

Practice Development Series

Scleral Lens Q&A

with Maria Walker, OD, MS, FAAO, FSLs

An interview with Craig W. Norman, FCLSA



[Craig Norman](#)

Dr. Maria Walker, thank you for getting together with me to answer a few followup questions from the many attendees of the March 7, 2019 Practice Development Educational Series webinar sponsored by ABB Optical.

“First, are there any specific contraindications for the use of scleral lenses?”

[Dr. Walker](#)

There are no absolute contraindications but, there are certain conditions that you must be careful of, and for certain patients it may not be the best device. Examples would be patients with severe glaucoma, especially those who have some sort of trabeculectomy or shunt, or any sort of surgery in the anterior chamber. Today we don't really know enough regarding whether a scleral lens affects intraocular pressure.

Now, these are devices typically fit onto diseased eyes, so it's all a risk/benefit analysis, and often you're co-managing with another specialist.

Another patient group worth mentioning though are those with endothelial compromise. Patients who don't have properly functioning endothelial pumps, and don't have proper hydration maintained, it's harder for them to maintain corneal health when wearing a scleral lens. This is a big system, oxygen must travel a long way to get to the cornea.

So ultimately, patients who have trouble metabolizing oxygen in the cornea and patients with

issues with fluctuating IOP or glaucoma are the two most obvious populations to consider relatively contraindicated for scleral lens wear, and I'd recommend considering other modalities first. However; there's no absolute contraindications, but these are situations where you're more careful.

[Craig Norman](#)

“How do you determine which lens to start with? Is it based on K's or some other method?”

[Dr. Maria Walker](#)

Every lens manufacturer suggests a different method to determine that. Some start with K's and you'll match the K's to whatever the K value of the base curve is. Most employ different sagittal depths using those sag values rather than a base curve value, because it's easier to think of the lenses in sag depth.

Some diagnostic sets simply have a specific lens that you start with. For example, for a new fit patient who presents with moderate keratoconus, it might be suggested to start with “Lens B”. Sometimes the lens or lens case may be a different color designating that's where to start. In other cases if you know the patient is an advanced cone you'd consider starting with a little deeper sag because they'll need a deeper lens.

Each fitting set is unique and regardless of what lens you put on first, you're usually know with good accuracy how close you are to the proper fit relationship. If you put a lens on and there is a thousand microns of clearance, simply subtract

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seven or eight hundred microns of clearance to determine the initial lens to order. Likewise, if you have a lens that's touching or just grazing the cornea then let's add three hundred microns. So, regardless of what you start with, it's a pretty easy system to know where to go once you put that first lens on.

[Craig Norman](#)

“How do you suggest managing the lens fit for those cases that have small bubbles under the lens?”

[Dr. Maria Walker](#)

There's a couple of potential scenarios regarding this question. If you apply a lens and there are no bubbles but after a while you get little micro bubbles, that's indicative of an area where there's too much edge left or there's a space between the conjunctiva and the lens where these little bubbles will sneak in over time. Sometimes these are referred to as late forming bubbles.

You don't want to confuse those with application bubbles because they occur over time. Usually, that means you need to play around with that periphery to get the lens closer to the conjunctiva, so it doesn't have a little air gap. The best way to evaluate that is to put fluorescein over the top of the lens, right at the edge where think the gap is so that you can see where the fluorescence is able to get underneath the lens easiest.

[Craig Norman](#)

Excellent tip! The next question refers to the use of OCT. ***“Are you using an anterior segment lens or corneal lens for OCT measurements?”*** I believe this refers to an attachment or mode with the instrument.

[Dr. Maria Walker](#)

Most practices don't have a dedicated anterior segment OCT, but instead have multifunctional instruments. So, the corneal versus anterior seg is most likely is regarding the view mode and what one is attempting to evaluate. If you want to look at the center of a scleral lens for apical clearance, then the corneal mode would be better. If you're interested in looking at the landing zone, you'd want to consider using the anterior seg mode.

[Craig Norman](#)

“Here's a common question; should there be 200-300 microns of clearance immediately after application or after waiting twenty to thirty minutes?”

[Dr. Maria Walker](#)

Immediately after application. My most perfect fits usually have about one hundred microns of clearance over most of the cornea, which means we probably started with 200-300 on initial application. I don't recommend letting the lens get much closer than 100um to the cornea in any area. If you get too much closer, you worry that some days maybe the lens settles a little more and you don't want to be in a situation where you're within fifty microns because you could end up touching.

So, 200-300 microns, maybe 250-300 given that the average person's lens will settle about a hundred and fifty microns, so that puts you at about a hundred once it's all settled in.

But also keeping in mind, and I'm sure you'll agree Craig, that Patient A's lens is not going to settle the same as Patient B.

Generally, older patients have spongier conjunctivas that'll settle in a little more than an eighteen-year old new cone, although it doesn't always work that way.

[Craig Norman](#)

“You mentioned that possibly there is possibly a difference, from one day to another on the amount of settling. What would be the reason for that?”

[Dr. Maria Walker](#)

I'm not entirely sure. Part of it is when the patient puts the lens on, sometimes they squish it in a little bit more. There have been studies, that did find some actual fluctuation in the thickness of conjunctiva from day to day, so I think maybe if our blood vessels are a little more dilated one day versus the other, certainly for those that have allergies. You might get a little bit of edema one day versus the next, remembering these are diseased eyes, so it's not always going to be the same exact conjunctiva morphology every single morning when they put it on.

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I think it's just a combination of maybe you have some more fluid in the conjunctiva, maybe the blood vessels are dilated, overall inflammatory response, etc.

[Craig Norman](#)

I noticed when you were presenting, you showed OCT images of where the lens edge was sticking into the conjunctiva, and you were drawing that line to demonstrate it was still an okay fit.

It's amazing to me that while it looks like there's a tremendous amount of encroaching on the conjunctiva, if you look at the same kind of image with a soft lens, very often they look almost identical, and we just don't think about that being an issue in a soft lens.

[Dr. Maria Walker](#)

Evidently, there is a little bit of a factor of a change in the index of refraction as light passes through the lens so there is a little bit of artificial compression of that tissue. I think the key with sclerals specifically the OCT is nice for looking at subtle changes, but I'm more looking at the slit lamp and saying can I say real impingement of blood vessels, and like reddening before I'm worrying about what I see with an OCT.

[Craig Norman](#)

I think OCT, to your point, is much better suited for teaching.

[Dr. Maria Walker](#)

Exactly, and it's great, and I also use it to evaluate subtle areas where I want to make really fine changes, but it really is only in advanced fitting. Honestly, it's also because we have one. I'm not sure I would go out for that purpose alone if I was in private practice.

[Craig Norman](#)

That's why the multifunctional instruments make a lot of sense.

[Dr. Maria Walker](#)

Exactly. If you've got one, good, use it. You can have fun with it, but I don't think it's a necessity specifically.

[Craig Norman](#)

I think we answered most of the questions related to this, except for one and that is, ***"Do you have to adjust for lens settling over the limbus zone also?"***

[Dr. Maria Walker](#)

Yes, but usually these lens designs are suited for most eyes so if you have a lens that's crossing the cornea how you want, it usually crosses the limbus how you want and then everything settles down.

You're not going to expect that same amount of settling because there's a curve there and so when you settle down, you don't expect a hundred microns, a hundred and fifty over the limbus, but you can pretty much be assured that as long as you've got a decent amount of central clearance by two hundred microns or so, you may only change the limbus clearance by forty microns, and it's different from design to design. You have to ultimately look at it and make sure it's not touching, and if it is then you can have the limbus clearance adjusted, and you can do that independently of the other features in just about every lens.

Just watch it on every patient and if you need to adjust it, you can adjust it.

[Craig Norman](#)

These next questions relate to oxygen. Mostly, ECPs want to know what is the best Dk for a scleral lens, and some relate to corneal edema. So first, ***"what is opinion on tear exchange with scleral lenses?"***

Some practitioners argue that the patient may need to have some tear exchange to avoid debris formation from devitalized corneal epithelium, while others say gentle seal-off with minimum to no tear exchange will avoid tear debris from getting under the lens.

[Dr. Maria Walker](#)

Like most questions, it really depends on your patient. I prefer a lens fit that once you put fluorescein at the edge of the lens, you'll get a little bit that trickles in. What you don't want to see is after fluorescein installation that suddenly tears go underneath the lens on the first blink.

But, within the first three or four blinks I want to see it at least sneaking in a little bit on the edges.

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Sometimes, I'll even move the lens with my thumb to see if I can move the lens a little bit, just to get fluorescein to come in. You don't want too much tear exchange because of tear debris. Some say you want some tear exchange, so you don't get debris. There's a happy medium, so if you have complete seal off, you'll get some metabolic waste build up and debris. If you have complete exchange on every blink, you'll get even more debris cause it's just sloshing in. What you want is a sealed system so tears are not just free flowing in and out. But I do want tears mixing underneath the lens. Then I'm getting enough oxygen and I'm usually confident that I'm eliminating most of the debris during the blink cycle.

[Craig Norman](#)

That's well said. You don't want total seal-off, and you don't want total flushing of tears with every blink. It must be somewhere in between.

[Craig Norman](#)

“What do you do with corneal swelling above fifty?”

[Dr. Maria Walker](#)

If a patient has corneal swelling above fifty, the first thing I do is look at my lens thickness. Most of the evidence is showing that tear thickness is not so much what matters, mainly because you're getting good mixing of tears. But lens thickness, especially if you have plus power, can get quite thick so I consider the possibility of decreasing thickness? If it's a four-hundred-micron lens, I can go to two fifty or three hundred. That's an easy change to make.

[Dr. Maria Walker](#)

I'll also start increasing the DK, so I order most lenses standard with anywhere from a hundred to one fortyish of DK. Now there are lenses that have higher Dk in the 160s and expect within the year, up to two hundred DKs will be readily available.

In general, you want a lens made as thin as possible - usually about 300 microns if it's greater than that already. So, I make my lens thinner. The next thing I consider is maybe make a toric edge so that I'm encouraging tears to exchange a little bit more if they're not already. I do fluorescein analysis to ensure I'm getting some tears under there. Again, I

try to improve tear exchange with that lens edge and make a lens as soon as I can make it and with the highest DK possible.

[Dr. Maria Walker](#)

If that still doesn't work, I will have patients try to wash themselves out for a couple of days before they try the new lens. I feel they can get stuck in this edematous response where they don't even get back to baseline before you throw another lens on there. So, let their eyes breathe a little bit, introduce the new lens, then see them after six or seven hours of wear. You do have to think about whether they have a disease. If they're swelling that much, what's going on with their actual endothelium? And so then you have to talk to them about limiting their lens wear.

That's my last consideration. If we can't fix it, then suggest to the patient to wear the lenses for four hours, take them out for a half an hour, then wear them for four more hours. Usually this is the type of patient who's had a transplant or other unusual situation so they're not strangers to taking specific and careful care of their eyes. And when you talk to the patient it's like “look you got a transplant, you have a diseased eye, this is the best we can do.” It's not an issue because that's how we're trying to make sure that they don't have to go in for another transplant.

[Craig Norman](#)

“When you talk in terms of lens thickness, do you go strictly by center thickness or do you look at harmonic thickness, the averaged thickness across a larger zone of the lens.”

[Dr. Maria Walker](#)

Yeah! That's going a little deeper into the analysis, and if you've got that OCT, to look at the center thickness and over the limbus, along with at the edge. Talk to the manufacturer and see if you can design a lens that has the thinnest features in each spot. You must be a little bit careful because sometimes if you thin lenses out too much in certain areas, they'll break a little bit easier.

[Craig Norman](#)

That's terrific. ***“Regarding endothelial cell count, how low can it be before you become worried about corneal health?”***

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[Dr. Maria Walker](#)

Anything less than 1500 cell/mm² a healthy endothelium should have about two thousand, and most healthy ones have way more than that. So, if somebody's got fifteen hundred or less, I'm just watching them, but in my experience the issue is the lower the count gets, the harder it is for the instrument to get a reading. I think if you get under about eight hundred, I would never say no because you just never know.

Sometimes you'll see patients with low endothelial counts who have no problem with corneal edema. I don't know how it's happening but there's more factors there about the actual functionality of the tissue, so I would say fifteen hundred is where would watch closely. At something less than 800 cell/mm² I'd be really impressed if the cornea could withstand edema.

[Craig Norman](#)

Okay, just a couple of other questions. ***“Do you recommend presoaking or rubbing the lens with conditioner prior to dispensing?”***

[Dr. Maria Walker](#)

Always, yes. Many scleral lenses are received from the manufacturer in fluid, although some of them aren't. So, if you have patients coming in that day for dispensing make sure those lenses are nice and clean, so they'll wet well, and have them in conditioner.

[Craig Norman](#)

“Do any of the lenses that you use for diagnostic lenses come with Hydra-PEG?”

[Dr. Maria Walker](#)

No, and the reason, is that Hydra-PEG lenses must be wet. Diagnostic lenses, for quality control and infectious control reasons, should be stored dry. If you stored diagnostic lenses wet, especially in the case of Hydra-PEG coating which is very lubricious, I would be uncomfortable putting a lens on one patient, then taking it off, and putting it on another. Hydra-PEG is good for individual patients, but I would be wary of storing lenses treated in this manner for my diagnostic lenses.

[Craig Norman](#)

Excellent response, thanks. ***“Next, what is your favorite preservative free, artificial tear?”***

[Dr. Maria Walker](#)

It depends. Sometimes it's patient cost. If one is using artificial tears for application solution it gets pretty expensive, so I usually tell them to go ahead and use a generic one. An overall issue with generic eyecare products is that they have different preservatives than current branded ones. But, in this case they are preservative free so I don't see a big problem here. I used to just go to Refresh Optive because that was what we had in the clinic, but I think as long as it's a clear generic instead of a milky one a generic should be fine. I also tell the patient to play around with different products to find out what works best for them.

[Dr. Maria Walker](#)

Keep in mind that the artificial tear is being used in attempt to mitigate fogginess or debris. So, I want to use a higher viscosity, so even Celluvisc. Conversely, if a patient just has a little bit of comfort issue and doesn't really like the saline, I might recommend Refresh Optive to give something a little less viscous.

[Craig Norman](#)

We've come a long ways as it wasn't that long ago when we attempted to avoid artificial tears completely for application, but it sure does make sense in certain cases.

[Dr. Maria Walker](#)

I agree.

[Craig Norman](#)

Another question is ***“do you have a favorite scleral lens fitting kit?”***

[Dr. Maria Walker](#)

No, because at this point, the market has become quite competitive since we have so many sclerals that are available and if they weren't any good they would have probably been discontinued by now.

It's important to get one that has a multifocal available. If you find yourself wanting to make lots of little changes and you want to have control of every single curve, find yourself a lens that's got four or

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five different curves you can change. On the other hand, if you just want a really simple set, where you don't want to think about making a lot of changes, consider one that has fewer parameter changes options. I think ABB Optical truly is great because there are so many brands in the scleral category that are available.

For some patients you may want to use a larger diameter lens, while in another case it may be a smaller diameter. My response is based upon who's your population that you're fitting, and what do you want to use it for there may be one brand more preferable than another, but they're all pretty good.

[Craig Norman](#)

Today they are for sure. Your point about if they weren't really good products then the market would have driven them out is correct, and the combination of the lens design and fabrication is really fantastic.

[Craig Norman](#)

One last question. ***“What advice would you give to a patient who loses their removal plunger?”***

[Dr. Maria Walker](#)

Unbelievably, I had a patient this morning who had that issue. This patient used her application plunger to get by, but those are tricky because you must get the whole plunger on the lens and squeeze it to get the suction properly. It can be tricky but can be used if you can establish that suction component on the lens.

Alternatively, if the patient has no plungers at all, one can flip the lens out at the edge of the lens. I advise the patient they should look up and then push their lower lid against the edge of the lens forming an air pocket and although it may be a little uncomfortable it'll get the lens out. Some patients have just done this on their own. It's just like removing a GP lens using the edges of your eyelids to butt up against the edge of the lens and pop the lens out. The reason we don't routinely do that with sclerals is because there is that extra suction property and the plungers just make it easier. It is a method to consider though when the patient is in a bind without their removal plunger.

[Craig Norman](#)

Thank you, Dr. Maria Walker. Your recent webinar was terrific and this Q&A session extremely interesting as well.