

IME SUPPLEMENT | SEPTEMBER 2023

EUROTIMES



ESCRS Clinical Trends Survey 2022 Results

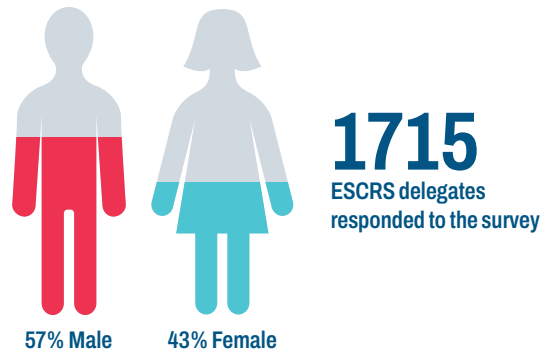


Survey Background & Overview

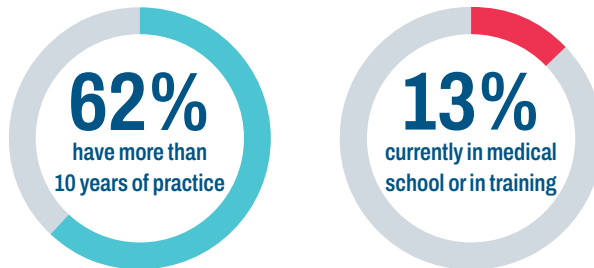
This report contains the results of the 2022 ESCRS Clinical Trends Survey, conducted at the 40th Congress of ESCRS in Milan, Italy. Delegates also had the option of taking the survey online at the ESCRS website. Questions addressed several areas of clinical practice, including general cataract surgery, astigmatism and toric IOLs, presbyopia correction, glaucoma and MIGS, and corneal refractive surgery.

More than 1,500 physicians responded to the 146 questions developed and reviewed with the ESCRS leadership team and substantiated by a data scientist. To better identify the educational needs of its members, ESCRS leadership continually refers to the results of these surveys and the feedback they elicit. The collected data will also enhance the opportunities featured at the Annual Congress of the ESCRS, the ESCRS Winter Meeting, and other educational channels such as *EuroTimes* supplements and the ESCRS Education Forum online.

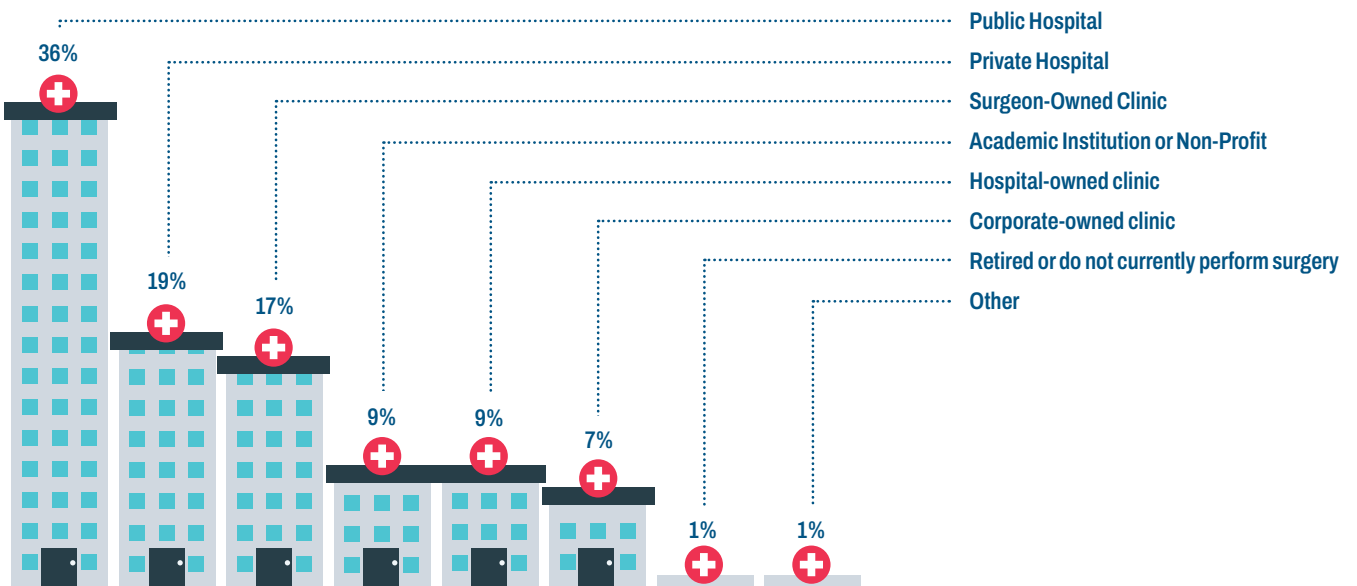
We invite you to study the Survey's key findings and be ready to take advantage of upcoming educational events. ESCRS encourages all delegates to participate in the 2023 ESCRS Clinical Trends Survey, taking place in September at the 41st Congress of the ESCRS in Vienna, and online at <https://tfgedu.questionpro.com/ESCRS2023>.



Years in Practice:



Primary Surgery Locations:



General Cataract Surgery

BY FILOMENA J. RIBEIRO, MD, PHD, FEBO

According to the ESCRS 2022 Clinical Trends Survey, delegates have an average annual cataract surgery volume of 386 eyes, with a notable 23% performing over 600 surgeries per year. With the aging European population, it is anticipated that these numbers will continue to rise. Hence, it becomes imperative to not only consider the clinical and practical aspects of cataract surgery but also the broader social, economic, and environmental consequences associated with this increasing demand.

Phacoemulsification

The divide and conquer method is the most commonly preferred technique for breaking up the nucleus during phacoemulsification, chosen by 37% of respondents. Interestingly, the higher volume surgeons tend to do less divide and conquer and more of the chop techniques. While divide and conquer is commonly taught and great for beginners, it's clear that as volume and likely experience increase, doctors tend to gravitate towards other methods. Personally, I find that chop techniques, particularly vertical chop, are faster, utilize less ultrasound, and therefore offer increased safety and efficiency.

Perhaps more important than any individually preferred technique is proficiency in each technique. Being adaptable to various challenges is crucial. It is necessary to become skilled in different methods, especially when dealing with complex or difficult cataracts, as they may require alternative approaches. I firmly believe that all surgeons should master multiple techniques and adapt them accordingly to the specific surgical case at hand.

“I firmly believe that all surgeons should master multiple techniques and adapt them accordingly to the specific surgical case at hand.”

Bilateral surgery

The survey results revealed that bilateral/same-day cataract surgeries are infrequent, with 61% of delegates not performing this procedure. Among those who do, it is typically used in extenuating circumstances and/or at low volumes. The top two reasons for performing bilateral/same-day surgeries include extenuating circumstances (21%) and patient convenience (20%). In contrast, the main reasons for not performing them are concerns about infection and endophthalmitis risk (47%) and regulations/policies (14%).

In addition to considering the benefits mentioned earlier, it is important to take sustainability into account when deciding whether to perform bilateral procedures. By opting for bilateral surgeries, we can reduce the carbon footprint, which becomes increasingly significant as the number of individuals requiring cataract surgeries rises. Efficiency is another aspect to consider, especially in the context of public national health systems where patients may have to travel extensively for each surgery.

When I started in medicine, it was common practice to perform bilateral procedures, but due to the risk of endophthal-

mitis and regulatory changes, my country (Portugal) restricts bilateral surgeries except in exceptional cases. These circumstances have significantly altered the approach to performing these procedures, and delegates should be sure to follow any local regulations and guidelines on the practice.

Ultimately, finding the right balance between convenience, efficiency, sustainability of bilateral surgeries, while mitigating the risk of endophthalmitis and infection, varies depending on the country and specific healthcare setting.

Patient Education Level

In 2022, 45% of delegates report that their patients were educated on refractive IOL options when they see them at their initial consultation, up from 25% in 2020. Correspondingly, the number of patients that know nothing at all has been nearly halved, decreasing from 23% in 2020 to 12% in 2022. I believe the increase in patient education is driven by a wider range of solutions available to address their specific needs. Patients have voiced concerns about inadequate information prior to surgery. Despite cost-related issues, it is our responsibility as surgeons to prioritize patient education, enabling them to make informed decisions and achieve favorable outcomes.

The preferred method for educating patients, cited by 48% of delegates, is direct communication between the doctor and the patient. This personalized approach is also my preferred method. However, it could be beneficial to have additional resources available to patients, allowing them to prepare themselves before appointments. Providing general information via printed materials or websites, as well as advanced tools, such as those that can simulate post-surgery vision, are all valuable.

Digital Operating Room (DOR)

When delegates were asked about the main advantages of working in a DOR, the survey found that the top advantages, which are closely related, were improved efficiency and workflow, cited by 55% of respondents, and shortened procedure time (36%). The streamlined and quicker surgeries enabled surgeons to handle higher volumes of procedures. Additionally, comfort for the surgeon during the procedure and improved surgical outcomes were also commonly mentioned advantages.

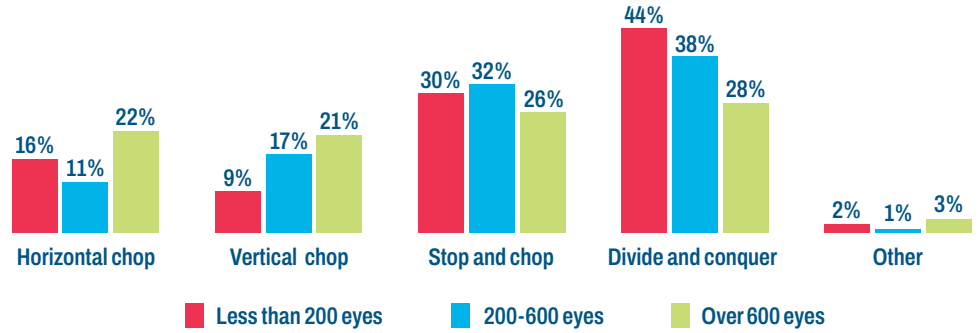
Having personally transitioned to a DOR, I can confirm the significant benefits in terms of workflow, efficiency, procedure time, and surgeon comfort. However, I believe safety is an understated advantage as it was only cited by 17% of delegates. With all necessary information readily available in the operating room, the likelihood of errors, such as placing the wrong IOL in the wrong eye, is greatly reduced. As a result, I am particularly enthusiastic about these digital solutions as they appear to provide a heightened sense of safety during surgical procedures.

The biggest barrier to adopting a DOR was unsurprisingly cost which was cited by 60% of delegates, as by far the most commonly cited barrier. There is indeed a huge upfront cost, and this may be difficult to overcome in a small clinic, but in bigger settings like hospitals, one solution could be to have several doctors performing a type of surgery split the cost.

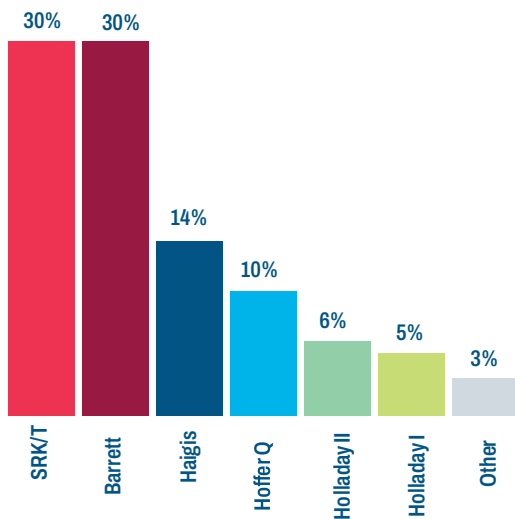


Average annual volume of cataract surgery/respondent:
386 Eyes

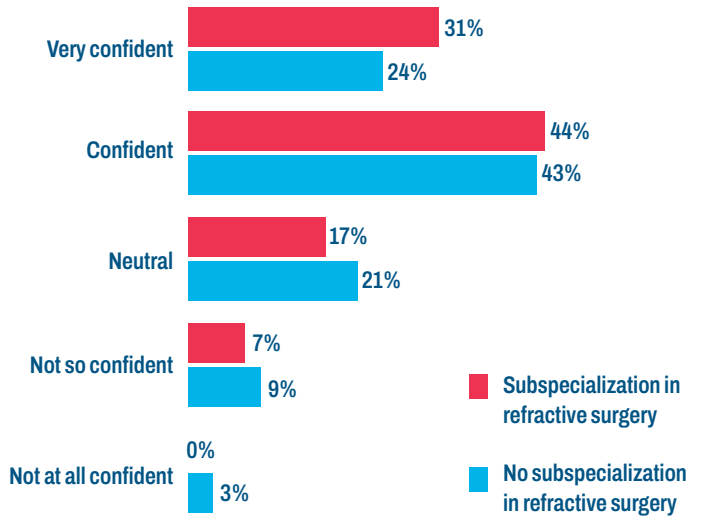
What is your preferred method of breaking the nucleus during phacoemulsification?



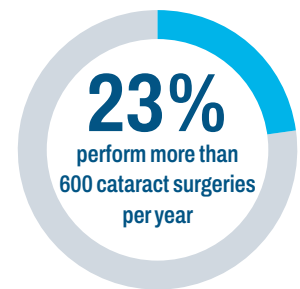
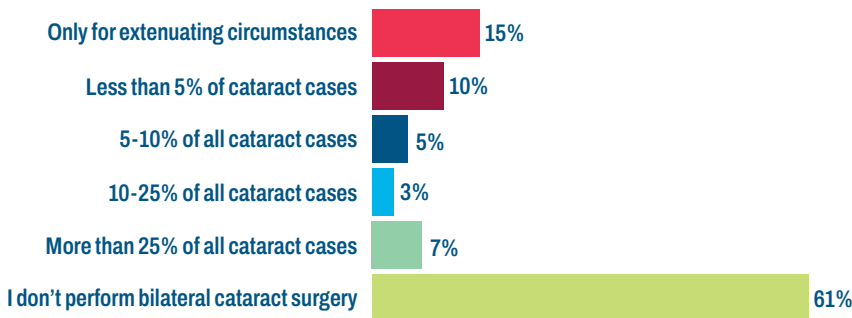
What is your preferred lens formula for the majority of your cataract surgeries? (select all that apply)



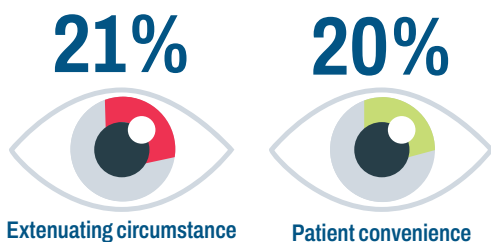
What is your current level of confidence to customize your phaco machine settings in cataract patients with more common complicated cases (i.e. small pupils, soft lenses, IFIS, and weak zonules)?



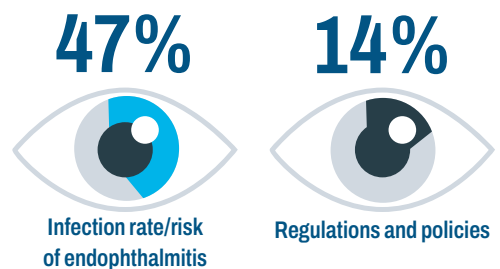
How often do you perform bilateral/same-day cataract surgery?



If you do perform simultaneous bilateral/same-day cataract surgery, what are your primary reasons why?



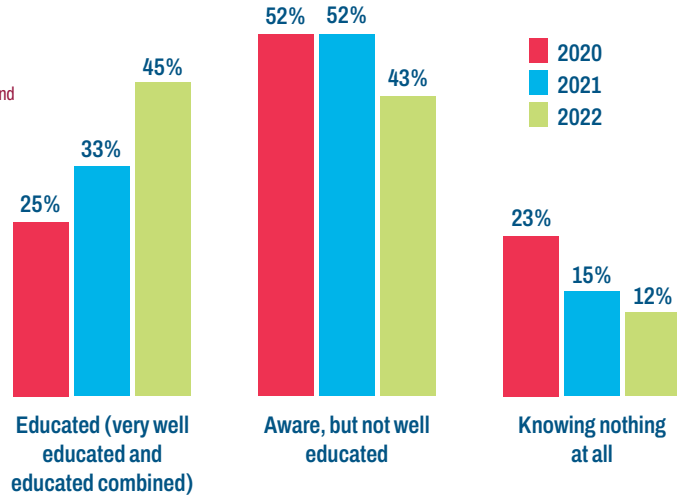
If you do not perform bilateral/same-day cataract surgery, what is your primary reason why not?



How educated are your patients on refractive IOL options when they see you in person at their initial consultation?



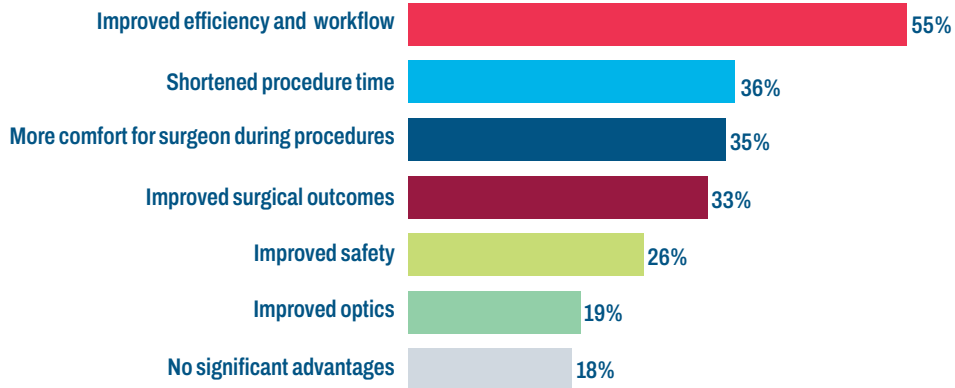
*patients that are well educated and educated have increased by 20% point since 2020



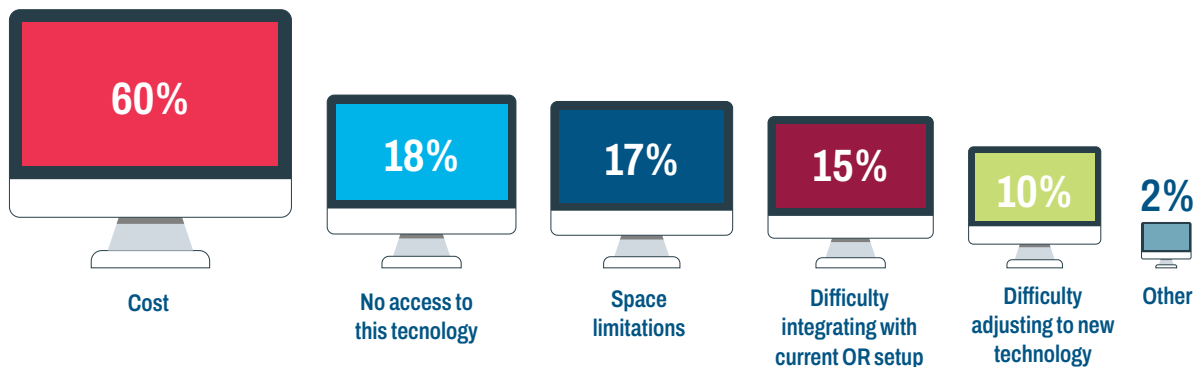
What do you consider to be the most efficient way to educate patients on refractive IOL options available to them?



What do you believe to be the main advantages of working in a digital operating room (DOR)? (Select all that apply.)



What are the most significant barriers to integrating a digital operating room (DOR) in your practice? (Select all that apply.)



Astigmatism-Correction and Toric IOLs

BY RUDY NUIJTS, MD, PhD

Toric Conversion Rates

The survey revealed that the utilization of toric IOLs in cataract procedures has experienced a seven-point percent increase since 2016, which I believe can be attributed to the growing confidence in the procedure. Interestingly, if cost was not a limiting factor, 37% of cataract patients with clinically significant astigmatism would receive a toric lens.

What may also be at play here is a lack of consistent definitions for clinically significant astigmatism, with significant variability across different institutions. In our department, the threshold level is set at 1.25 diopters of astigmatism, although some practitioners opt for a lower threshold of 0.75 diopters. Ongoing research aims to establish a more scientifically grounded standard for defining the threshold. Additionally, patient preference and satisfaction as well as institutional factors may also influence the decision-making process and potentially impact the reported utilization rate.

Optimizing Toric Surgeries

The use of digital image registration to align the intended axis grew from 2016-2019 but has since stabilized at about 20%. Research by my group has shown digital image registration is more accurate than manual marking and reduces misalignment but doesn't actually improve visual acuity or reduce astigmatism. To be sure, workflow advantages exist, but the

widely accepted practice remains manual marking, as approximately 70% of delegates utilize these methods either with slit lamps or specialized devices developed for this purpose, a practice that I support.

Seventy-three percent of delegates, including myself, consider posterior corneal astigmatism in the toric power calculation. Early calculators without this consideration led to overcorrections for with-the-rule astigmatism and under-corrections for against-the-rule astigmatism. These algorithms have been corrected, and there is no good reason to not consider posterior corneal astigmatism in your toric power calculation. I suspect some delegates are unaware of these facts, only underscoring the need to educate doctors.

Residual Rotational error

According to the survey, the majority of delegates (65%) believe that a postoperative rotational error of 4-10 degrees is acceptable for toric IOL implantation before significant visual quality degradation and loss of visual acuity occur. It is important to note that the acceptable level of misalignment depends on the toricity of the lens. A higher cylinder of four to six diopters would make even a small misalignment more relevant compared to a cylinder of 1.5 diopters. Re-interventions due to misalignment are observed in only 2% of patients, though some patients with residual astigmatism may not desire re-interventions.

Presbyopia-Correcting IOLs

BY OLIVER FINDL, MBA, FEBO

Trends in Presbyopia-Correcting Lens Usage

The 2022 ESCRS Clinical Trends Survey found that delegates use presbyopia-correcting intraocular lenses (IOLs) in 10% of current cataract procedures, representing a 3% point increase since 2016. Among presbyopia-correcting IOL options, half of all respondents say they primarily use trifocal IOLs but there was an increase in the use of extended depth of focus IOLs and the emergence of enhanced monofocal IOLs, though trifocal IOL unquestionably still play an important role. Conversely, bifocal and accommodating IOLs are essentially gone.

The choice of IOL type should be carefully matched to the patient's specific needs and expectations, considering factors such as the desire for spectacle independence, nighttime driving requirements, and demanding visual tasks. In some cases, a combination of refractive technology and monovision may provide good intermediate and near vision while avoiding potential drawbacks of diffractive technology.

Barriers to Utilizing Presbyopia-Correcting IOLs

The primary concern regarding the adoption of more presbyopic-correcting options was the cost burden on patients. I agree that this is a valid concern, particularly for enhanced monofocal lenses that often lack reimbursement. When patients have to pay out of pocket, their expectations tend to rise, making it a complex issue beyond affordability alone. The

second major concern raised was related to night-time quality of vision. However, considering advancements in technology, this should be less of an issue today, especially for non-diffractive technology. Loss of contrast and visual acuity emerged as the third most significant concern. Considering that most patients do not engage in hobbies or occupations where this would significantly impact their daily lives, this concern may be outsized relative to how much it actually affects patients.

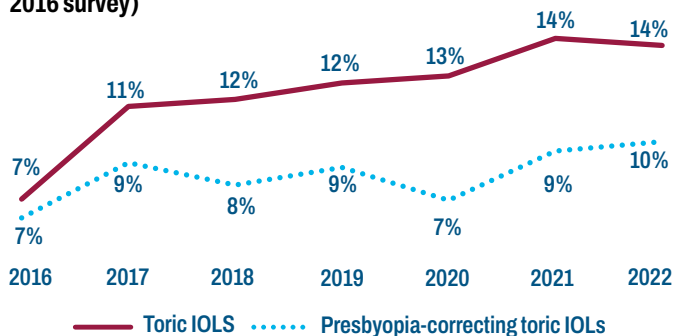
Risk of Visual Aberration

Respondents were asked the probability of functionally significant visual aberrations without residual refractive error were examined for different types of IOLs. The highest rate, at 5.4%, was reported for bifocal presbyopia-correcting IOLs, followed by enhanced monofocal, extended depth of focus (EDOF), and trifocal presbyopia-correcting lenses falling in that order.

Personally, the most surprising finding was the 4% rate for EDOF lenses. Based on my experience, when patients have healthy eyes and no residual refractive error, one wouldn't expect significant visual aberrations at such a level.

However, heterogeneity is important in this context. There is a continuum that spans from monofocal to monofocal plus to EDOF, and then to bifocal and trifocal lenses. The boundaries between these categories are not clearly defined, and surgeons may be using lenses labeled as EDOF that differ substantially in design and functionality.

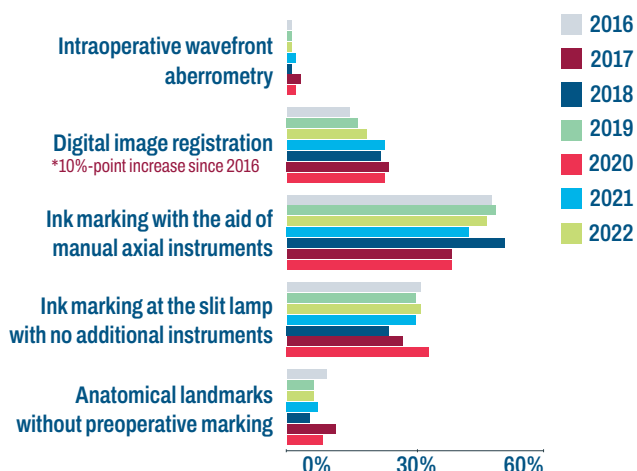
For patients with clinically significant astigmatism, 14% of current cataract procedures involve a toric IOL (7% point increase since 2016 survey)



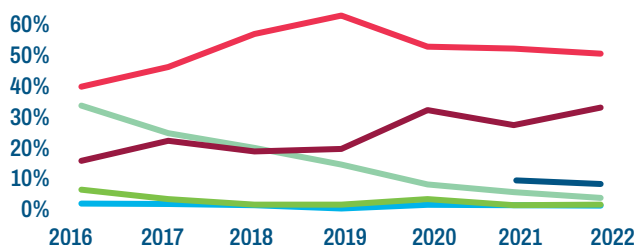
Among qualified candidates, 10% of current cataract procedures involve presbyopia-correcting IOLs (3% point increase since 2016 survey)

37% of cataract patients with clinically significant astigmatism would receive a toric IOL if cost were not an issue

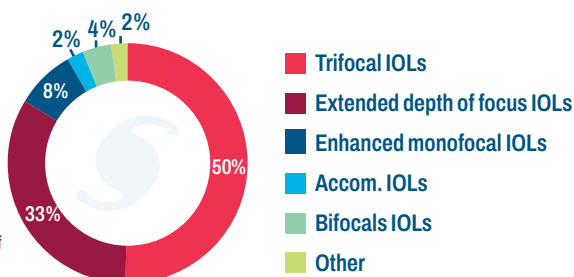
How do you align the intended axis of placement for a toric IOL?



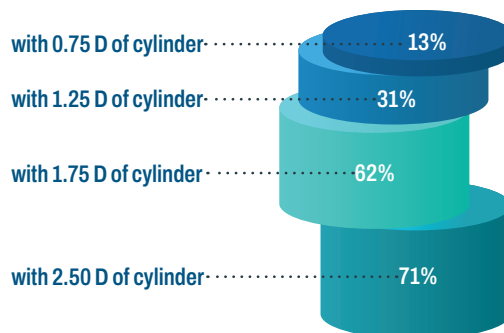
What type of presbyopia-correcting IOL technology is used in the majority of your presbyopia correction patients?



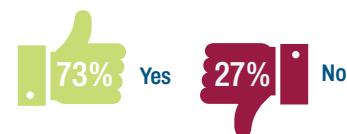
*Represents breakdown of 2022 data



Percentage who implant toric IOL to manage astigmatism in a monofocal cataract patient...

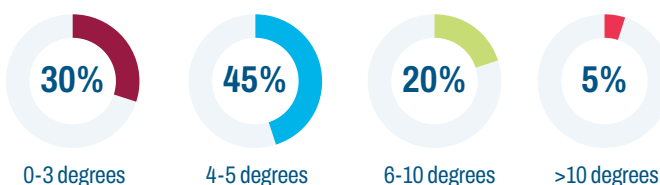


Do you consider posterior corneal astigmatism in your toric power calculation?



18% of current presbyopia IOL procedures are TORIC presbyopia-correcting IOLs (versus a spherical presbyopia-correcting IOL)

After implanting a toric IOL, how many degrees of postoperative rotational error is acceptable before visual quality and degradation of visual acuity are significantly affected?



Biggest concerns against performing more presbyopia-correcting IOL procedures:

- 69% Cost to patient
- 57% Concern over night time quality of vision
- 42% Concern over loss of contrast visual acuity

What do you believe will be the chances of a patient who has no residual refractive error and a healthy ocular surface having functionally significant visual aberrations at night...

- 2.2% In a monovision patient with two monofocal IOLs
- 5.4% In a bifocal presbyopia-correcting IOL patient
- 4.9% In a trifocal presbyopia-correcting IOL patient
- 4.0% In an EDOF presbyopia-correcting IOL patient
- 3.2% In an enhanced monofocal presbyopia-correcting IOL patient

Glaucoma and MIGS

BURKHARD DICK, MD, PHD, FEBOS-CR

When ESCRS delegates were surveyed about their glaucoma management practices during the 2022 Clinical Trends Survey, they reported seeing an average of 28 glaucoma patients per month. However, this number varied significantly, potentially influenced by factors such as the age of the patients and whether the respondent specialized in glaucoma.

Prevalence of Glaucoma

On average, respondents indicated that 10% of their patients have glaucoma, which when contrasted with previous years' data, reveals a modest yet consistent decline in the estimated prevalence of glaucoma. The decline in diagnosed glaucoma cases suggests underdiagnosis rather than a true prevalence decrease. Reimbursement rates likely impact this trend, with low coverage discouraging glaucoma diagnoses. Certain surgical centers altogether omit glaucoma diagnoses before cataract surgery, even when indications of both conditions are present.

Interestingly, delegates believe that 16% of cataract surgery patients are classified as MIGS (Minimally Invasive Glaucoma Surgery) candidates. To me, this suggests this is closer to the actual number of glaucoma cases as these individuals have a confirmed diagnosis of glaucoma and are not merely glaucoma suspects or potentially having mild glaucoma.

Laser and Surgical Interventions

The survey found that 12% perform glaucoma surgery, 15% perform glaucoma laser procedures, and 27% perform both. Perhaps more striking than the breakdown of procedures performed is the fact that nearly half of all delegates, 45%, do not perform glaucoma laser or surgical procedures and instead only have a medical glaucoma practice.

“Surgical and laser interventions should increasingly be seen as a first line and not a last-resort treatment.”

When it comes to initiating surgical intervention in glaucoma patients, the survey found surgeons are much more willing to use laser interventions early on as compared to surgical approaches. For example, 43% of delegates use it as a first-line treatment or after the first-line treatment. This contrasts with only 11% using surgical intervention at these stages. In my opinion, the earlier the better for these treatments. Surgical and laser interventions should increasingly be seen as a first line and not a last-resort treatment.

Interestingly, the survey indicated that a higher percentage of delegates (30%) do not perform surgery compared to those who do not perform laser procedures (21%). This implies that a significant number of glaucoma specialists may prefer to focus on medical management or may collaborate with other specialists for surgical interventions, potentially due to the complexity and specialized nature of glaucoma surgery.

MIGS

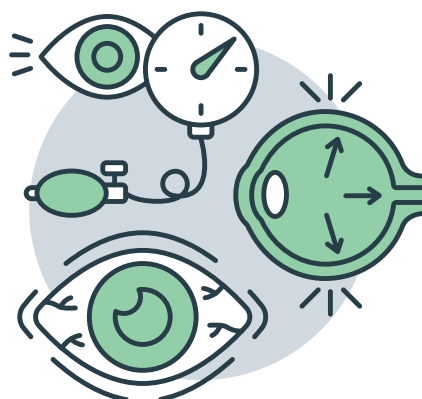
According to the survey, 24% of delegates currently perform MIGS, indicating a decrease from the 30% reported in 2018. I believe this decline is not necessarily due to surgeons' familiarity or capabilities, but rather stems from the workflow involved. Performing MIGS entails additional steps such as patient diagnosis and discussions concerning cost, insurance, and out-of-pocket expenses. These rather than clinical factors, may be limiting the implementation of MIGS. It is also worth noting here that 2022 saw an uptick in the percentage of delegates that planned to do, reaching a high of 32%. Thus, there are still many delegates open to the idea of using MIGS even if they are not currently performing this treatment.

“There are still many delegates open to the idea of using MIGS even if they are not currently performing this treatment.”

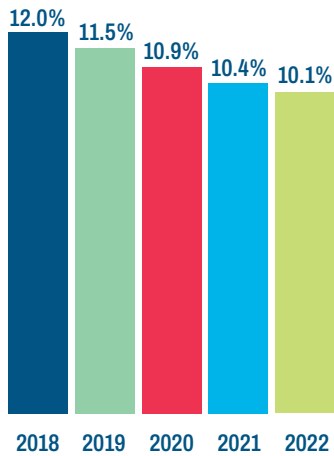
The low utilization of MIGS may also be related to a lack of confidence among specialists. Only 37% of glaucoma specialists and 22% of non-specialists feel confident in performing MIGS procedures. Whether the low usage causes the lack of confidence, or the lack of confidence leads to low usage is unclear. Regardless, this highlights the need for further efforts to enhance practitioners' comfort and proficiency in this field. Focusing beyond presentations on the potential of various MIGS devices, attention should be given to the broader aspects, including coping strategies, integration, and comprehensive training. Moreover, the additional cost associated with MIGS creates higher patient expectations.

Sustained Delivery Devices

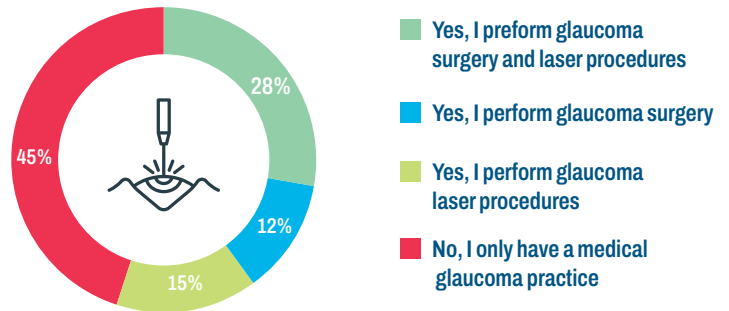
The survey revealed that 73% of delegates agree or strongly agree that implantable sustained-release devices will address patient compliance issues, improve treatment time frames, and visual outcomes overall. This is one additional avenue that can improve patient outcomes by sidestepping the patient compliance issue. It's no surprise then that many delegates believe that this will help in this area.



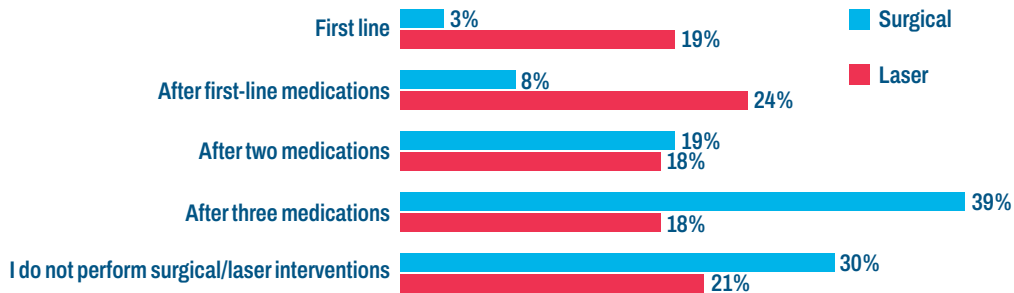
What percentage of ALL your cataract patients would you estimate have glaucoma?



Do you perform any glaucoma surgery (including MIGS) or laser procedures?



When do you usually initiate intervention for your glaucoma patients?

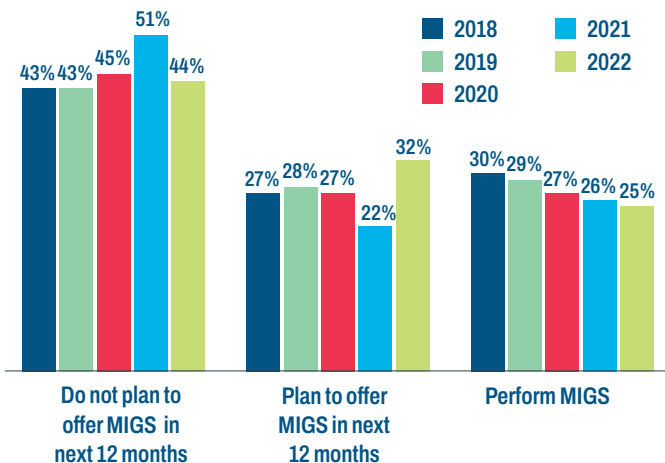


28 average number of patients seen each month that are considered as having glaucoma

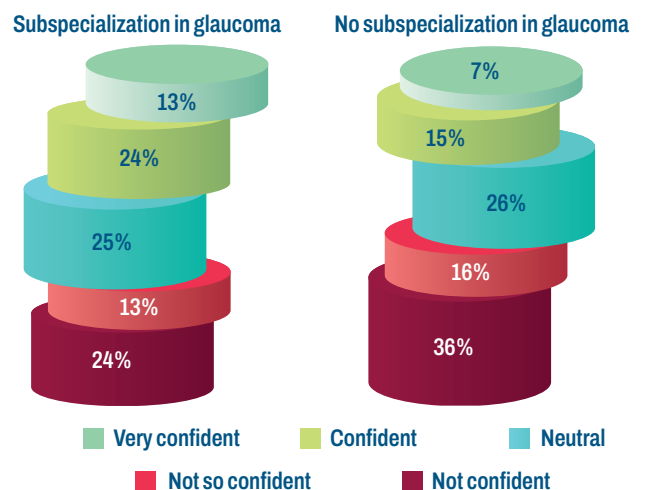


16% of cataract surgery patients, currently on topical therapy for glaucoma, are candidates for a minimally invasive glaucoma surgery (MIGS) device

Of your surgical cataract patients with glaucoma, which of the following best describes your use of/interest in Minimally Invasive Glaucoma Surgery (MIGS)?



What is your confidence level in performing MIGS procedures on cataract surgery patients?



Refractive Surgery

THOMAS KOHNEN, MD, PHD, FEBO

The 2022 ESCRS Clinical Trends Survey results indicated that 53% of delegates refrained from performing corneal refractive surgery, a number that was marginally smaller (45%) among those specializing in cornea/external disease/anterior segment. Wavefront-optimized and standard ablation, each representing 24% of the responses, are the most prevalent techniques. The wide applicability of wavefront-optimized procedures with their asymmetrical profile makes it very popular. In contrast, techniques such as wavefront customized and topography customized, on the other hand, are less frequently employed due to problems with decentration.

Laser Vision Surgery vs Intraström Lenticule Extraction

With regards to corneal refractive and intraström lenticule extraction (ILE), 73% of delegates reported that they do not perform these procedures. Given the associated laser requirements, I would have potentially anticipated a lower overall usage rate. While the survey's percentages may be reflective of the larger surgical community, the rate of ESCRS delegates performing this procedure could potentially be higher.

In terms of dry eye prevalence, delegates perceived ILE to have a clear advantage over laser vision correction (LVC). According to their estimates, only about 6% of ILE procedures result in dry eye, a markedly lower rate than the 17% associated with LVC. This contrast is probably due to the smaller opening required for the removal of the lenticule in ILE, as opposed to the larger incision necessitated in LASIK, a type of LVC. This larger incision increases the likelihood of nerve damage and subsequent dry eye. The risk of ectasia, however, was perceived to be equally low for both procedures. It is important, though, to stress that these are subjective views and further research is needed to substantiate these numbers.

The top three perceived advantages of ILE over other refractive procedures include a lower incidence of dry eye, improved postoperative ocular surface, and enhanced biomechanical corneal stability. However, it's crucial to note that current research has not substantiated the claim of improved biomechanical corneal stability with ILE.

LVC, despite its perceived drawbacks in terms of dry eye, does have its advantages. One key advantage is the relative ease of retreatment. In LASIK, if retreatment is needed, the existing flap can simply be lifted and the eye retreated. But in ILE, retreatment necessitates a separate procedure where a femtosecond laser is used to open the cap.

Identifying and Navigating Pre-Operative Dry Eye

It's encouraging to observe that the majority of surgeons are making it a standard practice to examine the ocular surface during their preoperative examination, be it for cataract surgery or LVC. However, this practice is more prevalent in LVC than cataract surgery, most likely due to the fact that a meticulous examination is essential in LVC as dry eye can seriously compromise the outcome. In contrast, the significance of examining the eye's surface during cataract surgeries is dependent on the type of procedure, with it being less critical for monofocal lens procedures compared to premium IOL surgeries where

certainty in the stability of the ocular surface is paramount.

When moderate dry eye is identified, about 68% of the delegates are inclined to delay surgery until the dry eye condition is better managed. This approach is indeed commendable. Not only does it make the patient more comfortable, but it also provides more accurate pre-operative measurements that can be utilized to evaluate the procedure's outcome more effectively. As a practice, when I detect dry eye, I provide

“There are no disadvantages to postponing surgery, while there are considerable benefits.”

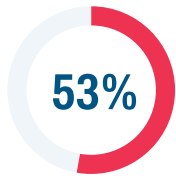
the patients with drops as pre-treatment for several days, repeat the measurements, and then evaluate whether it's now an optimal time to proceed with surgery. We obtain more reliable outcome measurements this way. There are no disadvantages to postponing surgery, while there are considerable benefits.

Corneal Collagen Cross-Linking

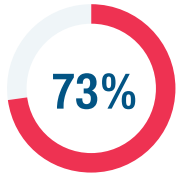
According to the data, 45% of delegates perform corneal cross-linking, 18% intend to, and the remaining 37% do not engage in this practice. I hypothesize that these figures largely reflect the influence of nation-specific reimbursement policies. When reimbursement rates are low, surgeons may be less inclined to perform the procedure. Given the time-consuming nature of the procedure and the high expectations from patients who incur out-of-pocket expenses, it could create unrealistic hopes that the procedure cannot fulfill. It's crucial to understand that the procedure does not treat the disease by improving the cornea. Its purpose is merely to halt disease progression, which might not live up to the heightened expectations of patients.

When it comes to determining the suitability for corneal collagen cross-linking, delegates most often used progression in Kmax, change in topography, or a change in tomography. From my perspective, both topography and tomography changes are highly effective measures. However, tomography offers the added advantage of providing pachymetry data, allowing the visualization of corneal thickness, which is crucial for me. If the patient's cornea is excessively thin, I would recommend crosslinking. But the crucial element here is the purpose behind gathering this data. If the objective is to determine whether to proceed with crosslinking, tomography or OCT should be employed. However, if the goal is merely to confirm the presence of keratoconus, a range of devices including topography can be utilized.

“It's crucial to understand that the procedure does not treat the disease by improving the cornea. Its purpose is merely to halt disease progression, which might not live up to the heightened expectations of patients.”

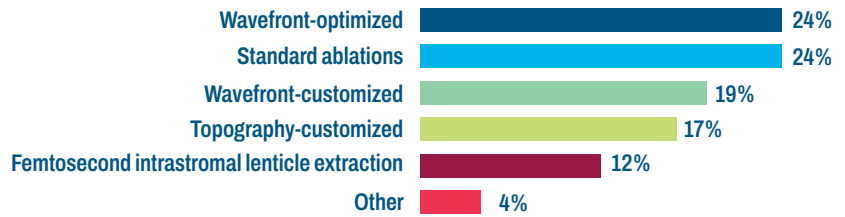


Percent of surgeons that do not currently perform corneal refractive surgery

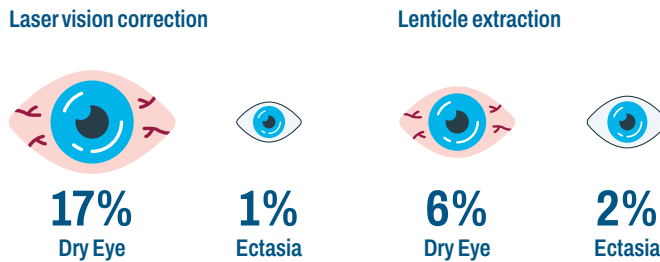


Percent of surgeons that do not currently perform intrastromal lenticule extraction

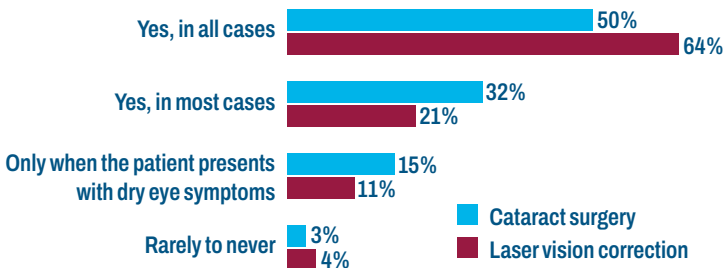
What category are the majority of your corneal refractive procedures CURRENTLY?



What percentage of your laser vision correction and intrastromal lenticule extraction patients experience dry eye or ectasia after the procedure?



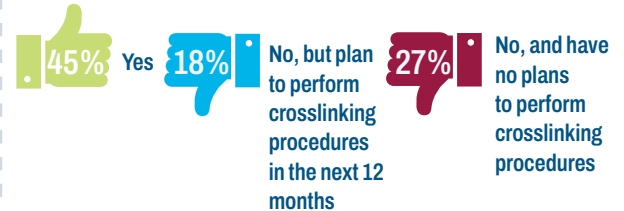
Are you systematically checking the ocular surface in your preoperative laser vision correction/ cataract surgery examination?



How likely are you to postpone surgery in a patient with moderate dry eye until the dry eye is better managed?

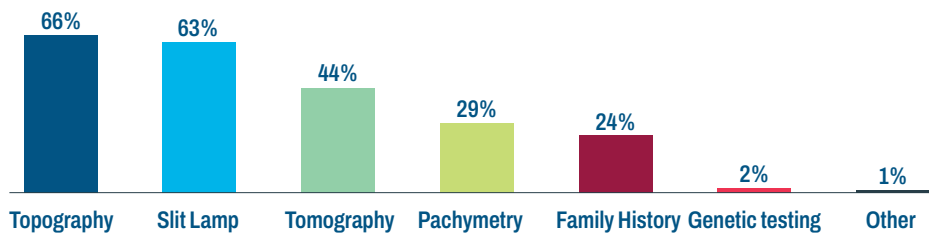


Are you currently performing corneal collagen cross-linking?

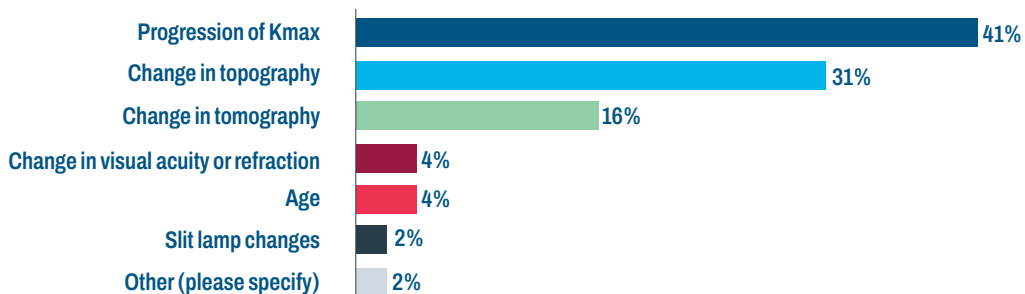


8% average percentage of cataract procedures the have abnormal, irregular, or weakened corneas

What do you use to diagnose corneal irregularities? (Select all that apply.)



Which factor do you primarily use to determine suitability for corneal collagen cross-linking?



Contributors to this Issue

General Cataract Surgery (p.3)



Filomena J. Ribeiro, MD, PD, FEBO
Head of Ophthalmology Department,
Hospital da Luz Lisbon, Portugal

Astigmatism-Correction and Toric IOLs (p.6)



Rudy Nuijts, MD, PhD
Professor of Ophthalmology, Vice-Chairman, and
Director of the Cornea Clinic and the Center for
Refractive Surgery at the University Eye Clinic
Maastricht, Maastricht University Medical Center
(MUMC), the Netherlands.

Presbyopia-Correcting IOLs (p.6)



Oliver Findl, MBA, FEBO
Chief of the Institute and Chief of the Department of
Ophthalmology, Hanusch Hospital, Vienna, Austria

Glaucoma and MIGS (p.8)



Burkhard Dick, MD, PhD, FEBOS-CR
Professor of Ophthalmology and Chairman
University Eye Hospital Bochum, Germany

Corneal Refractive (p.10)



Thomas Kohnen, MD, PhD, FEBO
Chairman and Director, Department of Ophthalmology,
Goethe-University, Frankfurt, Germany

