TAKING THE MYSTERY OUT OF SCLERAL LENSES

Patient Selection, Instrumentation, Fitting Techniques, and Follow-Up Evaluation

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First in a series of four scleral lens CE activities for 2020

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ACTIVITY DESCRIPTION
The goal of this article is to better eyecare professionals' understanding of scleral lenses; ideal candidates, techniques, and technologies for fitting; and lens design. A review of the literature will provide the reader with a better understanding of various instrumentation, scleral lens prescriptions, and fitting techniques.

TARGET AUDIENCE
This educational activity is intended for optometrists, contact lens specialists, and other eyecare professionals.

ACCREDITATION DESIGNATION STATEMENT
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Recently, significant innovations and advancements in modern ocular imaging technology and lens manufacturing have facilitated the fitting process for scleral lenses (SLs) and increased their prescriptions. Still, clinicians may hesitate in proposing SLs due to their doubts concerning numerous aspects including patient selection, instrumentation to fit SLs more accurately, fitting techniques, first lens selection, and follow-up visits. A detailed description of these concerns is provided to increase practitioners' awareness and confidence, to simplify the fitting process, and to ameliorate patient experience.

Interest in scleral lenses (SLs) is increasing globally because of their ability to provide visual rehabilitation in severe cases, such as irregular corneas, and because of their therapeutic effect on ocular surface diseases by providing comfortable wear. The evolution in contact lens manufacturing and ophthalmic instrumentation has primarily contributed to a better understanding of the ocular surface contour, leading to the formulation of new SL designs and techniques, thus increasing the fitting rate success. However, during their daily practice, clinicians may hesitate to prescribe SLs because they still have questions: Which patients may not be good candidates for SL wear? What equipment is needed to fit SLs more accurately? What are the different fitting techniques? How to identify the first lens selection? When should follow-up visits be scheduled, and at what frequency? What should be observed and verified during these follow-ups?

Clarifying these questions increases practitioners' awareness and confidence and facilitates the fitting process.

PATIENT SELECTION

Correct patient selection and pre-screening are crucial to SL success. A good candidate for SL wear can be identified based on the ocular surface condition and health, clinical history, and expectations. Past physical, medical, and ocular treatments and previous contact lens modalities and care regimen also provide valuable information for management strategies, lens design, and materials.

The main indication for SL use is the correction of corneal irregularities for visual rehabilitation. The liquid reservoir created beneath the lens acts as an optical lens that corrects both regular and irregular astigmatism as well as aberrations created by the anterior cornea, thus enhancing visual acuity and quality.[1-3]

A second large group that benefits from SLs is ocular surface disease patients. The 2017 TFOS DEWS II report recommended the use of therapeutic contact lenses—both soft lenses and SLs—in step 3 of the management and treatment recommendations for dry eye disease.[4] The precorneal fluid reservoir provides continuous hydration of the underlying ocular surface, alleviating symptoms and reducing clinical signs induced by ocular surface diseases. SLs are also a beneficial therapeutic option for lid and orbit disorders, for refractive errors in normal and healthy eyes, and as drug delivery devices.

Additionally, there are no age restrictions for SL wear. Parents or caregivers of pediatric patients should be trained in SL handling and care. Geriatric patients may be fit as well. A study has shown that SL application and removal ability did not differ by age or diagnosis type.[5]

In some ocular conditions, the use of SLs may be contraindicated or may necessitate caution, such as fitting SLs in patients who have corneal endothelial abnormalities with reduced cell density or Fuchs' endothelial corneal dystrophy. These conditions are seen in elderly patients, in those who have diabetes or dry eye diseases, or in those who underwent ophthalmic surgeries.[1] The endothelium performs a crucial function of maintaining corneal health and transparency. A cell density below the limit of 700 cells/mm^2 may lead to corneal decompensation, causing edema.[6,7] The use of SLs may reduce the oxygen transmissibility and exacerbate the preexisting edema. A thinner lens and reduced post-lens tear reservoir thickness may be indicated to increase oxygen delivery to the cornea. Altering SL peripheral back-surface toricity may create tear exchange, allowing the entrance of oxygenated tears into the fluid reservoir. Switching to a fluid-ventilated design or introducing channels in the lens periphery may be beneficial as well.

Patients who have diabetes, who are immunocompromised, or who have non-healing epithelial defects should also be closely monitored because they may develop complications related to SL wear.[8]

SLs for the correction of refractive errors in patients who have glaucoma is not recommended, as the effect of SLs on intraocular pressure is still unknown. Particular attention is needed with glaucoma filtration devices, glaucoma drainage implants positioned near the limbus, or blebs because the SL may alter the function of the drainage device. A small-diameter lens that avoids interaction with the device may be suggested. A notch, an increased elevation in the lens periphery, a customized lens, or an impression technique may also be indicated.

Patients who have a psychological intolerance to a foreign body on the eye; an inability to follow instructions for cleaning, storage, maintenance, and asepsis of the SLs; poor personal hygiene; and/or who are incapable of understanding the risk factors are not good candidates for SL wear. However, some patients may be able to overcome these difficulties with adequate patient education.[1]

Patients who have unrealistic expectations are more likely to have a compromised overall satisfaction with SLs, which can lead them to abandon SL wear. Some patients may request SLs for conditions that cannot benefit from their use, and these patients are often extremely disappointed after the fitting. Therefore, it is crucial to assess patient eye conditions and expectations and to clarify the limits and challenges of SLs before starting the fitting process.

SL wear during water sports may increase the risk of infection. Clinicians need to clearly explain the risks and consequences of using SLs when participating in them. If worn, the lenses should be removed, cleaned, and rinsed immediately after completion. The use of a mask is highly recommended. Boxing and martial arts may represent a substantial risk for trauma and lens rupture in the eye. Headgear use in these cases is highly recommended.

INSTRUMENTATION

The advent and growing popularity of SLs has required professionals to better understand the ocular surface profile and the assessment of SL fitting. This requirement has led the industry to invest in innovation of diagnostic instruments that increase SL fitting success. Currently, the instrumentation that may be needed when fitting SLs includes slit lamp examination, anterior segment optical coherence tomography (AS-OCT), corneoscleral topography, Scheimpflug tomography, specular microscopy, and pachymetry. Their utility and benefits when fitting SLs are summarized in Table 1.

Slit Lamp Examination Whatever technique is used for fitting SLs, the use of the slit lamp is fundamental to examine ocular health (both before and after lens fitting), to assess SL fitting, and to evaluate the ocular surface profile.

Before fitting SLs, an eye examination is crucial to identify pre-existing ocular diseases that could limit the best-corrected visual acuity. It is essential to assess the corneal and conjunctival health with fluorescein and lissamine green, respectively. The information needed to decide the SL diameter and geometry includes eyelid position, conjunctival irregularities or elevations, palpebral aperture, and corneal diameter. Documentation and photodocumentation of baseline observations and findings are pertinent to optimize fitting strategies, to monitor changes over time, and to prevent attributing any significant findings to poor-fitting SLs.

Clinicians who don't have access to new technological instrumentation may successfully use the slit lamp to assess the scleral contour by observing the lens behavior on the eye and the clinical signs. The presence of sectorial blanching, impingement, lens edge lift-off, and stained tear influx denotes a toric sclera. If the clinical signs appear in only one quadrant or area, the sclera is asymmetric or irregular.

It is necessary to use two different dyes to assess the lens fitting relationship with the underlying ocular surface.[9] To verify the lens vault and to estimate the fluid reservoir depth, fluorescein is the indicated dye because of the high contrast of its orange color with the colored iris. To better evaluate the lens alignment on the sclera and the influx of the stained fluid in the tear reservoir, lissamine green is the most appropriate dye because its green color has a higher contrast with the white sclera.

Corneal Topography Corneal topography informs the corneal profile and whether patients need SLs. In the case of corneal irregularity, if the difference between the greatest and the lowest elevation is less than 350µm, a corneal GP contact lens may be successfully fit 88% of the time.[10] However, when the difference is greater than 350µm, SLs are required.

Performing corneal topography before fitting SLs is crucial for choosing a lens design, increasing fitting success, and significantly reducing chair time. When the cornea exhibits a high amount of astigmatism or irregularity, the fluid reservoir depth does not appear uniform in the different parts of the corneal area, compromising the lens fitting. A customized lens with a toric or quadrant-specific design in the corneal and limbal zones allows a similar fluid reservoir thickness in every part of the corneal area.[11] Several corneal topographers provide the corneal sagittal height at a specific chord, which is essential information to determine the sagittal height of the initial SL selection.

Corneal topography may also help to identify lens flexure on the eye. In some cases, during SL wear, residual astigmatism may appear and may be due to lens flexure.

TABLE 1

THE VARIOUS ASSESSMENTS PERFORMED WITH THE DIFFERENT INSTRUMENTATION THAT MAY BE NEEDED IN SCLERAL LENS PRACTICE AND THEIR BENEFITS

INSTRUMENTATION	ASSESSMENTS	BENEFITS
SLIT LAMP	Ocular condition before and after lens wear	To predict fitting results
		To regulate patients' expectations
		To choose the appropriate lens geometry
		To monitor issues or complications
		To modify lens geometry
	Eye and lid characteristics	To choose the appropriate lens geometry
	Ocular surface profile	
	Visible iris diameter	
	Corneal and limbal vault	To optimize lens fitting
	Lens alignment with the conjunctiva	
CORNEAL TOPOGRAPHY	Corneal profile before and after lens wear	To select between a corneal lens and a scleral lens
		To include a customized corneal zone
	Corneal sagittal height	To select the appropriate lens sagittal height
	Lens flexure	To optimize the lens alignment on the conjunctiva
OCT	Corneoscleral profile	To choose the appropriate lens geometry
		To design customized scleral lenses
	Ocular sagittal height	To select the appropriate lens sagittal height
	Scleral lens fitting on the eye	To perform a more accurate evaluation
		To optimize lens fitting
	Corneal and scleral thickness	To monitor the effect of lens wear on the ocular surface
	Lens thickness	To monitor the changes in lens thickness after re-order
CORNEOSCLERAL TOPOGRAPHY	Ocular sagittal height	To select the appropriate lens sagittal height
	Ocular surface profile before and after lens wear	To choose the best initial lens selection
		To optimize lens alignment on the conjunctiva
		To design customized scleral lenses
		To monitor the effect of the lens on the ocular surface after lens removal
SCHEIMPFLUG TOMOGRAPHY	Anterior and posterior corneal topography	To detect early ectasias
	Ocular surface profile	To choose the appropriate lens geometry
		To design customized scleral lenses
	Imaging of the anterior segment	To monitor the effect of the lens wear on the eye
	Global pachymetry	To monitor the changes of corneal thickness before and after lens wear
		To perform a differential diagnosis of pellucid marginal degeneration
SPECULAR MICROSCOPY	Endothelium condition	Patient selection for scleral lens wear
		To monitor the changes of the endothelium before and after lens wear
	Pachymetry	To monitor the changes of corneal thickness before and after lens wear
PACHYMETRY	Corneal physiology and thickness	To monitor the changes of corneal thickness before and after lens wear

Performing topography over a centered SL verifies whether the lens' anterior surface is spherical (indicating internal astigmatism) or toric (confirming lens flexure).

AS-OCT Initially, AS-OCT was not developed for SL assessment, but over time this technique has been adapted for this purpose, and it is now likely to be the gold standard for SL evaluation on the eye. The use of AS-OCT in evaluating the SL fit provides essential clinical information in addition to the examination with the slit lamp. AS-OCT is mainly used to measure the thickness of the fluid reservoir and lens alignment on the conjunctival tissue. With AS-OCT, the vault is determined by measuring the distance between the anterior surface of the cornea or the limbus and the posterior surface of the lens using a caliper. The instrument's caliper tool allows a higher level of precision of the vault compared to the estimation performed with a slit lamp.

AS-OCT may also be used before fitting any SL to assess corneoscleral profile to determine the lens sagittal height and design.

When more oxygen delivery to the cornea is needed, a thinner lens may be required. The use of AS-OCT allows for the measurement of lens thickness, from the center to the edge, to monitor the initial thickness and the changes after lens re-order. The corneal and scleral thickness may be measured as well. It is crucial to monitor corneal thickness changes after SL wear, especially in cases prone to edema such as post-penetrating keratoplasty and in patients who have a reduced endothelial cell density.

Caution is required while assessing the SL fitting because the AS-OCT instruments assume a uniform ocular refractive index for thickness calculation, which is altered while wearing a SL.[12] A reduced vault and conjunctival compression or indentation may be the result of an optical artifact arising from the difference between the refractive indexes of the lens material and corneal and conjunctival tissue, or a combination of the two.

Corneoscleral Topography Currently, there are two corneoscleral topographers available. Using fluorescein, they can measure the ocular surface elevation up to 22mm by projecting patterns onto the ocular surface and using two offset cameras to triangulate height data. One of these instruments measures 350,000 points, generating 3D height maps of the ocular surface. While measuring, the patient looks in primary gaze. This instrument uses software to determine the best lens fit of several SL designs that are commercially available.

The second corneoscleral topographer uses a uniquely coded projected pattern to identify matching points across multiple views.[13] Measurements are taken in primary, superior, and inferior gaze directions. The software then combines the three images and generates a single stitched topography. This instrument uses software to design a customizable SL.

Scheimpflug Tomography Scheimpflug tomography delivers highly accurate elevation data and measurements of the anterior and posterior cornea, global pachymetry, and high-quality imaging of the anterior segment. Measuring the posterior cornea is crucial to detect early ectasias such as keratoconus, because the anterior corneal surface may appear healthy, but posterior anomalies may exist. Ambrosio has found posterior corneal changes in 88% of contralateral eyes of patients previously diagnosed as unilateral keratoconus.[14]

The global pachymetry is essential to monitor the changes of corneal thickness after SL wear and for the differential diagnosis of pellucid marginal corneal degeneration (PMD). The diagnosis of PMD has been made based on a corneal topography pattern appearing as a "crab claw" or "kissing doves" without considering the corneal thickness. These patterns also can be frequently seen in keratoconus. However, in PMD, there is a peripheral thinning localized inferiorly, approximately 1mm from the limbus.

Recently, one Scheimpflug system has integrated software for the assessment of the corneoscleral profiles up to 18mm. This scanning process is a tear film independent measurement and reproducible as all other data measured, and a link to external SL fitting software is available.

Specular Microscopy Specular microscopy allows practitioners to assess endothelial cell size, shape, and density and to detect the presence of abnormalities such as guttata and endothelial cell inclusion bodies, and it also provides pachymetry measurements. The frequency of this examination depends on the corneal condition and risk factors for edema occurrence.

Pachymetry When fitting SLs, it is crucial to monitor corneal physiology. Pachymetry allows practitioners to assess baseline corneal thickness and to verify any changes after SL wear. Tomography may be measured using either optical or ultrasound methods. Several new instruments such as AS-OCT, Scheimpflug tomography, and specular microscopy include tomography measurement with an optical method using low coherence reflectometry.[15,16]

FITTING TECHNIQUES

The SL fitting process can be laborious, requiring time and patience. The fitting process consists of performing an initial evaluation of the eye condition, choosing the appropriate lens diameter and design, selecting the lens with the proper sagittal height, evaluating the lens on the eye, and making modifications where necessary. Different techniques can be used, and practitioners need to understand the benefits and limits of each technique. Innovative and advanced instrumentation reduces the number of lenses applied to the eye and patients' concern. The application of an improper initial lens or various lenses on the eye during the first visit may increase patients' anxiety and lead them to perceive the practitioner as inexperienced, and an inappropriate initial lens may cause discomfort and may complicate the fitting process.

Slit Lamp and Diagnostic Fitting Set Technique Many practitioners do not have access to advanced technological devices. Hence, the most common SL fitting technique adopted worldwide is to use the slit lamp in combination with a diagnostic SL fitting set. A preliminary eye examination is crucial for the selection of lens diameter and design. The lens diameter is the most fundamental consideration in the SL fitting process, and it depends on several factors, such as the horizontal and vertical iris diameters, presence of conjunctival irregularities, palpebral aperture, and scleral contour. The corneal shape may be evaluated by viewing the profile of the cornea outside of the slit lamp. This information is helpful to select the sagittal height of the initial lens. The lens sagittal height should be higher compared to the ocular sagittal height at a specific chord, by about 350µm, for initial fluid reservoir depth and lens settlement. After lens application, a slit lamp examination is essential to verify the lens vault. The presence of a dark area in the corneal and limbal zones indicates an insufficient vault.

The scleral shape can be evaluated using a slit lamp by fitting a SL and verifying the presence of sectorial blanching, impingement, and lens edge lift-off.[17] When fitting a spherical SL on a significantly toric or asymmetric sclera, the lens touches the flattest meridian and lifts off in the steepest one. Sectorial blanching and impingement in the horizontal meridian denote a with-the-rule scleral toricity. When they appear in one area, the sclera presents an asymmetric shape. A lens edge lifting off in the vertical meridian means that the sclera exhibits a with-the-rule toricity. When instilling lissamine green in the eye, the dye enters into the tear reservoir where the lens is lifted off, confirming scleral toricity or asymmetry (Figure 1). Fitting a toric SL may confirm scleral toricity when the lens is rotated manually; if the lens recovers to its initial position, the sclera is toric.

Fitting guides are provided with all diagnostic trial sets. Their use is fundamental for the lens fitting process and for modification of lens geometry.

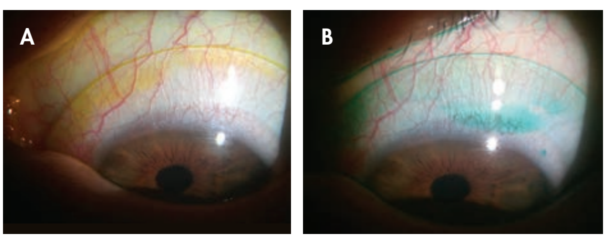


Figure 1. Comparison between the use of fluorescein (A) and lissamine green (B) for the assessment of the lens alignment on the sclera. The use of lissamine green allows a better evaluation because its green color has a higher contrast with the white sclera. Additionally, the images show a sectorial lens edge lifting off with a moderate tear influx into the liquid reservoir. The lens lifting off in the vertical meridian denotes a with-the-rule scleral toricity.

TABLE 2

SCLERAL SAG FACTOR TABLE

DIAMETER (MM)	MICRONS (µM)
14.00	1,700
14.50	1,800
15.00	2,000
15.50	2,200
16.00	2,400
16.50	2,600
17.00	2,800
17.50	3,000
18.00	3,200

Corneal Topography Fitting Technique The use of corneal topography may be helpful for identifying the corneal profile. As stated earlier, performing corneal topography before applying any SL indicates whether the cornea exhibits a high amount of astigmatism or irregularity, thus requiring a toric or asymmetric corneal zone.

Corneal topography may also be helpful for determining the sagittal height of the initial diagnostic lens selection. Some topographers provide the corneal sagittal height at a precise chord, generally at 10mm. The "scleral sag factor" table then can be used to calculate the sagittal height at the chord at which the SL in the trial set is measured and marked (Table 2).[18,19]

For example, if the corneal sagittal height measured with the topographer at 10mm is 1,750µm and the trial SL diameter is 16.5mm, 2,600µm need to be added to 1,750µm, considering the fluid reservoir height (350µm) and lens settlement. In this case, the lens sag is 4,700µm. The following formula may be used for this estimation:

Lens sagittal height = Corneal sagittal height at 10mm + Scleral sag factor + Fluid reservoir height.

This method allows a very close estimation of the final lens sagittal height needed.

Some topographers have included software to design the SL based on topographical data, refractive error, and corneal diameter. When fitting, the software guides the clinician through the changes when issues occur.

AS-OCT Fitting Technique AS-OCT is relevant before fitting any SL to assess corneal sagittal height, corneoscleral junction shape, scleral curvature, and scleral elevation. These measurements are helpful for selecting the proper lens sagittal height and design. As with corneal topography, it is possible to measure the ocular sagittal height at a specific chord and use the "Scleral Sag Factor" to calculate the lens sagittal height at the chosen diameter.

During the fitting process, AS-OCT is typically used to assess the lens fitting on the eye because it provides a more accurate measurement of the lens vault and evaluation of the lens alignment on the conjunctival tissue. An optimal relationship between the lens edge and the conjunctiva follows a 50/50 rule: 50% of the lens edge sinks softly into the conjunctival tissue, and 50% is above the tissue. When more than half of the lens edge sinks, blanching and impingement may potentially occur. When more than half is above the conjunctiva, the lens edge is lifting off, resulting in lens awareness and discomfort.[20] Additionally, AS-OCT is convenient to assess conjunctival and scleral compression after SL removal. Tissue compression differs with each lens design and may affect tear exchange, comfort, and the amount of conjunctival staining when removing the lens.[21]

AS-OCT may also be helpful to design customized SLs. Gemoules was the first to present a fitting technique based on the use of AS-OCT.[22] The instrument must capture a 16mm full image and 10mm wide in high-resolution mode. With the use of specific software, it is possible to import and put in scale the cross-sectional tomograms of different meridians to design customized SLs.

Corneoscleral Topography Fitting Technique Corneoscleral topography provides the ocular sagittal height at a definite chord as well as the presence of scleral toricity or asymmetry or conjunctival irregularity. The various lens designs and brands commercially available are included in the software of one of the instruments. Based on the data collected and the lens design selected, this software then calculates the best lens fit, and the amount of peripheral toricity is suggested. This process helps practitioners identify the initial diagnostic lens, reducing the number of lenses applied to the eye to reach the best fit. An over-refraction is then needed to finalize the lens order (Figure 2).

The other available corneoscleral topographer uses software that evaluates the amount of scleral toricity and includes it in the lens periphery, if needed. The software identifies the best lens fit from one specific design of SLs. After lens application and evaluation on the eye, it is possible to modify the lens geometry and to design a customized SL (Figure 3).

Performing corneoscleral topography during the follow-up visits after SL removal is helpful to evaluate the impact of the lens on the ocular surface. This evaluation helps to optimize the fitting, increase comfort, and reduce the incidence of ensuing problems with time.

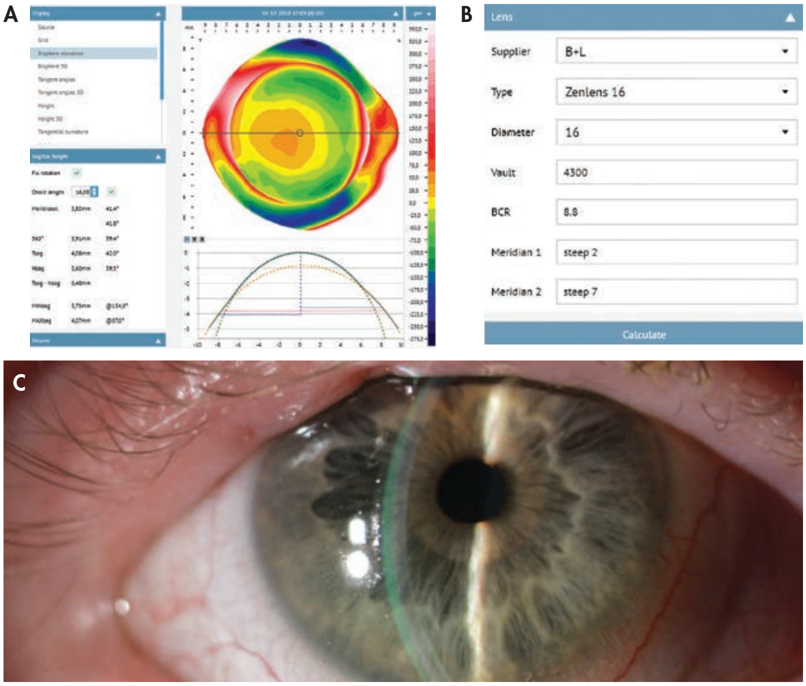
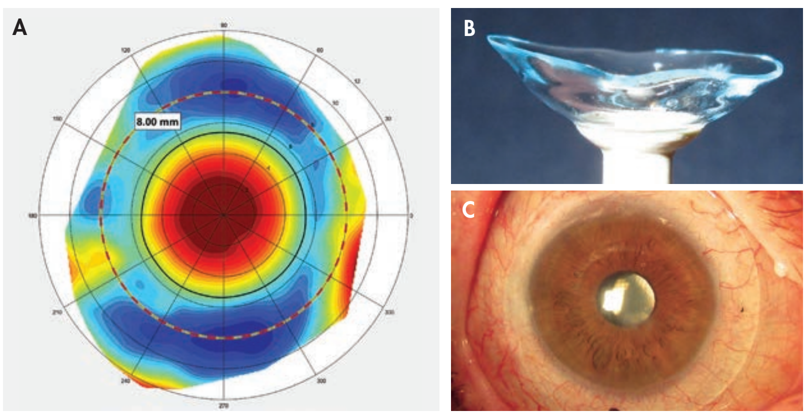


Figure 2. (A) Corneoscleral topography showing the different ocular sagittal heights at 16.00mm. (B) The software calculation of the best lens fit of a specific design commercially available. The lens sagittal height calculated in this case is 4,300µm. (C) Fitting assessment of the first lens selected from the diagnostic set showing adequate vault and peripheral alignment. The selection concept consists of choosing the closest lens to the calculation made by the software with the higher sagittal height. In this case, the initial lens sagittal height chosen is 4,500µm.



Images courtesy of Greg DeNaeyer, OD

Figure 3. (A) Corneoscleral topography of an eye with GVHD and post-glaucoma surgery showing an asymmetric-irregular scleral profile. (B) A custom scleral lens designed with software that the system uses. (C) View of the scleral lens applied on the eye.

Scheimpflug Tomography Fitting Technique Scheimpflug tomographers scan optical sections of the cornea, providing a full elevation map of the anterior and the posterior cornea. Corneal elevation data may be beneficial for the first lens selection. During the fitting process, Scheimpflug tomography may also be used for an accurate lens assessment on the eye.

A software update was recently developed for one Scheimpflug system to extend the coverage up to 18mm horizontally and 17mm vertically. These measurements can be used to detect and quantify scleral toricity and asymmetry, hence, to select SL diameter and design. A study compared the corneoscleral profile measurements with Scheimpflug tomography to an impression-based technology and revealed excellent repeatability up to an 18mm diameter. Reliability was shown over various scans, and there was conformity to impression elevations.[23] A link to external fitting software for customized SLs is available.

Impression Technique The impression technology produces a SL that creates a smooth refractive surface for the eye, improving vision. The process consists of making primarily an impression, which is sent to the laboratory where a 3D scanner processes the model version. Lastly, the back surface of the lens is created with lathe-incorporating software based on Elevation Specific Technology to exactly match the singular irregularities of each eye. Recently, a study investigated the outcomes of patients fit with impression-based SLs.[24] While many subjects involved in the study failed with previous treatment, including conventional SLs for vision rehabilitation, all patients reported increased satisfaction.

FOLLOW-UP EVALUATION

After lens dispense, it is crucial to schedule follow-up visits. Their frequency depends on the ocular surface conditions and compliance. A first visit may be scheduled for around one to two weeks later to verify further lens settling and any problems related to SL wear. If modifications are needed, another appointment may be scheduled for a new dispense. If the lens exhibits an optimal fit, good vision, and good comfort, the next follow-up visit may be scheduled at one month. Following this appointment, an additional follow-up evaluation may be then scheduled at four to six months.[25]

In compromised corneas, an initial evaluation after four to six hours of SL wear is crucial, and closely scheduled follow-up visits are needed. A reduced initial wearing schedule of about four to six waking hours is recommended. If complications do not occur at the follow-up visits, the wearing schedule may be progressively increased.

At each follow-up visit, it is essential to:

- Document best-corrected visual acuity for both distance and near vision
- Perform an overall evaluation outside of the slit lamp to check for ocular redness and blanching
- Evaluate SL fitting using the slit lamp and document and photo-document the following: apical, peripheral, and limbal vault; scleral zone and edge relationship (blanching or impingement); conjunctival prolapse; and presence of air bubbles or debris in the post-lens tear reservoir and on the anterior surface.
- Evaluate the ocular surface and document and photo-document the following: ocular redness; corneal and conjunctival staining; limbal and conjunctival hypertrophy; vascularization; microcysts; edema; and adverse events.
- Confirm the improvement of symptoms and vision with SLs
- Document the average comfortable wearing time
- Verify whether patients comply with proper use, application, removal, and care of SLs
- If needed, provide further recommendations on handling and on solutions for cleaning, disinfection, storage, and filling lenses.

Compliance is fundamental for SL success and to prevent complications. Patients, with time, may forget or confuse the instructions provided during the education sessions. Providing written recommendations regarding lens handling and wear, solutions, cases, and application and removal devices increases the compliance rate. Compliance should be verified at each follow-up visit by observing patients handling the lenses. Using the questionnaire proposed by Fadel & Toabe may help to ascertain the level of compliance.[26]

CONCLUSION

Despite the significant interest in SLs, some enigmatic aspects may impede clinicians from prescribing them or make the fitting process more laborious. Consequently, additional time for more lens modifications to reach an optimal fitting may be required, which may add to the frustration and costs for both practitioner and patient.

However, patients and clinicians will benefit from the clarification of various questions related to patient selection, instrumentation, fitting techniques, and follow-up visits. In addition, practitioners will deepen their knowledge, master the SL fitting process, gain awareness and confidence in SL fitting, achieve fitting success, reduce chair time and costs, optimize the patient experience, and increase patients' overall satisfaction.

For references, please visit www.clspectrum.com/references and click on document #290.

Daddi Fadel runs an optometric practice specializing in contact lenses in Italy where she designs and fits special customized lenses. She is the founder and president of Accademia Italiana Lenti Sclerali (AILeS). She reports no conflicts of interest.