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Best Practices in Integrated Care

This ongoing series, now in its second year, is featured in each issue of *AOC* and its sister publication *CRST*. The articles will clarify how eye care providers can best work together to provide patient-centered care of the highest quality possible.

CHARLES RETINA INSTITUTE:

ONE CLINIC'S EXPERIENCE WITH INTEGRATED CARE

The integration of optometry into our clinic is an advantage, even if we sometimes have to navigate some delicate politics.

BY MOHAMMAD RAFIEETARY, OD, FAAO, AND JORGE CALZADA, MD, FACS


Charles Retina Institute is one of the few retina subspecialty clinics in the United States that employs the services of an optometrist. We realize that our care model is unique; at the same time, it has helped us grow into a state-of-the-art facility capable of providing patients with excellent care across the range of retinal needs, from medical to surgical to imaging and advanced diagnostics. Our center is also involved in several clinical trials, and we regularly host physicians from around the world for advanced surgical training.

From the outside, it seems like we have a lot of competing demands, and this is actually true. But front and center in our operations is a commitment to excellent patient care, which is

Charles Retina Institute.

reflected in our mission statement, "To provide the best level of clinical retina care available and to advance medical knowledge about retinal diseases." Although while it is a nice thing to be unique and to participate in an integrated model, we do so not for a sense of novelty, but rather because it allows us to be better at what we hope to accomplish.

ORGANIC EVOLUTION OF AN EYE CARE MODEL

Today, the "Meet Our Physicians" page on our website (www.charlesretina.com) lists two vitreoretinal surgeons, three postophthalmology residency fellows in vitreoretinal training, and a staff optometrist. If one were to look at other retina practices, there would only be a handful that employ optometrists. We are different, however; our care model evolved organically, and perhaps where we ended up was not as intentional as it may seem.

During the mid-1990s, when there was market pressure to consolidate eye care practices, Charles Retina made a decision to bring an optometrist on board to serve as a liaison with area optometric physicians. That individual (Dr. Rafieetary) had experience in both academia and in a referral center practice. Over time, as the practice got busier, and because of Dr. Rafieetary's professional interests, we saw an opportunity to distribute the workload and be more efficient in the manner of our care delivery.

Thus, the decision to venture forth in a model of integrated care was intentional, but the way we practice today is more a matter due to need and opportunity.

In our center, the physicians each have some administrative role in the day-to-day running of the practice, and we all keep a line of communication open with the referring providers. The bulk of all of the physicians' time is spent caring for patients. The two surgeons and fellows divide time between surgical and clinical care, and our optometrist spends the majority of his day involved in clinical care.

At Charles Retina, Dr. Rafieetary has an independent retina clinic and recommends treatments that, when they are outside of the scope of optometric practice, are provided by the in-house ophthalmologists. This may include, for example, the pre- and postoperative care of patients undergoing vitreoretinal surgery. He also works closely with our imaging department (see *Clinical Imaging*) to offer advanced level diagnostic services.

PROS AND CONS IN OUR PRACTICE

We have witnessed many advantages to our particular model of care, and we acknowledge that our preferred model does involve managing some complexities.

Having an optometrist on staff to manage his own clinic adds an in-house referral source. He also maintains tighter relationships with community optometrists than the retina surgeons could by themselves; this comfort level makes it easier for colleagues to share in the care of patients. Increasing the volume of general retina clinic patients allows for a relative increase in surgical volume and medical complexity in the retina surgeons' schedules, which benefits everyone in the practice.

Because the optometrist is always present in the clinic, patient flow and clinical coverage are maximized. The optometrist benefits by having a busier, more complex, and interesting clinic than he would have independently; meanwhile, the vitreoretinal surgeons benefit by getting access to increased surgical volume and clinical complexity.

As much as there may be advantages to this integrated model, there are also internal and external politics to be cognizant of. Retinal subspecialty practices are not the same as OD/MD referral centers where the referrals are primarily from optometrists and perhaps area health care providers. Referrals to retina subspecialty clinics typically come from other ophthalmology practices, and some ophthalmologists would prefer for their patients to be seen by ophthalmologists instead of optometrists. The practice has to understand those wishes.

CLINICAL IMAGING

We often get comments from colleagues about the quality of posterior segment images of our patients at the Charles Retina Institute and questions about how are we able to obtain them. The answer is that we have recruited a highly qualified and well-trained imaging staff and that we have invested in proper technology.

Our imaging capabilities really come from the leadership of our imaging technician, Byron Wood, CRA, who has been an ophthalmic photographer/angiographer for 35 years. That kind of experience matters, and he has earned the trust of the physicians to produce excellent work and to train the future generation of imaging technicians.

The ability to offer advanced imaging also comes from the equipment we have in the clinic. In particular, scanning laser ophthalmoscope and optical coherence tomography are among the most important technologies we have, and they have enabled us to have a full range of highly reliable diagnostic services. However, it is sill important that they be used correctly: These technologies are best used as "pathology-guided" tools, in which case the ordering physician guides the technician to explore a specific structure or region to fully investigate the morphologic change. Ultimately, the diagnosis has to come from the physician and not the machine.

Navigating the delicate politics of patient referrals requires open channels of communication between the optometrist and the retina surgeons. In a way, the framework to maintain open communication is built into our operations. From a logistical standpoint, it would be a disadvantage to have the optometrist work in isolation in clinic; instead, it is in the interest of seamless patient care that the optometrist has constant access to the surgeons to provide needed procedures and to be available for surgical or medical consultation.

CONCLUSION

Looking to the future of eye care, there are ample opportunities for greater collaboration between optometry and ophthalmology in the care of retina patients. For the model to be successful, it is going to require an open mind and a focus on always doing the right thing for the patients. Collaboration and communication between all the doctors is paramount. Our model is not easy to reproduce, but given the right people and the right environment, it can be recreated.

There is no doubt in our minds that the proper structure has to be in place for such a model to work. However, the essential component for success is the individuals that make up the team. The surgeons at Charles Retina have learned to trust the clinical examination and diagnostic skills of our optometrist, and thus, finding the right optometrist is critical for this model to work. That said, any optometrist with commensurate skills will also need space to grow as a professional, and the surgeons have to provide the correct setting to allow this. Therefore, there is both an individual as well as a system that is required for success in this model. ■

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Best Practices in Integrated Care

EVOLVING TRENDS IN RETINA

Refinements to current techniques with an eye to optimizing patient care.

BY ALAN FRANKLIN, MD, PhD

If there is one constant in retina, it is that the field remains in a constant state of evolution. There are still a few potential revolutions on the horizon with some very interesting prospects in genetics and stem cells. By and large, however, most of the innovations in retina are less about changing the paradigm and more about refining and improving the status quo.

Herein are my thoughts on some of the more important evolving trends in retina in terms of emerging clinical trial data, new medical therapies, advanced imaging modalities, and refinements in surgical tools that will change how we work both in clinic and the OR.

CLINICAL TRIAL DATA

DRCR.net Studies

Most physicians are aware that the 1-year results of the Protocol T study were published in 2015.[1] The study demonstrated that all of the antivascular endothelial growth factor (anti-VEGF) agents were equally effective and safe in eyes with mild diabetic macular edema (DME), defined as visual acuity of 20/40 or better. In the study, however, among patients with 20/50 or worse vision, patients treated with aflibercept (Eylea; Regeneron) achieved larger visual gains than those treated with ranibizumab (Lucentis; Genentech) or bevacizumab (Avastin; Genentech). Anatomic outcomes followed a similar pattern.

It is hard to say that the results will have an impact on clinical practice, but it certainly seems plausible that there will be more use of aflibercept in DME patients. This was really the first head-to-head study of these agents to demonstrate a difference in results; we have not seen anything like that in age-related macular degeneration (AMD) or retinal vein occlusion (RVO). It will be interesting to see if anything changes with the 2-year data, which are due this year.

The DRCR.net also recently released the results of its Protocol S study, which demonstrated that early treatment with ranibizumab preserved more central and peripheral vision than panretinal photocoagulation in eyes with proliferative diabetic retinopathy.[2] The result was pretty well expected, but the data provided confirmation of the hypothesis.

MEDICAL THERAPY

There is a plethora of new medical options for retina disease in the pipeline, and there are a few in particular that are worth keeping track of.

Allergan has been testing its DARPin anti-VEGF formulation that has shown very promising results. In particular, it has shown signs of greater durability and better visual outcomes than what has been seen in other anti-VEGF trials. And so, this agent, if it continues to prove safe and effective, has the ability to reduce the number of shots required to treat VEGF-mediated diseases (such as AMD, DME, and RVO).

At the same time, other modalities in the pipeline portend to increase the number of injections retina specialists will be delivering—but that may not be a bad thing altogether. After much talk, 2015 saw the initiation of major trials of complement inhibitors for treatment of dry AMD. This is a tremendous unmet need in retina, so the prospect of additional injections is, in fact, welcome news. Data readouts are expected in 2016 on several studies.

This past year also saw the approval of a second sustained-release corticosteroid (fluocinolone acetonide) implant device (Iluvien; Alimera), which is approved for DME, joining Ozurdex (dexamethasone intravitreal implant; Allergan), which is approved for RVO, posterior uveitis, and DME. It is still not clear where these products fit in the treatment paradigms, although efforts are underway to delineate how they can be best put to use. I expect we will start to figure this out in 2016, but it will remain an ongoing topic of conversation.

IMAGING

There really have not been any new imaging devices released for retina purposes since the release of spectral-domain optical coherence tomography (OCT). But there is a good reason for this: OCT really is an indispensible tool for understanding the structure of the retina, and nothing else has proven as effective.

Refinements to the OCT platform, however, offer tremendous promise, namely OCT angiography (OCT-A) and intraoperative OCT. OCT-A may be a big step forward in the ability to noninvasively image the vasculature. At the current time, it does not appear likely to supplant fluorescein angiography (FA), but rather to complement it. With FA, the operator can

visualize leakage in real time and get a semiquantitative sense of how much leakage is occurring. OCT-A, on the other hand, provides the ability to know where vessels are in three dimensions, and it probably has a better ability to distinguish very small vessels than FA, which might be especially relevant for certain pathologies, such as macular telangiectasia and early choroidal neovascularization.

Intraoperative OCT is a newly emerging technology, and there have been some promising studies to show that it may help steer surgical decision making. However, static imaging is of unknown utility, and the fact that it is viewed through the microscope oculars limits its functional impact.

SURGICAL

An evolving trend in the surgical realm may actually answer many questions about adapting intraoperative OCT into regular OR protocols. Heads-up retina surgery may become increasingly important as surgeons are provided more and more modalities for use during surgery. Trying to view it all through oculars while concentrating on surgery is going to be difficult, to say the least.

With heads-up surgery, a high-resolution camera in the microscope projects an image on a screen positioned at the foot of the bed. Surgery is performed through 3-D glasses. The digital image capabilities offer the possibility for things like vascular pattern registration for pattern laser, endoscopic procedures, and other advanced surgical adjuncts. But what heads-up capabilities really provide is a palette upon which we can display all the various imaging modalities and new technologies that are or will become available for use in surgery.

Not to be forgotten in the surgical realm is that 27-gauge surgery is becoming more popular. For some patients, size does matter. The move to smaller instruments adds more versatility to the surgical armamentarium, and in most cases, quicker recovery because there is less of a footprint on the eye. Design modifications by manufacturers in this space have answered concerns about flexibility, and second-generation equipment is really, truly ready for prime time use.

CONCLUSION

There is a lot to stay aware of in the retina space, but in the end, patient care will continue to improve as we gain access to better study data, new medications, even more advanced imaging capabilities, and improved surgical tools. There is still the prospect of some very exciting developments in genetics and stem cells, and the recent approval of an artificial vision system (Argus II; Second Sight) demonstrates the high-level science being conducted in this space. This article has not even delved into the world of drug delivery devices, which are just now starting to become real possibilities, although they are equally important in shaping the future of retina care.

In retina, though, it seems that as soon as we accept that something is a possibility, it is in our hands before we know it, and the field is already imagining what is next. ■

1. Wells J, Glassman A, Ayala A, The Diabetic Retinopathy Clinical Research Network. Aflibercept, bevacizumab or ranibizumab for diabetic macular edema. *N Engl J Med.* 2015;26;372:13:1193–203.
2. Writing Committee for the Diabetic Retinopathy Clinical Research Network, et al. Panretinal photocoagulation vs intravitreous ranibizumab for proliferative diabetic retinopathy: a randomized clinical trial. *JAMA*. 2015;314(20):2137–2146.

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OPTOMETRY: WE SHOULD BE RETINA EXPERTS ALREADY

Reviewing the retina is not an option; it is an obligation.

BY JEROME SHERMAN, OD

The topic of integrated care gives us an opportunity to talk about the optometrist's role in caring for the posterior segment needs of patients. In truth, however, eye care practitioners review the retina during almost every encounter with a patient. So, when we think about opportunities for optometry to get more involved in retina service, we should remember to not look past the obvious.

By some estimations, about 70% of individuals in the United States who seek out an eye care practitioner wind up seeing an optometrist; what that implies is that 70% of the retinas attached to the eyes of individuals needing eye care are seen by an optometrist.[1] But what that really implies is that optometrists have an inherent responsibility and obligation to conduct a thorough review of the retina's structure and function.

THE TOOLS OF PRACTICE

Virtually every optometry student is taught how to use an ophthalmoscope to look at the retina very early in training. At SUNY College of Optometry, we teach this technique to students within the first 2 weeks of school. The ophthalmoscope was invented in the mid-19th century and is still used in practice today, and there is a very good reason for its longevity in practice. Ophthalmoscopy forms the basis for determining the relative health of the retina, optic disc, and vitreous.

However, certain pathologies—especially those in earlier stages or with either mild or subtle presentation—are invisible on ophthalmoscopy. Thus, tools such as optical coherence tomography (OCT) and ultra-widefield (UWF) imaging become important for understanding the structural elements of the retina. With spectral-domain OCT, 10 layers of the retina are visible, and many modern machines add the ability to view the vitreous and choroid in stunning detail.

Advancements in imaging are still ongoing and portend to shape the future of practice. OCT angiography (OCT-A) is a newer modality that has some crossover with fluorescein angiography (FA). Note that OCT-A, unlike FA, does not rquire an injection of fluorescein. Yet, there are some suggestions in early research with OCT-A that it may, in some cases, supply information that FA cannot. For instance, OCT-A may be more sensitive in depicting very small vasculature in both the superficial and deep capillary plexus, in some cases as small as 7 µm. That finite level of imagery may, for example, also unmask capillary changes at the optic nerve head; recent research suggests that avascularization at and around the optic nerve head may be the earliest indication of glaucomatous changes.

Small or finite vascular changes may also be relevant for wet age-related macular degeneration (AMD). Early choroidal neovascularization may indicate a change from the dry form to the wet form of AMD, or else may signal early changes in wet AMD that portend progression to more advanced stages of the disease.

In eyes with diabetic retinopathy, recent studies suggest that OCT-A may be useful for measuring areas of capillary perfusion and nonperfusion. From these examples, it is easy to appreciate how impressions gleaned from OCT studies are additive to the clinical impression.

Another technology, UWF imaging (Optos), permits the ability to see 80% to 90% of the retina without dilation. There is growing literature suggesting that pathologies with central involvement (ie, AMD) may have precursors in the peripheral retina; equally, that peripheral changes may be indicative of different AMD subtypes, which may be associated with varying prognoses. It seems that UWF may be a valuable diagnostic tool, and may have applicability in stratifying risk as well.

In particular, UWF can be performed with autofluoresence, which depicts changes in the retinal pigment epithelium. Because of its adjacent proximity to photoreceptors, damage to the retinal pigment epithelium may be diagnostic of photoreceptor cell dysfunction and loss. Above and beyond this utility, a lot of retinal pathologies, in early and even late state, are invis-

ible to standard color as viewed with biomicroscopy and color photography.

STRUCTURE FUNCTION CORRELATIONS

The value of OCT and UWF is that they add to impressions gained with ophthalmoscopy to understand the structural health of the retina. However, there is often discordance between structure and function in eye care, and this is especially true with regard to retinal pathologies.

Visual acuity and color testing have both been in use for a long time to provide a base understanding of function, as have contrast sensitivity and visual field testing. There are also promising tests in development that may add even more information. I am currently involved in research on the Rabin Cone Test, which is a subjective test that measures color vision and contrast sensitivity simultaneously. We are finding that there may be some patterns emerging in certain diseases that are unique in the sense that this is information we would not have access to otherwise. One example is that some patients have abnormalities with color vision at low contrast even though their color vision at high contrast may be normal. The next step will be to determine how this information correlates with disease diagnosis and progression as well as the structural tests mentioned herein.

Other metrics of function are derived from electrophysiology tests, such as visual evoked potential (VEP) and electroretinography (ERG). Of great importance, both tests are objective. Briefly, VEP measures the electrical activity of the entire visual pathway at the level of the occipital cortex, and ERG supplies insight about the performance of the inner retinal cells of the eye. Both VEP and all the different types of ERG tests show functional abnormalities that may be invisible to ophthalmoscopy. One form of ERG, pattern ERG, may have utility in glaucoma suspects to detect changes that occur prior to loss of nerve fiber layers apparent on OCT.

UPSIDES, DOWNSIDES, AND STANDARD OF CARE

The very big upside to all of this technology available to the practicing optometrist is that its use is usually in the best interest of the patient. Although devices like OCT and UWF imaging assist with the diagnosis, they can never replace the clinician's impression. That is to say that diagnostic systems are tools of practice and not a substitute for expert clinical knowledge and diagnostic acumen.

If there is a downside to the use of advanced technology in optometry practice, it is that all of these devices cost money, and one needs to be properly reimbursed to have acquisition and maintenance costs covered, let alone to make a profit.

This discussion of the optometrist's role in evaluating the retina needs of patients should, in my opinion, include thoughts about standard of care, both from a medicolegal perspective as well as how it relates to serving the best interest of patients. As general guidance, the use of technology in medicine as it pertains to standard of care falls under the consideration of whether "like practitioners under like circumstances" would use the same level of technology for the same purpose. If more than 51% of one's colleagues are utilizing a certain technology for a certain purpose, then that can arguably be considered the standard of care. And so, optometrists cannot get too far behind the curve, lest they risk malpractice.

There is an aspect to standard of care that has more to do with whether we are serving the best interest of patients with current practice. The current estimation is that about one-third of optometrists have an OCT device in their practice. Based on that, one could build persuasive arguments for and against OCT being the standard of care—and understand that OCT in this sense is being used as a stand-in for just about any form of structural testing. The same rationale could be applied to the use of UWF imaging, for example, with ensuing consideration as to whether it is standard of care.

But I think that focusing too much on the legal aspects of whether one is practicing good medicine misses the point and invokes thoughts of defensive medicine. I think its much simpler to say that if 70% of individuals seeking eye care services rely on an optometrist, then we have an inherent responsibility to review and understand the health of the whole eye, from back to front and everything in between.

We do not necessarily need to look for opportunities to expand optometry's role in retina care. Instead, caring for the retinal needs of our patients' eyes is our opportunity to fulfill our obligation and responsibility.

1. American Optometric Association. The State of the Optometric Profession. 2013. https://www.aoa.org/Documents/news/state_of_optometry.pdf. Accessed February 22, 2016.

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