Micronutrients and the Older Adult, Part 1: Micronutrients of Importance to Older Adults

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ABSTRACT

The aging population continues to increase worldwide, and many older adults now live longer and healthier lives. The process of aging is accompanied by a variety of physiological, economical, and psychological changes that can compromise nutritional status and increase the risk for poor nutrient intake among older adults. A decreased energy intake associated with advancing age has important implications in terms of nutrient intake among older adults, including protein and micronutrients. Suboptimal intake for several micronutrients is prevalent among older adults.

INTRODUCTION

Increasing life expectancy has led to a steady rise in the number of older persons globally. In 2012, the number of older Americans aged 65 years and older had reached 43.1 million.1 As many of these older Americans continue to remain healthy and active well into their eighties and even nineties, and have better medical management of chronic diseases and their comorbidities, the size of the older population is projected to double between 2000 and 2030.2 According to the US Bureau of the Census, the size of the population age 85 and over is projected to be 7 million by 2020.1 The baby-boomer generation will reach age 65 between 2010 and 2030, meaning that by 2030, one in five American citizens will be older adults,1 and two out of every three older Americans will have multiple chronic conditions.3 The number of older persons worldwide is expected to reach more than 1.2 billion by 2030, with 840 million living in developing countries. Given that there will be a steady increase in the number of older adults in the population, there will also be an increase in chronic health and nutrition-related problems, including malnutrition and micronutrient deficiencies typically seen in the aging population.

Decreased energy intake and the numerous changes occurring during the aging process are among the main reasons for an increase in nutritional deficiencies and chronic medical conditions. Marian and Sacks report that 87% of older adults have one or more medical conditions and metabolic risks (such as hypertension, diabetes, or dyslipidemia).2 The most frequently occurring conditions among the older people were uncontrolled diabetes (34%), diagnosed arthritis (50%), all types of heart disease (32%), any cancer (23%), and diabetes (19%).3 Nutrition plays a central role in the management of these and other chronic diseases, the prevention of disease, and the maintenance of a healthy life.

CHANGES IN NUTRITIONAL REQUIREMENTS ASSOCIATED WITH AGING

Numerous changes that are part of the normal aging process can affect nutritional status and utilization of essential nutrients. These include:

- Changes in body composition (such as an increase in the fat percentage and a decrease in muscle mass [sarcopenia]) pose...
Micronutrients
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significant risks, including a reduction in resting metabolic rate and reduced muscle strength.

• Changes in sensory abilities (such as a loss of smell and taste, decreased saliva production, and deterioration in the ability to identify food flavors) can lead to a decrease in appetite, which in turn can result in a poor intake of foods, weight loss, and increased morbidity.

• Changes in physiological functions (such as reduced kidney and liver function, lowered cardiac output, decreased gastric motility, and decreased vitamin absorption).

• Changes in immune function and decreased immunological functions can increase the risk of infections, malignancy, and autoimmune disorders. Aging also reduces the ability to combat inflammation and increases wound-healing time.

• Decreased functional capacity and mobility of some organs and systems (such as dentition changes, dysphagia, achlorhydria, gastric dismotility, metabolic disorders, drug-nutrient interactions resulting from prescribed medications, and a host of other factors that affect nutrition intake and health status).

• Cultural and psychosocial issues (such as the death of a spouse, living alone, depression, religious beliefs, and food insecurity) also impact the nutritional status of older adults, often resulting in chronic malnutrition and micronutrient deficiencies.

In particular, physical conditions commonly present among older people, whether part of the normal aging process or not, can affect nutritional intake and metabolic demand. All these changes play a key role in determining the nutritional needs of older adults.

MICRONUTRIENT REQUIREMENTS AND NUTRITIONAL STATUS

The aging process increases the nutritional vulnerability of older adults, even under affluent circumstances. Additionally, diet as well as genetic and environmental factors has a major effect on longevity. Chernoff points out that “there are uncertainties about actual nutrient requirements of older adults due to the difficulties associated with conducting studies on patients who have multiple comorbidities.”

Since energy requirements decrease with age, meeting recommended allowances for micronutrients becomes a challenge for many older adults. Inadequate nutritional intake is highly prevalent among the elderly, affecting nearly 44% of otherwise healthy community dwellers in developed countries. The declining energy intake associated with advancing age creates an increased need for several other nutrients, including vitamins (such as vitamins C, D, and the B vitamins) and certain minerals (calcium, magnesium, and zinc) to maintain organ systems whose functionality is declining (such as alterations in digestion, absorption, metabolism, and excretion). In the United States, total energy intake decreases substantially with age, by 1,000 to 1,200 calories daily for men and 600 to 800 calories daily for women. This decrease can result in a lowered intake of several nutrients, including calcium, iron, zinc, the B vitamins, and vitamin E. Older adults therefore face the challenge of selecting nutrient-dense foods without exceeding energy requirements.

Inadequate intake of these specific micronutrients among older adults, even in the most developed countries, is common and has been linked to the risk of chronic diseases. The social changes that accompany urbanization in many developing countries (such as increased consumption of high-energy and high-fat foods, reduced availability of fresh fruits and vegetables, increased food costs, and higher risks of food insecurity) also contribute to increased nutritional risks for the older population. More recent evidence about the dietary trends of older adults indicates increasing intakes of nutritionally sparse foods. More than 90% of older adults who are 51–70 years of age, and 80% of those above 71 years of age, had high intakes of empty-energy foods that exceeded the discretionary allowances. These dietary changes can escalate the rates of chronic diseases among older adults, such as diabetes, heart disease, and obesity.

The Food and Nutrition Board of the Institute of Medicine (IOM) compiles the Recommended Dietary Allowances (RDAs) (8-10). The RDA is the average daily dietary intake level sufficient to meet the nutritional needs of 97.5% of healthy people. Whenever compelling research indicates that a current RDA is not accurate, the IOM revises it. For example, the IOM lowered the calcium requirements for men ages 50 to 71 from 1,200 mg daily to 1,000 mg daily, based on studies that showed an increase in prostate cancer risk for men who exceeded this daily intake. The RDAs are just one measurement for determining daily vitamin and mineral allowances. The Dietary Reference Intakes (DRIs) include three different values:

• Adequate intake (AI) is the amount needed to prevent deficiency when a Reference Dietary Intake (RDI) cannot be established. (The RDI is a daily requirement set by the U.S. Food and Drug Administration [FDA] for use in nutrition labeling.)

• The Estimated Average Requirement (EAR) is the amount that would sustain health in 50% of people.

• The tolerable upper-intake level (UL) is the maximum daily amount that would not cause harm.

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VITAMINS
Vitamins are complex organic compounds—very different from fats, carbohydrates, and proteins. They occur naturally in a variety of foods and are essential for normal physiological functions in the body. Vitamins, also known as micronutrients, are required in small amounts (micrograms and milligrams), and are divided into two groups based on their solubility in fat solvents or water.

### Table 1: Vitamin and mineral DRIs, RDAs, and AIs for older adults.

<table>
<thead>
<tr>
<th></th>
<th>Males 51–70 Years</th>
<th>Males &gt;70 Years</th>
<th>Females 51–70 Years</th>
<th>Females &gt;70 Years</th>
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<tbody>
<tr>
<td><strong>Vitamins</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Vitamin A (μg/d)a</td>
<td>900</td>
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<tr>
<td>Vitamin D (μg/d)b,c</td>
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<td>20</td>
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<tr>
<td>Vitamin E (mg/d)</td>
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<td>15</td>
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<td>15</td>
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<tr>
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<tr>
<td>Thiamin (mg/d)</td>
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<tr>
<td><strong>Minerals</strong></td>
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<tr>
<td>Calcium (mg/d)</td>
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<td>Selenium (μg/d)</td>
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<td>Manganese (μg/d)</td>
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<tr>
<td>Fluoride (μg/d)</td>
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<td>30*</td>
<td>20*</td>
<td>20*</td>
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<tr>
<td>Molybdenum (μg/d)</td>
<td>45</td>
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</table>

Note: This table, taken from the DRI reports (http://www.nap.edu), presents RDAs in bold type and AIs in ordinary type followed by an asterisk (*). The RDA is calculated from the EAR value. If sufficient scientific evidence is not available to establish an EAR, an AI is usually developed.

1. As retinol activity equivalents (RAEs). 1 RAE=1 μg retinol, 12 μg β-carotene, 24 μg α-carotene, or 24 μg β-cryptoxanthin. The RAE for dietary provitamin A carotenoids is two-fold greater than retinol equivalents (RE), whereas the RAE for preformed vitamin A is the same as RE.
2. As α-tocopherol. α-tocopherol includes RRR-α-tocopherol, the only form of α-tocopherol that occurs naturally in foods, and the 2R-stereoisomeric forms of α-tocopherol (RRR-, RSR-, RRS-, and RSS-α-tocopherol) that occur in fortified foods and supplements. It does not include the 2S-stereoisomeric forms of α tocopherol (SRR-, SRS-, SRS-, and SSS-α-tocopherol), also found in fortified foods and supplements.
3. As niacin activity equivalents (NE). 1 mg of niacin=60 mg of tryptophan; 0–6 months=preformed niacin (not NE).
4. As dietary folate equivalents (DFE). 1 DFE=1 μg food folate=0.6 μg of folic acid from fortified foods or as a supplement consumed with food=0.5 μg of a supplement taken on an empty stomach.
5. Although AIs have been set for choline, there are few data to assess whether a dietary supply of choline is needed at all stages of the life cycle, and it may be that choline requirement can be met by endogenous synthesis at some of these stages.
6. Because 10–30% of older adults may malabsorb food-bound B12, it is advisable for those older than 50 years to meet their RDA mainly by consuming foods fortified with B12 or a supplement containing B12.
7. In view of evidence linking folate intake with neural-tube defects in the fetus, it is recommended that all women capable of becoming pregnant consume 400 μg daily from supplements or fortified foods, in addition to intake of food folate from a varied diet.
Water-soluble vitamins consist of the eight B vitamins and vitamin C. The fat-soluble vitamins (vitamins A, D, E, and K) are stored in the liver and adipose (fat) tissue when not used, and pose a risk for toxicity when consumed in excess amounts. Additionally, fat-malabsorption disorders have an adverse effect on fat-soluble vitamins.

Vitamin A
Vitamin A includes a group of compounds known as retinoids. The three preformed retinoid compounds that have metabolic activity are retinal, retinol, and retinoic acid. Vitamin A is essential for vision, maintaining healthy cells, bone health, and regulation of the immune systems for older adults. In addition, vitamin A may play a role in prevention of cancer and chronic diseases. Although vitamin A deficiency is rare in the United States, it is the most significant cause of blindness in developing countries. Night blindness and dry skin may also indicate a vitamin A deficiency. Older adults diagnosed with liver disease and alcoholism are at risk for this deficiency, because their damaged livers may be incapable of storing vitamin A. Additionally, older adults who suffer from chronic diarrhea and/or fat-malabsorption syndromes may develop a vitamin A deficiency over time. Vitamin A toxicity occurs infrequently but is a concern among older adults who consume large doses of vitamin supplements. Symptoms of toxicity include fatigue, vomiting, loss of appetite, blurred or double vision, and jaundice caused by liver damage.

Older adults need smaller amounts of vitamin A than do younger adults because of compromised hepatic function, which may contribute to an increased risk of toxicity. Consumption of high levels of vitamin A can increase the risk of toxicity, resulting in changes in the skin and mucous membranes, as well as fractures in the older population. Sebastian et al. measured nutrient intake adequacy of vitamin/mineral supplement users, non-users, and infrequent users among 4,384 adults aged 51 years and older residing in households in the United States. They report that the UL for vitamin A was exceeded by older women taking vitamin supplements—9% of women aged 51 to 70 years, and 5% of women aged 71 years and older. They comment that this finding is of concern because long-term daily vitamin A intake of 3,000 μg or more has been associated with hip fractures in postmenopausal women.

Vitamin A is found as retinol in animal foods, and as carotenoids, beta-carotenes, lycopene, zeaxanthine, and lutein in plant foods. Some of the best sources of vitamin A are liver, orange and deep-yellow vegetables, and dark-green leafy vegetables. The IOM encourages consumption of all carotenoid-rich fruits and vegetables for their health-promoting benefits.

Vitamin D
Vitamin D is commonly referred to as the sunshine vitamin because the body can synthesize it from adequate exposure to sunlight. Of the 10 vitamin D compounds (vitamins D1 through D10), those most important to human nutrition are D3 (ergocalciferol) and D2 (cholecalciferol). The active form of vitamin D is like a hormone because it is made in one part of the body and regulates activities in other parts. Vitamin D plays a critical role in the body’s use of calcium and phosphorus. It is essential for bone health and helps prevent osteoporosis and fractures in older adults. Vitamin D also regulates blood calcium levels.

Inadequate intake of vitamin D increases the risk for several medical conditions, including osteoporosis, hypertension, heart disease, certain types of cancers, musculoskeletal pain, and alterations in glucose and lipid metabolism. Vitamin D deficiency is increasing worldwide and is particularly high among homebound and institutionalized older adults, as they are more likely to stay indoors and be inadequately exposed to sunlight. Even in developing countries with abundant sunlight, older people have less exposure to sunlight than do younger adults. Furthermore, advancing age decreases the ability for skin exposed to UV light to form provitamin D3. Vitamin D toxicity, which occurs from excessive consumption of supplements, results in hypercalcemia, loss of bone mass, nausea, vomiting, and loss of appetite.

The primary sources of vitamin D are milk and other dairy products fortified with vitamin D. It is also found naturally in oily fish (such as salmon, sardines, and herring), cod liver oil, and other fish oils. Egg yolks, butter, and liver also provide vitamin D; the amount varies because it depends on the vitamin D content of the foods consumed by the source animal. Plants are a poor source of vitamin D, and strict vegetarians and vegans need to obtain this nutrient via supplements. Recently, newer sources of vitamin D shown to be bioavailable and safe are UVB-irradiated yeast and mushrooms and may be good options for vegetarians. Sunshine is the most dependable source, depending on geographic location.

Vitamin E
Vitamin E is an antioxidant, and its activity is enhanced by other nutrients also involved in antioxidant pathways, such as vitamin C and selenium. Alpha-tocopherol is the only form of vitamin E that meets the daily intake requirement. It is involved in the synthesis of blood coagulation factors. Vitamin E may be required for bone metabolism to facilitate carboxylation of proteins and to reduce urinary calcium excretion. As an antioxidant, vitamin E may reduce the risk of some degenerative diseases, such as cancer and heart diseases. Besides functioning as an antioxidant, vitamin E is involved in immune function in vitro studies of cells, and other metabolic processes. Fat-malabsorption disorders resulting in vitamin E deficiency usually cause neurological problems in...
older adults. Large doses of vitamin E interfere with blood clotting.

The decline in physical function that occurs with aging was determined by Bartali et al. in Italy, with 698 independently-living persons age 65 and older. They concluded that a low serum level of vitamin E is associated with a decline in physical activity.

Vegetable oils and products made from vegetable oil (margarine and salad dressings) are the best sources of vitamin E. Fruits and vegetables, grains, nuts (almonds and hazelnuts), seeds (sunflower), and fortified cereals are good sources. Animal products are medium to poor sources of vitamin E, as the content depends on the fat composition of the source animal. Cooking, processing, and storage can reduce the vitamin E content of foods.

**Vitamin K**

Vitamin K plays a crucial role as a cofactor involved in the synthesis of blood coagulation factors for bone metabolism. It also facilitates carboxylation of proteins, such as osteocalcin, involved in bone formation, and reduces urinary calcium excretion. Some vitamin K is produced by colonic bacteria and is absorbed in the colon.

Vitamin K deficiency is characterized by hemorrhage manifested by an increase in clotting time. Older adults taking antibiotics for long periods of time may become deficient in vitamin K, because the antibiotics sometimes kill intestinal bacteria. Although no UL has been established for vitamin K, excess amounts can cause the breakdown of red blood cells and initiate liver damage. People taking blood-thinning drugs or anticoagulants need to moderate their intake of foods containing vitamin K, because excess vitamin K can alter clotting times.

Vitamin K is mainly obtained from two sources: food (mostly plant food) and bacteria present in the colon. Phylloquinone is the primary form of dietary vitamin K, from sources such as fruits and dark green leafy vegetables. Vegetable oils (soybean, cottonseed, canola, and olive) are good sources of vitamin K; however, exposure to light and length of storage affect an oil’s vitamin K level. Animal products contain small amounts of vitamin K. Eggs yolks, butter, and various cheeses contain small amounts of melaquinones, another form of vitamin K. Vitamin K₇ is found in fermented dairy and soy products, fish, meat, liver, and eggs. Vitamin K requirements for older adults are similar to that of other adults.

**B Vitamins**

All B vitamins are water-soluble. The more significant B vitamins are thiamin, riboflavin, niacin, B₁₂, folate, and B₉. The other B vitamins (such as pantothenic acid and biotin) are available in a wide variety of foods, and their dietary deficiencies are not an issue among older Americans. B vitamins act as coenzymes or as parts of coenzymes in several metabolic pathways in cells. All B vitamins function in energy-producing metabolic reactions, and some play a role in other aspects of cellular metabolism. The milling and processing of cereal grains removes most of the B vitamins, along with the germ, bran, and husk. However, the United States and several other countries mandate vitamin-B enrichment of cereals and other grain products to restore some of the lost vitamins and minerals.

**Thiamin**

Thiamin, also known as vitamin B₁, plays an important role in many energy reactions. It is the vitamin portion of the coenzyme thiamin pyrophosphate (TPP). TPP participates in a vital reaction known as decarboxylation, which removes a carboxyl group and releases it as carbon dioxide. During glucose metabolism, for example, decarboxylation removes one carbon from the three-carbon substance pyruvate to form the two-carbon molecule acetyl CoA. TPP is also involved in a decarboxylation step in the citric acid cycle, and it also plays a role in nerve function.

Thiamin deficiency is usually related to heavy alcohol consumption and often seen along with limited food consumption. Thiamin deficiency due to inadequate energy intake or consumption of nutrient-poor foods. Beriberi, a thiamin deficiency disease, occurs among people whose major source of energy is polished rice. Polishing removes the rice hulls and therefore the thiamin. Inadequate intake of thiamin also affects the cardiovascular, muscular, nervous, and gastrointestinal systems, which depend on thiamin to fuel their activities. The brain and nervous system rely on glucose for energy, and thiamin as part of TPP is vital in glucose metabolism. Because thiamin and several other B vitamins are present in the same foods, thiamin deficiency and other B vitamin deficiencies occur together. Wernicke-Korsakoff Syndrome, often a result of chronic alcohol abuse or malnutrition, also results in thiamin deficiency. Thiamin toxicity has not been reported. Excess intakes are excreted rapidly by the kidneys.

Thiamin is found in many foods. Pork is a very rich source, and legumes and some nuts and seeds are good sources. In the United States, most of our dietary thiamin is obtained from enriched or whole-grain products such as rice, bread, pasta, and ready-to-eat cereals.

**Riboflavin**

Riboflavin, also known as vitamin B₂, is part of two coenzymes: flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD). These coenzymes participate in several metabolic pathways, including the citric acid cycle and the beta-oxidation pathway that breaks down fatty acids. Both of these enzymes are crucial for energy metabolism. Riboflavin-containing coenzymes also participate in reactions that involve the removal of ammonia during the deamination of some amino acids. Riboflavin deficiencies are virtually unknown. Alcoholism along with a poor diet can be a risk factor for

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Niacin deficiency. Long-term use of barbiturate drugs and repeated exposure to these drugs accelerate niacin metabolism. Chronic conditions such as cancer, heart disease, and diabetes may worsen a niacin deficiency. Toxicity of riboflavin has not been reported.

Milk, milk products, breads, and ready-to-eat cereals provide most of our riboflavin. This vitamin (along with thiamin, niacin, folic acid, and iron) is added to enriched products. Organ meats are good sources of riboflavin, as are mushrooms, spinach, and tomato paste.

Niacin
Niacin, also known as vitamin B₃, is the name for two similarly functioning compounds: nicotinic acid and niacinamide (also known as nicotinamide). Like the other B vitamins, it is a coenzyme and participates in various metabolic pathways. The coenzymes of niacin, namely nicotinamide adenine dinucleotide (NAD) and nicotinamide adenine dinucleotide phosphate (NADP⁺), play vital roles in oxidation-reduction reactions. They also play a key role in glycolysis (extracting energy from carbohydrate and glucose), fatty-acid synthesis, and the deamination of amino acids. Niacin also is known to help lower blood cholesterol (LDL) levels and reduce blood pressure. Resistant to the effects of heat, light, air, acid, and alkali, niacin is one of the most stable B vitamins. Because the amino acid tryptophan is a niacin precursor, the body can produce niacin in the presence of adequate dietary tryptophan. Adequate riboflavin, vitamin B₆, and iron are also needed for this conversion.

The niacin deficiency disease pellagra, which can lead to death, is best described by its classic symptoms: dementia, diarrhea, and dermatitis. Pellagra was widely prevalent in those parts of the world where corn was a dietary staple. A protein in corn tightly binds niacin, thereby reducing its bioavailability. Nixtamalization is an ancient practice that helps to release the maize’s niacin and involves alkaline steeping, soaking, draining, and washing whole-kernel maize before grinding it. A modernized version of this method is now widely used in countries where corn is a staple food. Deficiencies of iron and vitamin B₆ may also contribute to pellagra. Consumption of large doses of niacin supplements can cause flushing, nausea, and blurred vision.

The best food sources of niacin are organ meats, beef, poultry, fish, sunflower seeds, and peanuts. Foods that contain tryptophan, including red meats, poultry, eggs, and dairy products, are also good sources of niacin. Fortified foods such as breads and ready-to-eat cereals are common sources of niacin.

Vitamin B₆
Vitamin B₆ is also known as pyridoxine. It is a group of six compounds with vitamin B₆ activity: pyridoxine (an alcohol), pyridoxal (an aldehyde), pyridoxamine (which contains an amino group), and their respective 5-phosphate esters. Pyridoxal 5-phosphate (PLP) and pyridoxamine 5-phosphate (PMP) are the active forms of vitamin B₆. Vitamin B₆ as a coenzyme is involved in more than 100 enzyme reactions and is most involved with protein metabolism. Both PLP and PMP are involved in amino-acid metabolism. PLP is also involved in the metabolism of one-carbon units, carbohydrates, and lipids. Vitamin B₆ also plays a role in cognitive development through the biosynthesis of neurotransmitters, and in the maintenance of normal homocysteine in the blood. It is also involved in immune functions and hemoglobin formation.

Although deficiency of vitamin B₆ is rare, inadequate vitamin B₆ status can occur along with low levels of vitamins B₁₂ and folic acid. Vitamin B₆ deficiency is associated with microcytic anemia, depression, confusion, and weakened immune function. Malabsorption syndromes, ulcerative colitis, and kidney diseases can result in vitamin B₆ deficiency. Alcoholism increases the risk for vitamin B₆ deficiency because alcohol decreases absorption of the vitamin and interferes with the synthesis of the coenzyme PLP.

In the United States, the primary source of B₁₂ is from fortified foods, such as cereals. Other foods rich in this vitamin are meats, bananas, carrots, and potatoes. Vitamin B₆ is not stable when heated, resulting in significant losses when foods are cooked.

Vitamin B₁₂
Vitamin B₁₂ exists in several forms and contains the mineral cobalt. Cobalamin is part of a group of cobalt-containing compounds. Methylcobalamin and 5-deoxyadenosylcobalamin are the forms of vitamin B₁₂ active in human metabolism. Vitamin B₁₂ is necessary for proper red blood cell formation, neurological function, and DNA synthesis. It also functions as a cofactor for methionine synthase. Symptoms of vitamin B₁₂ deficiency include fatigue, weakness, weight loss, constipation, and megaloblastic anemia. Atrophic gastritis, a condition affecting 10–30% of older adults, decreases secretion of hydrochloric acid in the stomach, resulting in decreased absorption of vitamin B₁₂. The decrease in hydrochloric acid levels can also lead to an increase in the growth of normal intestinal bacteria that use vitamin B₁₂, thus reducing the amount of vitamin B₁₂ available to the body. Older adults with atrophic gastritis, gastrointestinal disorders, or gastrointestinal surgery are unable to absorb the vitamin B₁₂ that is naturally present in food. Because dietary sources of vitamin B₁₂ are limited, strict vegetarians and vegans are at greater risk for vitamin B₁₂ deficiency than are lacto-ovo vegetarians and non-vegetarians.

Vitamin B₁₂ plays a key role in folate metabolism. Methionine synthase, which is an enzyme dependent on vitamin B₁₂ functions in the methyltransfer cycle. This cycle is necessary to maintain the supply of the methyl donor S-adenosylmethionine, and if interrupted it results in a reduction of a wide range of methylated compounds.
products. One such important methyl-
lation process is the reduction of myelin basic protein, as seen in per-
nicous anemia (PA). The relationship
between impairment of the methyla-
tion cycle and anemia is explained by
the “methyl trap” hypothesis. It
suggests that when the folate cofac-
tor 5-methyltetrahydrofolate (THF) is
formed, the enzyme 5,10-methyl-
yleneTHF reductase that forms the
cofactor cannot use it in the back
reaction in vivo. Thus the only way for
this folate cofactor to be recycled to
THF is through the methionine-syn-
thase enzyme, which is dependent
on vitamin B12.
When the activity of the enzyme is compromised, as it is
with PA, the cellular folate is trapped
as 5-methylTHF, which results in neu-
ropathy and/or anemia. Treatment with
vitamin B12 reactivates methionine
synthase, allowing the trapped
folate to be released and resumes
regeneration of erythrocytes. Vitamin
B12 enzymes also work with tet-
rathydrofollic acid (THFA) to convert
homocysteine to methionine, thus
reducing the homocysteine blood
evels and decreasing the risk of
heart disease.
Vitamin B12 deficiency affects about
30% of adults over 60 years of age.27
Deficiencies of vitamin B12 and folate have been associated with a
risk of vascular disease. Homocys-
tine blood levels are influenced by
dietary intake of vitamin B12, folate,
and vitamin B9. Low intakes of vi-
tamin B9 or folate can result in high
homocysteine levels. Other recent
studies have also demonstrated a
connection between low levels of B
vitamins and cognitive decline. Age-
related cognitive abilities ranging
from benign memory loss to progres-
sive dementia may be affected by
deficiencies of folate and vitamin B12,
resulting in elevated homocysteine
levels among the elderly population.
An interesting study conducted in
Scotland28 with healthy, community-
based older adults over 70 years of
age, concluded that concentra-
tions of folate and vitamin B12 were
positively associated with cognitive
ability after control for childhood IQ.
Von Arnim et al.29 determined the
effect of daily micronutrient supplement-
ment for a two-month period
on blood and tissue levels and on
general nutritional status among 58
patients, aged 61 to 81 years, living
independently in Germany. They
concluded that daily micronutrient
supplementation improved serum
micronutrient status, with improved
metabolic markers for B vitamins
but not for intracellular antioxidant
status. More recently, Qi et al.30 as-
essed the prevalence of vitamin B12
deficiency in the absence of anemia
and macrocytosis, before and after
fortification among nationally repre-
sentative Americans older than 50
years of age, using cross-sectional
data from the NHANES 1991–1994
(prefortification) and 2001–2006
(postfortification). Their results sug-
gest that the prevalence of low se-
rum vitamin B12 status in the absence
of anemia and macrocytosis among
older adults did not increase after
fortification.
Vitamin B9 is found naturally only in
foods from animal sources, such as
meats, liver, and milk. Fortified foods
such as cereals are good sources of
vitamin B12.
Folate
Folate (also known as folic acid or fo-
lacin) is a generic term for naturally
occurring food folate and folic acid;
the latter is the fully oxidized mono-
glutamate form found in dietary
supplements and fortified foods.30
Folate functions as a coenzyme
and plays a role in the metabolism
of amino acids and the synthesis of
nucleic acids. One of the most im-
portant folate-dependent reactions
is the conversion of homocysteine
to methionine in the synthesis of
S-adenosyl-methionine. Another im-
portant folate-dependent reaction is
the methylation of deoxyuridylate
to thymidylate in the formation of DNA,
which is required for proper cell divi-
sion. An impairment of this reaction
can result in megaloblastic anemia,
a hallmark of folate deficiency.21,31
Isolated folate deficiency is uncom-
mmon, and it usually coexists with oth-
er nutritional deficiencies. Alcoholism,
poor diet, and malabsorption disor-
ders can result in folate deficiency.
Older adults with alcohol depen-
dency along with a poor diet that does
not provide adequate amounts of
folate can become folate deficient.
Alcohol interferes with folate absorp-
tion and metabolism and acceler-
ates its breakdown. Several medical
conditions, such as malabsorption dis-
orders, inflammatory bowel disease,
atrophic gastritis, and gastric surgery
can also reduce folate absorption.
Folate along with vitamin B12 is known
to lower homocysteine levels, thereby
reducing the risk for cardiovascular
disease and stroke.
In 1998 the U.S. Food and Drug Ad-
ministration mandated that all grain
products be fortified with folic acid
to reduce neural-tube defects in
infants.32 This fortification has led to
improvements in the folate status of
all age groups, including the older
population. In fact, older adults ex-
hibited the highest red blood cell
(RBC) folate levels in the most-recent
NHANES survey.16
Enriched grains and cereals, a va-
riety of vegetables (including leafy
greens), lentils, enriched orange
juice, and liver are sources of dietary
folate. Folate is highly sensitive to
heat, ultraviolet light, and exposure to
oxygen. Approximately 50 to
90% of folate present in foods is de-
stroyed during cooking, processing,
and other preparation methods. Fo-
late-rich foods such as fruits and vege-
tables should be consumed raw, or
cooked quickly in minimal amounts
of water via steaming, stir-frying, or
microwaving to reduce cooking loss-
es. Vitamin C functions in changing
folate to its active form.
Vitamin C
Vitamin C is also known as ascorbic
acid. Humans are unable to synthe-
size vitamin C, so it must be obtained
from dietary sources. An antioxidant
that minimizes free-radical damage
in cells and boosts immune, vita-
min C is required for the synthesis of
collagen, the neurotransmitter nor-
epinephrine, and the mitochondrial
lipid-transporter carnitine. Vitamin C
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also functions in oxidative-reduction reactions.

Collagen is an essential component of connective tissue, which plays an important role in wound healing. As an antioxidant, vitamin C has been shown to regenerate other antioxidants within the body, including alpha-tocopherol (vitamin E). Additionaly, vitamin C is important for immune function and improves the absorption of dietary iron. High levels of vitamin C are stored in cells and tissues, with the highest present in leukocytes (white blood cells), the eyes, the adrenal glands, the pituitary gland, and the brain. Low levels are found in extracellular fluids such as saliva, plasma, and red blood cells. The intestinal absorption of vitamin C is regulated by at least one dose-dependent active transporter. Oxidized vitamin C (dehydroascorbic acid) enters cells via some facilitated glucose transporters and is then reduced internally to ascorbic acid.

Scurvy is the most well-known manifestation of vitamin C deficiency. Symptoms include fatigue (possibly due to impaired carnitine biosynthesis), inflammation of the gums, and malaise. As deficiency progresses, connective tissue becomes weakened and collagen synthesis becomes impaired, resulting in joint pain, hyperkeratosi, poor wound healing, swollen and bleeding gums, loss of teeth, and capillary fragility. Iron-deficiency anemia can occur from reduced absorption resulting from low vitamin C intake. Smoking increases vitamin C requirements by 30%–50%. People who consume a limited variety of foods are at risk for vitamin C deficiency. So are alcohol and drug abusers, because they may not obtain adequate amounts of vitamin C. The third National Health and Nutrition Examination Survey (NHANES III; 1988–1994) found that 19% of older Americans ages 65 to 74 years old had vitamin C deficiency. Tan and Flood indicate that increased intakes of vitamin C may reduce the risk of developing age-related cataracts.

Although vitamin C toxicity is uncommon even when large doses are consumed, taking more than 2,000 milligrams per day for prolonged periods of time can cause nausea, abdominal cramps, and diarrhea. In older adults with kidney disease, excess vitamin C may contribute to oxalate-containing kidney stones. High vitamin C intakes can be a problem for people with hemochromatosis, a metabolic disease that causes excess iron accumulation.

Fruits and vegetables are the best sources of vitamin C. Citrus fruits and their juices, peppers, broccoli, tomatoes and tomato products, kiwi fruit, strawberries, and Brussels sprouts are very good sources of vitamin C. Vitamin C is the most sensitive vitamin and is easily destroyed by exposure to air (oxidation), alkali, and over-cooking. Since some older adults have difficulty chewing raw fruits and vegetables, their diets need to be planned well to ensure adequacy for vitamin C and suitable food choices.

MINERALS

Minerals are essential inorganic elements, unchanged by digestion or when the body uses them during biochemical processes. They also make up important structures in the body, such as bones, and are found in cells, tissues, and hormones. Like vitamins, minerals play a role in facilitating normal body functions, including energy production, metabolism, and cell repair. Minerals work in synergy with vitamins. The minerals required in larger amounts are classified as major minerals, and those needed in very small quantities are classified as trace minerals.

Calcium is essential for the formation of fibrin, the fibrous protein that makes up the blood-clotting structure. Serum calcium is tightly regulated and does not fluctuate with changes in dietary intakes. The body uses bone tissue as a reservoir to maintain constant concentrations of calcium in the blood, muscle, and intercellular fluids. Bone undergoes continuous remodeling, with constant resorption and deposition of calcium into new bone. There is a constant change in this balance depending on age. In older adults, especially among menopausal women, bone breakdown exceeds formation, resulting in bone loss and increasing the risk for osteoporosis.

Efficiency of calcium absorption decreases as calcium intake increases, and also as age increases, dropping to 15–20% in adulthood with continued decline during the aging process. Vitamin D improves calcium absorption. Phytic acid and oxalic acid, found in some plant foods, bind to calcium and inhibit its absorption. A high intake of protein and sodium increases calcium excretion. Alcohol intake reduces absorption of calcium. Several factors associated with aging contribute to altered calcium balance. A decrease in vitamin D absorption coupled with a decreased production of cholecalciferol in the skin, impaired formation of 1,25-dihydroxyvitamin D by the kidney, and a reduction of vitamin D receptors in the intestinal epithelium cause a decline in calcium absorption.

Inadequate intake of calcium is not evident in the short term, as circulating blood levels of calcium are tightly regulated. Hypocalcemia usually occurs from renal failure, surgical removal of the stomach, and use of certain medications such as diuretics. Symptoms of hypocalcemia include muscle cramps, convulsions, abnormal heart rhythms, and numbness. Over a longer period of time, an inadequate intake of calcium causes osteopenia, which, if not treated, can lead to osteoporosis. Older adults with calcium deficiency
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are faced with the risk of fractures. Postmenopausal women face more bone loss due to decreased estrogen production, increased bone resorption, and decreased calcium absorption. Lactose intolerant older adults are at risk of calcium inadequacy if they do not eat dairy products. Vegetarians might absorb less calcium because they consume more plant-based foods containing oxalic and phytic acids. Hypercalcemia (high levels of calcium in the blood) can cause renal insufficiency, vascular and soft-tissue calcification, hypercalcuria, and kidney stones.

The aging process leads to a decline in renal function, resulting in calcium malabsorption and accelerated bone loss. Hence the requirements for calcium and vitamin D increase with aging. A review of 16 observational studies assessing hip fracture and calcium intake found that an increase in usual calcium intake of 1 gram per day was associated with a 24% reduction in the risk of hip fracture among postmenopausal women. Although calcium carbonate is well absorbed and tolerated by most people, Lanham-New recommends the use of calcium citrate for elderly patients with absorption problems, such as achlorhydria or inflammatory bowel disease.

Dairy products provide more than half of the calcium in the typical American diet. Tofu processed with calcium salt, canned fish with bones, and calcium-fortified foods are additional foods rich in calcium. Green leafy vegetables such as spinach have a high calcium content, but most of the calcium is bound to oxalate and therefore cannot be absorbed. Several brands of orange juice, cereal, bread, and yogurt are fortified with calcium.

Magnesium
Magnesium is the fourth-most-abundant cation in the body. About 50-60% is found in the bones, and the remainder is equally distributed between muscle and other soft tissue. Magnesium is a cofactor in more than 300 enzyme systems that regulate diverse biochemical reactions in the body, including protein synthesis, muscle and nerve function, blood glucose control, and blood pressure regulation. It is essential for the functions of the cardiac, neuromuscular, and central nervous systems. Magnesium is required for energy production, oxidative phosphorylation, and glycolysis. It also contributes to the structural development of bone. Magnesium plays a role in the active transport of calcium and potassium ions across cell membranes, a process important for muscle contraction, nerve impulse conduction, and normal heart rhythm.

Magnesium deficiency due to low dietary intake is uncommon because the kidneys limit urinary excretion of magnesium. Hypomagnesemia occurs with a variety of diseases, including kidney disease, and is associated with chronic alcoholism and certain types of diuretics. Prolonged diarrhea and poor diet can also cause magnesium deficiency. Early signs of magnesium deficiency include loss of appetite, nausea, vomiting, fatigue, and weakness. As deficiency worsens, muscle contractions, seizures, abnormal heart rhythms, and coronary spasms can occur. Severe magnesium deficiency can result in hypocalcemia or hypokalemia, because mineral homeostasis is disrupted. Hypermagnesemia is uncommon in the absence of kidney disease. Too much magnesium from foods does not pose a risk in healthy adults, because the kidneys eliminate excess amounts in the urine.

Using elderly survivors from the original cohort of the Framingham Heart Study, Tucker et al. investigated the relationship between dietary magnesium intake and bone mineral density at five hip sites and one forearm site. Over the four-year study period, they determined that greater intakes of magnesium were associated with significantly smaller losses of bone mineral density at two hip sites in men. No significant differences between bone loss and dietary mineral intake were identified in women after four years. In a more recent study, Odabasi et al. identified a statistically significant difference between osteoporotic and healthy subjects in red blood cell magnesium concentration.

Magnesium is present in a variety of foods, namely legumes, whole grains, green leafy vegetables, fruits, nuts, seeds, fish, and dairy products. When whole grains are processed, the bran and germ are removed, which decreases the magnesium content.

Phosphorus
Phosphorus serves many roles in the biochemical reactions of cells, and has a crucial role in maintaining bone mineral density along with calcium. Deficiency of this mineral may serve as a marker of general nutritional inadequacy, similar to protein deficiency seen in the elderly, and could lead to an increased risk of fracture. It is important that the necessary ratio of phosphorus to calcium be maintained for the elderly.

A healthy diet that includes adequate servings of fruits and vegetables, whole grains, nuts, and other nutrient-dense foods can help to optimize the intake of phosphorus, magnesium, potassium, vitamin C, vitamin K, and other nutrients required for bone health.

Milk and milk products, meats, and eggs are very good sources of phosphorus, as are legumes and nuts. In general, foods rich in protein are also rich in phosphorus. Food additives, especially those used in processed meats and soft drinks, are high in phosphorus.

Iron
Iron has several vital functions in the body. It is necessary for growth, development, normal cellular functioning, and synthesis of some hormones and connective tissue. It is a component of the two heme proteins hemoglobin and myoglobin. Hemoglobin in red blood cells transports oxygen to the tissues, and myoglobin in muscle facilitates the movement of oxygen into muscle cells. Iron also

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serves as a cofactor in several enzyme reactions and in the synthesis of neurotransmitters. It is also essential for optimal immune function and as a transport medium for electrons within cells. Dietary iron has two forms: heme iron (from animal meat products) and non-heme (from plant foods). The bioavailability of heme iron is higher than that of nonheme iron, because it is not affected by inhibitory factors. The phytates, polyphenols, tannins, and fiber present in plant foods inhibit iron absorption, so the bioavailability of iron from plant foods is much lower than that from animal foods.

Iron deficiency is uncommon in the United States. Because iron deficiency is associated with poor diet, malabsorption disorders, and blood loss, older adults with iron deficiency usually have other nutrient deficiencies. Iron deficiency is more common among hospitalized, institutionalized, or chronically ill older adults. The main causes in people with cancer are chronic anemia and chemotherapy-induced anemia.

As discussed previously, two other types of anemia—caused by either a deficiency of folate or vitamin B12—are megaloblastic anemia and pernicious anemia. Megaloblastic anemia is a blood disorder marked by the appearance of very large blood cells, whereas anemia resulting from a lack of intrinsic factor (IF) is called pernicious anemia. The body’s inability to make IF may be the result of several factors, such as chronic gastritis, gastrectomy, or an autoimmune disease.

Data regarding the non-institutionalized, community-dwelling, older American population obtained in the NHANES III survey (1988–1994), reported by Guralnik et al., indicates that for adults ages 65 years and older, the prevalence of anemia was 11% in men and 10.2% among women. The richest sources of heme iron in the diet are red meats and seafood. Dietary sources of nonheme iron include legumes, nuts, beans, spinach, iron-enriched bread, cereals, and grains. Heme iron has higher bioavailability than nonheme iron does. Iron absorption from foods can be improved by including foods rich in vitamin C. Calcium might reduce the bioavailability of both nonheme and heme iron.

Zinc

Zinc is an essential trace element. It is required for the catalytic activity of approximately 100 enzymes. Zinc plays a role in immune function, protein synthesis, wound healing, DNA synthesis, and cell division. Zinc is required for proper sense of taste and smell.

Several factors including malabsorption, trauma, muscle wasting, physiologic stress, alcohol abuse, and medications contribute to poor zinc status among the elderly population. Adherence to a strict vegetarian or vegan diet also compromises zinc status, because the bioavailability of zinc from vegetarian diets is lower than with non-vegetarian diets. Beans and whole grains, which are commonly consumed by vegetarians, contain phytates that bind zinc and inhibit its absorption. Zinc deficiency can result in reduced immune function, dermatitis, impaired wound healing, and loss of taste acuity.

Results from NHANES II (1976–1980), reported by Briefel et al., identified women and men older than 70 years of age as having some of the lowest intakes of dietary zinc. Zinc is present in protein-rich foods such as red meat, seafood, oysters, and clams. The availability of zinc from plant sources such as legumes, rice, grains, and cereals is reduced because of the phytate content of these foods.

SUMMARY

Older adults are living longer and will continue to become a significantly larger segment of the population. Undernutrition and micronutrient deficiencies are reportedly common, particularly among hospitalized or institutionalized older adults. Adequate intake of several micronutrients is a challenge for older adults, including vitamins A, C, D, E and folate; and minerals such as calcium, magnesium, iron, and zinc. Appropriate nutritional intervention as part of total care can be vital for mitigating the burden of chronic disease and disability, thereby improving the quality of life for older adults.

ABOUT THE AUTHOR

Vijaya Jain, MSc, MS, RD, CDN, is currently a nutrition consultant in New York and an active board member of the New York State Women, Infants and Children (WIC) Association. As a registered dietitian since 1979, she has over 30 years of experience in planning, directing, and coordinating nutrition programs in diverse settings. At the University of Illinois, Ms. Jain served as the director of the Graduate Internship Program and as a senior nutrition specialist. She has led the efforts to enhance school lunch programs with soy-protein foods in India and Central America, in partnership with the World Initiative for Soy in Human Health, the primary goal of which is to create sustainable solutions to the problem of protein malnutrition around the world. Ms. Jain also coordinated research and education efforts in Central America for the introduction of soy and whey-based multi-micronutrient supplements, and for the development of microenterprise projects for families affected with HIV/AIDS. She was actively involved with Illinois Soy, which aims to improve the nutritional profile of the Illinois elementary and
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secondary school lunches and reduce obesity among school-aged children. As a clinical nutritionist at the New York Presbyterian Hospital of Columbia and Cornell Universities, Ms. Jain provided nutrition counseling to nutritionally vulnerable groups and individuals. At the Ossining Open Door Health Center in New York, she was Director of the WIC program.

She received her MSc degree from the University of Madras, her MS degree from the University of Illinois at Urbana-Champaign, and her BSc degree from the University of Bangalore. Ms. Jain is the recipient of Distinguished Service Awards from the New York State WIC Association (2000) and the New York State Metropolitan WIC Association (2005). She also is a certified cardiovascular nutritionist and has served as co-chair of the nutrition committee of the American Heart Association.

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Spotlight On Your Colleagues

Spotlighting Susan Saffel-Shrier, MS, RDN, CD, CSG

Susan Saffel-Shrier, MS, RDN, CD, CSG, has focused her career on nutrition and aging. Her article, “Residency Redesign to Accommodate Trends in Geriatrics: An RC-FM Variance to Establish a Patient-Centered Medical Home in an Assisted Living Facility,” was published in the February 2012 issue of Family Medicine.1 Susan is a member of the Healthy Aging DPG.

Tell us a little about your professional background and your career path.

I received both my master’s degree in nutrition and my graduate certification in gerontology from the University of Utah. I knew as an undergraduate that I wanted to work with older adults. After teaching several years in the Division of Nutrition at the University of Utah, I transferred to the Family Medicine Residency Program, Department of Family and Preventive Medicine, School of Medicine. My initial position was as an RDN/gerontologist with the geriatric team responsible for geriatric nutrition and gerontology clinical education. I am currently the director of geriatric education for family-medicine residency, and was recently promoted to full professor (clinical).

In addition to providing clinical training and managing the residency program, I have created multiple interprofessional teams to enhance the care of the older adult and encourage direct interactions between team members to include RDNs. The faculty portion of these teams consists of a geriatrician, physician assistant, pharmacist, and dietitian; and learners include family medicine residents, PA students, pharmacy students, nutrition students, and sometimes a medical student.

Describe your current job and its focus on the micronutrient needs of a geriatric population.

I have developed the residency’s geriatric education program to focus on experiences spanning the continuum of care. These clinical services include senior centers, home visits, an assisted-living facility, nursing homes, outpatient senior clinics, and hospice settings. I provide direct clinical education during home visits, as well as visits to the assisted-living facility and the outpatient senior clinics. I also provide didactics on geriatric nutrition.

I perform nutrition screening and assessment in all these settings. This includes evaluating the intake of micronutrients commonly deficient among older adults, including vitamins B12, B6, vitamin D, and calcium. Diet and supplements are reviewed for accuracy, which includes laboratory testing and treatment recommendations. Antioxidant intake is also evaluated based on fruit and vegetable intake, along with food group consumption.

When working with a geriatric population, what are the most common nutrition concerns you see, and how do you address them?

As one ages, numerous biological, social, and psychological changes can influence health and nutrition adequacy. In geriatrics, functional assessment is the cornerstone to evaluating health. Functional status refers to the ability to perform daily activities such as meal preparation, food shopping, transportation to grocery stores, cognition, continence, hydration, and feeding. Any deficits in these abilities can result in poor nutrition. Poor functionality in terms of daily-living activities is typically the first sign of a decline in health status, and is also an indicator of decreased life expectancy. Assessing function as a potential influence on nutrition can lead to identifying nutritional risk. As an example, a patient with mild to moderate dementia could have difficulties with all levels of meal preparation, including a limited ability to drive to and from grocery stores, select nutritious foods, and follow recipes.

From a biological perspective, we know that vitamin B12 deficiencies are common among older adults. This is due to an age-related change in gastrointestinal bioavailability of this vitamin. Therefore, a vitamin B12 laboratory test (methylmalonic acid) is ordered routinely. A vitamin B12 deficiency is related to cognition issues and anemia, which can have a significant, negative impact on functional status.

How do you view the research conducted in these areas?

Understanding the role of nutrition in maintaining function is important for maintaining older adults’ independence and reducing health care costs. This patient-centered aspect of health care needs further investigation. As we begin to focus on outcome-based care and reimbursement, dietetics practitioners need a better understanding of how nutrition can prevent and/or slow the progression of disease. We need more research in the area of longevity and nutrition. These longitudinal-type studies can direct future care options.

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You recently coauthored an article about the importance of interprofessional teams in assisted-living facilities. How do you feel dietetics practitioners can improve quality of care and health outcomes?

Team-based care has been a constant in geriatrics. In many settings the team is multidisciplinary. An interprofessional team takes this approach one step further by meeting face to face with the patient. We investigated how an interprofessional team utilizing a comprehensive geriatric assessment improves overall evaluation of functional status. One of these functions was nutritional status: sensory deficits, weight, dentition, protein, calorie, vitamin D status, and vitamin B12 status. We also found that when part of an interprofessional team included an RDN, the family-medicine residents and physician-assistant students improved in assessing nutritional status. Although there was an improvement in the learners’ skills, the results were not statistically significant. I believe that this in part reflects the providers’ familiarity and clinical skills in nutrition screening.

These results are not surprising to me, as nutrition is often inadequately addressed in medical training. In fact, recent medical schools’ curriculum evaluations have shown a decrease in nutrition education from the minimum 25 hours. Training physicians to conduct accurate, thorough nutritional assessments is particularly important, since physicians are typically the first point of patient contact.

Knowledge of nutritional screening is essential to ensure appropriate referrals. Interprofessional teams can also address appropriate nutrition screening and assessment when an RDN is a core team member and present at the point of care.

Any take-home messages for our readers?

I feel dietetics practitioners need to play an active role in interprofessional geriatric teams. Research has shown that health professionals frequently know very little about the scope of their colleagues’ expertise. It is important that we demonstrate our knowledge of nutrition and how to translate evidence-based nutrition into dietary recommendations. We need to emphasize food first and supplements (if needed) second.

The exciting news is that these opportunities are increasing as we move toward patient-centered medical homes, which emphasize outcome-based care. As dietetics practitioners, we also need to demonstrate our knowledge of micronutrient metabolism, appropriate laboratory testing, and dietary recommendations. We must be assertive in recommending lifestyle changes as a livable treatment option, one that can be complementary to other treatments.

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**OVERVIEW**

How we care for older adults in the United States is changing, and with this change are expanded opportunities for dietetics practitioners. This article defines caregivers as those people at least 18 years of age who provide care to someone 50 years of age or older. For many years, older Americans often received care in a nursing home or long-term care facility. However, economic changes and an evolving healthcare system increasingly focused on keeping older adults in the community are leading to many more family members taking on the role of caregiver. Today 61% of homebound older adults currently depend on family members for care. It is estimated that anywhere between 16% and 19% of American adults are currently providing care to an older adult. Furthermore, with population estimates continuing to predict an increase in the percent of the American population over age 50, the actual number of older adults requiring the assistance of caregivers is likely to increase, as well.

Studies show that caregivers have additional obligations beyond their caregiver roles. The American Association of Retired Persons and the National Alliance for Caregiving found that 74% of Americans who provide care for an older adult are also employed. Results of a 2011 Gallup survey estimate that more than one in six employed Americans are caregivers for an older adult. Despite the documented rise in unpaid, informal eldercare, little data details the characteristics of these caregivers, and even less information covers the nutrition care they provide. The article “Journeying as a Caregiver for an Elder Adult,” on page 24 of this edition, highlights some of the information known about this caregiving population, including caregiver nutrition, and provides details on a number of resources and information for caregivers. In contrast, this article presents the results of a recent survey conducted to gain more insight into who is providing care to older adults in America.

Studies have linked proper nutrition in the older adult population to a reduction of up to 56% in overall complications, such as infections, and a 50% decrease in avoidable hospital readmissions. Conversely, malnutrition has been shown to lead to poorer health outcomes, including slower wound healing rates, an increased risk for medical and surgical complications, delayed recovery, increased length of hospital stay, and increased mortality. Given that good nutrition plays such a major role in the health of our nation’s older adults, and with the majority of community-based care now being provided by family caregivers, it is essential that dietetics practitioners learn more about family caregivers and the care they are providing.

The survey results presented in this article provide information on how employed caregivers balance caregiving with their work lives, the types of government/community assistance programs the older adults they care for may be using, and how nutrition plays a role in caregiving. This article also identifies potential opportunities for dietetics practitioners of the older-adult population to reach out to these caregivers and those who work with them to help support optimal nutrition care.

**METHODS**

The 2014 Older Adult Caregiver Study was an online survey of 1,050 people ages 18 and older, focusing on their experiences with and expectations of providing care for older adults. The survey was designed by Families and Work Institute with support from the Abbott Nutrition Products Division of Abbott and administered by Qualtrics. The 15-minute survey was completed between June 6 and June 20, 2014. Each participant who completed the survey was provided an incentive of $1.00 for his or her participation.

Respondents had self-selected to participate in the survey from an existing panel maintained by e-Rewards Market Research. The survey panel was constructed using a “closed” or “by invitation only” online recruitment method, where prevalidated individuals or individuals who share known characteristics were invited to enroll into the survey panel. e-Rewards Market Research verified each panelist’s identity via 1) a valid and unique e-mail address for receiving surveys, 2) verifying physical addresses provided by e-Rewards panelists in the United States against government postal information, and 3) utilizing third-party ID validation to confirm profiles, thereby ensuring that members did not give incongruous answers during enrollment (for example, an 18-year-old physician). A random sample of 4,035 existing panel members was invited to participate in the survey, resulting in a final response rate of 26%. A typical response rate for this methodology is 10–12%, giving this survey a higher-than-average response. Quotas of 50% were set for gender (male/female) and employment status (employed/unemployed) to ensure sufficient samples of both groups for comparative analyses.

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1 Traditionally, older adults may be defined as those 65 years of age and older. However, with the increasing rates of chronic disease leading to more adults needing care at younger ages, the decision was made for the purpose of this research and article to include care provided to adults 50 years of age and older.
2 Families and Work Institute is a nonprofit center dedicated to providing research for living in today’s changing workplace, changing family, and changing community.
3 Qualtrics is a data-collection and analysis platform used by universities, companies, nonprofit groups, and government organizations to generate, distribute, and analyze surveys and survey data. More information is available at http://www.qualtrics.com/.
Of the 1,050 total respondents, 633 (approximately 60%) identified themselves as caregivers for someone age 50 or older in the past five years. The survey results from this self-identified caregiving group are the primary focus of this article. The survey questions examined participant involvement in care of older adults, caregivers’ views on nutrition, utilization of government assistance, the effect caregiving has on work performance, and how employed caregivers view employer support.

RESULTS

Demographics

A total of 1,050 individuals were surveyed, with 633 (approximately 60%) identifying themselves as caregivers for an adult age 50 or older in the past five years. Table 1 presents the demographics of all 1,050 respondents, and Table 2 shows the demographics of the narrowed group of 633 individuals who identified themselves as caregivers for an older adult. Tables 3 and 4 provide data related to the employment charac-

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Table 1: Demographic representation of total sample population.

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</tr>
<tr>
<td>Age</td>
<td>18–24</td>
<td>73</td>
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<tr>
<td></td>
<td>25–44</td>
<td>210</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>45–64</td>
<td>567</td>
<td>54</td>
</tr>
<tr>
<td></td>
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</tr>
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<td>Midwest</td>
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<td>Single</td>
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<tr>
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<td>$15,000–$24,999</td>
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<td>13</td>
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<tr>
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<td></td>
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</tbody>
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* Geographic region separation based on U.S. Census regions.
** Income separation based on U.S. Census income guidelines.

---

Table 2: Demographic representation of self-identified older adult caregivers in the survey.

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<thead>
<tr>
<th>Demographic</th>
<th>Classification</th>
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<th>%</th>
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<tbody>
<tr>
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<tr>
<td></td>
<td>Female</td>
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<tr>
<td>Age</td>
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<td>Geographic region*</td>
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<tr>
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<td>$50,000–$74,999</td>
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<td>71</td>
<td>11</td>
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<tr>
<td></td>
<td>&gt;$100,000</td>
<td>107</td>
<td>17</td>
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<td>512</td>
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<td>1</td>
</tr>
</tbody>
</table>

* Geographic region separation based on U.S. Census regions.
** Income separation based on U.S. Census income guidelines.

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3 Of these 633 caregivers of an older adult age 50 or older, 88% had cared for someone age 65 or older.
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Continued from page 16

teristics of all respondents and of the caregiver group, respectively.
Additionally, 44% percent of the total 1,050 respondents reported that they expect to provide care in the next five years (these respondents believe they will continue in their current caregiving roles or anticipate that they will be needed as a caregiver in the future), though this is likely a conservative estimate of actual future caregiving, as there is no way to truly predict upcoming care needs.

After dividing the participants into a caregiver group and a noncaregiver group, the self-identified caregiver group was composed of 53.7% females, 46% males, and 0.3% transgender individuals. The average age of the caregivers was 50 years, with the youngest caregiver being 18 years old and the oldest being 85 years old.

The caregiver group showed some notable differences in demographics. Specifically, the subgroup identified as “ongoing caregivers”—those who reported they were currently providing care and also planned to continue providing care over the next five years—contained the highest percentage of Hispanics (57% of the 1,050 respondents). This same subgroup also contained almost half of the total respondents whose reported household income exceeded $100,000 in 2013. These results contrast with those of the subgroup who provided care in the past five years and did not plan to continue that care in the next five years (the “past caregiver” group), who made up only 10% of those reporting their household making over $100,000 in 2013. The past caregiver subgroup also had a higher proportion of males (54%) versus the ongoing caregiver subgroup (44% male).

Those who were not part of the caregiver group—participants who did not provide care to an adult age 50 or older in the past five years—were divided into two groups: those who planned to provide care in the next five years (the “future caregiver” subgroup) and those who did not plan to provide care in the next five years (the “non-caregiver” subgroup). Both the noncaregiver and future caregiver groups were male dominant (both 58% male). The noncaregiver group made up over one-third of the total respondents who reported a household income of less than $25,000 in 2013. This noncaregiver group was also the least likely to have children under the age of 18 living at home (13% of total respondents).

Details of Care Provided

Surveyed caregivers were responsible for an average of 1.67 elders in the past five years. This care was most often for a parent (49%), grandparent (18%), neighbor or community member (13%), parent-in-law (12%), or spouse/partner (11%).

Our data also illustrated that care recipients were afflicted by a variety of chronic diseases. Figure 1 presents the most commonly identified nutrition-related chronic conditions. Seventy-nine percent of our surveyed caregivers reported providing some type of medical care for their care recipients, including blood sugar tests, assistance with medications, and/or making decisions regarding medical treatments.

Continued on page 18

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**Table 3: Employment data of total sample population.**

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Classification</th>
<th>N</th>
<th>%</th>
</tr>
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<tr>
<td><strong>Employment Status</strong></td>
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<td>40</td>
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<tr>
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<td>Part-time</td>
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<tr>
<td></td>
<td>Self-employed</td>
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<tr>
<td></td>
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</tr>
<tr>
<td></td>
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<td>Student</td>
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<td>Salary</td>
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</tr>
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<td>Other services</td>
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<td>14</td>
</tr>
<tr>
<td></td>
<td>Retail/wholesale trade</td>
<td>73</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Public administration</td>
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<td>6</td>
</tr>
<tr>
<td></td>
<td>Goods-producing</td>
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<td>23</td>
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<tr>
<td></td>
<td>Finance, insurance, real estate</td>
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<tr>
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</tbody>
</table>

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**Table 4: Employment data of self-identified older adult caregivers in the survey.**

<table>
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<th>N</th>
<th>%</th>
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<td>Self-employed</td>
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<td>Unemployed</td>
<td>86</td>
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<td></td>
<td>Retired</td>
<td>178</td>
<td>28.1</td>
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<td></td>
<td>Student</td>
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<td><strong>Pay Type</strong></td>
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<td>Salary</td>
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<td>13</td>
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<tr>
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<td>Retail/wholesale trade</td>
<td>52</td>
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<td></td>
<td>Public administration</td>
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<td></td>
<td>Goods-producing</td>
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<td></td>
<td>Finance, insurance, real estate</td>
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<td>17</td>
<td>4</td>
</tr>
</tbody>
</table>

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* Geographic region separation based on U.S. Census regions.
** Income separation based on U.S. Census income guidelines.
As shown in Figure 2, for caregivers whose care recipients were recently discharged from the hospital, the caregivers reported receiving medical information about a number of different topics. Participants reported devoting a median of 18 caregiver hours a week to hands-on care (such as housework, meal preparation, physical care, and transportation). A median of 5 hours per week was spent performing other, indirect care for their older adult, such as arranging for services and providing financial assistance.

**Nutrition Care Responsibilities**

Our results show that the most common types of nutrition care provided were grocery shopping (86% of caregivers), meal preparation (74%), and providing oral nutrition supplements (ONS) (38%). Of the 468 caregivers (74% of total respondents) who reported being involved in meal preparation for an older adult, 62% provided a specialized diet tailored to the health needs of their care recipients.

Four percent of caregivers provided assistance with tube feedings.

Figure 3 illustrates the number of caregivers who said they strongly agree or agree with the benefit of therapeutic nutrition for the health of older adults.

In another question, 79% of surveyed caregivers reported that they view proper nutrition as very important for achieving positive health outcomes for older adults. This contrasted slightly with the 59% of caregivers who felt that health care professionals viewed the importance of nutrition care as very important for achieving positive health outcomes for older adults. While this last finding indicates that caregivers may feel that healthcare professionals do not consider nutrition to be quite as important as the caregivers themselves do, the overwhelming majority of caregiver respondents reported that information on proper nutrition/diet and/or the use of ONS provided to them upon their elder’s hospital discharge (86% and 80%, respectively) was either very useful or useful. Only 3% of caregivers found the nutrition/diet information provided to them to be useless.

For advice on providing eldercare, most caregivers (71%) stated they would ask their care recipient’s doctor or other health care professional. Caregivers also identified the internet (57%), their own doctor or health care professional (52%), and family or friends (50%) as potential sources for caregiving advice. Other, less common information sources identified by caregivers included their employer’s human resources department (7%), their employer’s employee assistance program** (EAP) (7%), a coworker or supervisor (6%), and other resources (4%) that included support groups, Area Agencies on Aging, senior centers, social services, and nursing hotlines.

**Use of Governmental or Other Assistance/Programs**

As Figure 4 lists, Medicare was the most familiar and most used govern-
Eldercare
Continued from page 18

Care programs. Familiarity with Medicaid, home meal delivery (such as Meals on Wheels), and SNAP was over 50%, but use of these programs was notably lower than Medicare usage. Further analysis of the data revealed that 57% of caregivers who identified the use of one of these programs were using two or more programs.

Figure 4: Self-identified caregivers’ reported familiarity and use of older adult care programs.†

Caregiving and Employment

While 11% of caregivers in this survey reported having to quit their jobs in order to fulfill eldercare responsibilities, the majority of working caregivers ranked their employers relatively high in terms of support for work adjustments. Eighty-three percent of caregivers rated their employers as very or somewhat supportive in allowing them to change their work schedules, which was also the most common work adjustment made by employed caregivers (50%). Other common work adjustments made by employed caregivers included working fewer hours (41%), working from home/onsite (33%), taking a leave of absence (29%), and changing their jobs or position at their current jobs (13%) or changing employers (9%). Employed caregivers identified employers to be most supportive (either very supportive or somewhat supportive) of employees adjusting their work schedules in order to provide care (83%), but employed caregivers also found employers to be supportive of employees working from home (83%), taking a block of time off of work (73%), and working fewer hours overall (72%). Few employed caregivers in our study reported an employer being not supportive at all of a work adjustment they made. Few employers were completely unsupportive of employees changing jobs or positions (5%), working fewer hours (2%), taking a block of time off (2%), and working from home (1%).

DISCUSSION

The results of our survey shed light on several new focus areas where dietetics practitioners in aging and community programs may play an important role and could regularly work with caregivers, healthcare professionals, and employers to further support the nutrition care of our older adult population.

Integrating Community Nutrition Programs Into Transitions of Care Models

Recent healthcare reforms mean today’s hospitals are very focused on decreasing hospital readmissions because high readmission rates can specifically impact healthcare reimbursements.14 One way healthcare institutions are addressing this challenge is through programs that target transitions of care, such as enhanced discharge planning. Our study showed that most caregivers have found nutrition-related discharge information useful. Furthermore, the caregivers in our study identified healthcare professionals...
as the source they were most likely to call on for information related to caregiving. These results illustrate that caregivers are both receptive to and appreciative of information at hospital discharge. Yet our study findings also document that caregivers’ use of community nutrition programs, such as Meals on Wheels, may be somewhat limited. It should be noted that HIPAA regulations that limit the types of information healthcare professionals can share with family and friends are not generally applicable to information relevant to the patient’s care, although each healthcare practice may have its own policies regarding sharing patient care information.

Lack of awareness about community nutrition programs creates an opportunity for community-based dietetics practitioners to work with their institutionally-based colleagues and help educate those engaged in discharge planning. Specifically, providing information on how family members can readily access community nutrition programs such as congregate or home-delivered meals and products such as ONS may help prevent and/or treat malnutrition.†

Studies have shown that one in three Americans enters the hospital malnourished. Without nutrition intervention, patients may become further malnourished during their course of hospitalization and recovery at home, which places them at increased risk for readmission. An article from the Journal of Nutrition in Gerontology and Geriatrics notes that registered dietitian nutritionists (RDNs) are not as actively involved in discharge planning as they should be. The article emphasizes that social workers, who often carry large patient loads and have far less of a focus on nutrition in discharge planning, do not see nutrition programs as readily available for patients in need. It also identifies a lack of education of patients, caregivers, and staff on the benefits of nutrition services and the impact of malnutrition as major barriers to participation in community nutrition programs.

Another concern expressed in this article is that transition of care models, such as the Naylor Transitional Care Model and the Coleman Care Transitions Program®, do not address malnutrition, although it is believed that both models could be adapted to do so. An important focus for community dietetics practitioners in aging could be increasing the visibility for community nutrition programs with the health care professionals responsible for discharge planning. A new multidisciplinary initiative, the Alliance to Advance Patient Nutrition recently published a consensus paper that outlines six principles to address malnutrition in the clinical setting. One of these areas is specifically focused on including nutrition in the patient discharge plan. The Alliance has created a toolkit with patient education materials as well as other resources that may be useful in integrating nutrition into discharge planning.

Including Dietetics Practitioners and Community Nutrition Programs in the PCMH

The Affordable Care Act promoted development of the Patient-Centered Medical Home (PCMH). PCMHs are effective in improving patient health outcomes and decreasing costs, particularly by reducing hospital visits and emergency-department care. PCMHs are based on a team approach and focus on care that is patient-centered, comprehensive, coordinated, accessible, and committed to quality and safety. Under the model, primary-care physicians are responsible for the total health of their patients, which brings opportunities for recommendations and referrals to those healthcare professionals outside physicians’ general scope of practice. The concept of the PCMH encourages physicians to accept responsibility for engaging and coordinating care, especially for preventative services such as nutrition. With more primary-care physicians focused on preventative care, dietetics practitioners have opportunities to promote how referring patients to community-based nutrition programs can lead to better health outcomes for older adults.

In addition, RDNs also have a role as direct-service providers in the PCMH model. The Academy of Nutrition and Dietetics states, “Registered dietitians can be an integral part of the team that provides patient-centered care to individuals through the medical home.” Primary care physicians also see the benefit of having RDNs as part of their health care teams. Studies have shown that physicians believe nutrition is an important part of patient care, yet they may feel inadequately trained to provide optimal nutrition counseling. In our own study, the caregivers believed that healthcare professionals did not view the role of nutrition quite as importantly as caregivers themselves did. It may be that caregivers are aware of some healthcare professionals’ apprehension toward providing nutrition care. Roles such as those presented by the Academy provide RDNs with a great career opportunity, because primary care providers in the PCMH model are now incentivized to manage total health, not just episodic care. Primary care providers will have strong interest in the evidence that medical nutrition therapy, like nutrition counseling, can impact the effectiveness of medical care and treatments. Caregivers will likely be very receptive to this; more than half of the studied caregivers involved in meal preparation provided specialized diets to their care recipients. In addition, primary-care providers will have interest in the value of products such as ONS, particularly as one of the studies showed caregivers provided ONS to the older adult in their care.

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‡‡ The two other feature articles in this edition also discuss malnutrition. “Micronutrients and the Older Adult, Part 1: Micronutrients of Importance to Older Adults” takes a broad approach concerning malnutrition. “Journeying as a Caregiver for an Older Adult” focuses on interventions caregivers can use to help their older adults avoid malnutrition.

† The Alliance to Advance Patient Nutrition is an interdisciplinary partnership of leaders from the Academy of Medical-Surgical Nurses, the Academy of Nutrition and Dietetics, the Society of Hospital Medicine, and Abbott Nutrition, and is dedicated to raising awareness about malnutrition among patients and advocating for improved patient nutrition practices.
A recent retrospective health economic study of Medicare patients aged 65 and older showed that ONS helped improve key outcomes, such as reduced 30-day hospital readmission rates for three of the most common ailments (myocardial infarction, congestive heart failure, and pneumonia) associated with readmissions for Medicare patients of this age group. Additionally, results from targeted nutrition screening and intervention programs that included ONS have shown decreased hospitalization rates from all causes in patients at risk for malnutrition.

The Academy provides a free member toolkit outlining how RDNs can become integrated in primary care practices and PCMH models. The toolkit notes that the new Comprehensive Primary Care Initiative (CPCI)—a Center for Medicare and Medicaid Service initiative being used to test the PCMH care model in various primary care practices across the United States—includes a new payment model that allows RDNs to negotiate with practices for both fee-for-service and fees for care management from patients’ standard monthly managed care fees. Also addressed in the Academy toolkit is the annual wellness visit available under Medicare Part B. This yearly visit allows Medicare Part B patients specific time with a physician or other health care professionals that can be used to “develop or update a personalized prevention help plan to prevent disease and disability based on [patients’] current health and risk factors.” The details of this service allow RDNs to provide portions of this annual visit, for which they can receive reimbursement.

Increasing Employer/Employee Awareness of Community Nutrition Programs and Services

The results from our surveyed caregiver group indicated that almost two-thirds of these caregivers were employed while providing care. Other research has shown that working caregivers often have trouble balancing caregiving with their work lives. Our study indicated similar results, with 27% of surveyed caregivers responding that it was difficult to perform the dual role of fulfilling their work responsibilities while also caring for an older adult. The good news is that many employers are beginning to recognize the spectrum of workplace-related issues associated with older-adult caregiving and are providing additional supportive resources for their employees. Families and Work Institute’s 2014 National Study of Employers survey found that about 43% of employers reported offering eldercare resources and referral programs to employees, which has increased from 31% in 2008.

Also, according to the Society for Human Resource Management, 11% of organizations have reported offering eldercare leave above the federal and state FMLA requirements.

Today more employers are providing resources and referral services for their employees than they have in the past, yet only 7% of the working caregiver respondents in our survey identified employer EAPs as a source they would seek out for assistance with caregiving duties. Nutrition-focused programs are a way for employers to raise awareness of their eldercare EAP programs, and this creates opportunities for dietetics practitioners. Currently, many employers already value nutrition programs because they are often well-integrated into existing employee health and wellness programs. Additionally, some dietetics practitioners, such as Rite for You Corporate Wellness, are regularly working with employer wellness programs to offer a range of nutrition services, including on-site screening, education, and counseling; telephonic health coaching; and wellness campaigns and challenges. Dietetics practitioners could expand their roles to integrate with employer eldercare programs as well, which often lack any information or resources on nutrition. Specifically, dietetics practitioners could provide information on how caregivers can access community nutrition programs and services for older adults. In addition, as our survey found that many caregivers are providing special diets, resources on disease-specific nutrition could be beneficial.

One resource that may be helpful in reaching out to employers is the free toolkit Employer Elder Care Toolkit: Focus on Therapeutic Nutrition. The toolkit is a project of the Families and Work Institute, National Association of Nutrition and Aging Services (NANASP), and Working Mother Media. It offers online information and resources to help employers give their working caregivers and mature workers the support to address important therapeutic nutrition needs. The toolkit is designed to be integrated into existing employer eldercare and EAP programs.

Survey Limitations

Limited published data on caregivers and nutrition existed for us to use for comparing our findings. Additionally, as our caregiver survey was not a probability sample, it may not be representative of the general population. However, the results of our study do provide valuable signposts for shaping future research and considerations on caregivers and nutrition.

SUMMARY

Presently the majority of housebound older adults in the community are receiving care from family members. The majority of these caregivers are also employed. Caregivers are providing all types of care and services, including complex medical and nutrition care and engaging community resources. These factors raise questions about who these caregivers are, the types of care they are providing, and the resources they may be utilizing.

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**The Family and Medical Leave Act (FMLA) is a U.S. federal law that provides certain employees with up to 12 weeks of unpaid, job-protected leave per year for specific family and medical reasons.

**Rite for You Corporate Wellness is an Ohio-based provider of corporate wellness and population health management services. Its clients span across all spectrums of industry and size.

**This organization consists of a team of clinicians and business experts in the fields of healthcare and population health management.
This survey helps provide answers to these questions. Over half of surveyed caregivers providing meals to their older-adult care recipients reported preparing specialized meals. Over one-third of caregivers are providing their older adults with ONS. Caregivers value nutrition care, and with over two-thirds of caregivers likely to look to health care professionals for caregiving advice, they are seeking help and support. Thus the results of our survey help identify the potential for a new set of opportunities for dietetics practitioners in aging to work regularly with health care professionals across the continuum of care. By reaching out to caregivers, healthcare professionals, and employers, dietetics practitioners in aging can provide important services and information that benefit the health and nutrition of older adults living in our communities.

ACKNOWLEDGEMENTS
We would like to give a special thanks to Kay Lakhi, MS, RDN, LD, NHA, President and CEO of Rite for You Corporate Wellness; and Cyndi Guveiyian, RDN, LD, of Dietary Solutions for taking time to offer a firsthand view of the role dietetic practitioners play in the corporate wellness and long-term care consulting industries.

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REFERENCES


INTRODUCTION
The medical model of care commonly focuses on a patient’s health status, treatments, and strategies to speed recovery. Often overlooked is one of the most important members of the healthcare team: the informal caregiver. An informal or family caregiver is defined as “any relative, partner, friend, or neighbor who has a significant personal relationship with, and provides a broad range of assistance for, an older person or an adult with a chronic or disabling condition.”¹ The National Respite Network and Resource Center disclosed that care provided by family members and friends is the backbone of long-term care services in the United States. A substantial increase in informal caregiving began in the 1950s when individuals with mental illness were deinstitutionalized. Later, those with developmental and physical disabilities also began to be deinstitutionalized and moved to less-restrictive, community-based settings.²

The Family Caregiver Alliance (FCA) was the first nonprofit organization in the country to address the needs of families and friends providing long-term care at home. According to the National Alliance for Caregiving (NAC) and the American Association for Retired Persons (AARP), approximately 65.7 million American families provide unpaid care for another family member. Of these, 43.5 million provide care to an adult 50 years of age and older.³ About 86% of caregivers provide care for a relative, 36% of whom are parents. Regarding gender, 66% of caregivers are women whose average age is 48 years.⁴ On average, caregivers spend 20.4 hours per week providing care.⁵ In 2009, the estimated economic value of unpaid caregiving in the United States was approximately $450 billion, more than both federal and state spending for medical and long-term care services in that year.⁶

The Eldercare Workforce Alliance explains that family caregivers can face physical, emotional, mental, and financial challenges in their caregiving role.⁷ Without an investment in the eldercare workforce, even more stress will be placed on family and other informal caregivers. Due to smaller family sizes, the divorce rate, and geographic relocation, the next generation of older adults may be less able to rely on their families for caregiving.

To better describe the needs and available resources for caregivers across the nation, the FCA published Caregiving across the States: 50 State Profiles. The FCA’s website has links to the profiles that contain each state’s background characteristics related to caregiving and aging, as well as information on publicly-funded caregiver support programs.⁸

THE OLDER AMERICANS ACT
The Older Americans Act (OAA) was signed into law by President Lyndon B. Johnson in 1965, and it has served as the primary vehicle for providing and coordinating community-based services for older Americans and their families. In its Declaration of Objectives, the OAA states that older adults should have “opportunities for a comprehensive array of community-based long-term care services adequate to sustain people in their communities and in their homes, including support to family members and other persons providing voluntary care to older individuals needing long-term care services.” In 2000 and 2006, the OAA was reauthorized with several amendments signed into law. One of the most significant developments from the 2000 amendments was the creation of the National Family Caregiver Support Program (NFCSP), designed to assist the hundreds of thousands of family caregivers of older loved ones who are ill or who have disabilities.⁹

The following are the five categories of support services delineated in the NFCSP:

- Information to caregivers about available services.
- Assistance to caregivers in gaining access to the services.
- Individual counseling, organization of support groups, and training to assist caregivers in the areas of health, nutrition, and financial literacy; and in making decisions and solving problems relating to their caregiving roles.
- Respite care for temporary relief from their caregiving responsibilities.
- Supplemental services, on a limited basis, to complement the care provided by caregivers. In some cases, these services can include congregate or home-delivered meals for the caregiver.

These categories are written to be flexible and respond to the needs of the caregivers in the area being served.⁹

OLDER-ADULT LIVING ARRANGEMENTS
As a growing number of Americans reach the age of 65, society is increasingly challenged to help them age with dignity and comfort. Meeting these challenges is critical for ensuring that baby boomers can look forward to their later years with optimism. The need for caregiving for older adults by professional caregivers or family members will increase sharply during the next decades.¹⁰ The demand for long-term care services and supports will also increase, given the effects of chronic diseases on an aging population. Figure 1 shows older adults’ living arrangements as published in the Older Americans 2012 Key Indicators of Well-being Report.¹¹

LONG-TERM CARE
The U.S. Senate Special Committee on Aging states that long-term care encompasses a wide array of medical, social, personal, supportive, and

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specialized housing services needed by individuals who have lost some capacity for self-care because of a chronic illness or disabling condition. By 2050 the number of individuals using paid long-term-care services in any setting (home, residential care such as assisted living, or skilled-nursing facilities) will likely double from the 13 million who used these services in 2000 to 27 million people. This estimate is influenced by growth in the population of older people in need of care.

ADULT DAY CARE

Adult day care is a source of respite care. It relieves the caregiver of his or her duties for the day by providing proper care in a safe environment. These centers usually operate during normal business hours five days a week, and some centers offer additional services during evenings and weekends. More than 4,000 of these programs are currently operating in the United States. Each center will focus primarily on social interaction, medical care, or Alzheimer’s care. Many of these facilities are affiliated with other organizations, including home-care agencies, skilled-nursing facilities, medical centers, or other senior-service providers.

ADDITIONAL HOUSING OPTIONS

Tara Fleming, Marketing Manager of NewBridge on the Charles, an independent living community in Massachusetts, describes additional housing options for older adults who can no longer live in their own homes.

• **Home health aide care and/or companion support.** For older adults who prefer to stay in their own homes but need assistance with activities of daily living, private home health care is a viable option. Home care can also be supplemented with an adult day health program or with professionally staffed programs at a local senior center offering socialization and nutritious food.

• **Congregate senior housing (also called senior apartments).** This option offers independent-market-rate or subsidized housing in an apartment complex offering the security and conveniences of community living. It is a good choice for older adults who are looking for ways to enjoy the company of friends in a setting that supports independence and the opportunity to “age in place.” Health care is generally not provided, but many communities allow a home health aide or nurse to visit residents in their apartments to assist with medicines and personal care.

• **Continuing Care Retirement Communities (CCRC).** These communities provide a continuum of care in a single location, often referred to as “aging in place.” Independent living, assisted living, and nursing care options are provided. It offers a full range of housing, residential services, and health care options to meet resident needs as they change over time. While the cost of living in a CCRC is often higher than for other types of senior living options, residents have a lifelong assurance that increased assistance and health care services are available if needed.

• **Assisted living.** Assisted living is a social model of care that provides a greater level of support than in-home care, day programs, or independent living. These residences typically provide all meals, housekeeping, programming, a predetermined number of hours of care each day, and nursing assessment and support. The staffing runs 24 hours a day, and some facilities provide special programs for dementia residents.

CAREGIVING SCREENING TOOLS

Lisa L. Onega, PhD, RN, of the Radford University School of Nursing, says that perceived caregiver strain has been associated with premature institutionalization for care recipients, along with reports of unmet needs. Screening tools are useful for identifying families who are at risk and should be assessed to identify their particular needs. The following are two of the most recommended screening tools used primarily by nursing staff working directly with older adults and their families.

The Preparedness for Caregiving Scale

The Preparedness for Caregiving Scale is a caregiver self-rating instrument. This tool consists of nine questions that ask caregivers how well prepared they believe they are for multiple domains of caregiving. Preparedness is defined as perceived readiness for multiple domains of the...
Modified Caregiver Strain Index

The Modified Caregiver Strain Index (MCSI) is a 13-question, quick-screen tool for evaluating caregiver strain. It covers the following major domains: financial, physical, psychological, social, and personal. The MCSI was modified and developed in 2003 with a sample of 158 family caregivers providing assistance to older adults living in a community-based setting.16

CAREGIVER ASSESSMENT TOOLS

Caregiver assessment refers to a systematic process of gathering information about a caregiving situation—problems, needs, resources, and strengths.18 It approaches issues from the caregiver’s perspective and culture, focuses on what assistance the caregiver may need and the outcome the family member wants for support, and seeks to maintain the caregiver’s own health and well-being.

The FCA’s National Center on Caregiving19 developed the Caregivers Count Tool toolkit for health and long-term-care program administrators and practitioners. The toolkit:

- Sharpens health care professionals’ awareness of family caregivers as an at-risk population in need of assessments to determine their own physical, emotional, and financial problems.
- Gives knowledge and skills to create a caregiver assessment that works in a particular setting.

There are many specific caregiver assessment tools, depending on the illness or condition of the care receiver. One example is the CareGiver Oncology Quality of Life questionnaire (CarGOQol), which consists of a 29-item rating scale measuring psychological well-being, burden, relationship with health care, administration and finances, coping, physical well-being, self-esteem, leisure time, social support, and private life of the caregiver.20 This type of caregiver assessment can be performed at any point of contact within the health care system. However, a comprehensive caregiver assessment should be performed when the patient is first diagnosed with cancer, when the patient presents in the emergency room, and when a major transition is planned. In systems where caregivers are assessed, caregivers can be acknowledged by practitioners as valued members of the healthcare team.21

Furthermore, the Alzheimer’s and Dementia Caregiver Center of the Alzheimer’s Association has developed a Caregiver Stress Check. This self-assessment tool helps the Alzheimer’s caregiver determine which resources to access for handling stressful moments. According to the signs of stress, the system gives valuable information for options such as respite care; courses for legal and financial planning; and access to the Online Caregiver Community AlzConnected as well as the Care Team Calendar, both of which help coordinate the work of different caregiving helpers.22

EVIDENCED-BASED EDUCATION PROGRAM FOR CAREGIVERS

In 2007, Powerful Tools for Caregivers23 (FTC) received the National Family Caregiver Award for innovation, responsiveness, and effectiveness from the National Alliance for Caregiving and the MetLife Foundation. The Powerful Tools for Caregivers program is an evidence-based six-week education program based on the highly successful Chronic Disease Self-Management Program developed by Dr. Kate Lorig and her colleagues at Stanford University. The six-week curriculum includes the following topics:

- Class 1: Taking Care of You
- Class 2: Identifying and Reducing Personal Stress
- Class 3: Communicating Feelings, Needs, and Concerns

The course includes The Caregiver Helpbook, which provides caregivers with tools for increasing their self-care and confidence when handling difficult situations, emotions, and decisions:

- Reducing personal stress
- Communicating effectively with family members, doctors, and paid help
- Practicing self care
- Reducing guilt, anger, and depression
- Experiencing relaxation techniques
- Making tough decisions
- Setting goals
- Problem-solving

The program has reached over 80,000 caregivers and is available in English, Spanish, and Korean.

COMMUNICATING EFFECTIVELY WITH HEALTHCARE PROFESSIONALS

Caregivers must communicate effectively with healthcare professionals as well as with care recipients. The Caregiver Action Network offers an on-demand webinar Communicating Effectively with Healthcare Professionals. The webinar explains how to develop good communication techniques and strategies to better prepare for medical visits. Opportunities for improving care of the recipient can be possible if effective communication between the caregiver and the healthcare professional is accomplished. The curriculum included in the webinar has proven to change the way caregivers behave in the healthcare environments in terms of self-confidence and follow-ups.24

TOOL KIT OF CHECK LISTS AND INFORMATION GUIDES

The Family Caregivers at Work: A Healthcare Communications Pro-
gram offers a toolkit that serves as a step-by-step guide to make the most of a doctor’s visit or of a conversation with a member of the healthcare team. It also helps the caregiver and care recipient make informed decisions regarding treatment options and services. Furthermore, it gives advice about how to communicate with health insurance companies.25

The Caregiver Action Network also developed the webinar and booklet Safe and Sound: How to Prevent Medication Mishaps, to address common needs and concerns of caregivers and reduce problems with managing medication for others and themselves. The program includes a supplement tool kit that lists the actions family caregivers can take to ensure they are delivering medications to the care recipient safely.27

WELLNESS

The World Health Organization defines wellness as the optimal state of health of both individuals and groups. There are two focal concerns: the realization of the fullest potential of an individual physically, psychologically, socially, spiritually and economically; and the fulfillment of one’s role expectations in the family, community, place of worship, workplace, and other settings.28

Dr. Jane E. Myers, professor of Counseling and Education Development, University of North Carolina at Greensboro, suggests that wellness is presented as an alternative model with the potential for empowering caregivers and helping them develop healthier lifestyles. She refers to the Wheel of Wellness model, shown in Figure 2, to emphasize that wellness-oriented approaches provide a focus on a person’s strengths as well as prevention of problems once the caregiving role is assumed.29

The model was developed following cross-disciplinary research linking healthy behaviors to life satisfaction, longevity, and quality of life. Dr. Myers explains that this model is based on counseling theory and provides a strong foundation for designing appropriate interventions to help families and individuals.

RIGHTS THAT SUPPORT CAREGIVER WELLNESS

Amy Cotton, MSN, GNP/FNP-BC, FNGNA, says caregivers may have mixed responses to their role.31 Caring for an older adult could create a deep, personal sense of satisfaction, yet it can also create physical, emotional, and financial strain. According to Cotton’s presentation, Caregiving: Maintaining Your Health, caregiving is a choice and a commitment. She enumerates four basic rights that support a caregiver’s wellness:

- I have the right to take care of myself.
- I have the right to say no without feeling guilty.
- I have the right to ask for help.
- I have the right to express how I feel.

Cotton points out that a well-constructed caregiving schedule—one that allows the caregiver adequate rest, breaks, a healthy diet, and regular exercise—is essential.31 Support groups can encourage self-care and support the idea that it is not selfish for caregivers to attend to their own needs. These groups can help caregivers cope with both the emotional and physical consequences of caregiving by teaching stress-management methods and providing exercise classes. Most support groups are run by trained professionals, such as social workers, and can help caregivers devise productive strategies for dealing with intra-family conflicts or tensions that may arise around difficult caregiving decisions.32

SPIRITUALITY

The word spiritual is derived from the Latin spiritus, a spirit or something within the body that provides the life force. This term refers to the domain of human existence that lies beyond the material world—the aspects of...
life that give a sense of meaning, connection, integrity, and hope.33

The Association of American Medical Colleges established the clinical definition of spirituality as follows34: “Spirituality is recognized as a factor that contributes to health in many persons. The concept of spirituality is found in all cultures and societies. It is expressed in an individual’s search for ultimate meaning through participation in religion and/or belief in God, naturalism, rationalism, humanism, and the arts. All these factors influence how patients and health care professionals perceive health and illness and how they interact with one another.”

Hebert et al. explain that inner peace, emotional strength, and spiritual guidance help caregivers to deal with stressful moments. These investigators also stress the importance of religious communities, which serve as social-support networks.35 Howard Gleckman, author of Caring for Our Parents: Inspiring Stories of Families Seeking New Solutions to America’s Most Urgent Health Crisis, suggests focusing on engaging communities and faith-based institutions to offer both practical and emotional support to family caregivers and make communities more livable.36

Moreover, some research suggests that spirituality helps caregivers to cope with depression. A large, multiethnic group study focused on adults providing care to a relative diagnosed with dementia found that religious participation, prayer, and beliefs were associated with a lower incidence of depression among caregivers.37 A recent study found that older persons with dementia respond best to holistic care that includes the spiritual aspects of their lives. Spirituality benefits caregivers and nurses/healthcare providers as well as patients. However, further investigation examining the phenomenon of spiritual interventions as treatment is warranted.

HEALTH

The FCA’s position papers show38 that most caregivers neglect their own health by not taking the time to engage in preventative health behaviors such as exercising, eating well, getting adequate sleep, and visiting their primary-care physicians. Caregivers are more likely to lack health-insurance coverage due to time out of the workforce. These burdens and health risks can hinder the caregiver’s ability to provide care, lead to higher healthcare costs, and affect the quality of life of both the caregiver and care receiver. Therefore it is extremely important for a caregiver to plan ahead of time and save money to pay health-insurance premiums.39 The American Heart Association lists a number of signs associated with caregiver burnout: appetite changes; depression; trouble sleeping; neglect or rough treatment for the person receiving care; losing control physically or emotionally; and excessive use of alcohol, medication, or sleeping pills.40

The Evercare Study of Caregivers in Decline found that caregivers believe their stress takes physical form as some of the other health problems they experience, including increased blood pressure, heart-attack scares, arthritis flare-ups, acid reflux, and headaches. Figure 3 shows the statistics associated with each symptom.41

FUNCTIONAL MEDICINE

Functional medicine addresses the underlying causes of disease, using a system-oriented approach and engaging both patient and practitioner in a therapeutic partnership. It addresses the whole person instead of an isolated set of symptoms. Functional medicine has twelve core principles. One of them is the search for a dynamic balance among the internal and external factors in a patient’s body, mind, and spirit. A functional-medicine practitioner can help a caregiver manage emotions and work toward health from a holistic perspective.42

NUTRITION FOR THE CAREGIVER

Because caregivers tend to experience constant stress, good nutrition becomes critical to maintain their

Figure 3: Caregiver health-decline symptoms.


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Caregiver
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health and well-being. Table 1 lists the signs of poor and proper nutrition as enumerated by Tamika Forkner, MS, RD, LD. Caregivers can use this list to identify their symptoms and make changes toward a healthier lifestyle.

Forkner says that a caregiver’s daily meal pattern should include three meals and two to three snacks. She suggests that caregivers use their cell-phone alarms to remind them to eat something every three hours. As a helpful tip, she encourages caregivers to choose a day to plan meals and cook for the week. She emphasizes that food choices should be as nutrient-dense as possible and to stay hydrated by carrying a bottle of water.

### NUTRITION MANAGEMENT FOR CAREGIVERS

Caregivers engage in activities that support good nutrition, including shopping, meal preparation, feeding the care recipient, and administering home enteral nutrition when required. Nutrition issues related to age such as reduced appetite, impaired sense of taste, and dehydration are special considerations when caring for an elder parent. Keeping records of weights and daily intakes of food and fluids can help identify nutritional problems.

Caregivers need nutrition education targeted toward specific diseases and conditions. Being adequately trained and prepared may help caregivers feel competent, provide efficacious care, have lower health care use, and contain help care costs. The Nutrition Tips for Caregivers booklet, written by the Nutrition Services department at God’s Love We Deliver, presents simple ways to approach different medical conditions and urges the caregiver to keep track of his or her own health as well. Table 2 lists examples of how to address issues and changes the care recipient might experience.

Research conducted by the Home Instead Senior Care® franchise network supports the important role healthy eating plays in successful aging. The caregiving network found that 62% of adult children in the United States and 57% in Canada caring for an older adult said their care recipients had three or more nutritional risks, including:

- Three or more prescribed or over-the-counter drugs per day.
- An illness or condition that made the care recipient change his or her diet.

### Table 1: Demographic representation of total sample population.

<table>
<thead>
<tr>
<th>Signs of Poor Nutrition</th>
<th>Signs of Proper Nutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue</td>
<td>Energy</td>
</tr>
<tr>
<td>Blood sugar spikes, low and high</td>
<td>Good blood sugar regulation</td>
</tr>
<tr>
<td>Dehydration</td>
<td>Good hydration</td>
</tr>
<tr>
<td>Unintentional weight changes</td>
<td>Weight management</td>
</tr>
<tr>
<td>Moodiness</td>
<td>Mood boost</td>
</tr>
<tr>
<td>Digestive problems</td>
<td>Good digestive health</td>
</tr>
<tr>
<td>Interrupted sleep patterns</td>
<td>More restful sleep</td>
</tr>
<tr>
<td>Cognitive issues</td>
<td>Cognitive function maintenance</td>
</tr>
</tbody>
</table>

Source: Presentation: Nutrition for the Caregiver By: Tamika Forkner, MS, RD, LD.

An estimated 83% of American family caregivers and 76% of Canadian caregivers help with groceries or other errands. Sixty-five percent in the United States and 53% in Canada assist with meal preparation. For these reasons, the Home Instead Senior Care® network partnered with Dr. Nadine R. Sahyoun from the University of Maryland and with Elisa Politi, RD, MPH, CDE, Nutrition Director at the Duke Diet and Fitness Center to launch its Cooking Under Pressure campaign.

The Cooking Under Pressure Handbook features the following:

- Signs that the care recipient’s diet needs a nutritional makeover
- Shopping tips for older adults
- Foods that should always be included in the recipient’s menu
- Nutritious recipes

### Table 2: Common health concerns related to age.

<table>
<thead>
<tr>
<th>Monitor the Following</th>
<th>How to Monitor</th>
<th>Further Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight changes</td>
<td>Check weight monthly.</td>
<td>Report any changes to primary doctor and dietitian.</td>
</tr>
<tr>
<td>Dental or mouth pain</td>
<td>Observe during meal time. Keep regular dental visits.</td>
<td>Report any changes to dentist or doctor.</td>
</tr>
<tr>
<td>Changes in food intake</td>
<td>Watch for changes in amount and types of food eaten or changes in eating schedule.</td>
<td>Try to alter mealtimes as needed to maximize intake, and honor food preferences.</td>
</tr>
<tr>
<td>Skin breakdown (increased risk with diabetes, incontinence, being bed-ridden)</td>
<td>Observe skin especially at bony prominent points, avoid excessive moisture in the area.</td>
<td>Report changes in skin integrity to the doctor immediately.</td>
</tr>
<tr>
<td>Depression/mood</td>
<td>Observe the care recipient’s mood and sleep patterns.</td>
<td>Report changes to the doctor or consult a mental health professional.</td>
</tr>
</tbody>
</table>

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Caregiver
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tive Director of Corporate Voices for Working Families; and Mary Beth Arensberg, PhD, RD, LD, FAND, of Abbott Nutrition agree that:49

“Despite the recognized link between nutrition and health, traditional U.S. medical treatment and health care coverage have not addressed adequate nutrition care or provided coverage for therapeutic nutrition. With healthcare reform’s emphasis on preventive and self-care models, links between nutrition and health can no longer be overlooked. A patient’s level of ability and/or family support to manage nutrition is a significant determinant of health outcomes and functional status, particularly for older adults. The increased health problems caused by inadequate nutrition also make it more difficult for family members to balance their caregiver roles with work."

SUMMARY OF CAREGIVING RISKS
Caring for an elderly parent or loved one can be emotional, tiring, and frightening for both the caregiver and the care receiver. Being responsible for another person includes instrumental, emotional, and informational caring.

The responsibilities of caring for an elderly family member can be demanding and overwhelming, which in many cases puts the caregiver’s own health in jeopardy. This problem depends on factors such as caregiving intensity, family or community support, and how the caregiver reacts to the situations he or she experiences. Additional stressors to the caregiver result from taking on the responsibility for someone else’s important affairs, determining what assistance is needed, finding appropriate and affordable resources, coordinating services, and providing care. All of these are constant challenges, but there are ways to handle them successfully.

To determine the relationship between the psychosocial stress caregivers experience and the possibilities of developing unhealthy behaviors, Aschbacher and colleagues50 investigated how certain mediators can cause or prevent those behaviors. Mediators under study include:

• Personality mediators. Can be either ameliorative (resilience, self-confidence, self-control, optimism, high self-esteem, a sense of mastery, finding meaning in life) or exacerbating (neuroticism and inhibition).

• Environmental mediators. These include social support, financial support, a history of significant life changes, and life trauma.

• Biologic mediators. These include increased levels of depression or anxiety in chronically stressed caregivers.

Based on the major components of health, caregivers experience the following:

• Physical Health. Caregivers have a higher risk of chronic health problems, such as heart disease, obesity, and depression.

• Emotional/Mental Health. Caregivers have increased symptoms of feeling anxious or sad. Feelings of hopelessness or being overwhelmed are common.

• Functional Health. Caregivers spend more time on care-related tasks, such as making decisions and handling their own affairs, and put more constraints on their ability to function.

• Social Health. Caregivers report feeling less free to socialize with others and more isolated from social activities.

• Biologic Health. Caregivers have increased levels of stress hormones, such as cortisol, and have more symptoms of depression and anxiety.

• Cognitive Health. Caregivers have decreased cognitive function, such as memory and attention, and have more difficulties with problem-solving and decision-making.

• Economic Health. Caregivers have decreased financial resources and more difficulties with paying bills and managing finances.

• Environmental Health. Caregivers are more likely to have physical health problems, such as heart disease, diabetes, and stroke.

• Community Health. Caregivers are more likely to have mental health problems, such as depression and anxiety.

• Social Health. Caregivers are more likely to have problems with social support, such as feeling isolated and having less access to social activities.

• Biologic Health. Caregivers are more likely to have problems with biologic function, such as fatigue and weight loss.

• Economic Health. Caregivers are more likely to have problems with financial resources, such as paying bills and managing finances.

• Environmental Health. Caregivers are more likely to have problems with physical health, such as heart disease, diabetes, and stroke.
• Social Health. Caregivers can become isolated and have less time to enjoy social interactions with other family members and friends, or to engage in hobbies.

• Spiritual Health. Caregivers can feel guilt if they wish their caregiving responsibilities would end sooner. Feelings of anger toward a higher power may develop.

The article “Caring for Our Aging Population: New Opportunities for Our Community Dietetics and Nutrition Professionals,” on page 15, includes additional information about caregiving matters and the responsibilities of eldercare. This article describes nutrition care responsibilities, caregiver work adjustments, hospital discharge processes, and focus areas where community dietitians concerned about healthy aging can play an invaluable role.

SUMMARY OF CAREGIVING BENEFITS
Caregiving for a loved one, especially when the care recipient is the caregiver’s parent or family member, gives the caregiver a sense of deep satisfaction for being able to support them during the aging process. It also gives them the opportunity of communicating with them and making sure they have a good quality of life. It is vital to adopt a positive attitude about caregiving, because it has numerous health benefits for both the caregiver and the care recipient. Both should find their interactions rewarding—they should be based on close feelings of love and attachment to the person receiving the care. For most older adults, the care received brings comfort, companionship, practical help, and safety. Their health and well-being is enhanced.

STRATEGIES
Strategies for caregivers to protect their own well-being include the following:51

• Find social support. Caregivers need support almost as much as the older-adult care recipients do. Pertinent questions include:
  o How long can I continue to provide this level of care?
  o How do I know when my own health is being compromised?
  o How can I overcome the daily isolation I feel?
  o What should I do when I feel I can’t keep going?

• Meditate.
• Take advantage of services that provide relief.
• Exercise and eat well.
• Read a book.

CONCLUSION
The healthcare team or social-service professionals should be able to help the caregiver cope with the increased demands. The team should also help the caregiver balance responsibilities to the care recipient, themselves, and other family members. Family-support caregiver programs are also prepared to help caregivers in non–health care settings.

The AARP Public Policy Institute52 encourages primary-care clinicians and other health care professionals to routinely ask every Medicare beneficiary if he or she is a family caregiver. This question embraces the concept of person- and family-centered care, and an orientation to the “whole person.” It would also open the door for discussions about caregivers’ needs, including their own physical and emotional health status, and spur providers to offer

Books and Websites
The resources below provide useful information for caregivers of elder parents.

Books
• A Cast of Caregivers—Celebrity Stories to Help You Prepare to Care, by Sherri Snelling.
• Chicken Soup for the Soul: Family Caregivers, by Joan Lunden and Amy Newmark.
• Family Meals: Coming Together to Care for an Aging Parent, by Michael Tucker.
• Dr. Ruth’s Guide for The Alzheimer’s Caregiver, by Dr. Ruth K. Westheimer.
• Confidence to Care: A Resource for Family Caregivers Providing Alzheimer’s Disease or Other Dementias Care at Home, by Molly Carpenter.
• Stages of Senior Care—Your Step-by-Step Guide to Making the Best Decisions, by Lori and Paul Hogan
• Juggling Work and Caregiving, by Amy Goyer

Websites
• American Association of Retired Persons (AARP) Caregiving Resource Center
• Ask Medicare
• Care Giver Action Network Website
• Eldercare Locator
• National Respite Network
• NIH National Institute of Aging
• The Caregiving Club Website
• Today’s Caregiver
• Lotsa Helping Hands
• Plugged-In Caregiving Technology for Family Caregivers
• National Care Planning Council Caregiver’s Handbook
• White House Conference on Aging 2015 Official Website

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proactive, anticipatory guidance and support.

The scientific and social foundation for improving the lives of caregivers exists; the challenge is to translate that foundation into widespread practice. The White House Conference on Aging 2015: The Shape of Things to Come, will address the importance of caregiving networks, in an effort to coordinate the services caregivers need. According to the U.S. Department of Health and Human Services’ Administration for Community Living Budget Overview, $173 million have been requested to fund programs designed to support family and informal caregivers by providing them assistance, counseling, training, information, and respite support.

It is essential for caregivers to find adequate resources and develop a series of skills through learning, support, and counseling from others who share their experiences. These kinds of support structures will help them succeed as caregivers for their elder parents and loved ones while they as well as their care recipients maintain the wonderful gift of health.

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