Successfully Fit the Most Compromised Corneas

Experienced industry leaders discuss the latest advances in gas permeable lens technologies and share their views on various practice management and clinical issues.

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The number of customizable gas permeable (GP) lenses is expanding, thanks to improved manufacturing technologies and expanded and innovative parameter and material options. While the existing patient base for GP lenses is small, relative to the overall contact lens industry, these new offerings afford an ability to fit a wider array of potential candidates, correcting for more complicated clinical challenges. We invited a panel of experts to participate in the following roundtable discussion on the new technologies available in GP lenses.

Participants:

Moderator: Milton Hom, OD, FAAO, practices in Azusa, California. He is a Diplomate in Cornea, Contact Lenses and Refractive Technologies and serves on several editorial boards, including *Review of Optometry, Optometric Management, Primary Care Optometry News, Review of Cornea and Contact Lenses* and *Optometry Times*.

Brian Chou, OD, FAAO, is an ophthalmic industry consultant and a partner in an optometry group in San Diego. He is on the editorial board for *Review of Cornea and Contact Lenses* and has more than 60 published manuscripts including the book *Spanish Terminology for the Eyecare Team*.

Richard L. Silver, OD, is in private practice in Santa Monica and Sherman Oaks, Calif. His practice is recognized as the leading source of special effect contact lenses for the entertainment industry. Current projects include the films "Pirates of the Caribbean," "Twilight," "Men in Black," "X-Men" and "Thor."

Donna C. Weiss, OD, serves as the Clinical Director of the Irregular Cornea and Contact Lens Department at Boxer Wachler Vision Institute. She holds dual academic positions at Western University of Health Sciences and Southern California College of Optometry and provides patient care in her private practice in West Los Angeles.

Milton Hom, OD, FAAO: ***What are some of the issues you face in terms of, for example, centration, stability, apical clearing and apical touch when you're fitting specialty gas permeable (GP) lenses?***

Richard L. Silver, OD: The biggest issue that I have is comfort. If I can get a patient comfortable with the GP lens, then I can work on centration, movement and then apical clearance—in that order.

Brian Chou, OD, FAAO: One of the considerations with keratoconic patients is that GP lenses tend to gravitate over the apex of the cone, so if the apex of the cone is infero-temporally displaced, that's often where the GP lens will sit, which has implications not only for comfort, but also for vision, if the patient ends up seeing through the peripheral optics of the lens.

Donna C. Weiss, OD: The technology available now is amazing and there are so many different types of lenses that my biggest

issue isn't so much finding a lens that will fit the patient, but finding a lens that matches the patient's motivation, goals and expectations. Most patients want to maximize vision and minimize expense. They're on the Internet looking for these options and frequently, these patients arrive almost dictating what lens we are to fit them with.

So my biggest issue is discussing the different lenses and the patient's knowledge to help them understand that there's a proper balance with a contact lens fit. And this balance of corneal health, visual acuity and proper lens alignment is needed for them to have a long, successful career in contact lenses. An example are those patients who arrive with severely compressed corneas. They don't understand the risk of central scarring and when a lens is designed to relieve compression, they'll point out how the other lens helped them see better.

Dr. Hom: Great point. I had a conversation with Bruce Bridgewater, OD, Clearion Custom 3-Zone Architecture (Acuity One) creator and designer of the fitting set, and I was impressed by the fact that he sees patients himself. Dr. Bridgewater comes from the perspective of one of us in designing this fitting system, so he understands what patients go through and how valuable it is that we don't have to order the lens; we have them at hand. This is evident in the way this lens was designed (see "A Closer Look at Clearion" at right). ***Now, for what kind of cases does the Clearion Custom 3-Zone Architecture work best?***

When and Why Clearion Makes Sense

Dr. Chou: I like using the reverse geometry profile for post-refractive surgery patients, such as after radial keratotomy (RK) or laser-assisted in situ keratomileusis (LASIK). There are obviously other reverse geometry lens designs available, but I've found the organization of the diagnostic set very friendly in making logical decisions on the fit. The lenses in the diagnostic fitting set are all made out of polymethylmethacrylate (PMMA), which I like because they wet very nicely, so you don't have to spend excessive chair time trying to fight dry spots on the lens to evaluate the fluorescein pattern and get a decent over-refraction.

Dr. Hom: ***What do you mean by "fitting set friendly"? Are other fitting sets not as friendly?***

Dr. Chou: The organization of the Clearion fitting set is well done with the ectasia profile on one end of the spectrum, and the reverse geometry profile on the other end, and then the continuous base curve profile in the middle.

Dr. Hom: It looks like the Clearion

A Closer Look at Clearion

Clearion's Custom 3-Zone Architecture is a proprietary technology that allows practitioners to specially design lenses for their most difficult cases. It is a highly customizable system of GP lenses that utilize a continuum of profiles to more closely approximate complex corneal topographic profiles. The Custom 3-Zone Architecture allows practitioners to independently alter back surface curves in 3 zones to accommodate for topographical variances ranging from mild corneal irregularity to excessive ectasia and profound central corneal flattening.

Continuous Base Curve
- *consistent radius through the first two zones*
- *high quality, continuous BC and a progressive curve PC system with fixed axial edge lift options.*
- *available in an almost unlimited array of parameters*
- *mild to moderate topographic irregularities*

Ectasia
- *accelerated flattening geometry*
- *significantly steeper BC1 and significantly flatter BC2*
- *moderate to advanced corneal ectasia*

Reverse Geometry
- *plateau-like geometry*
- *significantly flatter BC1 and significantly steeper BC2*
- *moderate to advanced central corneal flattening*

Diagnostic Fitting Set

Within a single binder, the Clearion Custom 3-Zone Architecture diagnostic fitting set includes 80 diverse and strategically organized lenses (14 Ectasia [EC] profile, 48 Continuous Base Curve [CBC] profile and 18 Reverse Geometry [RG] profile), with carefully crafted diagnostic options for a vast range of corneal topographies (extreme prolate to extreme oblate shapes). Exact parameters are clearly listed, which allow practitioners to accurately assess and, if necessary, modify three distinct and independent lens zones. Designed by practitioners, this comprehensive tool allows practitioners to quickly switch between a wide array of lens profile and parameter options needed with complicated, medically necessary corneal challenges.

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Custom 3-Zone Architecture has 80 lenses in the complete fitting set. We all know that coming from the world of soft lenses that if you fit from inventory or if you have a large trial lens selection, then that just makes things so much easier and saves chair time. ***Is that part of the power of using the Clearion Custom 3-Zone Architecture, because you have so many options and such a range of base curves?***

Dr. Chou: Yes, the number of lenses to cover a diverse range of corneal shapes is a big part of it.

Dr. Hom: ***Are there any other manufacturers that have such a diverse range in such diverse profiles?***

Dr. Chou: Not that I can think of.

Dr. Silver: The power of this fitting set is in the sheer number of lenses provided in one place and the option to switch profiles on the spot. For a few patients who had Intacs corneal implants (Addition Technology), I thought a reverse geometry profile would work based on corneal topography. After trial fitting, they actually did quite well with a continuous base curve lens. There was no having to order a new lens and wait a week. *I was able to prove that to myself on the spot, instead of having to order another trial lens and have the patient come back for another visit.*

Dr. Weiss: With this set, because you know all the parameters of the peripheral, mid-peripheral or central curves, it's easy to fit the cornea with multiple lenses. Knowing the exact parameters that provide optimized alignment, movement and centration allows you to create a highly customized lens. *Knowing the parameters reduces the guesswork and consequently the exchanges, thereby maximizing your profits and ultimately, patient happiness.*

Dr. Hom: ***Can you share any cases in which the Clearion Custom 3-Zone Architecture worked when other lenses did not?***

Dr. Silver: One patient was a 50-year-old female script supervisor with long-standing keratoconus and an inability to wear lenses through her normal working day. She had keratoconus with inferior central scar in her right eye and an inferior Intacs corneal implant in the left eye. Prior to being referred to me, she was wearing a three-point touch type small diameter GP (about 8.9-mm diameter and very flat-fitting lenses) of a different manufacturer's design in both eyes. The lens itself was fitting inferiorly and there was edge standoff on the lower lid. The lens was not sitting central and the patient was not getting the benefit of the GP optics. The comfort was poor, probably because of the centration and upper lid sensation of the superior edge of the lens.

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> — Richard L. Silver, OD

I got a satisfactory result with this patient using Clearion Custom 3-Zone Architecture by fitting the right eye with an ectasia profile and the left eye with a reverse geometry profile. Her previous best-corrected vision of 20/60 went down to the 20/30–20/25 range with full-day wear and comfort was excellent. *I was impressed with the fact that the patient had two different demands that I was able to satisfy with one manufacturer's different profiles.*

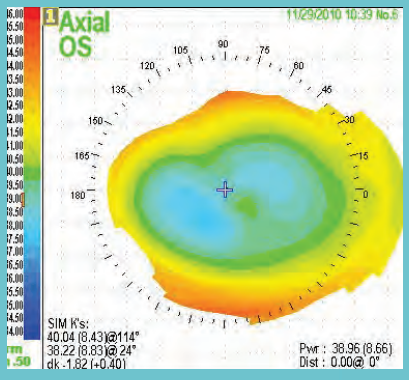

Figure 1: Topography of a post-LASIK oblate cornea. (*Photo courtesy of Boxer Wachler Vision Institute.*)

Dr. Weiss: I can think of two. The first case was a binocular keratoconic patient with a mild inferior temporal cone in her left eye. Her vision was fairly good in that eye (20/30 uncorrected). Yet, she had an advanced central cone (60D) in her right eye and didn't want a contact lens that made her eye look bigger, injected or enhanced her blue iris. She would only wear a hard lens and refused a piggyback because she didn't want to put in two lenses.

I also evaluated and treated a post-LASIK oblate cornea that needed toric alignment curves and toric peripheral curves (Figure 1). The patient's topography showed an oval ablation zone, horizontally elongated by 3 mm. The mid-peripheral cornea needed two different base curves in the alignment curve; otherwise, the lens would not properly center. *I tried other designs that failed to center as the Clearion does.*

Dr. Chou: I had good success recently with the Clearion reverse geometry profile for a middle-aged woman who had high hyperopic LASIK. The current corneal topography (Figure 2) has features of a keratoconic cornea with significant central steeping. She was probably about +6.00D OU preoperatively.

It was a very easy fitting process with the Clearion system for this particular patient. Within just two or three diagnostic lenses, I was able to move forward with the spherical over-refraction.

Many years ago, before the availability of Clearion Custom 3-Zone Architecture, I had a patient in a similar situation who I had to have back literally for more than a dozen visits, so this lens system has saved a tremendous amount of time.

Dr. Hom: Let's change gears and look at piggyback fittings. ***What advantages do they offer and when do you use them?***

A Time and Place for Piggyback Fitting

Dr. Silver: I've been able to use piggyback fittings to improve upon situations when there's an issue with comfort and/or centration.

As an example, I had a 74-year-old male jazz musician who had irregular corneas after hyperopic LASIK, with one eye having acceptable spectacle-corrected distance acuity. His pre-op prescription was in the +3.00D range and I was able to fit him with a continuous base curve profile and got great optics. I was quite happy, but he was totally unhappy because he couldn't tolerate having one rigid lens on one eye. I solved this dilemma by using a 1-Day Acuvue Moist Brand Contact Lens (Vistakon Division of Johnson & Johnson) as the base lens, in a 8.5 base curve and +1.00D prescription.

Dr. Hom: I like that idea, because you don't have to worry about disinfecting the one-day lens, so you don't have to worry about a dual disinfection system. ***It seems like there's a running theme about old hyperopic LASIK. Is that a big headache?***

Dr. Silver: It is a big headache because I think a large majority of these patients had unrealistic expectations about never needing to wear corrective lenses again. As Dr. Chou mentioned, if you look at the topography, these patients clearly look like keratoconic patients and their night vision is dramatically distorted by their central corneal irregularity. There aren't a lot of solutions for that other than this type of a rigid GP design.

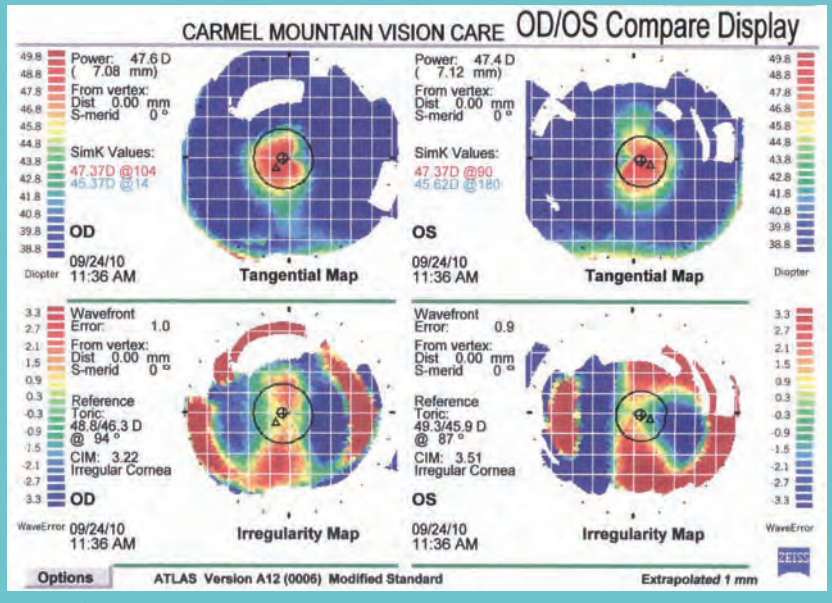

Figure 2: This patient's topography shows significant corneal steepening following LASIK for approximately +6.00D of hyperopia.

Dr. Weiss: Soft lens technology now offers many options with high-DK materials and the current rigid gas permeable materials are more oxygen permeable than ever. Therefore, if I have a patient who works in a dusty environment, has lens awareness or poor centration that is affecting his or her vision, I don't hesitate to reach for a piggyback.

Dr. Chou: Piggyback lenses have a definite role for the irregular cornea practice, mainly for when a patient has discomfort wearing a GP contact lens because of mechanical epitheliopathy. In such a scenario, the lens causes trauma to the epithelium and the soft contact lens serves as a bandage to protect the ocular surface as the patient blinks 11,000 times a day.

Dr. Hom: ***What are the characteristics of the Clearion Custom 3-Zone Architecture lens that make it well suited for piggyback fitting?***

Dr. Silver: The Clearion 3-Zone Architecture allows you to dramatically use a flatter or steeper secondary curve and to use the hinge points on the lens to customize the first set of lenses. There's obvious oxygen reduction when you have two lenses on the eye instead of one, and I think you can really loosen up the Clearion lens so that it provides adequate tear exchange, rather than the stasis that some lenses induce in a bicurve system. *The hinge makes a huge difference in being able to get the tear exchange if necessary, with a myriad of dioptric possibilities between the corneal and secondary curves, or hinge points.*

Dr. Weiss: I find use for the Clearion lens as a piggyback system with Intacs patients. The Clearion lens offers a fitting set with many different parameters so that

you can trial lenses to vault not only the cone, but also the Intacs. You can adjust optic zones, base curves, diameters and peripheral curves to truly customize the irregularities. If you work with a lens such as the Clearion, the transition into GP wear with a piggyback system is easy through these customizations.

Dr. Chou: Soft contact lenses are underutilized to piggyback, not just with Clearion, but with other GP lenses as well. You can also piggyback with hybrid contact lenses. The fact of the matter is that there will be situations in which you do your best to fit a lens and you still get some unavoidable touch and related micro trauma to the epithelium. That's where the soft lens can make a big deal. There certainly is added burden for the patient to keep track of a separate lens. But when the soft lens improves comfort by reducing epithelial microtrauma, the patient will accept the additional complexity and cost.

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> — Brian Chou, OD, FAAO

Dr. Hom: ***How has the piggyback application using Clearion benefited your patients?***

Dr. Silver: *With the ability to change multiple curves and edge profiles, I have been able to resolve, along with the piggybacks, some keratoconic patients in particular who had chronic peripheral ulcers and infiltrates with some chronic staining.* These were rigid lens wearers who were not on piggybacks that had chronic 3 and 9 o'clock staining that led to infiltrates, which in some patients led to chronic scarring. And so using the piggyback design with a more specific rigid GP as the top lens, it became beneficial for many patients in terms of resolving chronic corneal irritation.

There are a fair number of people who have keratoconus (with infiltrates) and poor blink habits due to marginal lens designs. For a visually challenged keratoconic patient, the ability to consistently wear a contact lens is a life-changing event. When these patients can't wear their lenses, they don't go to work. There are very few patients who need this kind of lens who see well out of a pair of spectacles. If you can't go to work and support yourself or your family, it becomes a larger issue than simply having a little bit of discomfort.

Dr. Weiss: It has the potential to be life-changing. I had a patient who couldn't watch his son play baseball. He said it was tortuous to go to games, and he quit coaching. Ultimately, he was happy with his hard lenses except during baseball season. So I designed a pair of piggybacks for him, and now he is at those baseball games watching his son hit home runs.

These are things we take for granted. So you look at the modalities that are available to you and how it's going to make your patient's quality of life better, and if you can do it without harming them, then of course we're going to utilize that technology.

Dr. Chou: I think Dr. Silver brings up a great application of piggybacks, which is for reducing 3 and 9 o'clock corneal staining. If you look in the literature, there are different things that you can do with the GP design.[1,2] For example, some say to decrease the diameter; others say to increase diameter. But I've found that piggybacking using a silicone hydrogel to prevent exposure is very effective.

Dr. Hom: ***What other patient types other than keratoconus are you able to fit with the Clearion Custom 3-Zone Architecture?***

A Lens Design with Multiple Applications

Dr. Weiss: I think because it's a lens that offers three different profiles (continuous base curve, reverse geometry and an ectasia), you can likely fit any irregularity, whether it's prolate or oblate. You have control to manipulate many parameters, which allows extensive customizations for many different types of irregular surfaces.

Dr. Chou: The beauty of the Clearion lens system is that even though clinicians might be inclined to reserve it for use with their irregular corneas, it is also useful for patients with normal corneas. (The function of the continuous base curve is to accommodate those sorts of eyes.) Some patients have one relatively normal eye, but their fellow eye has significant corneal irregularity, and the Clearion system has a portfolio of profiles to accommodate both eyes.

Dr. Silver: I would say that a consistent use I have had for the Clearion lens has been with corneal transplant patients for whom I had previously assumed I should be using a lens with more of an ectasia design or that had a steeper central base curve. After multiple trials with the reverse geometry Clearion profile, I have been able to get a lens that centers better and

actually gives greater comfort.

These patients often complain of reduced wearing time, which is usually a result of lens intolerance due to edge lift or changes with the host versus graft cornea interface.

Dr. Hom: ***If a practice only sees one to two irregular corneas a year, how would you suggest fitting them?***

Fitting the Infrequent Irregular Cornea

Dr. Chou: Proprietary lens designs such as Clearion Custom 3-Zone Architecture are very helpful for practitioners who don't prescribe for irregular corneas on a regular basis because it takes some of the guesswork out of the equation. The convenience and the counsel in prescribing is very helpful.

Dr. Silver: I don't think this is a lens you can fit empirically. You need the diagnostic fitting set, and you need to be able to service your patients if you are in a place where no one else is able to handle that for you. Not everybody practices in an urban setting and has someone close by who could handle irregular corneas. These are patients who are seen multiple times, but I would assume that anyone who fits GP lenses would be able to fit an irregular cornea with this lens with some consultation from the company.

Dr. Weiss: The first thing I'd recommend for anyone who is starting to fit irregular corneas is to use a topography. It will reveal the location, amplitude and surface area of the irregularity. This will greatly assist your initial lens selection. If you're only seeing one to two cases each year, I would recommend partnering up with companies that have great consultants with whom you can talk to about the lenses. And as Dr. Silver mentioned, I would definitely work with a company that could lend you a fitting set, because even with a topography and manual K's, you can't guess what lens is going to work.

I would also strongly urge anyone inexperienced with these cases to take slit lamp photos of the fluorescein pattern because sometimes, you don't know what you're looking at. And with today's technology (e.g., computers, iPhones) you can e-mail those photos directly to a consultant who can walk you through them. Lastly, I would just urge education. Conferences offer many classes that review the different types of designs as well as how and when to use them.

Dr. Hom: ***Is topography necessary? How would you fit an irregular cornea without topography?***

The Role of Topography

Dr. Silver: Keratometers do have value, although with an irregular cornea, you're going to get an irregular image back that sometimes is helpful only for getting an idea of what distortion you're dealing with and how the eyes flatten in the mid-periphery. I would start with a lens that's one diopter steeper than the flattest K you're getting with a keratometer. I would also start with an aspheric design and then just trial fit from there.

Dr. Weiss: Topography isn't necessary, it's just so much easier. If you don't have a topographer, it's important to be a very good listener and obtain a solid history. A good history will provide clues on what type of irregularity you are facing and what lens design to start with. Begin by closely observing fluorescein patterns and then proceed with changes that will relieve the noted problem areas.

Dr. Chou: Corneal topography is very desirable in prescribing for irregular corneas to the extent that I think that any clinician who wants to make irregular lens prescribing a significant part of their practice needs to have one. It is, I think, analogous to trying to manage glaucoma without tonometry or managing hypertension without a blood pressure meter.

Dr. Hom: Let's shift to the topic of practice management. ***What is your experience with compromised corneas, specialty lens fits and medically necessary reimbursement?***

Reimbursement

Dr. Silver: There's a big difference between medical insurance and vision insurance reimbursements for medically necessary contact lens fitting and lens supply. Vision Service Plan (VSP) has been very supportive and helpful, and I find them to be fair in their reimbursements. Medicare and private insurances have been very poor in their reimbursement rates. These companies still do not embrace the fact that there are medically necessary contact lenses that differ greatly from traditional cosmetic designs, and that they require high material costs and multiple office visits.

We have to realize that our profit

PRACTICE MANAGEMENT TIP:

"When I prescribe contact lenses for my irregular cornea patients, I let them know that I'm saving them one visit to the office for each diagnostic lens that I evaluate on their eye. Doing so emphasizes the value in what I am doing."

– Brian Chou, OD

margins might not be as great with insurance patients as with private patients, but we can get some reimbursement. We bill for material costs plus minimal markup, and we bill private insurance carriers on a per-visit basis. You can use a 99212 or a 99213 code for an office visit related to the irregular corneal diagnosis and get reimbursed for your office visits as long as you comply with whatever the complexity of the billing code requires.

Dr. Hom: I think there's also a co-morbidity, so in addition to coding for the irregular cornea, you can also bill for a 370.33, which is keratoconjunctivitis sicca; or 375.15, which is dry eye; or the allergic conjunctivitis code, 372.14. ***Are there any additional tests for which you've had success in billing?***

Dr. Silver: We've had good response billing for corneal topography. And in terms of the anterior segment photos, there is a diagnosable code that allows you to take one picture per year.

Dr. Weiss: Most of my Los Angeles clients are private pay, but I also work at a private office where I only accept two vision insurances that I know will reimburse me well for my time. The way those vision insurance programs work are some clients qualify for medically necessary fits, and those patients get one set of lenses for free and multiple follow ups over a four-month period until the fit is finalized. I also work at an academic institute where most of the patients pay cash for the fit, but at a reduced fee, because it is a teaching clinic. And, although the different offices that I work at price their services differently, most have a global fee that allows the patient to return until completion of the fit.

Dr. Chou: I agree that VSP has done very nicely in terms of servicing its members who have irregular corneas with prior authorization. I make a big differentiation in my practice between vision benefit plans and medical insurance. Vision benefit plans refer more to wellness and routine exams as opposed to medical insurances, which deal more with diseases and surgery.

Roughly 65 percent of the patients in my Southern California practice are a member of VSP and many have the necessary contact lens rider on their vision plan. That's worked very well for my irregular cornea patients, and for the remainder, it's just an out-of-pocket expense.

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>
> — Donna C. Weiss, OD

Dr. Hom: ***As my final question, given that the greatest growth in the contact lens market is coming from specialty lenses, how has or how could the Clearion lens help you expand your practice?***

Specialty Lenses in Future Practice

Dr. Silver: Many of these patients come from ophthalmology, and being known as a problem-solver with specialty contact lenses has allowed my general practice to grow. The goodwill that carries over from satisfying a difficult patient can result in a lot of referrals for other patients who don't have irregular corneas. I don't refer to any ophthalmologists who don't refer to me, and that relationship has built our practice tremendously.

Dr. Weiss: I think the idea of fitting an irregular cornea with one lens or one style is becoming obsolete. There are so many different types of lenses and modalities out there that to fit an irregular cornea efficiently, successfully and with limited remakes, doctors need to have multiple irregular cornea sets. And the Clearion is one more tool in the tool shed.

Not every piggyback, scleral, hybrid or even the Clearion lens is going to fit every patient, but when you have all the sets available to you, you increase your chances of a successful fit. When other lenses aren't working, the Clearion lens should be the one you reach for, due to the extensive customizations available.

Dr. Chou: The definition regarding specialty contact lenses has changed and continues to change. Years ago, if you prescribed toric or multifocal soft contact lenses, you were considered a specialty contact lens prescriber. But I don't think that applies so much nowadays, as the adoption of those lenses has become commonplace.

One of the real holdouts is the irregular cornea application of contact lenses with specialty GP designs, piggyback lenses, etc. The soft contact lens market is so commoditized now that patients are bombarded with direct-to-consumer advertisements, free trial lens coupons and sweepstakes promotions. In my view, specialty contact lenses such as the Clearion lens design are a breath of fresh air because patients typically don't come in asking for a post-surgical reverse geometry GP lens design and we can use our training and intellect to dictate which lens to prescribe, rather than having some 30-second commercial influence patients into telling us what to prescribe.

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