reduce complication rates, length of hospital stays, readmission rates, and sometimes death rates (Guenter et al., 2015). Many studies of nutrition interventions, primarily for older adults, have shown substantially reduced complication rates, length of hospital stay, and sometimes mortality (Tappenden et al., 2013). Studies have shown that high energy/high protein diets and ONS may result in positive outcomes for older adults during hospitalization and post-discharge, although some people may have difficulty with supplements due to gastrointestinal disturbances. Also, treatment for some vitamin and mineral deficiencies may be necessary (Agarwal et al, 2013). Specific study results follow.

- A hospital-based study found that screening for malnutrition and providing snacks to those identified as experiencing malnutrition reduced the length of stay in patients with low grip strength (Silver, 2009).
- In Texas, people who recently used the hospital or emergency department were enrolled in a study where a local agency delivered meals and medication management services in collaboration with local hospitals. Self-report data showed less health care use than would be expected compared to those with a similar profile from the National Health Interview Survey (Cho et al., 2015).
- A study of claims data found reduced hospitalization for Medicaid HCBS waiver participants who had meals as part of their services in Indiana. (Xu et al., 2010)
- In randomized-controlled trials, hospitalized older adults experienced decreased hospital readmissions, reduced mortality, and improved depression and quality of life scores when using ONS for 6 months. ONS appears to increase body weight in randomized-controlled trials. ONS also may also decrease hospital infections, incomplete wound healing, pressure sores or exacerbation of disease (Silver, 2009).
- Use of high protein supplementation led to reduced length of hospital stay and reduction in hospital readmission rates. In addition, use of supplements did not suppress food intake from other sources (Cawood et al., 2012).
- A retrospective study of adult inpatient hospital episodes compared use of ONS to the experiences of matched controls from 2000-2010. It showed than ONS led to significant reductions in length of stay, and readmissions. The results of this study are consistent with four randomized-controlled trials (Philipson et al., 2013).

Available evidence supports nutrition interventions in the hospital and after discharge for at-risk older adults. OAA nutrition programs are uniquely positioned to improve outcomes for this group through nutrition programs, including nutrition screening, assessments, education, and meals. In addition, the Aging Network can connect older adults to other services for which they might qualify, including medication management and home and community-based long-term services and supports.

## **6. Improving Nutrition among Older Adults**

Available evidence indicates that nutrition interventions in the community and hospital settings and nutrition services programs for older adults can help preserve health and well-being as well as prevent certain health services use. States, plans, and providers have utilized a number of these interventions and programs to address malnutrition among older adults. Some examples are:

- States, area agencies on aging, and other groups often augment OAA nutrition assistance program funds. For example, Ohio reported in 2016 that the OAA provided \$46 million in federal funding annually and that the state and its localities added an additional \$71 million of their own funding to these programs. (Ohio Department of Aging, 2016).
- Forty-six states have Medicaid HCBS waiver programs that included nutrition services (NASEM/HMD, 2015). For example, South Dakota's Department of Social Services provides nutrition supplements and meals under its Medicaid HCBS waiver (South Dakota Department of Social Services, 2015).
- Health plans, including those managing long-term services and supports, may screen older enrollees for nutrition risks and problems, assess people when risks are found and provide interventions tailored to individuals' needs. For example, some ACOs help people access food assistance (Fraze et al., 2016). In another example, Florida requires its Long-term Care Managed Care Program plans to cover home-delivered meals and nutritional assessment and risk reduction (Florida Agency for Health Care Administration, 2017).
- Hospitals, care transition, and other health care providers could conduct malnutrition screenings, assessments and interventions as their professional organizations recommend.<sup>8</sup>

As this list documents, there are a number of opportunities for improving nutrition for older adults, while helping them improve their health and well-being and potentially avoid use of certain health services.

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<sup>8</sup> As described in Section 5.2 of this issue brief.

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