Supplement to

November/December 2019

MODERNOPTOMETRY

THE IMPORTANCE OF COLLABORATIVE CARE FOR PATIENTS WITH DIABETIC RETINOPATHY

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A CE activity provided by Evolve Medical Education LLC.

This activity is supported through an unrestricted educational grant by Regeneron Pharmaceuticals and Carl Zeiss Meditec.

The Importance of Collaborative Care for Patients With Diabetic Retinopathy

Release Date: October 26, 2019
COPE Expiration Date: October 2022

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CONTENT SOURCE

This continuing education (CE) activity summarizes content captured from a roundtable discussion.

ACTIVITY DESCRIPTION

Diabetic retinopathy is the most common ocular complication of diabetes, responsible for more than 10,000 new cases of blindness yearly in the United States. This activity focuses on information for optometrists, as their role is crucial in educating patients with diabetes about the potential ocular complications of their systemic disorder and the benefits of diabetic eye exams and early treatment.

TARGET AUDIENCE

This certified CE activity is designed for optometrists involved in the management of patients with diabetes.

LEARNING OBJECTIVES

Upon completion of this activity, the participant should be able to:

- **Discuss** the increasing prevalence of diabetes and diabetic retinopathy
- **Identify** which patients need to be screened earlier based on their disease state
- **Explain** to patients the need for early referral to retina specialists
- **Summarize** how diabetic eye disease may affect patients with visually significant cataract and initiate appropriate treatment for these patients
- **Discuss** how imaging devices may be able to provide earlier diagnosis of disease or disease progression

GRANTOR STATEMENT

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COPE Course ID: 65119-PS
COPE Activity ID #118319

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DIGITAL EDITION

This supplement is part of a curriculum entitled *Then, Now, and Tomorrow: Evolving the Management of Diabetic Retinopathy and the Role of the Optometrist*. To view the full curriculum, please visit https://evolvemeded.com/course-group/then-now-and-tomorrow-evolving-the-management-of-diabetic-retinopathy-dr-and-the-role-of-the-optometrist/.

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PRETEST QUESTIONS

Please complete prior to accessing the material and submit with Posttest/Activity Evaluation.

1. Rate your level of confidence in your ability to diagnose and screen patients with diabetic retinopathy (DR) and diabetic macular edema (DME):

a. Not at all confident
b. Not very confident
c. Neutral
d. Confident
e. Very confident

2. Rate your level of confidence in your ability to triage and refer patients with DR and DME:

a. Not at all confident
b. Not very confident
c. Neutral
d. Confident
e. Very confident

3. A 42-year-old female patient with an 8-year history of diabetes presents for her annual eye examination. She has been referred by her endocrinologist after complaining about her vision becoming blurry. What tests are you likely to perform at this first visit?

Add a check mark to the items below that are consistent with your current clinical practice.

Action	Consistent	Not Consistent
Take detailed history of present illness discussing visual complaints, signs, and associated symptoms		
Proceed with an ICG angiography		
Perform B scan ultrasonography		
Perform tonometry		
Complete dilated posterior segment examination		
Perform color vision testing		
Assess visual acuity		
Complete Amsler grid monitoring		
Implement anterior segment examination		
Recommend AREDS vitamins		
Perform fundus photography		
Take axial length measurements		

4. Which systemic medication has been shown to slow the progression of diabetic microvascular complications, including DR?

a. Thiazolidinediones
b. Fenofibrate
c. Beta blockers
d. Aspirin

5. Which imaging technique is most useful in detecting DME?

a. B-scan ultrasonography
b. Fundus autofluorescence
c. Spectral-domain optical coherence tomography (SD-OCT)
d. Adaptive optics

6. A patient with a hemoglobin 10.4% presents to your office and funduscopic examination reveals microaneurysms, numerous dot blot hemorrhages, and scattered cotton wool spots in both eyes. What vision-threatening complication of DR is a patient like this at highest risk of developing over time?

a. Vitreous hemorrhage
b. Neovascular glaucoma
c. DME
d. Macular ischemia

7. According to the Centers for Disease Control and Prevention, approximately how many people with diabetes in the United States were undiagnosed as of 2015?

a. 7.2 million
b. 23.1 million
c. 70 million
d. 224 million

8. Which of the following is a recommended part of the vision examination for a patient with diabetes?

a. Visual field
b. Comprehensive dilated eye examination
c. Ultra-widefield imaging
d. Fundus photo

9. Which of the following best describes a patient who should be referred to a retina specialist?

a. A patient with diabetes, no matter the severity
b. A patient with mild disease
c. Every patient with moderate disease
d. A moderate patient suspected of having disease progression

10. In patients with diabetes, the risk for swelling following cataract surgery is _____.

a. No different from patients without diabetes
b. Less than in patients without diabetes
c. Greater than in patients without diabetes
d. Unknown

11. Which type of imaging is most commonly used by optometrists?

a. Fundus photography
b. OCT Angiography
c. SD-OCT
d. All of the above

12. The RISE/ RIDE and VISTA/VIVID studies showed anti-VEGF treatment _____.

a. Prolongs disease progression
b. Has no effect on mild disease
c. Induces neovascularization
d. Prevents progression and reduces vision loss when used earlier

13. In the PANORAMA trial, how many patients treated every 8 weeks had at least a 2-step improvement from baseline?

a. 0%
b. 15%
c. 65%
d. 80%

The Importance of Collaborative Care for Patients With Diabetic Retinopathy

This roundtable discussion brought together some esteemed eye care providers to review the current state of diabetic retinopathy (DR) evaluation, when to refer, and how to best manage patients. There have been major changes during the past 10 to 15 years in how DR is classified and treated, and not all providers approach these things in the same manner. This discussion is meant to produce awareness of how optometrists and retina specialists currently manage patients with DR, as well as provide insight into the future that will most likely see increased collaborative care, allowing for the best outcomes for patients.

—Eric Nudleman, MD, PhD, Moderator

DISEASE PREVALENCE

ERIC NUDLEMAN, MD, PHD: There have been major changes in the past 10 to 15 years in how we diagnose and treat DR. Let us begin with discussing the prevalence of DR.

EHSAN RAHIMY, MD: Since the 1990s, our entire country has rising rates of diabetes.[1] This makes me think of the cities where I completed my medical training and fellowship—all of which were urban centers with populations with high rates of diabetes. When I arrived in the San Francisco Bay Area, my colleagues were joking how we were no longer seeing diabetes. But that couldn't be further from the truth. We see it everywhere in this country, but what is different is the socioeconomic status of our patients, combined with the restrictions of working in different types of health care systems in different parts of the country. That's what makes diabetes such a multifaceted and challenging disease to manage. It's not just where you're practicing, it's the other factors that play into a patient's condition.

MARK T. DUNBAR, OD, FAAO: I think we're really facing a huge epidemic in the years to come.

DR. NUDLEMAN: The number of individuals diagnosed with diabetes in 2015 was 23.1 million, with an estimated undiagnosed population of an additional 7.2 million people.[1]

NATHAN STEINLE, MD: This is a global epidemic. Estimates suggest that by 2040, which is not that far away, we're going to have more than a half billion people with diabetes.[2]

If you break it down from there, 224 million will have some form of DR and the 70 million will have vision-threatening DR.[2] That's a huge number.

Q | **DR. NUDLEMAN:** Of the patients who have DR, how many of them are being screened in your region?

KATHERINE B. LYNCH, OD, FAAO: Oftentimes it comes down to access to care in general. It depends where we're working, but I often wonder if the patients we're seeing have proper access to care. Are they seeing a primary care doctor? Do they even know they're at risk? There are so many people with undiagnosed disease, not only with diabetes, but high blood pressure, etc.

At least in our area, which serves an urban population, we're seeing a lot of patients who didn't know they were at risk. They've been diabetic for many years before we even are able to see their retina and see that they have retinopathy.

DR. DUNBAR: I think the number is about 40%. It hasn't really changed during the past 10 years. About 60% are having some form of an eye exam, but 40% are still not recognizing the need to have it. And probably that's an underestimate.[3]

JOHN D. PITCHER III, MD: The 60% may not be getting adequately screened, in my opinion. They may be going every 3 years. They may not be adhering to some of the guidelines from the American Academy of Ophthalmology and American Academy of Optometry for screening based on their severity level.

DR. NUDLEMAN: In our own health care system where I practice in California, for people who are already within the system receiving appropriate care from primary medical doctors, our capture for patients with diabetes to get an eye exam is about 50% (unpublished internal data). If you include all the patients who are not receiving some form of health care, the numbers are likely much greater.

DR. RAHIMY: We're in a similar health care system to Dr. Nudleman, so we can keep track of a lot of these patients. When I joined this system, the big initiative was to do teleretinal screenings, and they were shocked to discover our screening rate was about 50% (internal data, unpublished).

DR. DUNBAR: Let's consider where we are with artificial intelligence (AI). We have already discussed that a significant number of patients with diabetes are not receiving routine eye care and given

the epidemic of diabetes appears to growing, there must be different approaches and avenues to address that. Look where AI is going; we may soon have the ability with screening photography to capture the retinal images of some of these people and be able to identify those with retinopathy.[4] The reality is, there's a segment of people that will never see a comprehensive ophthalmologist but would prefer to get their eye care in a convenient retail location or even by their endocrinologist/PCP while they are having their medical exam.

DR. STEINLE: It always amazes me when a patient comes into our office with a vitreous hemorrhage and they ask how it happens. When you tell the patient it's from their diabetes, they are nearly always surprised that the disease can impact their eyes in that way. It's just a foreign concept to some people. We definitely have to get that message out there.

BARRIERS TO SCREENING AND TREATMENT

Q | **DR. NUDLEMAN:** Less than a third of diagnosed patients with diabetes return for DR screening at least every 15 months. We know we have some challenges to overcome. Transportation generally affects people in a working age population and so there's issues with time off of work. If you adjust for demographics, those living more than 8 miles from an eye care facility are less likely to be compliant.[5] Dr. Pitcher, your patients are from a very large geographic area. How does that affect your patients?

DR. PITCHER: We have patients who drive 4 hours for treatment. They have access locally to screenings, but the treatment is administered in our urban center, and that is a huge burden for patients to make that trip. We rely on our network of general ophthalmologists, and especially optometrists, to make the appropriate diagnosis and appropriate referral.

DR. NUDLEMAN: AI certainly has some potential advantages. Dr. Rahimy is an expert in this technology. Do you want to tell us a how AI is expected to evolve in the coming years?

DR. RAHIMY: Dr. Dunbar did a great job touching base on the potential pivot points or areas where we can insert AI into the system. I think industry members and colleagues initially thought AI was going to the solution to many problems, but it really isn't. It's just a piece of the equation. Having automated analysis, sometimes called machine learning and deep learning, which are translated into algorithms that are going to basically interpret widefield images from different types of cameras to agree whether retinopathy is present or not is going to help in terms of being able to screen a huge patient population. Deploying it to remote areas to screen individuals who wouldn't normally have access is also a potential advantage, but how do you encourage these patients to come for treatment? How do we close that loop? I think that's an area that's been open to discussion.

DR. PITCHER: It's a balance between incentive and convenience. Many people have a diabetic screening because they went to their eye doctor for an eyeglass prescription. If they see you and you don't give them that, there's no real incentive to return for a lot of these patients who don't necessarily understand the gravity of the disease. If it's a patient who has advanced disease and has already lost vision, the incentive is very high to go through inconvenient measures to achieve care.

DR. LYNCH: I think so much of that hinges on education, as we discussed previously. Patients walk in with a vitreous hemorrhage and they had no idea it could even be possible. As Dr. Dunbar mentioned, so much of that comes down to a multidisciplinary approach to good care and education and discussing with our patients what the risks really are for the whole body, including the eyes.

DR. STEINLE: That's a good point. If you show the patient their fluorescein angiogram (FA), it's one of the few things that will change their behavior. If you tell them they're creatine is creeping up, or their heart is less healthy than it should be, it's so abstract that it doesn't often affect their daily life. But when it comes down to vision, people will usually make health care changes.

Q | **DR. NUDLEMAN:** Does anyone have experience with the recently approved platform that has integrated AI that allows a photograph to be interpreted by a machine and make a decision about the need for referral (IDx Technologies)? Has it has changed how we do things?[6]

DR. DUNBAR: I don't think it's changed anything yet. It would be easy to feel threatened by this technology but the reality is that it's not going to diagnose glaucoma or dry eye, so patient still will need to see their eye doctor. Rather, I think it's a glimpse of where technology is going to take us. And obviously it's not limited to DR or even eye care. But I think it's going to be an essential tool that helps move things forward to a place where we don't see the patient with vitreous hemorrhage walk in the door. We won't have to look at that patient and I think about how the system failed.

DR. NUDLEMAN: I entirely agree.

DR. LYNCH: What's striking about this is the number of images the AI platform can go through in a short amount of time.[4] And there are only so many of us and there are so many patients, 600 million people. I think there has to be a place for this where we can use it as a tool to make sure people who are at the highest risk are getting what they need.

DR. NUDLEMAN: I completely agree with Dr. Dunbar in that I think approval of the IDx platform may not have changed things currently, but the fact that the FDA approved this is evidence that they're open to this type of technology and being able to employ this in primary care specialist's office is a model that may be effective.

However, I think one potential limitation of IDx system is that the pictures taken are a narrow field. They are 50° images, and we all know that DR often begins in the periphery.[7]

DR. RAHIMY: The IDx system is only one platform and it is in its infancy as evidenced by how slow the uptick has been around the country. There's still a lot of issues regarding billing, reimbursement, and the payor system.

Potentially, Optos-related widefield imaging could become part of the next AI platform. In 2016, Verily partnered with Optos to develop solutions for earlier detection of DR and DME. More recently, Optos is teaming up with Google and Verily and that may be something coming down the pipeline.[8]

APPROACH TO SCREENING

Q | **DR. NUDLEMAN:** Let's first talk about the current situation. Dr. Lynch, walk me through what you would do with a patient who has a known history of diabetes, has been receiving treatment for diabetes for the past 5 years and now comes to see you for diabetic eye screening. You don't see any evidence of disease on examination. What's your approach?

DR. LYNCH: An examination for this patient would always include a dilated eye exam. You must perform a dilated eye exam to appropriately address the level of retinopathy.[9] I always discuss with my diabetic patients the need to have a dilated eye examination at least yearly, if not more frequently, depending on the level of retinopathy.

If the patient does not have DR, we have a discussion about what's ahead for that patient in the long-term. We discuss the risks of vision-related complications of diabetes, the reasons why we perform dilated eye exams and why is eye care important. I would see this type of patient on an annual basis.[9]

DR. DUNBAR: I agree 100%.

DR. STEINLE: Where I practice in California, many optometrists have Optos nonmydriatic ultrawide-field (UWF) imaging. Does that substitute for dilating in your minds?

DR. LYNCH: No, it does not substitute for a dilated eye exam and I don't think that meets the standard of care.

DR. DUNBAR: That could pose some legal issues, as well. I know in the state of Florida, at least on the initial visit, you must dilate.[10]

You can debate how often a patient with diabetes needs a dilated eye exam, but in my opinion, it should be annually (in the absence of retinopathy). If you're going to dilate and get UWF images, I think that's optimal, but recognize how difficult that would be.

DR. RAHIMY: Speaking to Dr. Pitcher's point about convenience, we see it happen with our optometry colleagues at our institution, when a patient is on lunch break and they want a quick examination. They don't want to have that dilated examination because of the inconvenience it poses to their daily activities. I have many patients come into my retina clinic and say they don't want their eyes dilated. That's when I ask, "Why are you even here in the first place?!"

DR. DUNBAR: In some practices, it is possible that the patient may force the issue and not have a dilated exam when they should. In our practice, we talk frequently about the importance of that exam. It's part of our culture. I tell the patient how the examination will let me know that he or she doesn't have a tumor or retinal tear or if they do have changes to their eyes related to their diabetes that aren't visible any other way.

DR. LYNCH: I'd like to believe, too, that in a practice where they weren't able to do a dilated exam, when clearly, it's indicated in the diabetic patient, that they are either rescheduling or they're sending them somewhere that will complete the exam.

WHEN TO REFER TO A SPECIALIST?

Q | **DR. NUDLEMAN:** Do you think a patient who has no overt DR needs a referral to a retina specialist?

DR. LYNCH: I do not.

DR. DUNBAR: I don't believe a retina specialist ought to see a patient who doesn't have retinopathy. I think they are busy enough when you consider the number of age-related macular degeneration and DR patients and everything else in between. If a patient wants to see a retina specialist, I think certainly they can, but the reality is that patients without pathology really should be managed by either the comprehensive ophthalmologist or the primary eye care optometrist.

Every optometrist looks at the retina. Period. There are plenty of optometrists in practice who grew up in an era before digital imaging and optical coherence tomography (OCT) who are great at examining the retina. All of us still need to rely on our clinical skills and abilities whether we take an image or not. Personally, I consider the indication for why I would do an OCT or a widefield fundus image. The presence of diabetic retinopathy is clearly a good indication to obtain these images.

Most optometrists feel very comfortable being able to recognize mild and moderate nonproliferative DR (NPDR), and these patients can be managed by the primary eye care provider. Any patient who I am suspicious of having severe NPDR I would send to a retina specialist.

DR. LYNCH: I agree, and we should be utilizing resources wisely, meaning only referring patients who actually need to be followed and treated by a retina specialist. I think it's with the patient who starts to tip over that moderate/severe line when we refer for treatment.

DR. NUDLEMAN: Do you routinely acquire imaging on patients who have a history of diabetes?

DR. LYNCH: I will perform imaging on patients for whom I suspect there is additional pathology related to their diabetes.

DR. NUDLEMAN: If there is no overt DR, then you do not get an OCT? You only dilate and look at the fundus?

DR. LYNCH: That's correct. I would say, the only exception to that may be if vision is poorer than expected and there doesn't seem to be a good explanation for that decrease.

DR. DUNBAR: I think Dr. Lynch and I are in unique situations. We both practice at academic university centers and there could potentially be a 2-hour wait for a patient to have fundus photo or OCT. For the optometrist in private practice who has a fundus camera readily available, he or she will likely take the picture because it's there and they can show the patient the image, whether it's for practice management or education. If I had an OCT and a camera readily available, I would take a picture and an OCT of every patient.

DR. LYNCH: I think more and more optometrists in private practice have imaging capabilities, not only fundus images but also very sophisticated OCT, in addition to widefield photos. So, I think it really varies.

DIFFERING PERSPECTIVES

DR. NUDLEMAN: I think this is a really interesting discussion, and it is the purpose of this group gathered for this round table discussion, because the perspective from retina specialists can be quite different from what Drs. Dunbar and Lynch have described.

We have found is that even in patients without overt disease, there's already microvascular damage.[11,12]

If you look by OCT angiography (OCTA) or contrast sensitivity for example, you already have a reduction in patients who have a history of diabetes, even without any hemorrhages in the eye.[13,14]

We have discovered with improvements in our technology that the extent of disease is often much worse than what we find on fundus exam. Widefield angiography has been particularly helpful to demonstrate that.[15,16]

DR. DUNBAR: What do you feel the referral guidelines should be? At what point do you want to see a patient? It's not realistic or even possible to acquire widefield angiography on the 30 million people with diabetes.[1]

Even if there are early microvascular changes, ie, mild disease, the risk of developing proliferative disease in a year is still very low (about 5% or less).[17]

As a result the recommended follow up schedule for these patients is 9 to 12 months. It might be helpful to note that with OCTA we're starting to see change even earlier and from a patient an education point, that maybe a call to action for the patient to do a better job of controlling their blood sugar/A1c. But, from a management perspective we wouldn't see that patient any earlier.

DR. PITCHER: I think Dr. Dunbar makes a really good point. Even with the changing paradigm and potential treatment of NPDR, all of those studies are based on classification of diabetes based on fundus photos or exams. Regardless of what the angiography shows, we still don't have good evidence to treat based on angiography.[18]

DR. LYNCH: Weren't those changes also present in the 1980s when they did Early Treatment Diabetic Retinopathy Study (ETDRS)? We weren't able to image the eye in ways we can now.

DR. NUDLEMAN: Regarding when I think patients should referred, I think any patient who has retinopathy of any degree would benefit from an exam from a retina specialist for a couple reasons. The first is because we have found the extent of the disease is often much worse than what you see on exam.[19]

Being able to perform an angiogram to show the patient how much disease is present may be impactful in terms of demonstrating to the patient to the effect of the disease. It is an opportunity to educate and encourage better control. Secondly, we've learned that treating with anti-VEGFs earlier in the disease prevents progression and reduces vision loss. That's been shown in retrospective data, in the re-evaluation of patients from RISE/ RIDE and VISTA/VIVID who were treated for DME.[20,21]

And also, from the prospective trials treating proliferative disease, you see regression of proliferation even in patients without edema.[22,23]

In the 52-week results of PANORAMA released earlier this year, 80% of patients who were treated every 8 weeks had at least a 2-step improvement in their disease score. In the group treated every 16 weeks, 65% improved by at least 2 steps from baseline.[24]

DR. DUNBAR: I would say that's not realistic. We're looking at a manpower issue; there just aren't enough retina specialists to be able to handle the demand as it is. And it's going to get worse.

DR. STEINLE: I don't think it's isolated to optometry. I think we're all under-classifying mild to moderate DR. On exam and in the color pictures, I'm typically a level below what is present. When I get the FA, I'm often surprised how much disease is present.

DR. DUNBAR: Even knowing this, I realize our retinal specialists see 80, 90, or more patients a day. And when you consider the number of intravitreal injections, that's not sustainable. Many patients with diabetes already have more health care visits than the average person without diabetes.[25]

I'm happy to send them if they want to see a retina specialist, but I don't think that's a good use of health care dollars for a retinal specialist to see every patient with mild or moderate NPDR.

DR. RAHIMY: I have two comments. First, I think what you're describing is largely region-dependent and practice-dependent. I agree with Dr. Nudleman in terms of my practice pattern. I encourage optometrists or comprehensive ophthalmologists to refer patients earlier rather than later. If for no other reason, it establishes a relationship with that patient. That first visit allows us to sit down and actually talk about their disease, show them whatever multimodal imaging we have and inform them that they may need treatment at some point in the future. As long as we've established that bond, it makes whatever they may need in the future that much easier to initiate when that time comes. Along those lines, I've encouraged our referring base to introduce the idea of injections, so

the patient is not shocked when I talk about putting a needle in their eye during the first visit with me.

Secondly, we're inundated with injections and retina specialists are very busy. That's part of the reason we're all here. The system is broken. We're reaching this breaking point, and I think to fix it will require thinking differently. For example, if we're seeing these patients earlier and showing them these images and doing more patient education from a variety of specialists, maybe we can prevent disease progression, so patients don't eventually need injections.

DR. PITCHER: I think a lot of this sorts itself out based on the providers in your area. I agree with Dr. Rahimy that it's great to be able to spend time with the patients and tell them not only you have a complication of diabetes but explain the treatment options. However, in a situation where you don't have enough time to have a discussion with every mild and moderate patient, which is the case for many retina specialists, I think this roundtable is a great opportunity for us to all share those thoughts so that the broad primary eye care community can be doing that education without necessarily having to refer. And there are certainly settings where there isn't time for an optometrist to have those discussions either. But in many communities, there are optometrists who are both capable, willing and excellent at delivering primary eye care and having those discussions on a medical basis with patients.

DR. LYNCH: The relationship between the optometrist and the retina specialist is also very important. In our clinics, we work closely with our retina specialists and we're very familiar with their thresholds for treatment, when they want to see patients, and their typical practice patterns. We are able to have those discussions and have a seamless transition of care to the specialist. I always encourage our students and residents to make those connections and form those bonds so that they're able to provide that kind of care once they are practicing independently.

DR. NUDLEMAN: Our discussion has touched on several topics relating to the burden of treating the increasing number of diabetic patients. The good news is that multiple companies are now developing drugs that appear to be longer lasting, including some with sustained delivery. That may have a role in treating patients so that we can prevent progression in patients with earlier disease.

DR. RAHIMY: Are most optometrists aware of the newer clinical trials in retina? Do they have access to clinical and real-world practice information related to retinal disease management?

DR. DUNBAR: I think that's going to take a while, but the message needs to get out. It is a paradigm shift. I think one of the reasons we have the larger pharmaceutical and device manufacturers investing money in clinical education is because we need to get that message to optometry.

If the science and data from clinical trials show that the sweet-spot for treating diabetic retinopathy is for moderate-severe NPDR, then all optometrist needs to know that. I think we all need to do a better job of making sure those patients are referred to the retina specialist.

DR. NUDLEMAN: That is a critical point—the transition from moderate to severe. Often when we examine a patient, even with UWF color imaging, my impression of the level of disease is usually less severe than it is on either reading center analysis or once we get additional imaging.

DR. LYNCH: Are you acquiring FA on all of your diabetic patients?

DR. NUDLEMAN: If they have retinopathy, I get a baseline angiogram. I want to see the extent of disease. I repeat the FA if I see evidence of proliferative disease.

DR. RAHIMY: I also get an FA on nearly every patient. I like it so I have a baseline, so I have something to compare in the future and show it to the patient for education purposes.

CATARACT SURGERY FOR PATIENTS WHO ARE DIABETIC

Q | **DR. NUDLEMAN:** Let's discuss cataract surgery in patients with diabetes. Does anyone approach these patients differently when scheduling cataract surgery? For example, a patient with some retinopathy but no edema.

DR. DUNBAR: It's important for the cataract surgeon to know the patient has diabetes. In terms of healing, it might take longer and if the patient has DME, that should be treated before cataract surgery.

DR. LYNCH: I agree. I think it's multi-step, You have to classify the stage of retinopathy and treat if there is edema. In our practice, we always refer patients with DME to the retina specialist prior to cataract surgery. In terms of the staging of retinopathy, our milder cases are going directly to the cataract surgeon, but a moderate stage DR patient would be referred to a retina specialist prior to cataract extraction. In our practice, our medication protocols are a bit different for diabetic patients, too. We start them on topical NSAIDs prior to cataract surgery, and we're comanaging that way because that risk for DME is so much greater.[26,27]

DR. NUDLEMAN: The risk for swelling after cataract surgery is much higher in diabetic patients. I know a lot of retina physicians who are pretreating before cataract surgery. Another critical point is getting imaging on those patients before they have cataract surgery, so you are aware of the extent of disease present. I think seeing a retina specialist before cataract surgery in patients with just moderate disease is a good opportunity to evaluate the situation before they go to the operating room.

DR. STEINLE: Something to watch for closely is the development of anterior segment neovascularization after cataract surgery.

DR. RAHIMY: Pretreating 1 to 2 weeks prior to cataract surgery with an anti-VEGF injection in a patient who has a history of DME, I think is a great way to ensure the patient's happiness postoperatively. One of the fastest ways to an unhappy postoperative cataract patient is someone who develops CME on top of their DME and

becomes much more difficult to treat afterward, where a single injection may have prevented that.

DR. STEINLE: Even having a patient with diabetes see a retina specialist before the cataract surgery, rather than after, may be a good idea. If it's before surgery, the patient knows there's a risk going into the cataract surgery in case there are complications.

DR. NUDLEMAN: That's exactly the reason to bring it up. As you know, cataract surgery has the perception of being very routine, with low risk and excellent outcomes. Patients expect to see perfectly afterwards. But, just having underlying diabetes puts the patient at increased risk for having postoperative edema.[26,27]

Therefore, seeing a retina specialist and having a baseline evaluation to determine how much ischemia is present and perhaps even pretreatment if they have a history of edema, I think is a good way to improve the outcomes and also manage expectations.[28]

CASE DISCUSSION

BONUS CONTENT: *For additional case discussions, please visit evolvemeded.com/online-courses/1908Supplement-2/.*

CASE

DR. PITCHER: This case highlights our discussions of when to treat and when to refer to a retina specialist.

This is a 48-year-old Native American woman who came in for her recommended follow-up for DR. She shared some ambiguous complaints of intermittent blurry vision, both near and far, and intermittent mild photophobia.

Her past medical history includes diabetes for 12 years, hypertension, high cholesterol, and she is currently taking the following medications: Insulin glargine, insulin, metformin, BASA, atorvastatin, losartan, amlodipine, pregabalin, omeprazole, levothyroxine, montelukast, and trazodone.

Her vision on today's visit is 20/30 in the right eye and 20/25 in the left eye. And that's corrected with her usual habitual lenses.

As with most every patient we see, we took an OCT (Figure 1) because those images often reveal pathology that we may not see on our examination. The OCT was unremarkable.

Based on this OCT, what is the next step for this patient in terms of what you would consider here for treatment and follow-up?

DR. STEINLE: Based on just this OCT, I don't see any significant macular edema. One point to mention is to make sure you look for the entire cube. Also, I always pay attention to the hyaloid (to assess if the hyaloid is elevated or not). This patient is age 48, so I expect the hyaloid to be down. I would bring this patient back in 6 months or so.

DR. PITCHER: Looking at the color photos (Figures 2 and 3) what do you see?

DR. DUNBAR: In the right eye (Figure 2), I see microaneurisms, dot blot hemorrhages, and some cotton wool spots superior nasally. I don't see venous beading. She doesn't have any DME, but, categorically, I would probably consider this moderate DR.

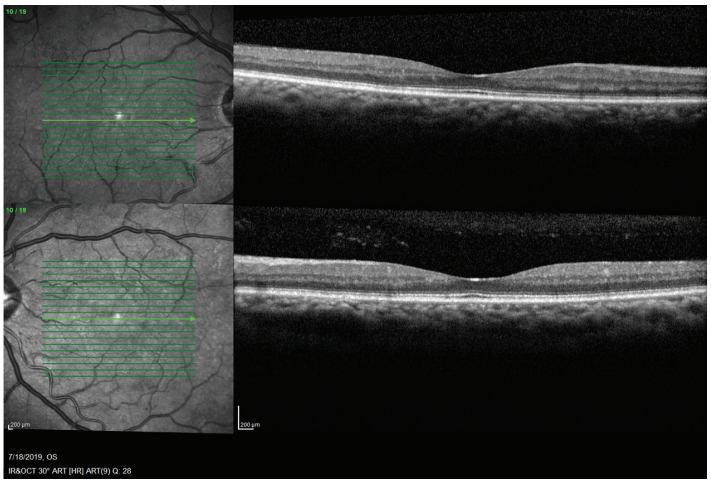

Figure 1.

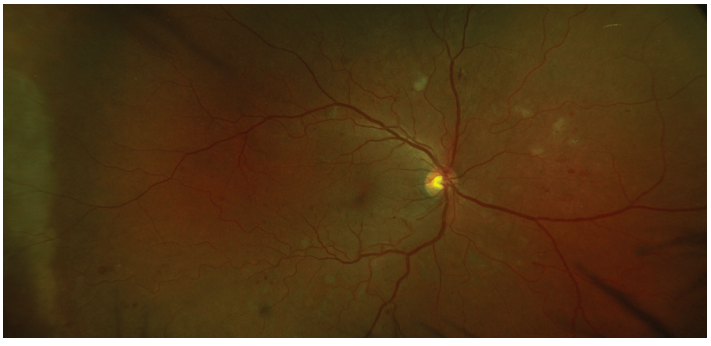

Figure 2.

DR. PITCHER: I agree. And what about this one the left eye (Figure 3)?

DR. DUNBAR: Maybe a little more hemorrhage. I don't have enough detail from the photo to see if a few areas represent intraretinal microvascular abnormalities (IRMAs). If I thought they were IRMAs, then the patient had reached the severe level of NPDR; I would say it's time to see a retina specialist.

DR. PITCHER: I thought there might be some IRMA here versus some neovascularization elsewhere, nasal to the disc, so I did an angiogram. You can see some early hyperfluorescence in these microaneurisms, and then quite a bit of peripheral ischemia, especially inferonasally (Figure 4). You also see some capillary dropout nasal where there's no perfusion in the peripheral retina. You can see angiographic edema and then the left eye is similar (Figure 5). Nasally you can see there are some areas of IRMA, which doesn't necessarily require a rating of severe; you can have moderate-severe with moderate IRMA.

But, in this case, for these purposes, I classify this patient as having moderate NPDR. Figure 6 shows the most recent OCT.

This patient had a sporadic follow-up going back to 2014 when I first saw her. Her OCT findings were similar; she never had center-involved

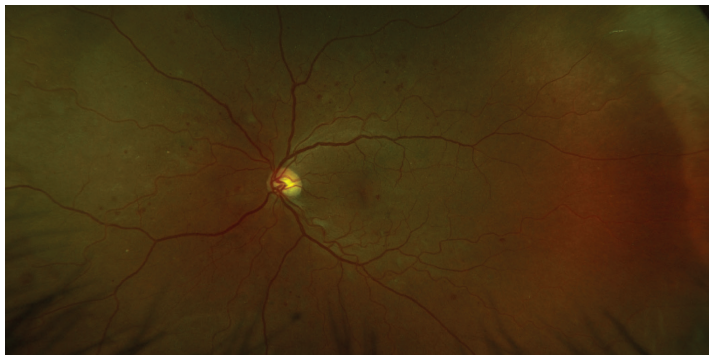

Figure 3.

Figure 4.

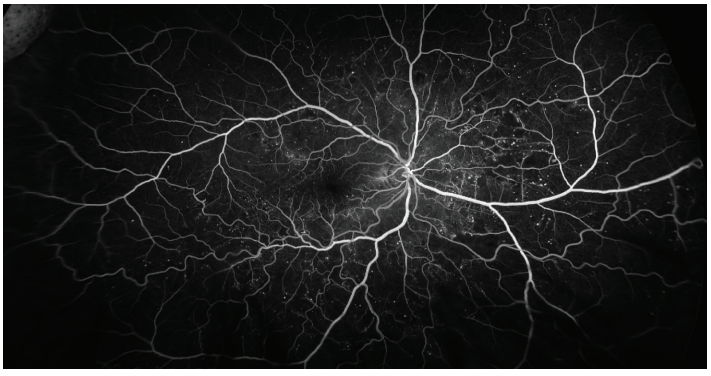

Figure 5.

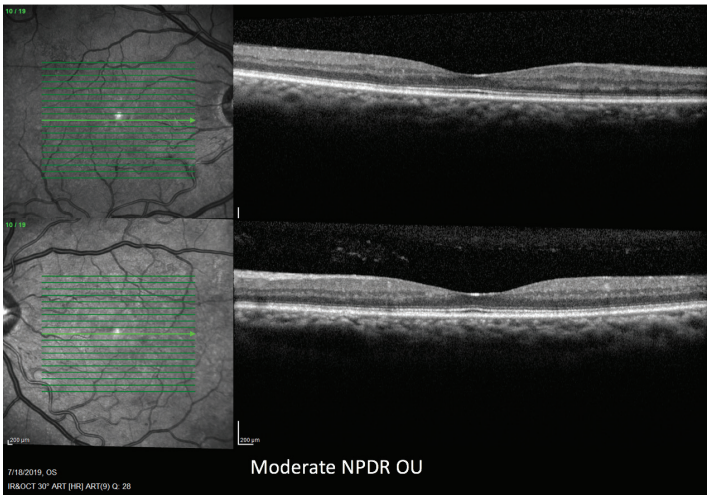

Figure 6.

edema; she never developed a proliferative event; and throughout all these visits, was classified as moderate nonproliferative. This is one of the first patients I saw when I started practice 5 years ago. My preference is to have a patient like this see their optometrist for those 6-month visits, until they reach a point of treatment, but this patient has stayed with me since 2014, so I was able to discuss with her the treatment options. And I think that's something that we all can do a better job of is talking about both systemic control and the evolving landscape.

The point is that retina specialists want to see the patient who can benefit most from treatment. With the PANORAMA data, we know the number needed to treat is three, ie, you need to treat three patients to get that one who benefits from injections.[29]

Moving to the severe category, the number needed to treat goes down to two. Because 50% of patients will develop a vision-threatening event. I really find that if we are going to see a patient, that severe cut-off point is a really important one. Right now, I'm still seeing patients once they develop NV or once they have center-involved DME. I think there is a role for earlier referral in that severe category. We know that half of those patients would benefit from treatment.

DR. RAHIMY: As retina specialists, our practice patterns and decision making are heavily driven by clinical trials data and outcomes. And simultaneously, this case beautifully illustrates how the time-point a patient enters the care system really drives what we're doing. If that patient was referred to me now, I would be more inclined to offer them intravitreal anti-VEGF therapy at the first visit base on some of our recent trial results from PANORAMA.[29] However, in this case, the patient was someone with whom Dr. Pitcher established a relationship lasting 5 plus years, starting when injections weren't routinely given for that disease severity and it would have been standard practice to just observe. But if I saw the patient now, I would potentially favor early treatment with intravitreal injections. It appears there is probably a component of overlying hypertension here, and even though this person has been stable for 5 years, you wonder at what point do they eventually develop neovascularization with all the IRMA present. I believe that moving forward, ideally, as a field we will strive to prevent PDR from happening in the first place rather than treating it once it develops. Especially when you have patients who are in the system and remaining compliant with their screening. I think in the future, whether that's a year, 5 years, 10 years from now, we're failing patients if we allow them to get to the point of NV.

DR. NUDLEMAN: I think some eye care providers would feel comfortable watching that patient. I do think they would benefit from treatment, but it would be reasonable to observe and bring the patient back in 4 months.

DR. STEINLE: I would probably watch the patient if I knew them well, and I trusted they would return for continued monitoring. But

if this patient came in for their very first visit, I'd be more prone to treat immediately since their reliability is unknown.

DR. PITCHER: And we don't treat patients in a vacuum. We treat the patient; we don't treat the pictures.

DR is one complication of diabetes that we can almost eliminate. With injections, you can reverse DR progression in the majority of patients. You can't do that with nephropathy, coronary arteries, neuropathy, or peripheral neuropathy. This is an incredible, powerful breakthrough medicine with which we can rewind the clock. And that resonates with a lot of patients and they want treatment at this particular time point. This particular patient was very resistant, hesitant. So, you have to weigh all those factors and have that relationship with the patient so that you can make that decision.

DR. DUNBAR: I think we all agree that this patient needs to see the retina specialist. Even though she doesn't have any neovascularization, she is at a point where it's critical to refer for consideration of treatment. Certain circumstances could defer that referral, for example, if it's a 4-hour drive or it's an inconvenience or difficult to get there, we might watch them a little bit closer. But I think that's the part of the relationship you establish with the patient.

DR. LYNCH: I absolutely agree. I think this is a patient who needs to be referred. And I do think that it comes down to the retina specialist to decide the risk/benefit for this particular patient.

DR. NUDLEMAN: These are great points. This patient has good vision, no edema for multiple years, has a few macular aneurysms and dot blot hemorrhages, but if you just look at the macula, it's not that bad. But when you look in the periphery, there's ischemia, cotton wool spots, and angiographic edema. This is a patient where early intervention could have a big impact.

CLOSING COMMENTS

DR. NUDLEMAN: I think we're lucky in eye care that we have an impact in our patients' quality of life. If a patient's vision is getting worse and we intervene and their vision improves, the patient is sometimes more willing to have better follow-up with endocrinology, etc. Controlling their diabetes can be a real battle for our patients, and we are fortunate because we often get results that are very impactful.

DR. RAHIMY: The issues we have discussed in terms of patients with diabetes are only going to become more challenging as the epidemic worsens. We're stuck at a bottleneck and it's not just in eye care. It's almost impossible for me to get a patient with PDR to see an endocrinologist in my own health system. This problem also happens with internal medicine doctors, family medicine doctors, etc. It's not just eye care providers.

DR. LYNCH: It's a big burden to the already-broken system. We have to figure out our most efficient path and how we reach the greatest number of people most effectively using the health care dollars and the resources that we have available.

DR. RAHIMY: We're in such a fortunate field of medicine that, collectively, as eye care specialists, we end up seeing these patients more than any other doctor. I think most patients really value the treatment and care we provide for them and they realize it makes such a big impact on their lives.

DR. NUDLEMAN: Often we're the window into the health care system. A large number of patients diagnosed with diabetes enter the health care system through the eye clinic. This gives us a chance, not just to impact their vision, but obviously to impact their lives. ■

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THE IMPORTANCE OF COLLABORATIVE CARE FOR PATIENTS WITH DIABETIC RETINOPATHY

Release Date: October 26, 2019
COPE Expiration Date: October 2022

INSTRUCTIONS FOR CREDIT

To receive credit, you must complete the attached Posttest/Activity Evaluation/Satisfaction Measures Form and mail or fax to Evolve Medical Education LLC; 353 West Lancaster Avenue, Second Floor, Wayne, PA 19087; Fax: (215) 933-3950. To answer these questions online and receive real-time results, please visit evolvemeded.com and click https://evolvemeded.com/online-courses/1908Supplement-2/. If you are experiencing problems with the online test, please email us at support@evolvemeded.com. Certificates are issued electronically; please be certain to provide your email address below.

Please type or print clearly, or we will be unable to issue your certificate.

Name _____ ❑ OD ❑ non-OD participant

Phone (required) _____ ❑ Email (required) _____

Address _____

City _____ State _____ Zip _____

License Number _____

OE Tracker Number _____

DEMOGRAPHIC INFORMATION

Profession
___ OD
___ NP
___ Nurse/APN
___ PA
___ Other

Years in Practice
___ > 20
___ 11-20
___ 6-10
___ 1-5
___ <1

Patients Seen Per Week (with the disease targeted in this educational activity)
___ 0
___ 1-5
___ 6-10
___ 11-15
___ 16-20

Region
___ Northeast
___ Northwest
___ Midwest
___ Southeast
___ Southwest

Setting
___ Solo Practice
___ Community Hospital
___ Government or VA
___ Group Practice
___ Other
___ I do not actively practice

Models of Care
___ Fee for Service
___ ACO
___ Patient-Centered Medical Home
___ Capitation
___ Bundled Payments
___ Other

LEARNING OBJECTIVES

DID THE PROGRAM MEET THE FOLLOWING EDUCATIONAL OBJECTIVES?	AGREE	NEUTRAL	DISAGREE
Discuss the increasing prevalence of diabetes and diabetic retinopathy.	_____	_____	_____
Identify which patients need to be screened earlier based on their disease state.	_____	_____	_____
Explain to patients the need for early referral to retina specialists.	_____	_____	_____
Summarize how diabetic eye disease may affect patients with visually significant cataract and initiate appropriate treatment for these patients.	_____	_____	_____
Discuss how imaging devices may be able to provide earlier diagnosis of disease or disease progression.	_____	_____	_____

POSTTEST QUESTIONS

1. Based on this activity, rate your level of confidence in your ability to diagnose and screen patients with DR and DME:

a. Not at all confident
b. Not very confident
c. Neutral
d. Confident
e. Very confident

2. Based on this activity, rate your level of confidence in your ability to triage and refer patients with DR and DME:

a. Not at all confident
b. Not very confident
c. Neutral
d. Confident
e. Very confident

3. A 42-year-old female patient with an 8-year history of diabetes presents for her annual eye examination. She has been referred by her endocrinologist after complaining about her vision becoming blurry. What tests are you likely to perform at this first visit?

Add a check mark to the items below that are consistent with your current clinical practice.

Action	Consistent	Not Consistent
Take detailed history of present illness discussing visual complaints, signs, and associated symptoms		
Proceed with an ICG angiography		
Perform B scan ultrasonography		
Perform tonometry		
Complete dilated posterior segment examination		
Perform color vision testing		
Assess visual acuity		
Complete Amsler grid monitoring		
Implement anterior segment examination		
Recommend AREDS vitamins		
Perform fundus photography		
Take axial length measurements		

4. Which systemic medication has been shown to slow the progression of diabetic microvascular complications, including DR?

a. Thiazolidinediones
b. Fenofibrate
c. Beta blockers
d. Aspirin

5. Which imaging technique is most useful in detecting DME?

a. B-scan ultrasonography
b. Fundus autofluorescence
c. Spectral-domain optical coherence tomography (SD-OCT)
d. Adaptive optics

6. A patient with a hemoglobin A1c (HbA1c) 10.4% presents to your office and funduscopic examination reveals microaneurysms, numerous dot blot hemorrhages, and scattered cotton wool spots in both eyes. What vision-threatening complication of DR is a patient like this at highest risk of developing over time?

a. Vitreous hemorrhage
b. Neovascular glaucoma
c. DME
d. Macular ischemia

7. According to the Centers for Disease Control and Prevention, approximately how many people with diabetes in the United States were undiagnosed as of 2015?

a. 7.2 million
b. 23.1 million
c. 70 million
d. 224 million

8. Which of the following is a recommended part of the vision examination for a patient with diabetes?

a. Visual field
b. Comprehensive dilated eye examination
c. Ultra-widefield imaging
d. Fundus photo

9. Which of the following best describes a patient who should be referred to a retina specialist?

a. A patient with diabetes, no matter the severity
b. A patient with mild disease
c. Every patient with moderate disease
d. A moderate patient suspected of having disease progression

10. In patients with diabetes, the risk for swelling following cataract surgery is _____.

a. No different from patients without diabetes
b. Less than in patients without diabetes
c. Greater than in patients without diabetes
d. Unknown

11. Which type of imaging is most commonly used by optometrists?

a. Fundus photography
b. OCT Angiography
c. SD-OCT
d. All of the above

12. The RISE/ RIDE and VISTA/VIVID studies showed anti-VEGF treatment _____.

a. Prolongs disease progression
b. Has no effect on mild disease
c. Induces neovascularization
d. When used earlier prevents progression reduces vision loss when used earlier

13. In the PANORAMA trial, how many patients treated every 8 weeks had at least a 2-step improvement from baseline?

a. 0%
b. 15%
c. 65%
d. 80%

ACTIVITY EVALUATION

Your responses to the questions below will help us evaluate this CE activity. They will provide us with evidence that improvements were made in patient care as a result of this activity.

Rate your knowledge/skill level prior to participating in this course: 5 = High, 1 = Low _____

Rate your knowledge/skill level after participating in this course: 5 = High, 1 = Low _____

This activity improved my competence in managing patients with this disease/condition/symptom. _____ Yes _____ No

I plan to make changes to my practice based on this activity. _____ Yes _____ No

Please identify any barriers to change (check all that apply):

_____ Cost
_____ Lack of consensus or professional guidelines
_____ Lack of administrative support
_____ Lack of experience
_____ Lack of time to assess/counsel patients
_____ Lack of opportunity (patients)
_____ Reimbursement/insurance issues
_____ Lack of resources (equipment)
_____ Patient compliance issues
_____ No barriers
Other. Please specify: _____
_____
_____

The design of the program was effective for the content conveyed. ___ Yes ___ No

The content supported the identified learning objectives. ___ Yes ___ No

The content was free of commercial bias. ___ Yes ___ No

The content was relative to your practice. ___ Yes ___ No

The faculty was effective. ___ Yes ___ No

You were satisfied overall with the activity. ___ Yes ___ No

Would you recommend this program to your colleagues? ___ Yes ___ No

Please check the Core Competencies (as defined by the Accreditation Council for Graduate Medical Education) that were enhanced through your participation in this activity:

_____ Patient Care
_____ Practice-Based Learning and Improvement
_____ Professionalism
_____ Medical Knowledge
_____ Interpersonal and Communication Skills
_____ System-Based Practice

Additional comments:

_____

_____ I certify that I have participated in this entire activity.

This information will help evaluate this CE activity; may we contact you by email in 3 months to see if you have made this change? If so, please provide your email address below.

_____

MODERN**OPTOMETRY**