# ESCRS CLINICAL TRENDS SURVEY 2021 RESULTS

### Survey Background & Overview

his report contains the results of the 2021 ESCRS Clinical Trends Survey, conducted at the 39th Congress of the ESCRS in Amsterdam. Delegates also had the option of taking the survey online. Questions addressed several areas of clinical practice, including general cataract surgery, astigmatism and toric IOLs, presbyopia correction, glaucoma, and ocular surface disease.



#### How Many Years Have You Been in Practice Post Training?



#### **Primary surgery location:**





More than 1,570 delegates responded to the 154 questions, which were 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* articles and the ESCRS Education Forum.

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 2022 ESCRS Clinical Trends Survey, taking place in person, in September at the 40th Congress of the ESCRS in Milan and online at https://tfgedu.questionpro.com/ESCRS2022





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



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# **Toric IOLs and Astigmatism Management**

by Oliver Findl

SCRS delegates were asked a series of questions regarding their management of cataract patients with astigmatism and their use of toric IOLs. The survey found that, for patients with clinically significant astigmatism, 15% of current cataract procedures involve a toric implant. This figure represents an 8% increase since the 2016 survey yet only a 1% increase from last year. Certainly, cost is a factor. The survey found that in the absence of financial considerations, 37% of cataract patients with clinically significant astigmatism would receive a toric IOL.

#### TORIC IOL CONSIDERATIONS

Delegates were asked about the degree of cylinder that warrants a toric IOL for astigmatism management in a monofocal cataract patients. At the high end, 63% would use a toric for patients with 2.50 D of cylinder, 55% would use the technology in patients with 1.75 D of cylinder, 31% of respondents said 1.25 D of cylinder, and just 9% would use a toric implant to manage astigmatism in patients with only 0.75 D of cylinder.

The decision of when to use toric technology depends on two factors, the technology of the IOL being considered and what level of spectacle independence the patient desires. In our hospital, with a standard monofocal IOL, our cut-off is 1.50 D and above. There is quite good data that in such patients a toric implant will be of value for uncorrected visual acuity and quality of vision. In the setting of a presbyopia-correcting IOL, however, the cut-off is lower. Because 1.00 D of residual astigmatism significantly compromises the function of presbyopia-correcting lenses, I would consider anything more than 0.50 D residual astigmatism a compromise.

#### ALIGNMENT TOOLS

There are numerous approaches to aligning the intended axis of placement for a toric IOL. This year's survey revealed that ink marking with the aid of manual axial instruments like RK and LRI markers or a Mendez gauge is the most popular choice for ESCRS doctors (37%), while 26% perform unaided ink marking at the slit lamp. The technology available to ensure proper placement continues to improve and evolve. This is clearly demonstrated by the fact that 23% or almost one-quarter of survey takers now employ digital image registration—an impressive 9% jump since the 2016 survey was conducted. Anatomical landmarks without preoperative marking is the method preferred by 11% of respondents and just 3% favor intraoperative wavefront aberrometry.

Precise and delicate corneal marking is important to ensure on-target outcomes in cataract surgery. Newer methods are continually being introduced, in clinical studies careful manual marking at the slit lamp has been shown to be quite accurate. Digital systems, however, are slightly more precise when it comes to placing the IOL at the steep meridian. Another advantage of digital systems lies in their ability to enhance workflow by avoiding certain extra steps. These platforms allow us to import the biometry image into the surgical microscope and match it up with the live image. Therefore, even if the eye moves during surgery the proper position will still be maintained. I favor using this approach. I will default to manual methods in the event of a low-quality biometry image.

#### **ROTATIONAL STABILITY, TOTAL CORNEAL ASTIGMATISM**

Surgeons understand that visual quality and acuity can be affected by rotational error; however, the amount at which this becomes an issue for patients varies widely from individual to individual. According to 56% of ESCRS membership, visual quality and degradation of visual acuity are significantly affected at 5 degrees or less; 40% reported their threshold to be 6 to 10 degrees; and 4% chose greater than 11 degrees being the point at which visual quality and quantity is negatively affected.

It has become widely accepted that total corneal astigmatism, including the contribution of the posterior surface of the cornea, is crucial to ensuring accurate visual outcomes. Three-quarters or 74% of ESCRS members account for posterior corneal astigmatism in toric power calculations.

#### **PREOPERATIVE MEASUREMENTS**

The ESCRS survey asked surgeons to identify the primary preoperative measurements, in terms of both power and axis, that drive their astigmatism decisions when implanting a toric IOL. The most significant measurement in the survey was optical biometry, with 76% and 67% of respondents choosing this method for power and axis, respectively. Scheimpflug tomography was next in order of importance, with 52% and 46% of respondents using that approach for power and axis, respectively, Placido disc topography followed at 34% and 32%, then manual keratometry at 21% for both power and axis. There were 16% and 14% of respondents who said they use OCT to measure power and axis, respectively, 7% and 5% use intraoperative aberrometry, and 2% fall into the "other" category for both power and axis.

In the past, we gave little thought to the eye's posterior surface in the context of astigmatism. We would measure the anterior surface with keratometry, topography, or both. Now we know that the posterior surface plays a role in total astigmatism. Current nomograms and online calculators allow for a correction factor to account for this. In some irregular eyes, however, it is better to measure total corneal astigmatism. OCT tomography images of the cornea are known to be more precise than those acquired with Scheimpflug technology in these situations. I believe this trend toward OCT biometry and total keratometric power will continue. I still do corneal topography using a Placido-based system to rule out irregular astigmatism. Many of today's high-resolution OCT platforms provide corneal maps that allow us to confidently determine irregularity. Over the next few years, I expect our use of Placido-based systems to continue to decline.



## **Presbyopia-Correcting IOLs**

by Francesco Carones

Patients seeking presbyopia-correcting IOLs are very motivated and committed to achieving spectacle-independence plus they are paying an extra fee. Therefore, it is crucial surgeons strive to achieve a plano result. We also know that PC-IOL technology is much more sensitive to the visual effect of any residual refractive error compared with a monofocal implant, making it even more critical that they are as close to plano as possible.

#### LENS CHOICES

In the presbyopia-correcting IOL (PC-IOL) section of the ESCRS clinical practice survey, respondents said that 11% of their current cataract procedures involve this type of lens—a 4% increase since 2016. Further, 15% of current PC-IOL procedures are toric versus a spherical implant.

The breakdown reveals that 7% are bifocal IOLs, 58% trifocal, 31% extended depth of focus or EDOF-type IOLs, 3% accommodating, and 2% other. The year-over-year trends show that the use of bifocal IOLs has consistently declined since 2016, from a high of 34%. Other trends were less linear, with trifocals accounting for 39% of procedures among the respondents in 2016, 45% in 2017, 56% in 2018, and hitting a high of 62% in 2019, before declining to 52% in 2020, and 58% in the most recent results. EDOF lenses comprised 16% of procedures in 2016, increasing to 22% the next year, then dropping to 19% in 2018. The proportion for this category was 20% in 2019, reaching a high of 33% in 2020, and then down slightly to 31% in the most recent report. The category of accommodating IOLs has remained stable at 3% since 2020. When enhanced monofocals are added to the mix, that category comprises 11% of procedures.

### "The agreement I make with patients is that I will do whatever I can to achieve the greatest amount of spectacle independence."

When it comes to PC-IOL technology, I explain to patients that the two main categories are increased range of focus IOLs like EDOF technology and what we call full range of focus such as trifocal or trifocal-like implants. My use of the two categories is about evenly split. Overall, I use PC-IOLs in about 85% of my lens replacement patients. My third choice is the enhanced monofocal IOL category which I use in patients who have a contraindication to PC-IOL technology such as macular pathology or for those who do not want to risk of any compromise to their nighttime quality of vison.

#### **HURDLES TO WIDER ADOPTION**

Surgeons biggest hurdles when it comes to performing more PC-IOL procedures are cost to the patient, noted by 58% of respondents; concern over nighttime quality of vision, which 53% of survey takers said was a potential problem; and the loss of contrast visual acuity, a worry expressed by 39%.

Based on the type of IOL, respondents were asked about the likelihood of functionally significant visual aberrations at night occurring in patients with no residual refractive error and a healthy ocular surface. The highest likelihood was 6% for trifocal patients while patients with monovision and two monofocal IOLs had the lowest expected likelihood of nighttime dysphotopsia at 2%. The survey also asked about the chances that a residual cylinder of 1.00 D or less would have an adverse impact on satisfaction and visual quality; 90% said bifocal or trifocal patients were likely to have issues with that amount of cylinder, and 91% said EDOF patients would potentially have decreased satisfaction and visual quality.

With PC-IOL technology there is a compromise between spectacle independence and the quality of night vision. For this reason, I use the issue of dysphotopsia as the starting point when determining the appropriate lens choice. I let patients know we need to decide which is more important to them, crisp, quality vision at night or spectacle independence. If dysphotopsia is a not a major concern, I recommend full range of vision technology (trifocal and trifocal-like lenses). Otherwise, an increased range of focus is likely the better choice (EDOF and EDOF-like lenses). If patients are extremely concerned about night vision, then a monofocal plus IOL is the only option, with a strategy for increasing near vision by leaving one eye slightly myopic. I find it very beneficial to set the expectation with patients receiving full range of focus IOLs that the night dysphotopsia will never go away. They must understand this is a consequence of the choice, not a complication.

The rule of any refractive surgery is to measure vision in 20/ happiness and not 20/20. Some patients with small amounts of residual astigmatism will be perfectly happy. For any patient who is not satisfied, however, I will perform an enhancement or touchup procedure regardless of the amount of refractive error and assuming there are no contraindications. The agreement I make with patients is that I will do whatever I can to achieve the greatest amount of spectacle independence.

#### FUTURE PRESBYOPIA-CORRECTING TECHNOLOGY

Turning to the future, respondents chose the presbyopia-correcting technologies they are most interested in integrating in the next 5 years. The most popular response was extended range of vision multifocal IOLs, chosen by 66%; followed by trifocal/quadrifocal IOLs at 48%; shape-changing IOLs at 20%; light-adjustable IOLs at 18%; and presbyopia femtosecond ablations at 14%.

The holy grail of presbyopia correction is a true dynamic accommodating IOL that mimics the crystalline lens. Until that time comes, I am most interested in emerging developments like femtosecond technology that can change the IOL's profile once it is in place.

Presbyopia femtosecond ablations

14%

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### **Glaucoma Management & MIGS**

by Simonetta Morselli, MD

n the ESCRS 2021 Clinical Trends Survey, respondents reported seeing an average of 26 glaucoma patients per month. They estimate that an average of 11% of cataract patients have glaucoma. Further, compliance is a big concern in the management of the condition, with 24% of patients currently prescribed one or two medications to control their glaucoma not adhering to their regimen. The number increased only by 1% for patients not compliant on a treatment schedule that included more than two pharmaceuticals.

#### **COPING WITH NONCOMPLIANCE**

In our practice, we find about 30% of new patients are not compliant with their medication regimen. When patients are first diagnosed, they are often anxious and fearful, so we do not go into a lot of detail about adverse outcomes at that time to avoid making them more frightened. When they return for follow-up, however, and we find we are not getting the results we expected because patients are not adherent, then we stress the importance of applying the drops. We explain exactly how to make sure they properly instill the medication, and we use much stronger language to emphasize the perils of not sticking to their regimen. We mention vision loss and blindness as consequences to non-adherence and find that afterwards only about 3% to 4% remain noncompliant with treatment.

"In our practice, we have a high rate of success in patients with cataracts and mild to moderate glaucoma who have a MIGS procedure."

#### MIGS

Turning to the minimally invasive glaucoma surgery (MIGS) category of procedures, ESCRS delegates report that 15% of cataract surgery patients, currently on topical therapy for glaucoma, are candidates for a MIGS device. Almost half currently use or plan to offer MIGS in the next 12 months. The breakdown of respondents performing glaucoma surgery—including MIGS or laser procedures—was 26%, 13% for those who perform laser only, and 11% who do surgery only. The remaining 50% of respondents indicated that they have a medical glaucoma practice. When broken down by length of time in practice, 70% of respondents in practice 5 years or less have only a medical glaucoma practice. Interestingly that percentage declines as years in practice increase. Only 12% of doctors in practice 5 years or less utilize all glaucoma procedures, but 40% of those practicing for 20 years or more do.

When we decide that a patient is suitable for MIGS, we select the appropriate procedure for that individual. The type of glaucoma is a factor in the choice of approach. For example, in a patient who is on one medication, a trabecular MIGS combined with cataract procedure can be enough to control the pressure. If the patient is on the maximum medication (ie, four drugs) and IOP is not controlled or there is visual field loss, we may choose a perforating MIGS intervention. We use a MIGS procedure in about 50% to 60% of patients. Prior to surgery we identify the appropriate target pressure for a patient and use that goal in our management postoperatively. We also continue to compare visual fields.

In our practice, we have a high rate of success in patients with cataracts and mild to moderate glaucoma who have a MIGS procedure. We do not compromise our surgical goal; we customize our approach for each patient as needed based on disease severity. We are sure to reserve the option of other possible interventions if the first choice is not enough to maintain target IOP and keep the visual field stable. For example, we start with angular surgery, ab interno canaloplasty/trabeculotomy, ab interno trabeculotomy with excimer laser, or ab interno high-frequency deep sclerotomy. The next step up would be a MIGS stent or shunt, and finally classical trabeculectomy, with the use of high-intensity focused ultrasound photocoagulation to treat terminal glaucoma (e.g. neovascular glaucoma).

#### **TIMING OF INTERVENTIONS**

The survey found that when it comes to initiating surgical intervention in glaucoma patients, 44% do surgery after three medications and 16% perform laser at that stage. Eighteen percent of respondents do surgery after two medications and 22% laser. After a first-line medication, only 6% would choose to do surgery and 21% would add laser treatment. Twelve percent of delegates perform laser as first-line treatment and only 3% surgery as first line. Of this group, 30% do not perform surgery and 29% do not do laser procedures. Interestingly, the survey revealed that almost 80% of delegates believe that implantable sustained release devices will address patient compliance issues, improve treatment time frames, and visual outcomes overall.



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### **Ocular Surface Disease**

by Beatrice Cochener

he 2021 ESCRS membership survey found that respondents see an average of 41 patients with dry eye disease per month; of these patients, 45% have a component of meibomian gland dysfunction (MGD) to their condition. Further, it is estimated that 20% of cataract surgery patients who present as asymptomatic for any ocular surface disease prior to surgery develop symptoms postoperatively.

According to the survey results, 61% of respondents systematically check the ocular surface in all laser vision correction patients and fewer than half, 45%, do so in their cataract surgery patients before the procedure. Five percent of members rarely or never systematically check the ocular surface before cataract or refractive surgery.

#### **MGD COMMON, PREVALENT**

My colleagues and I conducted a study that found the prevalence of MGD prior to cataract surgery to be more than half of patients, with 3% having severe atrophy. Just under half were not symptomatic, but about 40% will present with functional symptoms postoperatively. Given these values and knowing that dry eye is the main postoperative complication, it is important to carefully evaluate the ocular surface of all patients before surgery, regardless of symptoms.<sup>1</sup>

Because so many dry eye syndromes will be revealed only after surgery, patients must be informed of this potential aggravation induced by the procedure. Otherwise, they will attribute this postoperative dry eye, visual fluctuations, and subsequent inadequate results to the surgery and IOL implantation. It is worth noting that at the time of cataract surgery, evaporative dryness is the dominant feature in the form of meibomian dysfunction. However, the focus should not be exclusively on the lipid layer but on the entire ocular surface.

#### **USE OF DIAGNOSTICS**

ESCRS members were asked about the type and timing of their diagnostic tests before surgery. On a case-by-case situation, as decided during the consultation, 73% perform Schirmer testing, 66% do meibomian gland expression, and 55% look at fluorescein staining/tear break-up time (TBUT). At the initial point of care, 42% measure fluorescein staining/TBUT, 11% administer a dry eye questionnaire, and 15% utilize meibomian gland expression.

Respondents key common objection to the use of advanced tear film diagnostics is the cost to the surgeon, noted by 34%, followed by the lack of health system payment for the technologies, 32%, and limited access, 27%.

Assessing the ocular surface on a systematic basis does not require the use of sophisticated meibography platforms. Looking carefully at the conjunctiva, the cornea, pressing the eyelids, and evaluating the adnexa without forgetting the facial skin is the first step. We must continue to emphasize the key value of a well-used drop of fluorescein evaluated over 1 min, which provides information on the stability of the tear film, the corneal alteration in terms of epithelial regularity or keratitis, as well as conjunctival marking. While TBUT remains the reference standard, it is now understood that Schirmer testing, particularly in the area of Sjögren syndrome, and indocyanine green testing are the domain of clinical research protocols. In the field of surgery, we must emphasize the importance of looking at the lability of the topography or aberrometry images, whose fluctuations reflect the instability of the tear film. Tear film instability will lead to erroneous measurements during surgical planning, such as IOL power calculations, in particularly for toric lenses. Overall, a lot of information can be obtained with everyday tools.

#### **THERAPEUTIC CHOICES**

Beyond artificial tears and lid hygiene, the main therapies and treatments for managing moderate dry eye according to the respondents are topical corticosteroid, oral omega-3 supplements, and ciclosporin. For those patients with severe dry eye, the top treatments are ciclosporin, topical corticosteroids, punctal occlusion, and oral omega-3s. For MGD management, ESCRS members most commonly employ conventional/commercial warm compresses followed by meibomian gland probing.

The current range of treatments for the ocular surface is so wide that it can lead to confusion. One must try to adopt a hierarchical strategy and if possible, target the cause. Each patient will have a different response, sometimes requiring trial and error to define the optimal personalized treatment. Finally, it is necessary in all cases to spend time on therapeutic education, which allows the patient to understand that there is no cure for their condition, and they require long-term treatment.

#### HAVE AN ALGORITHM

Schematically, in patients with an unstable tear film or a slight keratitis with or without symptoms, high-quality, enriched, viscous lubricants are recommended. When the ocular surface disease persists after 1 month of treatment or is symptomatically moderate or severe, the introduction of an anti-inflammatory treatment, such as steroid, ciclosporin, or autologous serum may be discussed. In this situation, the cataract procedure should be postponed and only be considered after ocular surface optimization, with particular vigilance in the postoperative treatment.

In the context of cataract surgery, it is especially critical to pay attention to MGD since it frequently represents the cause of ocular surface disease. After confirming the diagnosis and grading MGD severity, the principal treatment are warm compresses and lubricating eye drops to restore the deficient lipid layer. Here again, patients must understand that the condition is chronic, and treatment benefits are often not immediate. It is recommended to prepare the ocular surface for surgery by initiating these treatments to ensure an optimized surgical result and to make the patient aware of the importance of the ocular surface.

1. Cochener B, Cassan A, Omiel L. Prevalence of meibomian gland dysfunction at the time of cataract surgery. J Cataract Refract Surg. 2018;44(2):144-148. doi: 10.1016/j.jcrs.2017.10.050.



#### Symptomatic vs asymptomatic cataract patients with OSD among ESCRS Clinical Trends Survey respondents, by year.



#### What are your objections to incorporating advanced tear film diagnostics into your practice? (Select all that apply.)

Cost to me Technologies not paid for by health system Limited access to technologies Increase my chair time Safety and efficacy — I do not see any differences None, I use advanced tear film diagnostic in my practice Practice flow disruption





- MGD Conventional/commercial warm compresses
- · Meibomian gland probing

of delegated routinely recommend preservative free ocular pharmaceuticals.

#### Timing of diagnostic testing:

On a case-by-case situation, as decided during the consultation: 73% Schirmer's 66% Meibomian gland expression 55% Fluorescein staining/tear break-up time

At the initial point of care: **42%** Fluorescein staining/tear break-up time 11% dry eye questionnaire 15% Meibomian gland expression

**Top therapies and treatments** for managing the following (beyond artificial tears and lid hygiene):

- Moderate dry eye Topical corticosteroid
- Oral omega-3
- Ciclosporin

### Severe dry eye

- . Ciclosporin
- Topical corticosteroid . · Punctal occlusion
- · Oral omega-3



