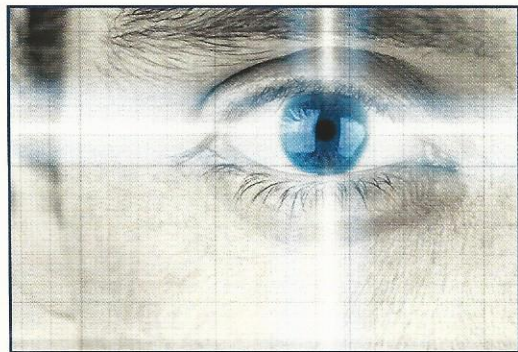


Bruce Bullock, MD

Personalized Medical Practice

In Our Sights: Sharper Focus on Macular Degeneration Offers New Hope



Treatments have likewise advanced. Last fall, a decades-old drug used to treat HIV/AIDS was reported in *Science* as unexpectedly exhibiting the capability to halt retinal degeneration. Nucleoside reverse transcriptase inhibitors, known as NRTIs, are already FDA-approved and can be rapidly and inexpensively translated into therapies for both dry and wet AMD (see sidebar), say the study's authors. At the same time, a nanosecond laser treatment was successfully used to reduce drusen (small fatty deposits beneath the retina) and the thickening of Bruch's membrane, both hallmark features of early AMD. Importantly, the structure of the retina remained intact, suggesting "this treatment has the potential to reduce AMD progression," according to *Medical News Today*. Stem cell transplantation shows enormous promise, as reported in *Lancet*, with sight restored long-term to a group of patients with severe vision loss. Additionally, injectable drugs and pills that target inflammation associated with AMD are in nationwide trials.

Technological innovations to help AMD patients include the 2013 introduction of a miniature telescope implanted behind the iris to magnify images. Google is developing a patent for a contact lens containing a built-in camera that will enable audible warnings via a remote device, detect and describe faces, and act as a text reader.

Today's AMD patients have no shortage of low-vision aids to help them adapt and live well. Computers, electronic magnifying devices and lighted spectacles enlarge printed materials, as well as a profusion of large print and electronic books, e-book readers and audio books. Additional solutions range from 'smart' thermostats, watches and remote controls to talking devices.

Finally, understanding who is at risk for developing AMD can be key to prevention. These include: white, female, smoker, family member with AMD, high blood

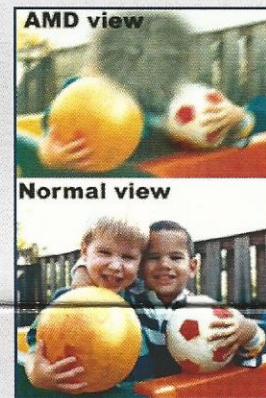
In the not so distant past, age-related macular degeneration (AMD), characterized by a loss of central vision, was deemed just another unfortunate consequence of growing older. The gradual breakdown of light-sensing retinal tissue that results in a blind spot directly ahead has caused each generation to struggle with driving a car, reading a printed page or recognizing a friend's face. As the population ages, the sheer number of people affected grows rapidly. Another case of AMD is diagnosed every three minutes in the U.S. More than 2.1 million Americans with advanced AMD now will grow to 3.7 million by the year 2030, according to the National Eye Institute, who warns the condition will soon take on aspects of an epidemic. A surge of clinical trials and investigative research aims to prevent that from happening, with sights set firmly on restorative, curative solutions.

Scientists exploring the possible causes have made much progress isolating a group of genes that increases the likelihood of an individual developing AMD. Other studies point to inflammation as the trigger. The macula needs a constant, rich blood supply to work correctly, and any interference such as narrowing of the blood vessels, fatty plaque deposits, or a shortage of antioxidants, can cause the macula to malfunction and become diseased.

When Dry Becomes Wet

Diagnosis of AMD is first confirmed with a visual acuity exam and testing with an Amsler grid. Those with AMD see the grid's straight lines as wavy or blurred with dark areas at the center. Additional tests help determine the type of AMD – the dry form affects about 85 percent of AMD patients, and in about 10 to 15 percent of cases, progresses to wet. The difference is significant. The wet form usually leads to more serious vision loss, caused by new blood vessels that leak fluid and blood beneath the retina, resulting in permanent damage.

While no treatment currently exists for dry AMD, in the last decade, a number of effective therapies have been implemented for wet AMD. These include monthly, intraocular injections (anti-VEGF) to inhibit a protein that stimulates formation of new blood vessels, photodynamic or 'cold' laser treatment, thermal (heat) laser photocoagulation...and on the horizon are topical eye drops that may someday replace injections. Nutritional supplements containing antioxidant vitamins, lutein and zeaxanthin are also effective in reducing the chances of dry AMD worsening to wet.



pressure, lighter eye color, obesity, and possibly, over-exposure to sunlight. To minimize risk, follow a healthy diet with plenty of leafy green vegetables and fish high in omega-3 fatty acids, exercise to keep weight and blood pressure under control, eliminate tobacco use, and wear sunglasses to protect from UV rays and high-energy visible (HEV) radiation.



Nutrition Corner

Find Your Roots with Winter's Best Veggies

While they may not have the crisp appeal of sugar snap peas or the sleek appearance of a summer tomato, winter's bounty of root vegetables and greens brings some of the year's most nutrient-rich dishes to the table. Serve up as chips or gratins, roasted or braised, mashed or raw, in soups or salads... see our recommendations for a taste of the season below.

If you like kale, try collard greens, a super-green that can be thinly sliced and used in salads, or braised with mushrooms for satisfying flavor without meat. Anti-inflammatory, antioxidant (cancer preventive) and cholesterol-lowering nutrients are on the long list of benefits.

Looking for low-carb substitutes for mashed or fried potatoes? Pureed cauliflower makes a delightful stand-in for mashed potatoes, especially when blended with Greek yogurt. Less common are Romanesco, an excellent source of vitamins C and K, fiber and carotenoids; Kohlrabi, with edible roots, leaves and stems packed with potassium and Vitamin C; and Celeriac, also known as root-celery, containing antioxidants, Vitamin K and phosphorus. For a healthy alternative to French fries, consider Jerusalem artichokes, or sunchokes, with a mellow taste and flaky texture, and plenty of energy-boosting iron and cholesterol-lowering soluble fiber. Slice matchstick-thin, mix in a sprinkle of vegetable oil, rosemary, cayenne, salt and pepper and bake for 15 minutes. Or enjoy a baked sweet potato, skin and all, for a winter treat that's high in Vitamin A and fiber, with a minimum of calories.

Beets, high in folic acids, offer crunch, color and taste. Sautee with garlic and some olive oil or use in soups for a nutritional boost.

Change up onions with leeks, which have a milder, sweeter flavor, and compounds such as allicin that fight free radicals in your body and flavonols that may help fight cancer and lower the risk of heart disease.

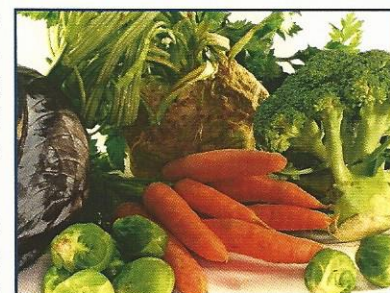
Carrots are always a sturdy choice, rich in beta carotene, a compound that may reduce heart disease and certain types of cancer (although supplements are not recommended, especially for smokers), and Vitamin A, which bolsters vision and bone growth. Parsnips offer a change of pace, with a sweet flavor, double the fiber of carrots, potassium and folate for cardiovascular benefits, and almost 40 percent of the daily requirement of Vitamin K, a nutrient associated with bone health.

Winter squash, in a variety of shapes, colors and flavors, are rich in Vitamins C and A, and can be boiled, baked, roasted, simmered, steamed, microwaved or sautéed. For a low-calorie alternative to pasta, try spaghetti squash which yields long yellow strands when cooked. Sweet potato fans will enjoy butternut squash, with a similar sweet nuttiness and an even silkier texture.

Broccoli contains calcium, folate, iron, protein, Vitamins A and C and fiber, and is versatile enough to steam, roast, stir fry, puree for soups or eat raw.

Give winter salads a spin with a bowl of curly endive, radicchio, beets, fennel, kohlrabi and turnip greens. Roast or boil until tender and dress while still warm to allow the flavors to be completely absorbed.

There are many more choices in the produce aisle...go browse your local grocery store and try something new this winter!



HEALTHWISE

Personalized Medical Practice

Bruce Bullock, MD

From the desk of Bruce Bullock, MD

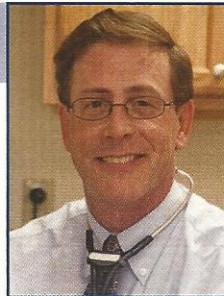
Dear Patient:

Happy 2015! If you are starting out the new year with a resolution to eat more healthily, we hope you'll consider trying the pick of the winter crop - root vegetables. We have unearthed some of the most nourishing treats of the season, and if you're seeking low-carb but tasty alternatives to mashed potatoes and French fries, you'll discover them in our Nutrition Corner.

Winter is also the time when many patients are concerned about their intake of Vitamin D, and ask how to maintain the appropriate levels of this essential nutrient. Take a look at some of the research regarding the "sunshine vitamin" we've included in this issue. You'll see at the present time there is no consensus on the amount of Vitamin D necessary for health and if blood tests measuring Vitamin D levels are helpful...however, we'll be monitoring the results of a nationwide trial in progress now that will give us some definitive answers by 2017.

Research into age-related macular degeneration, one of the leading causes of vision loss in older adults, is also yielding some promising answers. Advances in both technology and gene therapy are providing more than just a glimmer of hope, but may ultimately lead to restorative cures. If you or a family member are one of the more than two million people currently living with the condition, I encourage you to read through some of the latest findings in *HealthWise*.

Wishing you a year of good health,
Bruce Bullock, MD



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How Much Vitamin D Do We Really Need?

In the multi-lettered world of vitamins and minerals, why did Vitamin D move to the top of the list...and should it be there? Following is a look at the paradox of the "sunshine vitamin," critical to the body's healthy function in numerous ways, but may not be important enough to warrant regular screenings, according to the latest national recommendations.

The undisputed connection between Vitamin D, the sun, and bone strength was established early in the 20th century, when doctors discovered that sunlight triggers the production of Vitamin D and helped cure rickets in children. Essential for strong bones, Vitamin D helps the body absorb calcium. Unlike other vitamins, however, it is naturally present in very few foods (fish like salmon and mackerel, eggs, mushrooms and commercially fortified milk). Dr. John Cannell, who founded the Vitamin D Council to better advocate for its use, cautions: "It's nearly impossible to get what you need from food."

For many Americans, lack of sunshine except during the short summer season poses a concern because exposure to the sun is necessary to turn a chemical in the skin into Vitamin D. Even in sunny climates, people who spend most of their day indoors or faithfully apply sunscreen are at risk of Vitamin D deficiency, according to research that emerged in the 2000s. Low levels of the vitamin were increasingly linked to a litany of the world's ills—cancer, heart disease, diabetes, arthritis, even depression. By 2012, researchers had discovered that Vitamin D

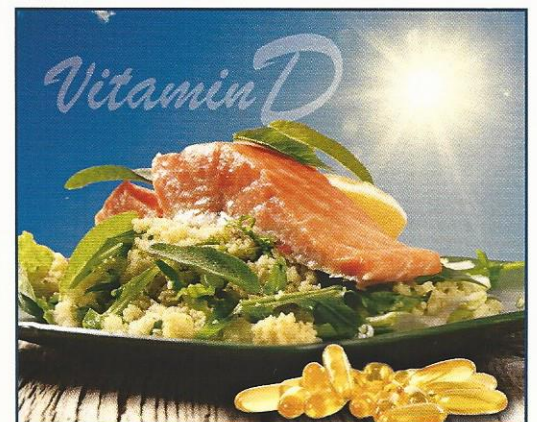
receptors were found not only in the intestines, but in many other organs.

"We know that basically every cell in your body has a Vitamin D receptor; it has been found in the brain, skeletal muscle, colon, breast, prostate, and the list goes on," Dr. Michael F. Holick, a prominent expert at Boston University Medical Center, told *Endocrine News*.

Additional research bolstered the importance of Vitamin D, such as a recent *British Medical Journal* study that tracked more than 95,000 participants for nearly 40 years to find that genes associated with permanent low levels of Vitamin D raised the risk of early death by up to 40 percent. However, the study's author cautioned that the relationship was not proven to be causal and therefore, no recommendations for supplements can be made.

The chicken-egg conundrum is explained by Dr. JoAnn Manson, Professor of Medicine at Harvard Medical School: "We're at a crossroads because we really don't know if there's a cause and effect relationship between Vitamin D status and outcomes such as heart disease and cancer." Obesity and lack of exercise contribute to higher rates of cancer and heart disease, so those factors could explain the illnesses, rather than a low Vitamin D level, she said.

In fact, despite the mountains of research, the U.S. Preventive Services Task Force (USPSTF) stated late in 2014 there is insufficient evidence to justify taking



mega-doses of Vitamin D to prevent chronic diseases, and did not recommend regular testing of blood levels. All eyes are now on the national, 26,000-participant VITAL trial, which will conclusively report in 2017 the effects of Vitamin D or fish oil on reducing the risk of cancer, heart disease and stroke.

Different medical experts suggest different guidelines for Vitamin D supplementation. The Institute of Medicine's guidelines state 600 IU (International Units) for ages 14 to 70, and 800 IU for age 71 and above; the Endocrine Society recommends 1,500-2,000 IU per day, and the Vitamin D Council advises "safe, sensible sun exposure, and if that's not possible, 5,000 IU a day."

Please call my office for recommendations on the right amount of Vitamin D for you.