DIET AND NUTRITION SUPPLEMENTATION
IN AGE-RELATED MACULAR DEGENERATION

From Clinical Care to Understanding PQRS

Highlights from a Roundtable Discussion

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CONTENT SOURCE
This continuing education (CE) activity is based on a roundtable discussion held on Wednesday, October 24, 2012, in Phoenix, Arizona.

TARGET AUDIENCE
This educational activity intends to educate optometrists.

OVERVIEW
Age-related macular degeneration (AMD) affects more than 1.75 million individuals in the United States. Owing to the rapid aging of the US population, this number will increase to nearly 3 million by 2020. Researchers forecast that cases of early AMD will increase from 9.1 million in 2010 to 17.8 million in 2050. With so many affected, intervention is essential. One of the greatest ways that optometrists can help patients is by providing solid recommendations about diet and nutritional supplements at all stages of AMD, but, most importantly, as early as possible. The selection of supplements is vast, and discerning the best recommendation for an individual patient can become confusing. This CE monograph evaluates the evidence and offers practical advice on the appropriate nutritional intervention for various stages of AMD. The monograph also incorporates practical pearls on reporting the Physician Quality Reporting System (PQRS) measures for AMD.

LEARNING OBJECTIVES
Upon completion of this activity, optometrists will be better able to:
- Describe the role of key nutrients in AMD pathophysiology
- Determine the appropriate nutrients and eye health supplements for each stage of AMD or AMD risk
- Counsel patients on appropriate dietary modifications and nutritional supplements to help prevent or treat AMD
- Understand the PQRS guidelines relating to Measure 140 and be able to properly code claims so that they are counted toward current and future PQRS requirements

ACCREDITATION DESIGNATION STATEMENT
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INTRODUCTION

Advanced-stage age-related macular degeneration (AMD) affects more than 1.75 million individuals in the United States. Owing to the rapid aging of the US population, this number will increase to nearly 3 million by 2020. More troubling still, researchers forecast that cases of early AMD will increase from 9.1 million in 2010 to 17.8 million in 2050.

With so many affected, intervention is essential. One of the greatest ways that optometrists can help their patients is by providing solid recommendations about nutrition and nutritional supplements. In fact, estimates indicate that progression to choroidal neovascularization and geographic atrophy could be reduced by 25% with nutrient therapy. But, at which stage of disease progression should this counseling take place, and what supplement formula should we recommend to patients, since no 2 cases are alike? The following roundtable discussion evaluates the numerous variables and offers practical advice on how to most effectively counsel patients, using good science as well as good sense.

THE STAGGERING EFFECT OF AMD

Dr Gerson: We all know that the number of cases of AMD is growing. But let us discuss the effect of this disease on quality of life (QOL). How does AMD really affect your patients on a personal level?

Dr Smick: We have all seen patients with bruises from falls caused by loss of part of their field of vision. It is painful and frightening for the patient.

Dr Ferrucci: Yes, patients are afraid of losing vision. In fact, studies show that people are more afraid of going blind than they are of dying.

Dr Gerson: AMD has an enormous effect on our lives, but how does it affect all of us financially?

Dr Ferrucci: The American Journal of Ophthalmology recently published a data analysis using Medicare claims data from 1997 through 2009. The authors evaluated patterns of disease progression to compare costs over time; the results clearly suggested that halting or slowing progression using proven treatments, such as Age-Related Eye Disease Study (AREDS)-endorsed vitamins or novel technologies, substantially lowers public health expenditures.

Dr Smick: Keep in mind, though, that the statistics in that study are a little misleading because, at the beginning of the study, anti-vascular endothelial growth factor (VEGF) agents were not yet widely used. These injections are expensive and would have driven the cost model up significantly.

Dr Gerson: This is likely 1 reason the government chose to include macular degeneration in the Physician Quality Reporting System (PQRS). See “Understanding PQRS”, page 4.

Dr Gerson: Measuring macular pigment optical density (MPOD) is very important in patients with or at risk for developing AMD. The more dense an AMD patient’s macular pigment is, the better the patient’s visual acuity and contrast sensitivity function. A healthy macular pigment results in decreased glare, chromatic aberrations, and photophobic pain. With that in mind, let us discuss the key nutrients that make up the macular pigment and the usefulness of measuring density.

Dr Shechtman: The 3 components of the macular pigment are lutein, zeaxanthin, and meso-zeaxanthin. These 3 human macular pigments block ultra-violet (UV) light and are strong antioxidants. It has been shown that a higher dietary intake of lutein and zeaxanthin is associated with decreased likelihood of having advanced AMD or large or extensive drusen.

Dr Ferrucci: The carotenoids also play a big role in glare recovery and photopic recovery.

Dr Gerson: This is definitely something worth talking to patients about. Not only can we say we are going to try to help prevent their vision from getting worse, but we may be able to help them have better quality of vision and better visual function.

Dr Ferrucci: The other issue is that we need to start initiating the discussion of nutrition when patients are 20 or 30 years old, not when they are 75, because by the time they have frank AMD, it is too late to be talking about prevention.

Dr Shechtman: I agree. There is research, however, showing that using lutein and zeaxanthin at a later age does have benefit.

Dr Gerson: In other words, it is never too early, nor is it ever too late, to discuss and implement supplementation strategies.

Dr Smick: I do not have a densitometer to measure MPOD. What can I do instead?

Dr Gerson: There are other ways we can tease out similar information. You can ask the patient some fairly simple questions to gauge fruit and vegetable intake and ask if he or she is light-sensitive. Knowing whether a patient is overweight or not, and knowing whether he or she smokes or not also will give you an idea of the range that patient’s MPOD is likely to be. Without the ability to objectively measure MPOD, such a subjective assessment serves as a fairly good surrogate for determining a patient’s risk level.

Dr Smick: I agree, but I have spoken to colleagues who say they alter the nutritional recommendation—sometimes cutting it back—based on the densitometer results they get at follow-up. That would be an example of a real benefit of actual measuring, would it not?

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Understanding PQRS

Dr Gerson: What exactly is the PORS system, and why was it developed?

Dr Brownlow: PQRS stands for Physician Quality Reporting System (formerly known as the Physician Quality Reporting Initiative). In effect, Medicare has identified certain procedures as being beneficial to patients’ overall health and therefore less costly in the long term. In order to encourage more doctors to perform these procedures, the government is willing to provide a financial incentive to practitioners who perform them.

Dr Gerson: Is PQRS the same thing as Meaningful Use?

Dr Brownlow: No. They are 2 separate programs. Meaningful Use is affiliated completely with electronic health care records. The PORS program provides an incentive payment to practices with eligible professionals who satisfactorily report data on quality measures for covered physician fee schedule services furnished to Medicare Part B Fee-for-Service beneficiaries.

Dr Gerson: What PQRS measures pertain to AMD, specifically?

Dr Brownlow: Measures 14 and 140. Measure 14 requires the eye clinician to perform a dilated macular examination and Measure 140 requires counseling on an antioxidant supplement, which would include, for example, counseling on the AREDS recommendations. To qualify for incentives related to these measures, the correct codes and qualifiers must be reported on at least 80% of eligible instances if reporting via registry-based reporting, or 50% of the eligible instances if reporting via claims-based reporting.

Dr Gerson: Please explain the codes—which ones do we use and when?

Dr Brownlow: Proper reporting is critical. I recommend selecting 4 applicable measures, so that if you encounter problems with 1, you still have some cushion. The AMD measures should definitely be on this list because, more than likely, you are already performing the necessary procedures. For example, if you have a patient with AMD (ICD-9 codes 362.50, 362.51, or 362.52), you are going to be doing an annual dilated macular examination, and in all likelihood, more than 1 per year. Because you are doing at least 1 dilated examination each year, you will be reporting the measure 2019F. By doing so, you will have attained one-third of the qualifications for the PORS bonus. AMD counseling on antioxidant supplements for patients with one of the same diagnoses should trigger the application of 4177F. By reporting these 2 measures related to AMD (2019F and 4177F) on 50% of the claims that include 1 of the AMD diagnosis codes (362.50-362.52), you will have attained two-thirds of the qualifications for a 0.5% PORS bonus. And that is an example of using only AMD codes.

Dr Gerson: So if we do all of this, how much of a bonus can we expect?

Dr Brownlow: For reporting-years 2012 through 2014, eligible professionals who satisfactorily report PQRS measures will earn an incentive payment equal to 0.5% of allowed charges. Additionally, for reporting-years 2011 through 2014, eligible professionals who satisfactorily report PQRS measures can qualify to earn an additional 0.5% incentive payment if they are board certified and participate in a maintenance of certification program for 1 year, as well as successfully complete a qualified maintenance of certification program practice assessment.

Dr Gerson: That sounds good, but for many practitioners it may not amount to very much. This may explain why, in 2010, less than 10% of optometrists who treated Medicare patients earned a PQRS quality bonus. Other than the financial incentive, what other reasons are there for participating?

Dr Brownlow: In a report to members, American Optometric Association president Dori Carlson, OD, indicates that Medicare and other health insurers are moving to ‘value-based’ or ‘pay-for-performance’ reimbursement, which makes understanding and participating in programs such as PORS increasingly important. As optometric physicians, we want to make it clear that we are players in the health care system and, if PQRS is 1 measure of the fact that we are players, then it is important that we participate as frequently as do our colleagues in ophthalmology.

Dr Smick: Optometrists talk about how much they document their charts, but in the end, it is the billing diagnosis and the procedure that triggers this quality data code.

Dr Brownlow: The diagnosis is key. If any of the diagnoses that are covered by PQRS are appropriate to be listed as a diagnosis that is germane to a particular patient visit, then that should automatically trigger the use of that particular measure. For example, if 362.50 is one of the diagnoses germane to a particular visit, and it appears on the chart in the assessment plan section, you should automatically enter a 2019F code on the claim form right below the entry of the office visit for the day.

Dr Smick: Also a 4177F to indicate that you counseled the patient.

Dr Gerson: My understanding is that at this point, there is no penalty for failing to report quality measures, but at some time in the future there may be.

Dr Brownlow: That is correct. The bonuses will remain at 0.5% through 2014, and penalties are set to begin in 2015, at which point eligible professionals who do not satisfactorily report under PQRS will be subject to a payment adjustment equal to 1.5% of their Medicare Physician Fee Schedule allowed charges. The payment adjustment increases to 2.0% in 2016 and beyond.

Dr Gerson: What if you did not counsel a patient on nutritional supplements, for whatever reason?

Dr Brownlow: The guidelines are generous. If you did not counsel a patient for a valid reason, that counts, too—assuming you have entered the measure on the claim form, with the modifier explaining why the measure was not done at that visit. Similarly, if you did not do the counseling at the current visit, but had done it during the previous 12 months, you still get credit for it—again, simply by reporting the measure on the claim with the appropriate modifier.

Dr Gerson: The bottom line with PQRS is that if you are practicing appropriately you are already doing what it takes to receive the bonus, so proper coding is all it takes to gain recognition and ensure that your practice is rewarded accordingly.


**THE POWER OF A PROPER DIET**

**Dr Gerson:** What does the word “supplement” mean to you?

**Dr Shechtman:** To me, it means “in addition to”.

**Dr Gerson:** I agree. So I think that we need to drive home the fact that these nutrients are supplements, not substitutes. Accomplishing this can be very challenging—especially with older patients who have been eating a certain way their entire lives.

**Dr Smick:** So the burden is on us to make sure that our patients understand that, even though they are taking these nutritional supplements, they still need to follow a good diet and maintain a healthy lifestyle.

**Dr Gerson:** Exactly. Most of us are aware of research that claims that 3 servings or more of fish per week will result in an approximately one-third risk reduction for developing macular degeneration. But, in fact, the Blue Mountains Eye Study shows that as little as 1 serving of fish per week can result in a 40% reduction in the incidence of age-related maculopathy.

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**WHEN TO USE AN AREDS FORMULA**

**Dr Gerson:** AREDS is the most well-known supplementation trial in eye care. But, is an AREDS formula appropriate for everyone with AMD?

**Dr Ferrucci:** No one treatment is right for every patient, whether it be vitamins for AMD or an antiglaucoma medication for those diagnosed with glaucoma. You have to weigh the pros and cons for the individual patient. For instance, there is a concern that the beta-carotene in AREDS formulas might increase the risk for lung cancer in smokers.

**Dr Smick:** So, who should get an AREDS formula? Dr Ferrucci, for whom do you recommend AREDS formulas?

**Dr Ferrucci:** Part of the original AREDS study showed a 25% risk reduction in patients with moderate or worse AMD. The study was not able to show a positive effect in patients with...
mild or less-than-mild AMD. So certainly, in patients with moderate or worse AMD, recommending an AREDS formulation makes sense. For others, you need to make a concerted effort regarding the wisdom of prescribing an AREDS formula. To some extent, patient expectations often guide my decision in such situations.

Dr Gerson: I would take it a step further: I absolutely do not use an AREDS formula with patients who have mild dry AMD because the science has not confirmed that it is beneficial and because of the potential negative effects of the AREDS formula. The high amount of zinc in AREDS can have potential adverse side effects. And studies have shown that beta-carotene is not very preventative; plus, the high level of vitamin E in AREDS could have negative effects in some patients. I think we consider an AREDS formula much as we do a prescription medication—it has potential side effects.

Dr Gerson: When to use an AREDS2 formula

Dr Gerson: We do not know exactly when we will have results of the AREDS2 clinical trial, but we anticipate it sometime before the end of 2013. Do you think that it is going to create a paradigm shift in how we treat patients?

Dr Gerson: I agree with you on recommending a lutein zeaxanthin-based supplement, and additional fish oil (1000 mg a day between EPA and DHA) if someone does not have adequate fish intake. But, I would caution against recommending a straight AREDS2 formula for patients with less than moderate-to-advanced AMD because it has high amounts of vitamin E and there have been studies that show one does not need these mega doses of supplements to get a positive effect.

Dr Shechtman: The omega-3 is crucial when it comes to the moderate stage of the disease, particularly for its anti-inflammatory effects. And, it may decrease the chances for the advanced stage of geographic atrophy.

Dr Gerson: Each patient has unique risk factors and a different lifestyle. Because of this, we really need to individualize which supplements we recommend. The evidence from randomized controlled clinical trials for patients with early-stage AMD that would support a definite recommendation does not yet exist.

Supplement warnings and potential adverse effects

Dr Gerson: We have touched a little on the fact that some supplements can have negative effects on certain patients. What do we know specifically about vitamin E?

Dr Shechtman: A large meta-analysis looked at vitamin E intake in 135,000 patients and found an increased association in total mortality from all causes. A dose-response analysis (≥400 IU) showed a statistically significant relationship between vitamin E and all-cause mortality. I am a bit cautious when making vitamin E recommendations in individual patients, such as those taking warfarin.
Dr Smick: Another nutrient of concern is zinc. AREDS2 is studying reduced zinc to evaluate if lower amounts of zinc compared with those in AREDS will alleviate some of the problems with urinary tract infections and latent Alzheimer disease.

Dr Gerson: It is unrealistic to think that our patients will get enough of these nutrients from their food, and so the value of discussing the importance of a good diet with our patients becomes a pressing issue.

THE ROLE OF GENETIC TESTING

Dr Gerson: Dr. Smick, I know you have been doing some genetic testing in your office. Why do you find that of value?

Dr Smick: Genetic testing is a great management and communication tool. When I tell a patient that I am going to start watching him or her a little more closely because of a risk of developing a sight-threatening disease, it really gets that patient thinking about his or her lifestyle and prompts the decision to make changes. Without genetic testing results, it is more difficult to get patients to modify their lifestyles. The genetic testing also helps my clinical decision making because the results dictate how soon I need to see a patient for follow-up. If, suddenly, a high-risk patient shows up with new drusen, I will not take a wait-and-see approach. Instead, I will immediately start considering next steps.

Dr Gerson: Please comment on the billing and economic ramifications regarding genetic testing.

Dr Smick: Genetic testing is revenue-neutral to the patient, and will have minimal cost, if any, passed on to the patient. The laboratory charges the patient, and often the patient may not have to pay. Nevertheless, these tests are an expense to the health care system, which is why I would not order them for a 75-year-old with mild AMD. But there certainly are patients who can benefit from genetic testing. If we get at-risk patients treatment sooner rather than later, thanks to a genetic test, we can save the health care system a great deal of money.

Dr Gerson: The cost incurred by performing genetic testing is a small price to pay if it allows you to provide better prevention. This saves the health care system tremendous amounts of money in the long run, and helps a person’s QOL if you can save vision in an eye!

DIFFERENCES IN SUPPLEMENTS

Dr Smick: Most of us do not have a laboratory for testing various supplements. Do we need to be concerned about the quality of brand X over brand Y? Some physicians will tell the patient to get a particular combination of ingredients wherever it can be found, under any label. What do you think about that?

Dr Gerson: That is a great point. First, when you prescribe something to your patient, you want to make sure that he or she is actually taking what you prescribed. Second, there is a big difference between 10 mg of lutein in one supplement and that in another if they are different types of lutein. Not all brands are the same.

Dr Ferrucci: We all have brands that we prefer and recommend. There are many brands available and it is virtually impossible to be familiar with each one, but when I recommend a certain brand, I tell the patient, “This is what I think is the best for you, so please do not take something else without checking with me to make sure it is as appropriate as what I am recommending.”

Dr Shechtman: I think one of the easiest ways to do this is to stay with reputable companies. There are new formulations of vitamins appearing on shelves every day. Researchers in a study looked at 22 commonly encountered products sold as ‘eye nutrients’ at local pharmacies and health food shops compared each product’s ingredients with the current AREDS recommendations and found that only 2 matched the dosage profiles recommended in AREDS, thus emphasizing how important it is for doctors to make the right recommendations for their patients.

~Are There Hidden Dangers in the Use of Multivitamins?

One study that garnered the attention of clinicians and the mainstream media was the recent Iowa Women’s Health Study, which looked at the use of multivitamins. The study found that several commonly used dietary vitamin and mineral supplements may be associated with increased total mortality risk. But that is not the whole story. A closer look at the study reveals some explanations for the higher mortality rate. For instance, the mean age was 61.6 years at baseline, and the association was strongest with supplemental iron.

Nonetheless, the report frightened a lot of people, including many of our patients who chose—perhaps prematurely—to discontinue taking a multivitamin. There will always be reports, like this one, that contain useful information that may be taken out of context. This further illustrates why it is so important for optometrists to take a close look at each patient’s entire health status and to discuss and customize a supplement prescription accordingly.


~Available Genetic Tests for AMD

- Macula Risk from ArcticDx
- RetnaGene from Sequenom
- AMD Risk Assessment from Asper Ophthalmics
- Laboratories at some universities
INDIVIDUALIZING CARE FOR PATIENTS WITH INTERMEDIATE OR ADVANCED AMD

Dr Gerson: We have determined that, in our patients with intermediate or advanced dry AMD, we use an AREDS-type supplement. But should we be adding in carotenoids or an omega-3?

Dr Shechtman: For an intermediate or advanced stage of the disease, whether the patient smokes or not, I use the smoker’s formula with the addition of lutein over beta-carotene. I also believe that 1000 mg of an omega-3 (composed of 350 mg DHA and 650 mg EPA) is critical at this stage.

Dr Ferrucci: I also have started to recommend 1000 mg of omega-3 (350 mg DHA/650 mg EPA) for my intermediate-or-worse AMD patients, and have begun using this dose of omega-3 in my patients with early AMD who also have additional risk factors such as family history, because the addition of omega-3 seems relatively safe and may have other health benefits besides AMD prevention.

Dr Smick: The benefits of MPOD testing might come into play when determining the need for carotenoid supplementation. If, for instance, a patient has very dense macular pigment, he or she may not need to supplement with lutein and/or other carotenoids.

Dr Gerson: Indeed. As much as we would like to say that every patient with mild AMD should have this supplement or that treatment, each patient is a little bit different when it comes to individualized medicine. It is our job to put the pieces of the puzzle together.

INDIVIDUALIZING CARE FOR PATIENTS AT RISK FOR DEVELOPING AMD

Dr Gerson: Let us consider a patient who does not have any retinal findings, but does have a number of risk factors, including a poor diet and a family history of AMD. Should you discuss supplements with this patient?

Dr Ferrucci: I think discussion is always appropriate. I talk to at-risk patients about vitamins and explain to them that, in their particular case, we do not know scientifically if taking any vitamins may help. From there, follow the patient’s interest level. Some patients want to be very proactive and others do not. For the proactive patient, a good starting point, in my opinion, is 10 mg of lutein and 2 mg of zeaxanthin, along with perhaps 1000 mg of omega-3.

Dr Smick: In at-risk groups with no family history of AMD, it is important to consider the cost of using supplements. Many of my patients simply cannot afford the cost of supplements.

Dr Gerson: True. Sometimes we can achieve as much good by convincing a patient to decrease body mass index (BMI) and to cut the glycemic index of food intake. Some patients prefer this more holistic approach of improving diet and whole body health as opposed to using an eye-specific supplement. I also mention to my patients that it is not only important to have sufficient vegetable and fruit intake, but that the right types and variations of these nutrients should be taken into consideration.

Dr Shechtman: I evaluate individual dietary intake and needs before making any recommendations. Behavioral modification is critical at this stage. Because of their protective capabilities, I do find carotenoids to be beneficial for those at risk for AMD.
COUNSELING PEARLS

**Dr Gerson:** What is your advice to optometrists on how to most effectively communicate with patients about AMD?

**Dr Smick:** Be frank and honest. Do not gloss over things. You have to be straightforward and explain that there is a very real risk involved.

**Dr Gerson:** Do you think it is important to offer the supplements in your office?

**Dr Smick:** No, but I do feel that it is very important that we prescribe, not just recommend. We are not as effective if we say, “Well, you should probably get something with some lutein and some zeaxanthin, and just go down to the corner grocery and you will probably find it there.” I think we need to write it out for the patient.

**Dr Ferrucci:** The one thing that I try to explain is that AMD is not just an eye disease: AMD is related to overall systemic health. This opens the door to a discussion about diet, weight loss, smoking, and exercise.

**Dr Smick:** Does anyone have any recommendations on how to initiate a discussion about BMI with patients? It is such a touchy subject.

**Dr Gerson:** I think we all need to come to grips with the fact that discussing issues such as weight and BMI is an important part of the medical care that we provide.

**Dr Smick:** Then perhaps we should include mention of BMI on one of the many forms that our patients fill out before their visit. “How much do you weigh?” and “What is your height?” –2 simple questions that would alleviate a lot of discomfort.

**Dr Gerson:** One of the most useful educational tools we have in our office is a handout, very basic but to the point. The opening statement is “You do not have AMD.” Following that, it states, “However, because of your risk factors, we are recommending the following treatment.” We list several different products and circle the exact one that we want for that particular patient. I am confident that handouts like this can go a long way toward educating patients.

**Dr Shechtman:** The bottom line is that an educated patient becomes a more compliant patient.

**Dr Gerson:** Nutritional support truly is an area in which we can make a big difference and really help our patients.
REFERENCES


1. Researchers forecast that cases of early AMD will increase from ________ in 2010 to ________ in 2050.
   a. 9.1 million / 17.8 million
   b. 7.8 million / 9.1 million
   c. 9.1 million / 18.7 million
   d. 17.8 million / 19.1 million

2. According to AREDS, AMD progression to choroidal neovascularization and geographic atrophy could be reduced by ________ with vitamin therapy.
   a. 15%
   b. 25%
   c. 35%
   d. 45%

3. Which PQRS measures pertain to AMD?
   a. Measures 14 and 16
   b. Measures 140 and 141
   c. Measures 14 and 140
   d. Measures 16 and 160

4. To qualify for incentives related to Measure 140, the correct codes and qualifiers must be reported on at least _____ of eligible instances if reporting via registry-based reporting or _____ of eligible instances if reporting via claims-based reporting.
   a. 50% / 50%
   b. 70% / 50%
   c. 50% / 80%
   d. 80% / 50%

5. With a denser MPD, patients should have:
   a. better visual acuity and better contrast sensitivity function
   b. decreased visual acuity and decreased contrast sensitivity function
   c. better visual acuity, but decreased contrast sensitivity function
   d. no measurable difference in either visual acuity or contrast sensitivity function

6. The carotenoids that compose the MPD are:
   a. lutein, omega-3, and zeaxanthin
   b. lutein and zeaxanthin
   c. omega-3, zeaxanthin, and meso-zeaxanthin
   d. lutein, zeaxanthin, and meso-zeaxanthin

7. Failure to report PQRS measures will result in a 1.5% payment reduction in _______ and a 2.0% payment reduction in ________.
   a. 2013/2014
   b. 2014/2015
   c. 2015/2016
   d. Never

8. Research indicates that higher dietary intake of lutein and zeaxanthin has been associated with:
   a. decreased likelihood of having advanced AMD
   b. decreased likelihood of having early-stage AMD only
   c. increased likelihood of progression to late-stage AMD
   d. decreased likelihood of progression of any stage AMD

9. How might you determine a patient’s risk level in the absence of a densitometer to measure MPD?
   a. Inquire about fruit and vegetable intake
   b. Ask if he or she is light-sensitive
   c. Ask if he or she is Hispanic
   d. Both a and b

10. Meso-zeaxanthin is found only in the:
    a. cornea
    b. central fovea
    c. retina
    d. conjunctiva

11. The Blue Mountains Eye Study shows that as little as _____ serving(s) of fish per week can result in a _____ reduction in the incidence of age-related maculopathy.
    a. 2/30%
    b. 1/40%
    c. 3/50%
    d. 4/60%

12. What is a good food source for obtaining lutein and zeaxanthin?
    a. spinach
    b. salmon
    c. wheat bread
    d. almonds

13. What is a good food source for obtaining omega-3?
    a. Brussels sprouts
    b. cereals
    c. oysters
    d. canned tuna

14. The AREDS formula contains _____ of zinc as well as _____ of beta-carotene.
    a. 0 mg/0 mg
    b. 40 mg/25 mg
    c. 80 mg/15 mg
    d. 90 mg/5 mg

15. The Women’s Antioxidant and Folic Acid Cardiovascular Study showed that, among other things, _______ helped reduce the incidence of AMD.
    a. folic acid
    b. vitamin B12
    c. magnesium
    d. both a and b

16. AREDS2 is not studying:
    a. effects of supplements on early AMD
    b. effects of supplements on cataract formation
    c. effects of eliminating beta-carotene on the development and progression of AMD
    d. effects of reducing zinc on the development and progression of AMD

17. When treating a patient with early-stage AMD, which supplements merit extra caution when prescribing?
    a. supplements containing vitamin E
    b. supplements containing meso-zeaxanthin
    c. supplements containing lutein
    d. supplements containing zeaxanthin

18. Which of the following conditions has/have been associated with higher levels of zinc intake?
    a. urinary tract infections
    b. Alzheimer disease
    c. prostate cancer
    d. all the above

19. Why might the Iowa Women’s Health Study have found an increased total mortality risk associated with the use of multivitamins?
    a. Mean age was 61.6 years at baseline
    b. Many of the study participants were taking supplemental iron
    c. All participants were white
    d. Both a and b

20. When discussing fish oil/omega-3 with patients, it is important to point out:
    a. fish oil can cause bad breath
    b. how much EPA/DHA should be in the formulation
    c. 1000 mg of fish oil is adequate
    d. all fish oils are the same quality, so the cheapest is usually the best option
DIET AND NUTRITION SUPPLEMENTATION IN AGE-RELATED MACULAR DEGENERATION

From Clinical Care to Understanding PQRS

Highlights from a Roundtable Discussion