Counseling the occasional unhappy patient after ophthalmic surgery is sometimes inevitable. However, the more successful you are at preoperative planning, the less likely you are to end up in this situation. A thorough preoperative work-up, including well-documented preoperative examinations, is the blueprint for creating happy patients and minimizing postoperative complaints.

Preoperative assessment is time-consuming but necessary to ascertain the patient’s history, eliminate any procedures that would not work for the patient, and establish goals for the chosen procedure. A thorough explanation of the options for treatment and their limitations will help the patient to make an educated decision, promote better compliance, and save time later. Below are my top five pearls for conducting the perfect preoperative examination for patients undergoing cataract surgery, refractive lens exchange, refractive surgery, and surgery for keratoconus.

**FIVE PEARLS**

**No. 1: Perform a macular function test.** Potential visual acuity measurements must be performed to determine if cataract surgery will produce visual improvement. I have developed an inexpensive measurement, the Vryghem Macular Function Test, which achieves 94.2% sensitivity and 32.4% specificity, and has positive and negative predictive values of 99.2% and 24.3%, respectively.1-3

For this test, a Parinaud near reading chart (Figure 1), an 8.00 D trial lens, and a Heine ophthalmoscope (Heine Optotechnik, Herrsching, Germany) are used. The patient has best correction plus 8.00 D in the trial frame, and the letter chart is positioned approximately 12 cm from the trial lens. The patient reads the chart while the lines are illuminated with the ophthalmoscope. Patients who can read the smallest numbers on the chart (grade Parinaud 1) are given a positive score, which assumes good macular function and probability for good visual outcomes after cataract surgery. Those who cannot read the smallest line are given a negative score, which assumes that their BCVA will be worse than 20/30 and that outcomes after cataract surgery may be poor. In patients with dense cataract who are not able to read the smallest line, the test has no negative predictive value.

**No. 2: Take astigmatism into account.** Preoperative examinations for cataract surgery and refractive lens exchange should include keratometry measurements. With the latest generation of multifocal IOLs such as the ATLISA (Carl Zeiss Meditec, Jena, Germany), the Lentis Mplus (manufactured and distributed by Oculentis GmbH, Berlin; and Topcon, Rotterdam, Netherlands), and the FineVision Micro F (PhysIOL, Liége, Belgium), exact keratometry is essential to ensure obtaining emmetropia and eliminating astigmatism. Such lenses function properly only if astigmatism has been completely eliminated. I also suggest microincision cataract surgery for implantation of these IOLs because of its astigmatic neutrality.

If the patient wears glasses, I compare the preoperative refraction with the preoperative keratometry, ensuring that at least two measurements are taken with the ARK Autoref/Kerometer (Nidek, Gamagori, Japan) and five measurements with the IOLMaster (Carl Zeiss Meditec). Placido-disc-based topography is used to detect asymmetric astigmatism. If the results indicate a small amount of against-the-rule astigmatism (less than 1.25 D), I perform arcuate keratotomy with the Mastel Arcuate Corneal Compass (MACC; Mastel, Rapid City,
If the patient has higher astigmatism, I use a toric or toric multifocal IOL, paying attention to proper alignment and centration.

No. 3: Budget extra chair time. It is extremely important to assess the visual needs of the patient before cataract surgery or refractive lens exchange. Take time to get to know your patient well. Is he or she professionally active, using the computer and driving a lot, or is he or she an older patient with less visually demanding needs? Is the patient a perfectionist or someone who is ready to cope with issues such as the unbalanced postoperative vision of monovision or the possible side effects of multifocal IOLs—loss of contrast sensitivity, halos, and double vision?

Give careful thought to the patient’s requirements for near vision and his or her financial situation and occupation. If a younger patient does computer work, we recommend the Lentis Mplus or the FineVision Micro F; for older patients who like to read, we recommend the AT.LISA or the FineVision. If the patient is not ready to pay for multifocal IOLs, we suggest monovision. However, if amblyopia is detected, monovision will not work. In patients who drive for a living or who are commercial pilots, we use monofocal IOLs, targeting both eyes for distance. Lastly, we find that patients with myopia are usually more difficult to satisfy than those with hyperopia.

One important message to relay is that 4% to 5% of patients will require LASIK fine-tuning for residual spherical or astigmatic error. The patient should also understand that any postoperative treatments will carry an extra cost.

No. 4: Detect form fruste keratoconus. This pearl
Applies to refractive surgery. Both Placido-based and elevation topography systems should be used to detect form fruste keratoconus. The surgeon can select from the Keratograph (Oculus Optikgeräte GmbH, Wetzlar, Germany), the Topolyzer (Alcon Laboratories, Inc., Fort Worth, Texas), the Pentacam (Oculus Optikgeräte GmbH), the Oculyzer (Alcon Laboratories, Inc.), and the Orbscan (Bausch + Lomb, Rochester, New York).

Do not forget the basics:
1. Eliminate the effect of warpage due to contact lens wear by asking patients to discontinue soft contact lens use for at least 5 days or hard lenses for at least 3 weeks;
2. Look for asymmetric astigmatism (with a kink in the axis), especially with thin corneas;
3. Check the keratoconus indices of all the topography systems you use, but do not trust them completely;
4. Account for preoperative astigmatism; in eyes with high regular astigmatism, the posterior elevation map can mimic form fruste keratoconus;
5. Repeat topography measurements in case of doubt; and
6. Note that none of the points mentioned above is an absolute indication of form fruste keratoconus.

When evaluating the surface of the cornea, take into account that dryness can affect measurement with Placido–disc-based systems. When no dryness is present, the images are more trustworthy than with elevation-based systems, and for this reason I prefer Placido-disc topography-guided treatments. Additionally, posterior elevation maps are important when using elevation topography systems; consider the recommendations of the topography system manufacturers. With the Orbscan, use the normalized map; with the Pentacam, check the progression of corneal thickness.

No. 5: Consider the patient’s age. When you are considering a younger patient for refractive surgery, it is important to consider their age in relation to the potential for future complications. Younger patients may be at higher risk for the development of keratoconus or other corneal conditions that could affect their vision.

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ering corneal collagen crosslinking with ultraviolet light (UV-CXL) for patients with thin corneas, base your strategy on the patient’s age. If he or she is younger than 25 years, keratoconus is more likely to progress, whereas it is more likely to remain stable if the patient is at least 35 years old.

If the patient has keratoconus, is younger than 25 years, and tolerates contact lenses, the best course of action is to assess his or her progression. Suggest UV-CXL only if progression has been demonstrated.

If the patient has keratoconus and is contact lens intolerant, especially if the patient is older, I suggest surgical visual rehabilitation techniques as follows: topography-guided surface treatment combined with UV-CXL in cases of low ametropia or astigmatism, and implantation of (toric) phakic IOLs such as the Artisan or Artiflex (Ophtec GmbH, Groningen, Netherlands) in cases of higher ametropia or astigmatism. I recently added intrastromal corneal ring segments, implanted in femtosecond-laser–made tunnels, to my therapeutic arsenal for eyes with medium or high ametropia and astigmatism. I use this technology in patients who want to avoid the risks of an intraocular procedure. The latter is performed after UV-CXL in cases of progressive keratoconus. However, in my early experience, the refractive result seems to be less predictable than with phakic IOLs.

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Editor’s Note: To obtain the Vryghem Macular Function Test, send a request to info@vryghem.be.


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