Phytochemicals and Healthy Aging, Part 1

Susan Karpiel, MS, RD, LD

INTRODUCTION

As the older adult population continues to grow, health care practitioners are increasingly challenged to meet the needs and goals of their patients and clients. Beyond addressing current health care concerns, they must also consider the future needs of a population whose longevity continues to increase. Historically, there have always been more young people than older people in the world, but this trend is rapidly changing worldwide. In fact, it is estimated that by 2020 there will be more people over the age of 65 than under the age of 5 for the first time in history. Additionally, 7% of this aging population will be the oldest of old (Americans who are at least 85 years of age and older). The number of centenarians will increase by approximately 400% between 2005 and 2030. Moreover, the oldest old represent 87% of those over the age of 65 with a noncommunicable disease. Conversely, with an increase in the centenarian population comes an increased desire to age healthfully and maintain a certain quality of life. Health care practitioners are integral to these goals. For dietetics practitioners, phytochemicals may be an additional tool for helping clients and patients achieve them. Based on recent scientific evidence, phytochemicals may support healthy aging.

Phytochemicals are compounds present in animals, plants and plant extracts. Although they are not nutrients, they offer a number of health benefits. Studies conducted over the past several decades consistently show a relationship between a diet high in fruits, vegetables, and whole grains and a lowered risk of chronic diseases commonly associated with aging, such as cardiovascular disease (CVD), cancer, high blood pressure, diabetes, Alzheimer’s, cataracts, and age-related macular degeneration. Phytochemicals are categorized into subgroups and further subdivided into families within these subgroups. Table 1 shows seven commonly investigated subgroups: terpenoids, phenolics, alkaloids, nitrogen-containing compounds, carbohydrates, organic acids and lipids, and organosulfur compounds.

Phytochemicals function as antioxidants and prevent disease by providing an oxidant-antioxidant balance needed in the prevention of disease and aging. For example, resveratrol (in the flavonoids and stilbenes families) is classified as a phenolic. As an antioxidant, resveratrol is known to prevent a number of diseases related to cell oxidation, such as cardiovascular disease, brain dysfunction, cancer, diabetes, and inflammation. In fact, it is reported that resveratrol has more antioxidant capacity than does vitamin C or vitamin E. A phytochemical’s health benefits depend on the presence of adequate amounts of fruits and vegetables. This combination produces a synergy that

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### Table 1: Seven commonly investigated categories of phytochemicals.\(^4,5\)

<table>
<thead>
<tr>
<th>Category</th>
<th>Carbohydrates</th>
<th>Nitrogen-Containing Compounds</th>
<th>Organic Acids and Lipids</th>
<th>Organosulfur Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subcategory:</strong></td>
<td><strong>Subgroup</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mono-saccharide:</strong></td>
<td>Fructose</td>
<td>Amines: Capsaicin, ephedrine, psilocybin</td>
<td>Aldonic acids: Ascorbic acid</td>
<td>Isothiocyanate: Phenylethy lisothiocyanate, benzylisothio-cyanate, 3-phenylpropy lisothiocyanate</td>
</tr>
<tr>
<td><strong>Disaccharides:</strong></td>
<td>Sucrose</td>
<td>Cyanogenic Glycosides: Amygdalin</td>
<td>Aldaric acids: Tartaric acid</td>
<td>Indole: Indole-3-carbinol</td>
</tr>
<tr>
<td><strong>Oligo saccharides:</strong></td>
<td>Amylase</td>
<td>Glucosinolates: Sulfuraphane, sinigrin, glucobrassicin</td>
<td>Omega-6 fatty acids: Arachidonic acid</td>
<td>Allyl Sulfur Compounds: Sulfides, ajoene, dithins</td>
</tr>
<tr>
<td><strong>Sugar Alcohols:</strong></td>
<td>Sorbitol</td>
<td>Purines: Caffeine</td>
<td>Waxes: Nonacosane</td>
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<tr>
<td><strong>Phenols</strong></td>
<td></td>
<td></td>
<td>Thiosulfonates: Allicin</td>
<td></td>
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<tr>
<td><strong>Terpenoids</strong></td>
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</table>

### Phytochemicals

<table>
<thead>
<tr>
<th>Subcategory:</th>
<th>Subgroup</th>
<th>Alkaloids</th>
<th>Phenolics</th>
<th>Terpenoids</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pyridine Alkalooids:</strong></td>
<td>Trigoneline</td>
<td>Phenolic Acids:</td>
<td>Carotenoids:</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>*Hydroxybenzoic acids:</td>
<td>Alpha-carotene, B-carotene, B-cryptoxanthin,</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Gallic acids, P-hydrobenzoic, protocatechuic,</td>
<td>lutein, zeaxanthin, astaxanthin, lycopene</td>
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<tr>
<td></td>
<td></td>
<td>*Hydroxy-cinnamic acid:</td>
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<tr>
<td></td>
<td></td>
<td>Ferulic acid, caffeic, P-coumaric, sinapic-acids, quinic acid</td>
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<tr>
<td><strong>Betalain Alkalooids:</strong></td>
<td>Betanin, indicaxanthin</td>
<td>Flavonoids:</td>
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<tr>
<td></td>
<td></td>
<td>*Flavonols: quercetin, kaempferol</td>
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<td></td>
<td></td>
<td>*Flavones: apigenin</td>
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<td></td>
<td></td>
<td>*Flavanols: catechins</td>
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<tr>
<td><strong>Indole Alkalooids:</strong></td>
<td>Ergine, reserpine, harman, vinblastine</td>
<td>Proanthocyanidins/condensed tannins: resveratrol</td>
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<tr>
<td></td>
<td></td>
<td>*Flavanones: luteolin, naringenin</td>
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<tr>
<td></td>
<td></td>
<td>*Anthocyanins: cyanidin, resveratrol</td>
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<tr>
<td><strong>Indolizidine Alkalooids:</strong></td>
<td>Swainsonine</td>
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<td></td>
<td></td>
<td>*Flavanones: taxifolin</td>
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<tr>
<td><strong>Pyrrolidine Alkalooids:</strong></td>
<td>Nicotine</td>
<td>Isoflavonoids:</td>
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<tr>
<td></td>
<td></td>
<td>Genistein, daidzein</td>
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<tr>
<td></td>
<td></td>
<td>Stibenes: resveratrol</td>
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<tr>
<td><strong>Quinoline Alkalooids:</strong></td>
<td>Quinine</td>
<td>Coumarins: Curcumin</td>
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<tr>
<td><strong>Isoquinoline Alkalooids:</strong></td>
<td>Berberine, morphine</td>
<td>Chalcones: Phlorizin, naringenin</td>
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<td></td>
<td></td>
<td>Shibenes: resveratrol</td>
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<tr>
<td><strong>Steroidal Alkalooids:</strong></td>
<td>Solanidine, solanine</td>
<td>Lignans: Matairesinosin, secioslariciresinol</td>
<td></td>
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<tr>
<td><strong>Tropane Alkalooids:</strong></td>
<td>Atropine</td>
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Phytochemicals
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results in health-related protections. Additionally, consumption of a wide variety of fruits, vegetables, and whole grains for phytochemical benefits is equally important.²

Because of the extensive amount of available phytochemical research and the variety in research methods and reporting, it can be an overwhelming task for the dietetics professional to assimilate this information and turn it in to practical applications. This article discusses recent research findings regarding the health benefits of specific phytochemicals, and how they pertain to the older adult population. It is presented in two parts. Part 1 (published here) includes an overview of commonly researched phytochemicals and their proposed benefits related to aging and the brain, skin, and cancer. Part 2 (which will be published in a future edition) includes a more in-depth discussion of phytochemicals and inflammation, the risks associated with phytochemicals, and scientific research on the health benefits of plants.

OVERVIEW: PHYTOCHEMICALS AND THEIR PROPOSED BENEFITS
Of the more than 4,000 phytochemicals identified to date, only a small percentage have been studied, but they have been studied in great detail. Hundreds of the studied phytochemicals are available mostly in foods of plant origin, but they are also found in marine animals, microalgae, and yeast.⁷ Furthermore, studies show that phytochemicals such as glucosinolate are activated by pest and insect attacks and play a role in the plant’s defense.⁸ Some of the most researched phytochemicals include phenolics, terpenoids, organosulfur compounds, and nitrogen-containing compounds.⁴

Phenolics
The category of phenolics includes five families: phenolic acids, flavonoids, stilbenes, coumarins, and tannins. They are most commonly found in the following fruits: cranberries, apples, red grapes, strawberries, pineapples, banana, peaches, lemons, oranges, pears, and grapefruit. Commonly consumed vegetables that contain the highest amount of phenolics are spinach, yellow onion, red pepper, carrots, cabbage, potatoes, lettuce, celery, and cucumber.⁴

Flavonoids
Flavonoids are found in vegetables; plant-based beverages such as coffee, tea, red wine, and fruit juices; and chocolate.³ Additionally, the flavonoid family can be further broken down into subfamilies, some of which are familiar to nutritionists: quercetin and catechins, epicatechins, anthocyanins, isoflavonoids, and resveratrol. Flavonoids are protective against many illnesses: heart disease, cancer (they starve cancer cells), high blood pressure, and strokes (by lessening the clumping and clotting of blood); they lower blood sugar protecting against diabetes and improve liver function.³ More specifically:
• Quercetin may help lower inflammation related to allergies, prevent cancer of the head and neck, and protect the lungs against pollution.⁴
• Anthocyanins (found in extracts from grape peels, grape seeds, and black raspberries) are found to selectively suppress the tumors in oral cancer.³

Terpenoids
The terpenoids category includes a number of families that have been extensively researched.

Carotenoids
Carotenoids have antioxidant and provitamin roles, as well as the ability to reduce the risk of certain cancers, degenerative diseases, immune dysfunction, and age-related macular degeneration.⁸ Carotenoids in sufficient concentrations serve as very powerful antioxidants and enormous protectors against lipid and oxidative stress.⁴ Of the more than 600 carotenoids identified, the majorities are found in plants, microorganisms, and animals.⁴ Astaxanthin is an example of a carotenoid found in animals. Astaxanthin is found in salmon, trout, shrimp, crustaceans, and yeast microalgae.⁹ Food sources include foods in the Brassicaceous family:

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broccoli, Brussels sprouts, rutabaga, turnip, Chinese cabbage, kale, cauliflower, cabbage, brown mustard, Indian horseradish, radish, watercress, and wasabi. Some examples of carotenoids and their functions are listed in Table 2. Carotenoids are released through heating, chopping, crushing and are best absorbed in combination with oil.

**ORGANOSULFUR COMPOUNDS**

Organosulfur compounds are phytochemicals also commonly found in the Brassicaceous family. They are similar in function to a hormone and are associated with cancer prevention, lowered cholesterol, and reduced risk of stroke from blood clotting. Some specific examples of organosulfur compounds and their associated health benefits:

- **Indoles** help regulate detoxifying hormones and promote cancer-fighting enzymes, particularly for estrogen-linked cancers.
- **Allyl sulfur compounds** prevent cancer by stimulating the immune system and blocking carcinogens from gaining entry into the cells, thereby, slowing down tumor development and allowing existing tumors to shrink. They also lower cholesterol and inhibit blood clotting. Food sources include garlic and onion. Chopping or crushing onion and garlic releases the organosulfur compounds.

**NITROGEN-CONTAINING COMPOUNDS**

**Glucosinolates**

Studies show an inverse association between the intake of glucosinolates and the risk of prostate and colon cancer. Glucosinolates are also associated with a lower risk of bladder, lung, and potentially breast cancers.

Some of the mechanisms responsible for these benefits involve the inhibition of angiogenesis and anti-inflammatory activity, the suppression of cytochrome P450 enzymes, the induction of apoptotic pathways, and suppression of cell cycle progression.

Sulforaphane (a glucosinolate) is found in broccoli, seeds, and sprouts. It has an inhibitory effect in cell system studies on tumor growth in prostate, breast, and colon cancers. Furthermore, sulforaphane, when combined with curcumin, is reported to decrease inflammatory markers, such as nitric oxide and selected prostaglandins and cytokines.

**AMINES**

**Ephedrine**

Ephedrine is isolated from ephedra, a medicinal herb that has been used in China for over 5,000 years. Ephedrine is a phytochemical that gives the medicinal herb its pharmacological benefits. Some of the benefits of ephedrine include enhanced cardiac rate and contractility, peripheral vasoconstriction, bronchodilation, and central nervous system stimulation. Ephedra is still being used worldwide in the forms of extracts and preparations. Ma huang, an alternative name for ephedra, was first recorded as an

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### Table 2: The reported health benefits of carotenoids

<table>
<thead>
<tr>
<th>Phytochemical</th>
<th>Reported Health Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha-carotene</td>
<td>- Promotes vision</td>
</tr>
<tr>
<td></td>
<td>- Improves immune function</td>
</tr>
<tr>
<td></td>
<td>- Promotes skin and bone health</td>
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<tr>
<td></td>
<td>- Reduces risk of esophageal and pancreatic cancers</td>
</tr>
<tr>
<td>Beta-carotene</td>
<td>- Slows the aging process</td>
</tr>
<tr>
<td></td>
<td>- Lowers risk of esophageal and pancreatic cancer</td>
</tr>
<tr>
<td></td>
<td>- Improves lung function</td>
</tr>
<tr>
<td></td>
<td>- Minimizes diabetic complications</td>
</tr>
<tr>
<td>Lutein</td>
<td>- Protects the macular area of the retina</td>
</tr>
<tr>
<td></td>
<td>- Reduces the risk of macular degeneration</td>
</tr>
<tr>
<td></td>
<td>- Reduces the risk of cataracts</td>
</tr>
<tr>
<td></td>
<td>- Reduces the risk of esophageal and pancreatic cancers</td>
</tr>
<tr>
<td>Zeaxanthin</td>
<td>- Protects the macular area of the retina</td>
</tr>
<tr>
<td></td>
<td>- Reduces risk of macular degeneration</td>
</tr>
<tr>
<td></td>
<td>- Reduces risk of ovarian, renal-cell, breast, esophageal, and pancreatic cancer</td>
</tr>
<tr>
<td>Lycopene</td>
<td>- Reduces the risk of prostate cancer</td>
</tr>
<tr>
<td></td>
<td>- Reduces the risk of heart disease</td>
</tr>
</tbody>
</table>

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anti-asthmatic in China in 207 BC. In
the 1920s Western countries began
investigating the use of this herbal
plant and discovered the benefits of-
ferred by ephedrine. By the 1990s
ephedrine was also found to have
thermogenic effects and was being
used for weight loss and performance
improvement. Additionally, using
ehedrine in combination with
caffeine enhanced the weight loss
benefits people received. Other pos-
sible benefits of ephedrine are the
treatment of asthma and high blood
pressure. However, in 2003 there
were 800 reports of toxification and
more than 20 deaths related to the
use of ephedra. As a result, the Food
and Drug Administration (FDA) began
investigating the safety of ephedra
and prohibited its sale the following
year. Currently, safety issues remain
concerning ephedra use and an in-
creased risk of heart disease.

PurInes
caffeine
Caffeine is a phytochemical that is
found mostly in beverages, such as
teas and coffee. It is thermogenic and
has lipolytic action that is most effec-
tive in people with normal weight. For
the older population it is often recom-
mended that caffeine intake be lim-
ited: It stimulates heart rate and blood
pressure as well as acts as a mild
diuretic. Additionally, studies show
that tolerance levels impact caffeine
benefits and the effectiveness of caf-
feine appears to improve with periods
of abstinence.

CARBOHYDRATES
Sorbitol
Many carbohydrates such as fructose,
sucrose, amylose, and sorbitol ex-
hbit health benefits because of their
phytochemical components. For in-
stance, dried prunes and prune juice
are known to have a laxative effect
in humans. It is believed that large
amounts of sorbitol (a syrup made of
83% sorbitol) in addition to the fiber
content of prunes, and phenolic com-
ounds contribute to this effect. The
majority of sorbitol enters the bowel
and bacterial fermentation can create
flatulence and loose stools. A dose
of 16 to 25 g sorbitol is found to be
an effective amount for “very soft or
watery stools,” which is equivalent to
eating 12 large prunes. However,
this amount may vary depending on
age, weight, and possibly on bacterial
flora of the intestine. Because sorbi-
tol has a slow absorption rate, blood

PHytocHEmIcAls And AgIng
The aging process is defined by Ergin
et al. as a physiological decline in
the body’s ability to counteract oxida-
tive stress, an increased susceptibility
to disease, and increased mortal-
ity. Oxidative stress results from the
body’s daily exposure to a variety of
environmental and biological stressors
that produce free radicals. Cells re-
quire antioxidants for cells to counter-
act, adapt, and survive this damage.
For health, the body needs to main-
tain redox balance, recycle antioxi-
dants, and clear out irregular proteins
and allow for remodeling. Pathways
for accomplishing this are numer-
ous and may include heat shock re-
sponse, unfolded protein response,
autophagy, antioxidant response, in-
flammatory response, and DNA repair
response. Any inadequacy in these
pathways can result in brain dysfunc-
tion and a variety of chronic diseases,
and is thought to be a primary cause
of aging.

Diseases associated with aging in-
clude Alzheimer’s, Parkinson’s, cancer,
cardiocvascular disease, vision-related
diseases, and aging skin. However,
evidence increasingly shows that anti-
oxidative phytochemicals can prevent
oxidative stress and counteract aging.
Although the actual mechanism
is still being studied, growing senti-
ment among scientists supports an-
tioxidants, such as polyphenols, as
preventive for certain cancers, cardio-
vascular disease, neurodegenerative
diseases, DNA damage, and possibly
aging.
Are Phytochemicals Harmful?

Even with the mounting evidence supporting the health benefits of phytochemicals, some researchers question if phytochemicals can be more harmful than helpful. Mukherjee and Gogoi report there is some concern that antioxidants and phytochemicals could potentially do more harm than good, in terms of reported risk related to an increase in glycation-mediated protein damage (carbonyl stress). In addition, Rahal et al. state that antioxidants can serve a dual role as an antioxidant or a pro-oxidant, depending on their co-oxidants. Additionally, an antioxidant’s role is dependent on the molecular conditions of the tissue and the environmental factors, such as oxygen tension, concentration of their transition metals and the current redox status. Aging is a complex mechanism; its foundation, and that of many diseases, is the redox biochemistry that impacts the majority of cellular processes. For instance, protein oxidation modification is related to the functional loss of target proteins, which is associated with aging and age-related diseases. Protein oxidation is caused by a reaction between protein amino acid residues and either reactive oxygen species (ROS) or reactive nitrogen species (RNS). Protein oxidation has also been shown to generate positive stress as well. According to Ergin et al., data show that ROS and RNS are necessary for the survival and regeneration of cells: They reprogram cells to extend their lifespans and neutralize severe and deadly challenges. It appears that cell survival requires adaption to the increased oxidant or redox status, and cellular redox homeostasis. Future research is needed to better understand the roles of and relationships between oxidation, pro-oxidants, and antioxidants.

**PHYTOCHEMICALS AS ANTI-OXIDANTS IN VITAMINS**

As previously mentioned, the detrimental effects of oxidative stress are believed to be the primary cause of aging as it relates to ROS. Although a higher intake of antioxidants is associated with a reduced risk of chronic age-related diseases, there is still some question as to the true health benefit of antioxidants if an offsetting nutrient deficiency is present. Additionally, whereas large clinical trials have not found health benefits from specific antioxidants, other smaller clinical trials have shown benefits. It is thought, however, that the effects of oxidative stress promote aging and chronic disease, and these effects are lessened by the antioxidant activities of enzymatic and non-enzymatic antioxidants. The enzymatic antioxidants are induced by a buildup of ROS/RNS to protect cellular function by neutralizing free radicals within the cell and they include superoxide dismutase (SOD), catalase, and glutathione. The non-enzymatic dietary antioxidants neutralize free radicals outside the cell and they include glutathione, ascorbic acid, uric acid, plasma proteins, alpha-tocopherol, beta-carotene, bilirubin, ubiquinone, and isoflavones. Additionally, studies show an inverse relationship between carotenoid supplementation and risk of esophageal cancer; and between pancreatic cancer and supplementation of magnesium, potassium, selenium, alpha-carotene, beta-carotene, beta-cryptoxanthin, lutein, zeaxanthin, niacin, total alpha-tocopherol, vitamin A, vitamin B6, and vitamin C.

In addition, ubiquinone (CoQ10) in a combined treatment with insulin was found to reduce lipid peroxida-
antioxidative defense and improve hypertension. ALA in rat studies is protective against hyperglycemia-induced cardiac tissue. Vitamins C and E also serve a protective role against oxidative stress in aged rats. Furthermore, the dietary intake of vitamins C and E show anti-cataract, anticancer, and anti-Alzheimer’s effects and prevent free radicals by preventing lipid peroxidation. Functions of the brain, aorta, heart, and liver are also protected by vitamin E via the reduction of carbonyl stress-induced cellular destruction in diabetic rats.

Finally, topically and orally administered astaxanthin may prevent skin sagging and also skin wrinkling as a result of UV radiation. Astaxanthin is found in microalgae, yeast, salmon, trout, krill, shrimp, crayfish and crustaceans. Other studies have linked vitamin D to anti-aging effects. Vitamin D is shown to protect the skin from UV radiation and to offer a potential advantage of delaying the aging process.  

**PHYTOCHEMICALS AND THE BRAIN**

Healthy aging has historically been associated with a lower risk for cardiovascular disease and stroke. However, as the American population grows older, neurodegenerative diseases, such as Parkinson’s and Alzheimer’s are becoming increasingly prevalent. In fact, Alzheimer’s is now a leading risk factor for aging and one of the top six leading causes of death with an estimated 114 million people worldwide expected to be diagnosed with Alzheimer’s by 2050. Furthermore, the normal aging process has a significant impact on cognition whether a neurodegenerative disease is present or not.

What is clear is that antioxidants are showing to be beneficial in the prevention of noncommunicable diseases typically associated with aging. For example, resveratrol is neuroprotective in that it reduces the death of brain cells caused by oxidized lipoproteins. It also lowers the gene expression related to inflammation and cell death, and it rescues brain cells in Alzheimer’s disease, Parkinson’s, and Huntington’s disease per in vitro and in vivo studies, respectively. Loss of mental ability is widespread among the aging. It occurs in the areas of attention, executive function, memory, reasoning ability, spatial orientation, processing speed, and functional decline. These cognitive changes are the result of age-related alterations in the brain’s neuronal communication: They are caused by accumulated damage from oxidative stress, inflammation, toxic protein accumulation, and a reduction in endogenous antioxidant defense.

The brain is a large consumer of oxygen, and as such is susceptible to oxidative stress damage. The consequences of this oxidative damage over time are neuron death, chronic inflammation, increased oxidation of protein and lipids, altered calcium buffering, the accumulation of damaged organelles and protein structures, and decreased neurotransmitter release. Hence, a growing body of research focuses on phytochemicals as a preventive aging strategy, given their antioxidant and anti-inflammatory properties. These compounds provide anti-allergic, anti-anxiety, anti-tumorigenic, anti-inflammatory, antioxidant, anti-proliferative, and anti-viral properties. Berries and tea are foods of recent interest along with the polyphenolic compounds anthocyanins, curcumin, resveratrol, and catechins. Recent epidemiological studies indicate a positive relationship between the consumption of these anthocyanins and a lowered risk of Alzheimer’s.

Anthocyanins, which are members of the flavonoid family, give berries their bright red, purple, and blue pigments. Studies show that the consumption of berries enhances brain health during aging. Berries contain phytochemicals that are neuroavailable and neuroactive, and they provide antioxidant, anti-inflammatory, and direct effects on the brain. For example, preclinical studies found that berries enhance cognitive and motor control in animals, dietary supplementation of berries reduces serum oxidation and inflammatory markers in humans, and grapes and blueberries improve the cognition of older adults with mild cognitive impairment.

Furthermore, the phenolics, curcumin, resveratrol, and catechins are shown to be highly potent antioxidants and have anti-inflammatory properties.
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They scavenge free radicals, regulate inflammatory responses, and are able to cross the blood-brain barrier, directly impacting areas involved in the pathogenesis of Alzheimer’s. These compounds diminish the production of neurotoxins, and enhance cellular defense processes, protecting the brain from α-β-proteins and plaque buildup. They are thereby protective against Alzheimer’s and other neurodegenerative diseases, such as Parkinson’s and Huntington’s disease.18

PHYSICOCHEMICALS AND AGING SKIN

Our population is growing older, and our skin shows the most obvious signs of aging. Consequently, as the aging population grows, so does the demand for strategies to maintain a youthful appearance, as well as health. As the number of centenarians grows exponentially and the number of people over the age of 65 outweights the number of five year-olds for the first time in history, so does the demand to maintain health and a younger look.1 Scientific interest in finding ways to maintain youthful skin and prevent the aging process is growing.

The aging process brings about two types of skin changes: chronological aging and photoaging. Changes from chronological aging occur naturally as a result of time, whereas those from photoaging are the result of sun damage to the skin. Changes related to chronological aging are partly caused by an accumulation of free-radical damage. This damage is caused from the continuous development of ROS and results in skin wrinkling, sagging, laxity, xerosis, and various pigmentation changes. Additionally, aging skin has fewer glands, atrophy of the extracellular matrix, less collagen, less elastin, and fewer fibroblasts.20 Moreover, photoaging adds to skin damage by causing further increases in cell oxidation and ROS formation. Skin changes related to photoaging include dry skin, hyper-pigmentation, wrinkling, and inelasticity. Both chronological and photoaging changes decrease collagen synthesis and increase connective tissue damage.20

Consumption of phytochemicals from plants and plant extracts is increasingly being studied for their potential anti-aging effects. The antioxidant properties of phytochemicals may protect the skin from free-radical damage, and possibly enhance collagen development. Some phytochemicals researched include phenolics, like catechins found green tea, which are possibly chemopreventive and protective against UV radiation damage. In addition, the extract of phenolics, like quinic acid, ferulic acid, and anthocyanins showed improved fine lines, wrinkles, and skin pigmentation. Other phenolics are found to protect the skin from UV damage by exhibiting antimutagen, antioxidant, anti-inflammation, and anticancer activity.20 The following is a list of benefits phytochemicals have on the skin and the foods that provide them (refer to Table 1 as needed):20

- **Skin cancer prevention:** Phytochemicals found to protect against skin cancer include the phenolics, such as catechins (flavonol subgroup), resveratrol (anthocyanins subgroup), and curcumin (coumarins subgroup). These phytochemicals are found in green tea, turmeric, grapes, cranberry, apple, strawberry, pineapple, banana, peach, lemon, orange, pear, grapefruit, and red wine. 
- **UV damage:** Phytochemicals include the phenolics curcumin (coumarins subgroup), anthocyanins, and resveratrol (anthocyanins subgroup). These are found in green tea, turmeric, grape, cranberry, apple, strawberry, pineapple, banana, peach, lemon, orange, pear, grapefruit, and red wine. 
- **Chronologic aging damage (wrinkles, pigmentation):** Phytochemicals include the phenolics quinic acid and ferulic acid (hydroxy-cinnamic acid subgroup), and those in the anthocyanins subgroup. These are found in wheat bran, apples, potatoes, turmeric, grape, cranberry, apple, strawberry, pineapple, banana, peach, lemon, orange, pear, grapefruit, and most vegetables.
- **Photoaging damage (dry skin, pigmentation, wrinkles, inelasticity):** Phytochemicals include the phenolics curcumin (coumarins subgroup), those in the isoflavonoid subgroup, and those in the anthocyanins subgroup. These are found in soybean, rice wine, red and purple fruits, coffee arabica extract, pomegranate, grape, cranberry, apple, strawberry, pineapple, banana, peach, lemon, orange, pear, and grapefruit. 
- **Promote collagen synthesis:** Cinnamon extract contains phenolics in the hydroxy-cinnamic acid subgroup.
- **Tightening and firming of skin:** There are many plant and plant extracts that help with tightening and firming the skin. They include phytoestrols, saponins (subgroups continued on page 9
Phytochemicals
continued from page 8

of the terpenoid category) and phenols. They are found in licorice, turmeric, cinnamon, aloe, hops, wild yam, and dill.

Although a large number of plants are being studied, there are still many questions and more research to be done. For example, many of these studies are in vitro and fail to address the critical questions of concentration, duration of use of the products, and possible interactions with other skin products on their effects of aging. Nevertheless, dietetic professionals are in a position to help their clients and patients protect their skin and promote a younger appearance by encouraging the consumption of phytochemicals and other lifestyle behaviors that promote healthy skin.

PHYSIOCHEMICALS AND CANCER
Cancer occurs when genes are mutated or modified. The most common type of mutation is a time-acquired mutation that manifests later in life. Acquired mutations can be caused by environmental, lifestyle, and hormonal factors; they can also be idiopathic. When a cell copies and divides its DNA, the new copy may contain an error. Because gene mutations occur often and accumulate over time, cancer risk increases with age, and older people have a higher cancer risk than do their younger counterparts. In addition to acquired gene mutations, where DNA sequencing is altered, epigenetic modifications can also occur. Epigenetic changes affect how genes are expressed, and they play a role in cancer development. However, because epigenetic modifications are reversible, they have provided a popular avenue for researching cancer preventative strategies and the role of phytochemicals in this area. Some of the mechanisms used for epigenetic regulation are DNA methylation, covalent modifications of core histones, and post-transcriptional gene regulation by non-coding RNA.

Research shows that phytochemicals have anti-cancer properties and can be used to prevent or treat diseases by targeting the activities of various epigenetic factors. Phytochemical mechanisms include antioxidant activity, induction of detoxification enzymes, preventing the formation of nitrosamines, binding/dilution of carcinogens in the GI tract, alteration of hormone metabolism, and the modulation of carcinogenic cellular and signaling.

Examples of some phytochemicals that play a role in regulating target epigenetic factors include resveratrol, genistein, isothiocyanate, curcumin, sulforaphane, organosulfur, and indole-3-carbinol.

Resveratrol, for example, is a polyphenol shown to be useful in preventing cancer and inflammation, and it enhances blood-sugar control. In the prevention of breast cancer, resveratrol is shown to be more effective when combined with adenosine analogues by inhibiting the methylation of genes related to breast cancer and less effective when acting alone. Additionally, because resveratrol targets the SIRT1 gene (which plays a critical role in aging and is associated with breast cancer), it may be part of an important strategy for the prevention of breast cancer. Furthermore, in vivo studies on mice found that resveratrol helps prevent prostate cancer by regulating cell survival and/or apoptosis, suppressing tumor growth in colon cancer, and when given in combination with tea polyphenols, suppressing mouse skin cancer.

Curcumin is found to prevent cancer by modulating aspects of intracellular signaling pathways involved in inflammation, proliferation, invasion, survival, and apoptosis. Curcumin studies show this polyphenol to be protective against prostate and various other cancers by blocking histone acetylation. Furthermore, in the treatment of human pancreatic cancer, curcumin significantly reduced target gene expression, enhanced the promotion of apoptosis of lung adenocarcinoma cells, and reduced the expression of breast cancer and human colon cancer genes that are over-expressed in some human tumors and thereby enhance cell invasion and metastasis.
Furthermore, tea polyphenols in black and green tea are found to lower the risk of cancer and other diseases. Types of polyphenols in black tea include catechins, flavanols, methyxanthines, theaflavins, and thearubigens. Green tea is composed of various polyphenol catechins, the majority being EGCG. Various studies have shown EGCG to be effective in preventing many cancers, such as ovarian, oral, esophageal, breast, gastric, prostate, skin, colorectal, pancreatic, head, and neck cancers. EGCG prevents cancer in a variety of ways: It suppresses the invasive ability of cancer cells, inhibits cell growth, suppresses the telomerase expression of gastric cancer cells, inhibits DNA methyltransferase (DNMT) activity, and reactivates methylation-silenced genes in human colon and prostate cancer cells. Limited studies indicate that tea polyphenols participate in epigenetic regulation by modifying gene expression in human cancer cells, such as liver and breast cancer. Additionally, the treatment of tea polyphenols showed a protective effect against UVB-induced skin tumors in rats.

Indole-3-carbinol is another phytochemical found in cruciferous vegetables (such as broccoli, cabbage, and Brussels sprouts). During digestion this compound is converted into many diindolylmethane (DIM) products that function as cancer preventative by inducing apoptosis in cancer cells and the modulation of various kinases and mediated signaling. Studies show these diindolylmethane products to be an effective treatment for human colon cancer, pancreatic cancer, and breast cancer, and lessen the effects of smoking on the lungs.

Genistein (a polyphenol isoflavone and subgroup of the phenolics) is found in soybeans. It is considered a phytoestrogen. Genistein has been shown in many studies to be effective in cancer prevention by targeting numerous enzymes and pathways involved in cancer, regulating gene transcription, demethylating a tumor suppressor gene in renal cell cancer, and increasing levels of acetylated histones involved in prostate cancer cell growth and cell-cycle arrest. Other benefits of genistein include the treatment of ovarian cancer and the suppressed growth of melanoma cells. Yet research results about genistein’s effect on cancer—protective or protumorigenic—continue to be paradoxically supportive of both conclusions. There are evidence-based concerns regarding the use of genistein. Most studies that exhibit detrimental effects from genistein involved mixed isoflavones from soy and red clover. However, one large study showed genistein alone caused gastrointestinal problems in many of the study participants. Additionally, there is concern that genistein may lower immunity. For example, one study where genistein was injected showed a negative effect on immunity. Another study found that infants fed soy milk formula have decreased immunity. Currently it is unclear if genistein lowers immunity, but the concern remains.

Another concern is the relationship between soy and breast cancer. Recent research by Setchell et al. indicates that rodents are not appropriate for learning about the implications of soy on human health, because they metabolize genistein differently than humans do, resulting in a much higher concentration. However, most studies showing a relationship between genistein consumption and breast cancer are rodent studies. Setchell et al. also state that recent data do not support the theory that isoflavones are inappropriate for breast cancer patients and those at high risk for breast cancer. Additional phytochemicals found to prevent cancer include:

- Sulforaphane, shown to prevent colon cancer, prostate cancer, and skin cancer. This compound is found in broccoli, broccoli sprouts, cabbage, and kale.
- Isothiocyanate, shown to prevent prostate and lung cancer. This compound is found in the cruciferous vegetables.
- Allyl sulfur compounds are found in garlic. They are shown to prevent stomach, colon, and breast cancer; quercetin (found in citrus fruits and buckwheat) is shown to prevent colon and prostate cancers.
- Lycopene, found in tomatoes, is an antioxidant that exhibits protection
Phytochemicals
continued from page 10

against breast, prostate, and lung cancers.
• Ellagitannins, found in many fruits and nuts, also have antioxidant activity and are shown to protect against liver cancer.

CONCLUSION
Given that the older adult population is most at risk for chronic disease, phytochemicals offer hope for a strategy that will help enhance life quality throughout the aging process. Phytochemicals have the potential to serve as an anti-aging strategy in a society that worships youth and values healthful aging. Although a plethora of research is available, only a small portion of phytochemicals has actually been heavily studied. More studies are needed to identify further the benefits of phytochemicals and to determine their dosage effects. Dietetics practitioners can help clients by promoting a balanced diet that is plant-based and includes a wide variety of fruits, vegetables, and whole grains.

References
Click here to see the references for this article.

About the Author
Susan Karpiel, MS, RD, LD, is a certified wellness coach. She has earned her master’s degree in nutrition from Texas Woman’s University (TWU) and is currently pursuing her doctorate degree in health studies, with a minor in nutrition. Susan worked as director of food and nutrition for 23 years in both long-term care and acute care. Additionally, Susan has experience as a clinical dietitian and as a consultant for long-term-care facilities. Susan is very passionate about health and wellness and plans to teach in higher education and work in worksite wellness.

Call for Information: Conferences and Events
The Healthy Aging DPG calendar contains events of interest to RDNs and NDTRs who work with older adults.

If you would like to suggest a conference or event for our calendar, please e-mail Robin Dahm (dahmRD@gmail.com) with your information. The event must focus on the nutritional and physical health of older adults.

Need Continuing-Education Credits?

HA DPG Offers CPEUs
For Self-Study Webinars
And Newsletter Articles

The HA DPG offers its members two ways to earn CPEUs:

- Self-study webinars,
Nutrition Facts
3 servings per container
Serving size 1/3 medium (50g)

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* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

A serving of avocado provides:

**Good Fats**
The Dietary Guidelines for Americans recommend replacing saturated fats with mono- and polyunsaturated fats (cholesterol-free good fats) to achieve overall healthy eating patterns.

**A Good Source of Fiber**
Fiber adds bulk to the diet, which can help people feel fuller faster and manage their weight. Diets rich in fiber may reduce the risk for certain chronic diseases.

**A Good Source of Folate**
Folate is important for proper brain function. Folate is key for pregnant women, as it is the best-known nutrient for helping to prevent certain birth defects.

**Nearly 20 Vitamins, Minerals and Phytonutrients**
Avocados are a nutrient-dense addition that can easily fit into a variety of healthy eating patterns to help increase fruit and vegetable intake.

Discover the avocado Nutrition Facts label at LoveOneToday.com/Label.

1 serving = 1/3 of a medium Hass Avocado

Breakfast Toast with Cottage Cheese and Avocado
Kale-Avocado Salad with Roasted Carrots
Oven-Roasted Salmon with Avocado-Citrus Salsa

It's Easy to Love One Today®

Find these flavorful, nutrient-dense avocado recipes and more at LoveOneToday.com/Recipes.

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Chair’s Message

Judy Simon, MS, RD, LDN

Congratulations on being a member of the Healthy Aging Dietetic Practice Group (HA DPG)! Your membership provides you with a number of terrific benefits:

- Free Continuing Professional Education Units (CPEUs) via educational webinars, self-study newsletter articles, and self-study webinars
- Available research and education grants
- An exceptional newsletter and additional supplement issues
- Regular communication via our monthly e-update
- Updates on issues important to you
- Resources to support you if you are studying for the Board Certified Specialist in Gerontological Nutrition (CSG) certification exam
- An online discussion board

To find out more, check out our member orientation video. Keep up to date on new resources and upcoming events, archived Spectrum articles and much more at our website!

HA DPG members participated in a number of professionally and personally rewarding activities during FNCE© 2016 this year. We hope many of you who traveled to the conference were able to attend HA DPG sponsored events.

If you were unable to attend FNCE© 2016 this year, we hope you’ll consider joining us at next year’s 100th Anniversary of the Academy of Nutrition and Dietetics, when FNCE© 2017 will be held in Chicago (October 21 through 24).

Speaking of professional opportunities, keep in mind that becoming a Board Certified Specialist in Gerontological Nutrition is a great way to advance your career and practice competencies. The HA DPG website contains a CSG Toolkit, which is offered exclusively to HA DPG members. We now offer CSG flashcards to help you study for the exam (HA DPG members can purchase these at a discounted price).

Have a wonderful fall and winter holiday season. I look forward to updating you again in 2017 about more exciting HA DPG news.

Tell Us What You Think!

We want to make The Spectrum as useful to you as possible. Please send us your feedback!

Click this graphic to let us know your comments, suggestions, and questions.

MARK YOUR CALENDAR:
UPCOMING CONFERENCES & EVENTS

Click here for a list of upcoming conferences, workshops, webinars, and other events related to healthy aging.
DATE: November 15, 2016

TO: Healthy Aging DPG Members

FROM: Maureen Janowski, Healthy Aging Second Century Liaison

RE: The Academy’s Second Century Initiative

As the Academy of Nutrition and Dietetics embarks on its 100th anniversary in 2017, the organization is taking this moment to chart a new vision for the future — a Second Century built with an extraordinary commitment to collaboration, a focus on service, and an emphasis on accelerating the progress toward solving the greatest food and nutrition challenges of our time. We aspire to create a world where people and communities flourish because of the transformational power of food and nutrition.

The Academy wants to keep its members informed over the next three years as the Second Century initiative continues, keeping everyone included in shaping the Academy’s future. The Academy is asking members to get involved throughout this process, providing feedback through surveys and key discussions at member meetings, and staying engaged to help create this new vision for the Academy. The Healthy Aging DPG’s website contains a page devoted to the Second Century initiative.

As the Academy kicks off the Second Century initiative, now is the perfect opportunity to learn more about the Academy’s history and the history of the profession through past articles of the Journal of the Academy of Nutrition Dietetics, including “History Snapshot: Dietetics Student Experience in the 1940s,” and through the Academy publications Carry the Flame and The First Fifty. Also, be on the lookout for upcoming meetings or webinars to learn more about the Second Century initiative.

Please direct additional questions to me at maureen.janowski@compass-usa.com or directly to the Academy.

Thank you,

Maureen Janowski, RDN, LD, CSG, FAND
Immediate Past Chair
Second Century Liaison
House of Delegates (HOD) Update
Moving the Profession Forward: Focusing on Wellness and Prevention
Amy Sheeley, PhD, RD, LDN; Healthy Aging DPG Delegate

I AM EXCITED TO WRITE MY FIRST SPECTRUM COLUMN as your Healthy Aging DPG delegate. In this important role, I am an important liaison between Healthy Aging DPG members and the House of Delegates (HOD). The HOD tackles overriding issues of strategic importance that impact our profession. I want to ensure that HA DPG always considers the aging American population during HOD discussions. My hope is that you will communicate your opinions and views with me on the subjects deliberated by the HOD. Please send your comments, feedback, ideas, or concerns to me at any time.

Fall HOD Meeting
The HOD met in Boston prior to FNCE® 2016 on October 14-15. The first day of the meeting was training on appreciative inquiry. The Academy describes appreciative inquiry as “a method of transforming organizations by focusing on what works.” It is used by the Academy’s Second Century Initiative. The House Leadership Team (HLT) believes it will work within the Knowledge-Based Strategic Governance model to improve membership engagement and build on strengths as an Academy and profession. The training was also provided to the Academy’s Board of Directors (BOD), Nominating Committee, and chairs of all Academy committees. Gervase Bushe, an internationally known expert on appreciative inquiry and previous speaker at the Academy’s Leadership Institute, conducted the training. The second day of the meeting covered the Mega Issue of Wellness and Prevention. The full backgrounder and all meeting materials can be found on the Academy’s HOD website (login required to view all the options). Objectives and motions related to this Mega Issue will be communicated in coming months, as delegates use the appreciative inquiry to design “solutions” with input from members. Please submit to me any thoughts or comments you have on this Mega Issue.

ACADEMY UPDATES
Two new practice resources on malnutrition and telehealth are now available on the Academy website.

Malnutrition
Registered dietitian nutritionists have the opportunity and responsibility to be at the forefront of the fight against malnutrition. Using the evidence-based tools and resources below, RDNs and NDTRs can help assess, document, diagnose and treat malnutrition in a variety of practice settings.

Malnutrition Resources from the Academy of Nutrition and Dietetics

Telehealth
Telehealth is an emerging area of practice for many health care professionals. Regulations, policies, and standards are in flux until a “gold standard” becomes consensus; but that has not stopped technology from entering into mainstream practice. It is not surprising that RDNs are asking themselves how their patients can benefit from Telehealth and Telenutrition.

Here, you will find information for providing telehealth care to your patients.

The Accreditation Council for Education in Nutrition and Dietetics (ACEND®) announced the release of the 2017 Accreditation Standards.

ACEND® ACCREDITATION STANDARDS WORK
2017 Accreditation Standards RELEASED
The ACEND® Board has released the 2017 Accreditation Standards for Nutrition and Dietetics Coordinated Programs (CP), Didactic Programs (DPD), Internship Programs (DI), Technical Programs (DT) and Foreign (FDE) and International (IDE) Dietitian Programs. The 2017 Standards will go into effect for eligibility applications for new programs in nutrition and dietetics on September 1, 2016 and for existing accredited nutrition and dietetics programs on June 1, 2017. ACEND® thanks all who have given input. The 2017 Standards are the results of a planned five-year review cycle of the current 2012 Accreditation Standards to ensure compliance with USDE regulations.

• Accreditation Standards »

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HOD Update
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The August Standards Update, which also is posted on the ACEND website, describes expectations for implementing the standards and the types of support that will be available for interpreting the standards.

Academy initiatives related to food technology, including genetically modifying foods, are underway. Members will be updated on these projects as they near completion:

- A manuscript describing the Evidence Analysis Library systematic review titled “Advanced Technology of Food Production” (currently available on the EAL). Its results will be submitted for publication in the fall to the Journal of the Academy of Nutrition and Dietetics.
- A white paper discussing genetically modified foods within the food supply will be submitted for publication upon completion.

The Academy kicked off its Second Century Initiative with a webinar and survey. The Initiative’s goal is to chart a new vision that will guide everything the Academy will do in the coming years. The process is twofold: Identify areas of opportunity for members, and then lead the way in accelerating progress toward good health and well-being for all people. The Second Century Initiative is an evolving, ongoing effort over the next three years. Results from a recent Second Century planning survey by members are now available.

Accreditation Council for Education in Nutrition and Dietetics
the accrediting agency for the Academy of Nutrition and Dietetics
The Academy’s accrediting agency for education programs preparing students for career as registered dietitians or dietetic technicians, registered.

If you have a “best of” story about a time you most exceeded your own expectations as a credentialed food and nutrition practitioner in helping a client or population improve health, please send it to me by December 1, 2016. I will link this to the following Mega Issue: How can we as Academy members capitalize on our strengths to create a future where credentialed food and nutrition practitioners play an integral role in wellness and prevention?

Early in 2017, you will have an additional opportunity to share ideas. We will be hosting open-space discussions with members as part of the design phase of Appreciative Inquiry. Within these sessions, you will have an opportunity to brainstorm and explore innovative ideas to advance the profession with regard to wellness and prevention.

—Amy Sheeley, PhD, RD, LDN; Healthy Aging DPG Delegate
THE SUMMER HAS PASSED, and these days were filled with legislative events and requests. As we move into the end of 2016, nutrition policy continues to be a highlight of our advocacy efforts. Here is a rundown of items.

NATIONAL DIABETES CLINICAL CARE COMMISSION ACT
The National Diabetes Clinical Care Commission Act (H.R. 1192/S586) has been introduced to the House and Senate. The bill has passed the House and is pending action in the Senate. This legislation creates a commission comprised of diabetes experts, including registered dietitian nutritionists (RDNs) and other health care professionals who treat diabetes, such as patient advocates and representatives from the federal agencies most involved in diabetes care. More specifically, the Commission will pursue the following goals:

• Consist of private-sector experts such as endocrinologists and other health care professionals who treat diabetes, such as patient advocates and representatives from the federal agencies most involved in diabetes care. More specifically, the Commission will pursue the following goals:

• Provide a formal mechanism for federal agencies to receive consistent and direct clinical expertise and a practical perspective from professionals who work directly with patients.

• Identify and evaluate current federal quality improvement activities and critical gaps in efforts to support clinicians in providing integrated, high-quality care.

• Make recommendations regarding clinically-based activities supported by federal resources to maximize their effectiveness in improving the quality of care for patients with diabetes and its complications.

• Assist in the development, coordination, and evaluation of clinical resources and tools produced by federal agencies; also assist in disseminating this information to health care professionals and patients in their communities.

• Evaluate innovative care models and outcomes-based registry data for providing optimal, cost-effective care.

• Evaluate the U.S. Department of Health & Human Services (HHS) diabetes screening program, annual wellness visit, and other prevention activities that may reduce diabetes and its complications; identify problems related to the utilization of programs and data collection.

• Forward recommendations to Congress and the secretary of HHS within three years and then sunset legislation.

• Operate with existing funds at no additional cost to the government.

UPDATE: PUBLIC ADVOCACY IN WASHINGTON, D.C.
With a change in the structure of the Public Policy Workshop, the Academy is holding quarterly advocacy meetings to attract more involvement for Washington, D.C. meetings. Its first advocacy meeting took place September 26 in collaboration with partner organizations from the Defeat Malnutrition Today coalition. This first meeting focused on older adult malnutrition in the acute-care setting, and malnutrition of older adults is the focus of this new coalition. The goals of Defeat Malnutrition Today are:

• Achieve the recognition of malnutrition as a key indicator and vital sign of older adult health

• Work to achieve a greater focus on malnutrition screening and intervention through regulatory and/or legislative change across the nation’s health care system.

Along with working with Defeat Malnutrition Today, the Academy has submitted to Centers for Medicare & Medicaid Services electronic measures (eMeasures) for its quality-improvement initiative. Working the National Quality Forum, the Academy defined the following eMeasures for the acute care setting:

• eMeasure #1: Completion of Malnutrition Screening within 24 hours

• eMeasure #2: Completion of Nutrition Assessment for Patients Identified at Risk for Malnutrition

• eMeasure #3: Nutrition Care Plan for Patients Identified as Malnourished after a Completed Nutritional Assessment

• eMeasure #4: Appropriate Documentation for a Malnutrition Diagnosis

continued on page 7

Comment and Content Reviewers Needed

We need people for these volunteer roles:

• Respond to legislative reviews

• Call for comments

• Serve as an expert reviewer

If you would like to provide your expertise, please contact me.
Legislative Update
continued from page 17

Look for more information via action alerts and in the next newsletter for updates and results of this initial advocacy meeting.

PUBLIC POLICY LEADERSHIP AWARD 2016
The Academy selects up to two Congresspersons each year to be honored for their legislative service and support for nutrition, food, and health issues. This year, Representative Diana DeGette (D) of Colorado received the 2016 Public Policy Leadership award. The Colorado Academy of Nutrition and Dietetics nominated Representative DeGette and presented her award September 19, 2016 in Denver, Colorado. She is serving her tenth term in Congress. Representative DeGette is the co-chair of the House Diabetes Caucus and serves on the House Committee on Energy and Commerce. She also sponsored the Preventing Diabetes in Medicare Act (known as H.R. 1686 in 114th Congress) and the Eliminating Disparities in Diabetes Prevention, Access, and Care Act of 2015 (known as H.R. 2651 in the 114th Congress).

RECENT LEGISLATIVE NEWS
On September 28, 2016, the Federal Register posted the notice of the final rule Medicare and Medicaid Programs; Reform of Requirements for Long-Term Care Facilities. (Click here to see the PDF version of this rule.) The published date was October 4, 2016. The regulation goes into effect November 28, 2016.

Long-term care providers affected by this rule must comply and implement this regulation based on staggered effective dates, which are outlined in the final rule. Over time, The Spectrum will provide you with interpretive guidelines, as well as upcoming survey and certification policy memorandums, to guide you as you navigate this process.

GET INVOLVED AND STAY CONNECTED!
Be on the lookout for upcoming action alerts. These do make a difference, and each alert literally takes seconds for you to complete. As one officeholder stated during a Hill visit this past year, “Oh yes, we do hear from you, and thank you.” Every comment matters, and one person can make a difference.

Our DPG’s annual report for last year is now available. Please click the graphic at left to access the full report.
Author Opportunities

The Spectrum is searching for articles from RDNs and dietetics students. We may publish it as a self-study CPEU article. Topics include (but are not limited to):

- Integrative medicine and older adults
- Iron and zinc, dietary and supplemental
- How physical activity prevents age-related diseases
- Risky food-consumption practices and older adults
- Cost-cutting strategies for nutritious meals
- Supplementation safety and older adults
- A topic that you suggest

If you are interested in becoming an author, or would like to suggest a possible author or topic, please contact Robin Dahm (dahmRD@gmail.com). Author guidelines and a topics pick list are located on the HA DPG website.

Healthy Aging
Dietetic Practice Group

Our Mission
Empowering and supporting members to be food and nutrition leaders promoting life-long wellness.

Our Vision
Optimizing longevity and wellness in aging through food and nutrition.

Get Up to Speed on Telehealth

Telenutrition involves the interactive use, by a RDN, of electronic information and telecommunications technologies to implement the Nutrition Care Process (nutrition assessment, nutrition diagnosis, nutrition intervention/plan of care, and nutrition monitoring and evaluation) with patients or clients at a remote location, within the provisions of their state licensure as applicable.

Are you interested in participating in this emerging field? The Academy has developed new resources to guide you.

LEARN MORE
KO: How did you become interested in the field of nutrition?
BR: Actually, my first career was as a musician. I played trumpet and received a music scholarship. Afterward, I was selected for the Army Band, traveling and performing for several years. Upon my return to civilian life, I was eligible for the GI Bill, so I returned to college. In taking a general nutrition course, I fell in love with nutrition. I think this happened because the instructor shared her love for nutrition. With that class, I found my passion and knew where I wanted to go. I began my second career—in nutrition.

KO: And now you focus on nutrition care for older adults and people in long term care.
BR: In 1987 I saw an ad for a multi-facility nutrition consultant. It sounded interesting and offered extensive training. I worked in that position for a few years and then moved on to become a regional director of nutritional services, and then a corporate director. In 1999 I started my own consulting business. The field has been very rewarding and fulfilling to me. I have never regretted a day of it.

Today the world of nutrition and aging offers so many opportunities, such as wellness, prevention and management of chronic disease at various locations, post-acute care with home health or assisted-living centers, and long term care.

KO: When did you get involved in nutrition policy?
BR: I became actively involved in nutrition policy while I was president of the Indiana Academy affiliate. I learned that policy efforts to protect the public and promote “best practice” nutrition can be successful only when we work with our political system for its support of laws. Understanding how laws are implemented by their administrators (such as the Centers for Medicare and Medicaid Services, and the U.S. Food and Drug Administration) is necessary. We have to be embedded in the process of determining nutrition policy and defining who provides nutrition services, along with payment for those services.

In 2010, I received the American Dietetics Association’s Grassroots Excellence Award, and not too long afterward was asked to serve with ANDPAC (Academy of Nutrition and Dietetics Political Action Committee) board of directors and was the 2013–2014 ANDPAC chairperson. I have also been working with the Academy’s CMS Workgroup since 2011. However, policy experience isn’t necessary to participate in policy efforts. We all care for our patients and clients, and we want to receive appropriate pay for our efforts, which means we all have to be interested in policy.

KO: You are a member of IMPACT. Can you tell us more about it?
BR: The IMPACT (Improving Medicare Post-Acute Care Transformation) Act was signed into law in 2014, and its implementation timeline spans from 2014 to 2022. During this time, the complete post-acute care system is continued on page 22

Help Us Shine the Spotlight!

We are searching for HA DPG members to interview for The Spectrum’s “Spotlight on Your Colleagues” column. Have you or a colleague walked an interesting career path? Is your practice innovating solutions for older adult clients? Do you or a colleague perform ground-breaking research?

We need your help to discover individuals whose work is quietly having a positive impact on our field. Please e-mail Robin Dahm the name and contact information of one or more individuals you would like to see spotlighted. Thank you!
being revamped. The Centers for Medicare and Medicaid Services (CMS) is developing standardized, interoperable assessment and quality measures, along with value-based payments rather than payment for services. Payment will depend on the quality of the services measured by these quality measures. I was excited to be a part of the Academy’s task force that developed practitioner tools and resources for post-acute care nutrition services. These are available at the Academy website.

**KO:** What do you like to do when you aren’t working?

**BR:** I have two adorable pet shih tzus that I love spending time with, and I also enjoy gardening, shopping for antiques, and woodworking. I recently restored an antique barn door and turned it into a kitchen island.

**KO:** Any advice for our members?

**BR:** For those just entering the field, I would recommend they get involved in their state affiliates to meet others working in the same field, and that they join DPGs to learn more about their areas of practice.

Be out there. Look for opportunities. Once you build your skill sets, be sure to network and reach out to help others. The rewards will come back to you tenfold. I’ve had a rewarding career, and it’s due to all of those people who opened doors for me and encouraged me to move forward. Surround yourself with people who make you a better clinician and person, and remember to focus on “excellence” and not “perfection.”

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**HEALTH PROFESSIONALS** have a new resource in assessing the health needs of their older adult patients, “Older Americans 2016: Key Indicators of Well-Being.”

The 179-page report from the Federal Interagency Forum on Aging-Related Statistics includes 41 indicators of health for the population aged 65 years and older, provides resources for health professionals and policy makers, and identifies areas that require additional support.

This publication groups the indicators into six categories: population, economics, health status, health risks and behavior, health care, and environment. It also includes a special section dedicated to informal caregiving.

The full report is available for download as an 8MB PDF. In addition, spreadsheets containing data from individual sections of the report can be downloaded as Excel files, and charts used in the report are available to download in a PowerPoint file.

The report is the seventh from the forum, which is comprised of 16 federal agencies, and included insights from the Department of Agriculture.
The Spectrum newsletter

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